

IBM Application Performance Analyzer for
z/OS
15.1

User's Guide



Note

Before using this information and the product it supports, be sure to read the general information under [Notices](#).

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This edition applies to IBM Application Performance Analyzer for z/OS 15.1 (5755-A04) and to any subsequent releases until otherwise indicated in new editions. Make sure you are using the correct edition for the level of Application Performance Analyzer.

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About this document

This document describes IBM Application Performance Analyzer for z/OS®15.1 and any subsequent releases until otherwise indicated in new editions.

For the latest Application Performance Analyzer PTF information, see <https://www.ibm.com/support/pages/node/341647>.

Appendix A contains information about IBM Web sites that can help you answer questions and solve problems.

IBM Application Performance Analyzer for z/OS (also referred to as Application Performance Analyzer) is a tool you can use to analyze the performance of user applications throughout the design, development, and maintenance cycle.

If you need to install Application Performance Analyzer, refer to the Application Performance Analyzer *Program Directory* for installation instructions.

Documentation conventions

The following table describes typographical conventions used throughout this document:

Convention	Explanation
boldface	Indicates a command or keyword that you should type exactly as shown.
<i>italics</i>	Indicates a variable for which you should substitute an appropriate value.
monotype	Indicates literal input and output.
Ctrl + D	Indicates two or more keys pressed simultaneously.
[]	Brackets surround an optional value.
	Vertical bars separate alternative values from which you must make a selection.
...	Ellipsis indicates that the preceding element can be repeated.

Changes introduced with IBM Application Performance Analyzer for z/OS 15.1

Read the following sections to learn the new and enhanced capabilities of IBM Application Performance Analyzer for z/OS 15.1. For more information about the enhancements and fixes that are available as continuous delivery APAR updates, see [Latest Application Performance Analyzer for z/OS Service Information](#).

Version 15.1.3

Enhancements to started tasks, sampling, exits, intercepts, and reporting include:

- New system reports showing CPU consumption metrics of system-wide address spaces
 - Z01 System CPU Usage by Jobname
 - Z02 System CPU Usage by ASID
 - Z03 System/Target CPU Usage Timeline
- Enhancements to S01 report, including:
 - Information regarding zIIP, zCBP and Enclave CPU
 - Display for CP and zIIP multithreading mode
- Additional compatibility support:
 - Db2 13
 - IMS 15.3

Version 15.1.0

Enhancements to started tasks, sampling, exits, intercepts, and reporting include:

- CICS Program name filtering
- New Db2 SMF reports
 - F30 Db2+ (SMF) Class 3 Wait Times (Was previously F20)
 - F31 Db2+ (SMF) CPU/Elapsed Times
 - F32 Db2+ (SMF) SQL Activity
 - F33 Db2+ (SMF) Buffer Pool Stats
 - F34 Db2+ (SMF) Locking Activity
- New Java reports - GC and Heap
 - J18 Java Garbage Collection Stats
 - J19 Java Heap Object Report
- Support for NATURAL / Adabas zIIP offload and Natural Optimized Compiler (NOC)
- JSON report download
- Sampling Rate Display on R03
- Checkpoint merge utility
- System Symbol support in Listener / Common Server
- Additional compatibility support:
 - z/OS 2.5
 - IMS 15.2

- MQ 9.2
- Adabas – all supported versions up to and including 8.5.x
- Natural – all supported versions up to and including 9.1.x

Enhancements specific to the plugin that include:

- Java 11 compatibility
- Eclipse 2022-03 compatibility
- Windows 11 compatibility

Chapter 1. Using Application Performance Analyzer/ISPF

Application Performance Analyzer/ISPF is the main interface to Application Performance Analyzer. It is used for submitting new observation requests, and for navigating the Performance Analysis Reports generated from observation requests. This chapter describes the Application Performance Analyzer/ISPF environment in general, how to submit observation requests, and how to navigate the reports.

Almost all panels in Application Performance Analyzer/ISPF are implemented as interactive reports. The first screen displayed when entering Application Performance Analyzer, “Observation Session List” follows the same rules and conventions as the Performance Analysis Reports.

For information about ...	See ...
Commands used to navigate ISPF reports.	“ISPF reports: navigation and control” on page 1
Application Performance Analyzer's main entry panel: the observation session list.	“R02 - Observation session list” on page 7
Accessing and using the performance reports menu.	“R01 - Application Performance Analyzer performance reports menu” on page 12

ISPF reports: navigation and control

You navigate and control Application Performance Analyzer/ISPF reports using two types of commands:

- Primary commands - commands that you type on the command line
- Line commands - commands that you type directly in input fields in the body of the report

Scrolling

The vertical and horizontal scrolling commands you are familiar with from using most ISPF applications are applicable when viewing Application Performance Analyzer reports. Use UP and DOWN (PF7 and PF8) to scroll towards the top and the bottom of the report. You can scroll Maximum, Half, a specific number of lines and by cursor position.

Similarly, use LEFT and RIGHT (PF10 and PF11) to scroll the report horizontally.

Report headings

Many reports present information in a tabular format in rows and columns. The table begins with one or more heading lines, which contain title fields for each of the columns. These heading lines will “lock” to the top of the report viewing area and the vertical scrolling commands will affect only the data lines.

Action (menu) bar

Report navigation primary commands can be displayed by selecting “Navigate” on the action bar menu or can be typed directly on the command line. The action bar menu can be removed from the display by entering the PREF command, and de-selecting the “Action Bar Visible” option.

File View Navigate Help

Retaining open reports

Once you have opened and viewed reports, they can be retained for later viewing. Application Performance Analyzer provides this feature so that multiple reports (from multiple observation requests, if desired) can be readily available for viewing without re-generating the reports. You can navigate through all the open reports using the WIN and JUMP (PF4) commands. Reports are retained when you exit them using the CANCEL (PF12) command.

Displaying HELP

For information about the report currently being displayed, position the cursor in the body of the report (not on an input field), and press PF1. Pressing PF1 on an input field will display specific information about that field.

Primary commands for report navigation

The following is a list of the commands used to navigate reports and explanations for using them:

WIN

You can use the WIN (WINDOW) command to display a selection list of open reports in a pop-up panel. From that panel, you can make a selection to jump to the selected report. The main Observation Session List panel will be the report listed at the top of the selection list, so you can use WIN to quickly get back to this panel rather than navigating through all your open reports.

JUMP (PF4)

You can use the JUMP command, or the PF4 key, to jump to another open report. Each time you issue a JUMP request, Application Performance Analyzer will skip to the next open report, on a rotating basis.

END (PF3)

Use the END command, or the PF3 key, to return to the display of the previous report — the one from which the current report was launched. The END command will close (delete) the current report. Entering END from the Report Selection Menu will exit the Application Performance Analyzer Performance Reporting Facility.

CANCEL (PF12)

Use the CANCEL command, or the PF12 key, to return to the display of the previous report — the one from which the current report was launched. The CANCEL command will leave the current report open. You can return to it any time using the JUMP or WIN command. Entering CANCEL from the Report Selection Menu will exit the Application Performance Analyzer Performance Reporting Facility.

REPORT CODE

Once you have selected an observation session, you can enter a three character report code, even if you are not in the report menu. You can be viewing one report, and can immediately open an additional report by typing its code.

UP (PF7)

Use the UP command, or press PF7, to scroll vertically towards the top of the report.

DOWN (PF8)

Use the DOWN command, or press PF8, to scroll vertically towards the bottom of the report.

LEFT (PF10)

Use the LEFT command, or press PF10, to scroll the report horizontally to the left.

RIGHT (PF11)

Use the RIGHT command, or press PF11, to scroll the report horizontally to the right.

FIND

The FIND command (abbreviation “F” can be used) finds all occurrences of a text string. It is similar to an ISPF FIND command, but does not have all the features. All occurrences of the target text string will be highlighted. To remove the highlights, enter the RESET command.

RESET

The RESET command removes the highlights set by the FIND command.

PREF

Use this to set preferences for General Display Settings. Put a slash “/” beside an option to select it. The available options are:

1. Action bar visible on panels
2. Use 3270 graphic characters
3. Show command line in pop-up panels
4. Show long descriptions on multiple lines
5. Suppress use of special +/- character

CONNECT

Only available on the R02 Observation Session List screen. If your installation has multiple Application Performance Analyzer instances running, you can change which one your ISPF session is connected to by typing CONNECT followed by the Application Performance Analyzer identifier. You can use the VER command to view which Application Performance Analyzer instances are currently running on the same z/OS image that you are logged in to.

VERSION

Only available on the R02 Observation Session List screen. Type VERSION or VER and a list of the Application Performance Analyzer started tasks are displayed, along with their version numbers, and when they were started.

You can enter SELECT on the command line of the Started Tasks List panel to connect to a different Application Performance Analyzer started task. The format is ‘SELECT stcid’, where stcid is the value from the ‘Stc Id’ column of the started task you want to connect to. When a valid, active started task is selected, the R02 Observation Session List automatically connects to the specified started task when you exit the VERSION dialog. "S" and "SEL" are aliases of SELECT.

SELECT

Available on the R02 Observation Session List screen. This command starts Performance Analysis Reporting for the selected request number. Specify a request number of a valid request after the command, such as SELECT 1234. The selected request number must contain an observation file. "S" and "SEL" are aliases of SELECT.

SETUP

Use the SETUP command to filter information and select options for reports. This command is useful for reducing the size of reports by removing information that is not critical. The options available using the SETUP command vary by report. You can get more details from the report descriptions.

HIDE

Only available on the R02 Observation Session List screen. Type HIDE to remove the list of commonly used Application Performance Analyzer primary commands from view.

SHOW

Only available on the R02 Observation Session List screen. Type SHOW to redisplay the list of commonly used Application Performance Analyzer primary commands at the top of the screen.

IMPORT

Only available in the R02 Observation Session List screen. Use the IMPORT command to load a sample file, or an exported hierarchy of observations. This can be a native Application Performance Analyzer sample file, or one that has been previously exported using the EXP or EXPH command and is in TSO XMIT format. The IMPORT command displays a pop-up window to enter the fully qualified data set name of the native sample file or TSO XMIT file, and to indicate if that original file is to be deleted after import. A new request description can be optionally entered.

During IMPORT, Application Performance Analyzer creates a new observation, assigns a new request number, and, if provided on the IMPORT pop-up window, adds the description to the imported observation. If a hierarchy is being imported, new request numbers are provided for all observations in the hierarchy. If indicated, Application Performance Analyzer will delete the original files. The date and time of the imported request is set to the current date and time, and the expiry date is recalculated based on the rules of the importing system.

Line commands for report navigation

You enter a line command directly in an input field in the body of a report. The line commands are usually typed directly over the text of the field, such as a column heading, or a data field in the report. Input fields where you can enter line commands are always underlined.

Many of Application Performance Analyzer's performance analysis reports contain input fields on which you can enter various line commands. Generally, you can enter line commands on quantified detail lines on the field under the "Name" heading.

The allowable line commands vary depending on the type of detail line. But, in all cases by entering "/" you can request the display of a Context Menu, which will present a list of the allowable line commands for that input field. The generally available line commands are summarized here, followed by details about each command.

- / Display context menu
- ? Display context help information
- + Expand
- ++ Show additional details (or just press the Enter key as a shortcut)
- - Collapse
- SV Sort by value
- SN Sort by name

"/" Context menu

Enter a slash "/" to display a context menu in a pop-up panel. The context menu lists the line commands that are available for that field. In addition, you are able to select the line command function directly from the context menu.

A sample context menu is shown below:

Enter S to select a function from this menu. The line command (Yellow) can also be entered on the main panel.

<u>Sel</u>	<u>To Perform the Following</u>	<u>LineCmd</u>
_	display context help information	?
_	show additional details about this line	++
_	expand to reveal next level entries	+
_	collapse to hide next level entries	-
_	sort next level entries by value	SV
_	sort next level entries by name	SN

"?" HELP

For context help information about the field, or report line, enter a question mark "?". Alternatively, you can press the PF1 key with the cursor positioned on the input field.

"+" Expand

Enter a plus sign "+" on a report detail line to expand the report to reveal additional detail lines which are at the next hierarchical level under the selected line. This offers a means of breaking down one quantified item into greater detail.

For example, consider the following line item which quantifies CPU time in System/OS Services:

<u>SYSTEM</u>	System/OS Services	44.30	=====
---------------	--------------------	-------	-------

Type a plus sign in the name field – SYSTEM:

<u>±SYSTEM</u>	System/OS Services	44.30	=====
----------------	--------------------	-------	-------

Press the ENTER key and the item will be expanded as illustrated here:

<u>SYSTEM</u>	System/OS Services	44.30 =====
→ <u>SVC</u>	SVC Routines	42.14 =====
→ <u>MVS</u>	MVS System	2.06 ==
→ <u>NUCLEUS</u>	Nucleus Modules	0.06
→ <u>IMS</u>	IMS Subsystem	0.03

The plus sign (+) entered on the Name heading field will fully expand the entire report to show the full hierarchy of detail.

The plus sign (+) entered on the Description heading will expand the width of the description field. The plus sign (+) entered on the heading for the scale (histogram) will 'zoom in' the scale.

You can also use this line command in the “+n” format , where “n” is the number of levels to expand. On the Description heading, this allows you to expand the width of the description field by a specific number of characters, for example “+12” will widen the field by 12 characters.

“++” Additional details

Enter “++” on a report detail line to display detailed information about the selected item. A pop-up panel will appear in which this information is displayed. The nature of the information displayed in these pop-up panels varies widely depending on the type of item selected.

Note: As a shortcut, you can also simply press the Enter key on an item, it will be treated as if you had entered “++”.

As an example, consider the I/O Analysis by DDNAME report:

```

File View Navigate Help
-----
D02: DASD Usage Time by DDNAME (0723/TSTJOB01)          Row 00001 of 00003
Command ==> _____ Scroll ==> CSR

DDName>Cyl   Volume>Unit   Percent of Time * 10.00% ±1.6%
                *....1....2....3....4....5....6....7....8..
VSA1-02      BKNSM2      31.16 =====
OUTFILE      BKNSM2      1.16 ==
INFILE       BKNSM1      0.05

```

Additional detail about the DDNAME VASM1-02, for example, can be displayed by typing ++ (or just pressing Enter) in that field:

```

File View Navigate Help
-----
D02: DASD Usage Time by DDNAME (0723/TSTJOB01)          Row 00001 of 00003
Command ==> _____ Scroll ==> CSR

DDName>Cyl   Volume>Unit   Percent of Time * 10.00% ±1.6%
                *....1....2....3....4....5....6....7....8..
++AM1-02     BKNSM2      31.16 =====
OUTFILE      BKNSM2      1.16 ==
INFILE       BKNSM1      0.05

```

A pop-up panel with detailed information will appear. (This pop-up panel is scrollable, more information is available by scrolling down with PF8):

```

File View Navigate Help
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| VSAM1-02      BKNSM2      31.16 ===== |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

Calculation Details
The 31.16% quantification represents 1,174 measurements
of DASD I/O unit activity for the DDNAME VSAM1-02 from
a total of 3767 overall measurements. This is the
percentage of the measured run time I/O
was observed for this dataset.

VSAM file VSAM1(2) OPENed at 9:36:17.72 Wednesday Mar 24 2004

DDNAME          VSAM1
Open Intent      KEY,DIR,OUT
Dataset Name     USER1.DATA.TESTPF.DAT
Storage Class    BKNSMS
Device Type      3390
% Free Bytes in CI 10%          Initial      Last
Volume Serial    BKNSM2      CI Splits      0          0
CI Size          8,192      CA Splits      0          0
Record Size (LRECL) 80      Logical Records 1          3,641
Number of Extents 1          Deleted Records 0          1
SHAREOPTIONS      (1 3)      Insrted Records 0          0
Organization      KSDS      Retrved Records 0          1
CIs per CA        78          Updated Records 0          0
Free CIs per CA    11          Byter Free Space 1,908,736 1,622,016
Free Bytes per CI  819          Number of EXCPs Z          Z,ZZZ
% Free CIs in CA   15%
Strings           1
DATA Buffers      0
INDEX Buffers     0

Index Component of VSAM1(2)

```

“-” Collapse

Enter a minus sign “-” on a report detail line to collapse (hide) all items under the selected line which are at the next hierarchical level of detail.

The minus sign entered on the Name heading field will collapse the entire report so that only items in the first level of the hierarchy are visible.

The minus sign entered on the Description heading will reduce the width of the description field.

The minus sign entered on the heading for the scale (histogram) will “zoom out” the scale.

“SV” Sort by Value

Enter “SV” to sort detail lines by value. When this is entered on a detail line, detail lines under the selected line – at the next hierarchical level – will be sorted by value. Entering the “SV” command repeatedly will toggle between sorting in descending and ascending values.

Enter “SV” on the 'Name' heading field to sort the first level items by value.

“SN” Sort by Name

Enter “SN” to sort detail lines by name. When this is entered on a detail line, detail lines under the selected line – at the next hierarchical level – will be sorted by name.

Entering the “SN” command repeatedly will toggle between sorting in descending and ascending names. Enter “SN” on the "Name" heading field to sort the first level items by name.

Note: The line commands listed above are not a comprehensive list of all that are available in the various reports. See the documentation for each report, or enter a “/” to get a context menu in any input field in any report.

R02 - Observation session list

When you start Application Performance Analyzer/ISPF, the Observation Session List panel is displayed. A list of commonly used primary commands is displayed at the top of the screen to assist those users new to Application Performance Analyzer. Once you become familiar with the Observation Session List, these commands can be hidden from view by entering the HIDE primary command. They can be redisplayed by entering the SHOW primary command.

This panel displays a scrollable list of all the observation session requests, whether they are complete, active, or pending. The list is usually filtered by the owner ID, so each user would only see their own requests. The list can also be filtered by Job Name. The SETUP command is used to specify how the list is to be filtered. When filtering is used to limit the observations which are displayed, the filter will be displayed beneath the appropriate heading.

Note: Although it is not started from the Report Selection Menu, the Observation Session List panel is implemented as a report, and, therefore, follows the same conventions as the Performance Analysis Reports panels.

A sample Observation Session List panel is shown here:

File View Navigate Help

R02: Observation Session List (CAZ0)Row 00078 of 00810

Command ==>Scroll ==> CSR

NEWTo define a new measurement

TNEWTo define a threshold measurement

CONNECTTo connect to another instance of the measurement task

VERSIONTo display version information for all instances

IMPORTTo IMPORT a previously Exported sample file or hierachy

HIDETo remove these commands from the display (recommended)

/On top of any ReqNum to get a list of the line commands

Reqnum	Owned By	Description	Job Name	Date/Time	Samples	Status
01871	USER1		CICS22A	Jan-3 18:12	100	Ended
01870	USER1		CICS22A	Jan-3 18:11	100	Ended
01869	USER1		USER2	Jan-3 18:11	3,450	Cancel
01868	USER2		USER1	Jan-3 18:10	10,000	Ended
01867	+ USER1	repeat m-step a	CICS22A	Jan-3 18:07	100	STEPS
01866	USER1		USER1	Jan-3 18:08	10,000	Ended
01865	+ USER1	repeat m-step a	PFTEST11	Jan-3 17:55	100	STEPS
01864	USER1		USER1	Jan-3 17:56	10,000	Ended
01863	+ USER1	repeat m-step a	PFTEST11	Jan-3 17:54	100	STEPS
01862	USER1		USER1	Jan-3 17:54	10,000	Ended
01842	USER1		USER1	Jan-3 17:52	10,000	Ended
01803	+ USER1	repeat m-step a	PFTEST11	Jan-3 17:51	100	STEPS
01802	USER1	batch interface	USER1	Jan-3 17:46	5,000	Ended
01801	USER1		CICS22A	Jan-3 17:45	100	Cancel
01800	USER1	RT#2 (open/clos	PFTEST02	Jan-3 17:46	17,070	Cancel
01799	USER1		CICS22A	Jan-3 17:30	100	Ended
01798	USER1		CICS22A	Jan-3 17:30	1	Stoppd

This panel is used to initiate a new observation request, by using the “NEW” primary command, or the “NEW” line command (described in the next section). The “NEW” primary command and the “NEW” line command both cause the Schedule New Measurement panels to be displayed. For Threshold Monitor requests, use the “TNEW” primary command. For more information about Threshold Monitor requests, see [“Using the TNEW command” on page 40](#).

This panel is also used to access the Reports menu, by entering the “R” line command on the request number for which you want to generate Performance Reports. The “NEW” and “R” commands are the most commonly used commands on this panel, and provide access to the primary functions of Application Performance Analyzer: submitting Observation Requests, and generating Performance Reports for a completed Observation Request.

Input fields

The inputs fields on this report are the ReqNum title field, and all the request number detail lines under it. The request number detail line input is described below in the section [“Description of detail lines”](#) on page 8.

You can type the following line commands directly on to the ReqNum title field:

- “?” Display context help information
- “+” Expand to reveal next level entries for all observations
- “-” Collapse to hide next level entries for all observations
- “SR” Sort report detail lines by Request Number
- “SJ” Sort report detail lines by Job Name
- “SD” Sort report detail lines by date/time
- “SO” Sort report detail lines by Owned By
- “SW” Sort lines by expiry days warning (only when expiry days warning is enabled)
- “SK” Sort lines with no delete date (only when expiry days warning is enabled)

Description of detail lines

Each detail line shows the following information about the observation session:

Request Number

This is the unique 5-digit request number assigned to identify the observation session. This is also an input field which accepts line commands. Type the line command directly on top of the request number. If the request number has a “+” beside it, this indicates that there are subsequent entries underneath this one. The line commands accepted in the Request Number field are as follows:

“/”

Display context menu.

“?”

Display context help information.

“++”

Show additional details about this request in a pop-up window. As with all reports, you can also press the Enter key instead.

“+”

Expand to reveal next level entries. This is used for multi-step, repeat schedule, USS, threshold and collateral Db2® requests. When there is next level entries available, a “+” will appear beside the request number.

“-”

Collapse to hide next level entries.

“D”

Delete the request.

“R”

Display performance analysis reports menu for this request, or start Realtime Monitor if request is currently active. When entered for parent observations of multi-step, repeat schedule, USS and threshold measurements, this will expand to reveal next level entries.

“S”

Select Reports or Realtime Monitor. When entered for parent observations of multi-step, repeat schedule, USS and threshold measurements, this will expand to reveal next level entries.

“T”

Tag up to 20 measurements at one time. Tagged measurements are used for variance reporting and CICS® multiple address space reporting. For variance reporting, use the “T” line command together

with the “V” line command, which you use to indicate the base measurement and launch variance reporting. For CICS multiple address space reporting, use the “T” line command together with the “R” line command, which you use to launch reporting for one of the CICS regions. In addition to the standard CICS reports, the specific CICS multiple address space reports are generated.

Note: Tagged measurements remain tagged only for the duration of the session.

“TR”

Create a new request to be Triggered when this request starts. This can only be used on a request that is in SCHED status.

“V”

Launch performance analysis reporting in a mode that enables access to variance reports. Use the “V” line command to compare a measurement previously tagged with a “T” line command. The measurement selected by the “V” line command is the base measurement in variance reports.

Note:

The report menu will be displayed in response to the “V” line command.

CAN

Cancel the request (request must be active).

CRAG

Cancel the RUNAGAIN count, specified in the “Times to repeat measurement” field of R03 Panel 8 when the request was created. This prevents any further measurements from being initiated automatically when the job is rerun. The request must not be in active or writing status.

KEEP

Keep this request until it is manually deleted. This overrides the auto delete feature.

MOD

Modify the request.

NEW

Create new observation request with the same attributes as this request.

The NEW line command will display the Schedule New Measurement panel with the input fields pre-filled with entries from the request on which “NEW” was typed. If you want an empty Schedule New Measurement panel, use the “NEW” primary command.

SUB

Create a new observation request with the same attributes as this request and submit it immediately. You use “SUB” instead of the “NEW” line command when you do not need to view or change any of the fields in the original request.

EXP

Export the sample file for this request to a file in XMIT format.

EXPH

Export the hierarchy of observations for this request, and all dependent requests under it, to a file in TSO XMIT format. All of the observations must have completed.

The request numbers can be displayed in different colors. Parent observations inherit the color of the most critical child. Expand the parent to see the color of the individual child observations. The colors that can be displayed are as follows:

Turquoise

The default color having no specific meaning

White

Indicates this observation has been 'tagged'.

Yellow

When the expiry days warning feature is enabled, indicates this observation will be automatically deleted in two or more days. Use the SW line command on the ReqNum heading to sort these observations by delete date. Use the KEEP command to prevent this request from being automatically

deleted. Users with administrator authority will see the yellow for all users' observations. All other users will see the yellow for their own observations only.

Green

When the expiry days warning feature is enabled, indicates this observation has no delete date or is marked 'Do not Delete'. Use the SK line command on the ReqNum heading to sort all these similar observations to the top of the list. Users with administrator authority will see the green for all users' observations. All other users will see the green for their own observations only.

Red

When the expiry days warning feature is enabled, indicates this observation will be automatically deleted within 24 hours. Use the SW line command on the ReqNum heading to sort these observations to the top of the list. Use the KEEP command to prevent this request from being automatically deleted. Users with administrator authority will see the red for all users' observations. All other users will see the red for their own observations only.

Owned By

This is the User ID of the “owner” of the request (the TSO ID of the user who created the request).

Description

This is the descriptive name of the observation session that was entered (optionally) when the request was made.

Job Name

This is the name of the job (or Started Task or TSO ID) that was measured.

Date/Time

This indicates the date and time of the completion of the measurement. If the measurement is not yet complete, the date and time when the request was made is shown.

Samples

If the session has a status of Ended or Active this is the number of observation samples done. If the observation session has not yet started (a status of “Sched” or “Future”) then this shows the number of observation samples requested. This field changes color depending on the status.

Status

This shows the status of the observation session:

- **Active** means the session is currently taking place.
- **Cancel** means the request was cancelled using the “CAN” line command.
- **Ended** means the session has completed.
- **ErrMsg** means the session was completed, but error messages are written during sampling. The sample file might be incomplete. Report S10 displays the error messages that are written during sampling.
- **Failed** means the request failed to complete normally, and did not create a valid sample file.
- **REPEAT** means that this is a repeating schedule request. The requests under this entry can be displayed by using the “+” line command to expand to the next level.
- **Sched** means the session has been scheduled but measurement has not yet been started.
- **STEPS** means that this is a multi-step request. The requests under this entry can be displayed by using the “+” line command to expand to the next level.
- **Stoppd** means the request was stopped for some reason, usually a CPU Usage control issue, look at report S01 and check for the CPU Usage Status field. It will be present if the request was stopped due

to CPU Usage controls. You can also use the “++” (or Enter key) line command directly on the request number field, and a reason will be shown in the detail window.

- **Tagged** means that this measurement has been tagged (with the “T” line command) for use in variance reports or CICS multiple address space reports.
- **Thresh** means that this is a Threshold Monitor request. The request under this entry can be displayed by using the “+” line command to expand to the next level.
- **Trig** means this request will be triggered when the corresponding scheduled request starts.
- **USS** means that this is a USS environment measurement. A separate measurement file is created for each spawned address space. Enter the “+” line command to expand this item to see each completed measurement.
- **MultJb** means that this is a multiple job request, created by entering a jobname with wildcards specified. The measurements under this entry can be displayed by using the “+” line command to expand to the next level.
- **IMS** means that this is an IMS Multiple Address Space (MASS) request. Enter the “+” line command to expand this item to view the individual IMS MPP region observations.

Note: A plus sign (+) that appears after the status means that this request will repeat if the target job runs again. This happens when the “Times to repeat measurement” field is specified, and the specified number of times has not been reached, or the optional specified time interval has not expired. Once the job has been rerun, or the optional time interval passes, the plus sign will disappear.

Sysid

The z/OS System id on which the measurement is executed.

Expiry Date

The date that the measurement will be deleted. If the measurement has no expiry date, “Do not Delete” will be displayed.

Duration

The elapsed time of the measurement.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window is shown here:

File View Navigate Help

General

Request Number	1946
Request Description	No Description entered
Request Status	Ended
Owner Id	USER1
Time of Request	Wednesday Jan 26 2005 11:01:57.13
Session Start Time	Wednesday Jan 26 2005 11:01:57.29
Session End Time	Wednesday Jan 26 2005 11:02:57.50
Session Duration	1 minutes, 0.21 seconds
Session Delete Date	Do not Delete

Measurement Criteria

Select by Job Name	CICS22A
Select by Sys Name	X235
Sample Interval	6000 microseconds
Duration	60 seconds

Measurement Information

Sample File DSN	0.USER1.R1946.CICS22A.SF
Samples Requested	10,000
Samples Done	10,000
ASID	005A

Data Extractors

CICS	Selected
IMS	Not Selected
IMS+	Not Selected
Db2	Selected
Db2+	Selected
MQ	Not Selected

R01 - Application Performance Analyzer performance reports menu

This panel is displayed as a result of entering the “R” line command to a line in the Observation Session List panel. It enables you to display Performance Analysis Reports for the selection observation session.

There are two distinct areas on this screen. The first, at the top of the screen, shows you a list of report categories. One of these categories is always highlighted (selected). The area at the lower half of the panel lists the available reports belonging to the highlighted (selected) category.

You can change the report category and hence change the list of available reports, by selecting a category by entering “S” beside the category, or by simply entering the single character code on the command line. You can then select a report from the lower portion of the screen.

As a shortcut, you can select a report directly by entering its three-character code on the command line. Note that if you are selecting by report code, it is not necessary to select the category to which the report belongs first, you can enter any three-character report code regardless of which category is currently highlighted. As a shortcut, you can also enter a report code on the command line while viewing a report, and that report will be opened, so it is not necessary to return to the report menu.

The most recently selected category persists from one session to the next.

This example shows the screen with Db2 Measurement as the currently selected category, note that if reports do not apply to the selected measurement, they category will be displayed in red, and will not be selectable.

```

File View Navigate Help
-----
R01: Performance Reports (1910/TSTJOB01)                      Row 00001 of 00008
Command ==> _____ Scroll ==> CSR

Select a category from the list below to view the available reports
A Admin/Miscellaneous      I IMS Measurement          E CICS Measurement
S Statistics/Storage       F Db2 Measurement         Q MQ Measurement
C CPU Usage Analysis       D DASD I/O Analysis       G Coupling Facility
W CPU WAIT Analysis        V Variance Reports        X Multi Address Space
J Java Measurement         B WebSphere App Server    H HFS Analysis
K SRB Measurement

-----

Enter S to make a selection or enter the report code on the command line

- F01 Db2 Measurement Profile          - F11 Db2 SQL CPU/Svc Time by Stmt
- F02 Db2 SQL Activity Timeline        - F12 Db2 SQL CPU/Svc Time by Plan
- F03 Db2 SQL Activity by DBRM         - F13 Db2 SQL Threads Analysis
- F04 Db2 SQL Activity by Statement    - F14 Db2 CPU by Plan/Stored Proc
- F05 Db2 SQL Activity by Plan         - F15 Db2 SQL CPU/Svc Time by Rq Loc
- F06 Db2 SQL Statement Attributes     - F16 Db2 SQL CPU/Svc Time by Enclav
- F07 Db2 SQL Wait Time by DBRM       - F17 Db2 SQL CPU/Svc Time by Corrid
- F08 Db2 SQL Wait Time by Statement  - F18 Db2 SQL CPU/Svc Time by Wkstn
- F09 Db2 SQL Wait Time by Plan       - F19 Db2 SQL CPU/Svc Time by EndUsr
- F10 Db2 SQL CPU/Svc Time by DBRM

```

The individual reports are described in the chapter [Chapter 3, “Performance analysis reports,”](#) on page [43](#).

Chapter 2. Entering observation requests

This section describes how to enter Observation Requests (measurements).

For information about ...	See ...
Initiating a new observation request	“Using the NEW command” on page 15
Entering job information	“Panel 1 – Job Information” on page 17
Specifying data extractors (CICS, Db2, IMS, MQ, Java™) or entering additional load libraries to search	“Panel 2 – Options” on page 21
Entering multi-step measurements	“Panel 3 – Multi-steps” on page 26
Selecting active jobs from a list	“Panel 4 – Active Jobs” on page 28
Specifying CICS or IMS transactions or Db2 stored procedures or user-defined functions	“Panel 5 – Subsystems” on page 29
Specifying Sysplex systems	“Panel 6 – Sysplex” on page 34
Entering a recurring future scheduled measurement	“Panel 7 – Schedule” on page 34
Additional options related to how the measurement is to be handled	“Panel 8 – Sched Options” on page 37

Entering an observation request

Using the NEW command

New observation requests are initiated from the Application Performance Analyzer Observation Session List panel (this is the panel where Application Performance Analyzer starts). You can use either the “NEW” primary command by entering it on the command line, or use the “NEW” line command by entering it on the request number field of an existing request. The “NEW” primary command will display the Schedule New Measurement panels with blank input fields. The “NEW” line command will display the Schedule New Measurement panels with the input fields pre-filled based on the existing request on which you typed the “NEW” command.

A sample Observation Session List panel with the “NEW” line command entered on the third request in the list is shown below.

File View Navigate Help						
R02: Observation Session List (0)						
Command ==> _____				Scroll ==> CSR		
Regnum	Owned By	Description	Job Name	Date/Time	Samples	Status
00200	USER1	CICS test 2	CICS22A	May-30 14:15	5,000	Ended
00199	USER1	VSAM TEST	PFTEST03	May-29 18:11	3,000	Ended
0NEW8	USER1	VSAM TEST	PFTEST03	May-29 18:11	2,998	Ended
00197	USER1		PFTEST03	May-29 18:10	4,349	Ended
00196	USER1		PFTEST03	May-29 18:07	3,801	Ended
00195	USER1	Loop with open/c	PFTEST02	May-28 18:08	20,000	Ended
00194	USER1	Loop with open/c	PFTEST02	May-24 17:55	20,000	Ended
00193	USER1	Loop with open/c	PFTEST02	May-24 17:56	5,000	Ended
00192	USER1		USER1PF1	May-22 17:54	3,019	Ended
00191	USER1		USER1PF1	May-22 17:54	10,000	Ended
00190	USER1	Loop with open/c	PFTEST02	May-22 17:52	20,000	Ended
00189	USER1	Loop with open/c	PFTEST02	May-20 17:51	20,000	Ended
00188	USER1	Loop with open/c	PFTEST02	May-9 17:46	20,000	Ended
00187	USER1	PF05	CICS22A	May-6 17:45	10,000	Ended
00186	USER1		CICS22B	May-5 17:46	10,000	Ended
00183	USER1	1000/60	ARAOSHOW	Apr-30 17:30	1,000	Ended

Using the MOD line command

If you need to modify a measurement request, you can use the “MOD” line command.

When issued on measurements that are pending, the “MOD” process uses the same panels as the “NEW” process, so all the information in this chapter applies to “MOD” and “NEW”. The “MOD” command can be used to modify future schedule requests, even if some of the generated future requests have run already.

When issued on measurements that are active or have completed, the “MOD” process allows you to change the **Description** field only.

Schedule New Measurement panels

After you have entered the “NEW” line command or “NEW” primary command, the Schedule New Measurement panel group is displayed.

The screens in the Schedule New Measurement dialog are divided into two sections. The top section is fixed and lists the available input panels. The current panel is highlighted. Each panel name is preceded by a symbol indicating if data has been entered to the panel. The symbol appears in green (green light) if data has been entered and is error free. A yellow or red light appears if there are warnings or errors in the data. The lower section of the screen is the input panel. It begins with an identifying heading.

Panel navigation

There are two methods you can use to JUMP from panel to panel:

- Type the panel number on the command line and press ENTER.
- Type a slash, immediately followed by the panel number in the first two positions of any input field.

These can be done in a single operation in combination with entry of input to the current panel. For example, you can enter input to Panel 1, place the cursor on the command line, type 2 and press ENTER. The entry to the Panel 1 input fields will be accepted and Panel 2 will appear. The same applies in this example if you type /2 in one of the data input fields. You must, of course, enter this on a field to which you are not specifying other input.

In some cases, automatic panel navigation occurs, for example, entering a jobname pattern will automatically take you to panel 4 to select from a list of active jobs based on that pattern.

Submitting the request

If you have entered enough data for a complete request to be submitted, “Input more data or ENTER to submit” will be displayed in the panel heading line. Pressing the ENTER key again will submit the request, unless you navigate to another panel to continue entering data.

There is a final confirmation prompt displayed before the request actually gets submitted. If you want to turn off this final confirmation prompt, use the `SETUP` command while you are in the R03 Schedule New Measurement dialog.

Primary commands

panel number

Enter a single-digit panel number to jump to that panel.

SUBMIT

Use SUBMIT to submit the request immediately and return control to the R02 panel.

JCL

Use JCL to display the JCL and control statements that could be used to request the equivalent measurement request as a batch job using CAZBATCH.

SETUP options

Use the `SETUP` command to specify various options affecting this dialog:

Prompt for confirmation before submitting ...

By default, this option is selected. Indicate if the final confirmation prompt is to appear or is to be suppressed.

Prompt for confirmation before returning ...

By default, this option is selected. Normally a warning message will appear when the END command (or PF3) is issued after data has been input. This is to warn that the input data will be discarded. Unselect this option to suppress the warning.

Translate CICS transaction ...

By default, this option is selected. CICS transaction codes entered to Panel 5 will be translated to uppercase. Deselect this option to suppress this translation of lowercase characters.

Suppress warning flags ...

By default, this option is not selected. Select to suppress display of the yellow warning symbols that appear to the left of input fields indicating a warning condition.

Panel 1 – Job Information

The R03 Schedule New Measurement dialog always starts with panel 1 (Job Information) selected, it is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00019
Command ==> _____ Scroll ==> CSR

  1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
  2. Options             4. Active Jobs     6. Sysplex        8. Sched Options
-----
Panel 1. Job Information

Job Name/Pattern . . . _____ ASID . . _____ PID . . _____
                        (Inactive)

Step Specification
  Step No. . . . . ____ Specify step number, program name,
  Program Name . . . _____ step name or step name + Proc step
  Step Name . . . _____ name. Use panel 3 to specify more
  ProcStepName . . . _____ than one step.

Description . . . . _____
Number of Samples . _____ Measure to step end . . . N
Duration (min:sec) . _____ Delay by (secs) . . . . . ____
Sampling Rate (/s) . _____ Retain file for (days) . . ____
Notify TSO User . . . _____ USS observations . . . . . Max. 20

```

The panel shown above was invoked with a NEW primary command, so input fields are mostly blank.

Panel 1 – input fields

Job Name/Pattern

This field is optional. Specify the name of the job, started task, or TSO region to be measured. Either one of Job Name/Pattern, ASID, or PID is required. You can also choose to specify any combination of the three.

Note: ASID and PID are not allowed when the Job Name/Pattern field contains a pattern or a dash ('-').

Searching for active jobs (*)

You can specify a job name pattern; for example, a job name prefix followed by an asterisk (*), a job name suffix preceded by an asterisk, or an asterisk by itself. The asterisk indicates that the region to be measured is currently active. A list of active jobs whose names match the wildcard pattern will be displayed in panel 4, where one or more can be selected for measurement.

Creating multi-job measurements (%)

You can specify wildcards in order to generate measurements for multiple jobs in one request. To sample multiple jobs in one request, use a percent (%) as a wild card character anywhere in the job name. Multiple percent characters may be used in the job name, such as %A%B% to sample any jobs with A and B in the job name separated by 0 to many characters. A job name that is 8 characters long might include a percent as the ninth character to signify sampling all jobs that contain the same 8 character job name. Panel 4 can be used to display the currently active jobs that will be sampled.

A job name pattern is only permitted in NEW or MOD requests. It is not valid for Threshold or Trigger requests. You can not specify a jobname pattern of "%". If a pattern is present in the jobname, then the request will automatically be set to only select active jobs.

You can schedule a multiple job request to start at a future date and time by using panel 7 Schedule, but only one future event is permitted.

The maximum number of jobs that can be measured from a multi-job request is defined during the installation of Application Performance Analyzer. When this limit is exceeded, Application Performance Analyzer stops creating measurements for this request and the status of the request is displayed as 'Stoppd'. The measurements that executed (within the limit) are accessible for report viewing under the request. To increase the limit, contact your system programmer.

Obtaining Db2 DDF Data

To obtain DDF data, you must measure the Db2 DDF address space with the Db2+ extractor turned on. The DDF address space is typically named xxxxDIST, where xxxx is the Db2 subsystem name, unless your organization has changed the name. You have the option of limiting the scope of a DDF measurement by specifying filtering criteria in Panel 5 Subsystems. DDF measurements may be filtered by Correlation Id, End User Id, and/or Workstation Id. For more information on measuring DDF activity, refer to [“Measuring DDF activity”](#) on page 336.

Measuring a specific Db2 stored procedure or user-defined function (-)

To measure a specific Db2 stored procedure or user-defined function, use a dash (-) as the first and only character in the Jobname/Pattern field. The information identifying the Db2 stored procedure or user-defined function must be entered on Panel 5. Subsystems. This feature is only available when the WLM Intercept is activated during Application Performance Analyzer installation, and you are given appropriate security access to it. Contact your system programmer for access if necessary. When measuring a specific Db2 stored procedure or user-defined function, the following measurement options are not applicable and will result in an error if used: Step specification/Multi Steps, Measure to step end, Delay by, Active Jobs, CICS and IMS selection criteria, Schedule and Schedule Options.

Measuring a specific IMS transaction across multiple MPP regions

To measure a specific IMS transaction that executes in multiple MPP regions, you must enter a dash (-) as the first and only character in the Jobname/Pattern field. The IMS transaction name and the IMS subsystem name or IMSPLEX group name must be entered on Panel 5 Subsystems. You must also select the MPP regions you want to monitor in Panel 4. Active Jobs. This feature is only available when the IMS Intercept is activated during Application Performance Analyzer

installation, and you are given appropriate security access to it. Contact your system programmer for access if necessary. When measuring a specific IMS transaction across multiple MPP regions, the following measurement options are not applicable and are ignored if used: Step specification/ Multi Steps, Measure to step end, Delay by, Schedule and Schedule Options.

Active/Inactive indicator

When a NEW command is entered, Application Performance Analyzer checks for and displays the current status of the job, started task, or TSO region immediately below the jobname. When it is detected as active, 'Active' is displayed, otherwise, 'Inactive' is displayed. It is only necessary to use Panel 8 Sched Options if you wish to change the observation status from that detected by Application Performance Analyzer.

When more than one active job is selected for measurement in Panel 4, the phrase '(Active - Multiple Jobs Selected)' is displayed below the Jobname. In this case, the name listed is the first job selected in Panel 4. You must use Panel 4 to view or change the jobs that are selected for measurement.

ASID

This field is optional. Specify the ASID of a job to be measured. ASID must be specified as a decimal number. ASID might be specified in conjunction with Job Name and/or PID and in this circumstance, the ASID must match the Job Name and/or PID.

Either one of Job Name/Pattern, ASID, or PID is required. You can also choose to specify any combination of the three.

Note: ASID is not allowed when the Job Name/Pattern field contains a pattern or a dash ('-').

PID

This field is optional. Specify the USS Process ID of a UNIX process to be measured. PID must be specified as a decimal number. PID might be specified in conjunction with Job Name and/or ASID and in this circumstance, the PID must match the Job Name and/or ASID.

Either one of Job Name/Pattern, ASID, or PID is required. You can also choose to specify any combination of the three.

Note: PID is not allowed when the Job Name/Pattern field contains a pattern or a dash ('-').

System name

This field appears only if the Application Performance Analyzer you are connected to is configured as a member in a SYSPLEX group. Specify the name of the system on which the measured job is to run (or is currently running). Specify an asterisk (*) in this field to indicate that the job could run on any of the systems in the group.

You can also select panel 6 to display a full list of available system names from which you can make a selection.

Note: Specifying an asterisk (*) is not allowed when the PID, ASID, or both are specified.

Step Specification Field Group

Step specification is not applicable when measuring specific Db2 stored procedures or user-defined functions.

The job step to be measured is specified by a group of four fields (Step Number, Step Program, Step Name, ProcStepName). To identify the step, you can specify one of the following:

- Step Number by itself
- Step Program by itself
- Step Name by itself
- Step Name and ProcStepName

If you leave all of these fields blank, the first job step is assumed. You cannot specify any of these fields when you are specifying measurement of a job that is currently active.

To schedule the measurement of multiple steps in the same job, select panel 3.

Step No.

If Step No. is specified, the other three step fields (Step Program, Step Name, and ProcStepName) must be left blank.

Step No. specifies the numeric step number.

For a NEW measurement, you may enter an asterisk (*) in this field to measure all steps in the job.

For a threshold (TNEW) measurement, you may enter an asterisk (*) in this field to measure all steps in the job that meet the threshold criteria entered in the Criteria panel.

Step Program

If Step Program is specified, the other three step fields (Step No., Step Name, and ProcStepName) must be left blank. Program Step specifies the name of the program coded in the PGM= parameter of the EXEC statement for the step you want to measure.

Step Name

If Step Name is specified, then Step Number, and Step Program must be left blank. You can specify Step Name by itself or in combination with ProcStepName.

Step Name specifies the symbol coded in the name field of an EXEC PGM = statement or an EXEC PROC = statement. In the event that the ProcStep name field is also supplied, this field always identifies the symbol coded in an EXEC PROC = statement.

In the event that the ProcStep name field is left blank, and Step Name matches an EXEC PROC = statement, the first step within that proc will be measured.

If the step to be measured is not within a proc, then Step Name specifies the symbol coded in the name field of an EXEC PGM = statement, and ProcStepName must not be specified.

ProcStepName

If ProcStepName is specified, then input must also be supplied in the Step Name field.

ProcStepName specifies the symbol coded in the name field of an EXEC PGM = statement that is part of a PROC.

Description

Enter a description for this observation request. This field is optional unless the option has been set during installation requiring a minimum description of 8 characters.

Number of Samples

Specify the number of times execution of the measured jobstep is to be sampled. Samples are taken in equal intervals. The sampling frequency is determined by dividing the number of samples by the specified measurement duration. If configured during installation, a default value will be displayed in this field for NEW and TNEW requests. An installation default value is used if you do not supply input in this field.

Note: This field is not used when sampling a Db2 DDF address space with the Db2+ extractor turned on, it will be ignored. In the case of DDF measurement, each SQL call is intercepted for the requested duration, no sampling takes place. The number of samples will always be converted to approximately one per second.

Measure to step end

This field is not applicable when measuring specific Db2 stored procedures or user-defined functions.

Specify 'Y' in this field to indicate that the measurement is to continue to the end of the step even if the specified number of samples has been recorded. Measurement will continue at the sampling rate calculated based on the specified duration and number of samples.

Duration (min:sec)

Specify the duration of the measurement. You can specify the value in seconds or in minutes and seconds. To specify the duration in minutes and seconds, separate the minutes value from the seconds value using a colon. If configured during installation, a default value will be displayed in this field for NEW and TNEW requests. An installation default value is used if you do not supply input in this field. Examples:

- 135 specifies 135 seconds
- 2:15 specifies 2 minutes and 15 seconds
- 2: specifies 2 minutes

The measurement will proceed for the specified time and the sampling rate will be established at a frequency that would perform the full number of samples for the specified duration.

The measurement will terminate before the duration ends if the job step ends first.

Delay by (secs)

This field is not applicable when measuring specific Db2 stored procedures or user-defined functions.

Specify a delay time, in seconds, to occur before initiation of the measurement. The delay will occur starting at the time execution of the job step begins. This cannot be specified for measurement of a job that is currently active.

Sampling Rate (/s)

This is the derived sampling rate calculated from the user supplied Number of Samples and Duration.

Note: This is not an input field. It is for informational purposes only.

Retain file for (days)

Specify the number of days after completion of the measurement for which the measurement file is to be retained. The file and all information about the measurement will be deleted after this period. Enter blanks or zero in this field for no automatic deletion of the measurement data.

Notify TSO User

Specify a TSO user ID to be notified upon completion of the measurement. Enter blanks in this field for no completion notification.

USS observations

Specify the maximum number of spawned address spaces or substeps to measure for a USS observation, up to the maximum defined in the system configuration. The same sampling frequency will be used for each spawned address space or substep. Sampling overhead can be high if several spawned address spaces are running simultaneously.

When this field is specified, the collection of measurements will be grouped under a USS master record on the Observation List panel.

Note: When you are deciding what values to enter in the Number of Samples and Duration fields, consider that Application Performance Analyzer does not have unlimited resources to store and report measurement data. Data spaces are used for collecting and reporting data. Extremely large amounts of measurement data can cause Application Performance Analyzer to fail in either the data collection or reporting process. Data space requirements for measurement data vary widely depending on the type of job or region being measured, data extractors selected, etc.

Panel 2 – Options

Panel 2 is used to enter extended measurement options (“Data Extractors”), and also to specify additional load libraries or HFS directories to be searched for external symbol information.

Enter a slash “/” beside each of the data extractors required for the measurement. The data extractors are used to measure additional information about CICS, Db2, IMS, Java, MQ, Adabas, Natural, WebSphere® Application Services and Service Request Blocks. When the CICS, Db2, IMS, or WAS data extractor is specified, further transaction information can be specified in panel 5.

Panel 2 is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00030
Command ==> _____ Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
  2. Options              4. Active Jobs     6. Sysplex         8. Sched Options
-----
Panel 2. Measurement Options

Data Extractors. '/'to select extended measurement options:
CICS  CICS information      - CICS+ CICS service/CPU time
IMS   DLI call information  - IMS+  DLI service/CPU time/counts
MQ    MQ call information   - MQ+   MQ service/CPU time/counts
Db2   SQL call information  - Db2+  SQL service/CPU time/counts
Cdb2  Collateral Db2 activity - Db2V  SQL Variables
Db2X  Db2 EXPLAIN from bind - SRB   SRB Sampling
Ada   Adabas call information - Nat   Natural information
Java  Java information      - WAS   WebSphere Activity
SYS   System information

ARG DSN: _____ Member: _____

Specify up to 10 load libraries, or up to 440 bytes of HFS directories, to
search for external symbol information. The load libraries apply only to
sampled modules that are fetched from dynamically allocated load libraries.
The directories apply only to sampled HFS programs that do not have absolute
path names. Enter multiple directories separated by at least one space.

_ Specify L for load libraries, D for directories
1  _____
2  _____
3  _____
4  _____
5  _____
6  _____
7  _____
8  _____
9  _____
10 _____

```

If your installation has configured Application Performance Analyzer to display the maximum number of trace entries for Db2+, IMS+ and MQ+, additional input fields will be displayed in Panel 2 based on your configuration. The following example shows the Db2, IMS, and MQ intercepts are enabled and the corresponding Max Trace Size settings are set to display their fields on Panel 2:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00030
Command ==> _____ Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
  2. Options              4. Active Jobs     6. Sysplex         8. Sched Options
-----
Panel 2. Measurement Options

Data Extractors. '/'to select extended measurement options:
CICS  CICS information      - CICS+ CICS service/CPU time
IMS   DLI call information  - IMS+  DLI service/CPU time/counts
MQ    MQ call information   - MQ+   MQ service/CPU time/counts
Db2   SQL call information  - Db2+  SQL service/CPU time/counts
Cdb2  Collateral Db2 activity - Db2V  SQL Variables
Db2X  Db2 EXPLAIN from bind - SRB   SRB Sampling
Ada   Adabas call information - Nat   Natural information
Java  Java information      - WAS   WebSphere Activity
SYS   System information

100   Db2+  Maximum number of trace entries in thousands
100   IMS+  Maximum number of trace entries in thousands
100   MQ+   Maximum number of trace entries in thousands

ARG DSN: _____ Member: _____

Specify up to 10 load libraries, or up to 440 bytes of HFS directories, to
search for external symbol information. The load libraries apply only to
sampled modules that are fetched from dynamically allocated load libraries.
The directories apply only to sampled HFS programs that do not have absolute
path names. Enter multiple directories separated by at least one space.

_ Specify L for load libraries, D for directories
1  _____
2  _____
3  _____
4  _____
5  _____
6  _____
7  _____
8  _____
9  _____
10 _____

```

Panel 2 input fields

Data Extractors

The data extractors are selected to direct Application Performance Analyzer to measure additional information about CICS, Db2, IMS, MQ, Java, Adabas, Natural or WebSphere Application Services. Use a slash to select one or more appropriate extractors.

CICS

This option is used to collect information about CICS session statistics and CICS transactions. CICS data is reported in the E01 through E11 reports and the CICS Multiple Address Space X series of reports. This extractor can also be selected when the WAS extractor is selected. In this situation, the external CICS interface (EXCI) data will be captured from any WAS Servant observation sessions, and reported in the B11 report.

CICS+

This option is used to collect additional information about CICS transactions, allowing exact transaction counts, service times and CPU times to be measured and reported in the E12 report. When CICS+ is selected, CICS is automatically included. Your installer might have chosen to limit access to this data extractor.

Db2

This option is used to collect information about SQL calls made during measurement. Db2 data is reported in the F01 through F10, F13 and F14 reports.

Db2+

This option is used to collect additional Db2 information, allowing exact call counts, service times, and CPU times to be measured and reported in the F11 and F12 reports. The F15 through F19 reports are produced for DDF measurements only. Db2+ also ensures that accurate SQL text is reported, as without Db2+ turned on it is possible for the SQL text to be incorrect. When Db2+ is selected, Db2 is automatically included. Your installer might have chosen to limit access to this data extractor, as Db2+ causes each Db2 call to be intercepted to collect additional data. This might have a small impact on the performance of the target address space. You should be careful when using this feature with other products that also intercept Db2 calls because unpredictable results might occur.

Db2V

This option is used to activate the Db2 variable extractor during measurement. It will extract SQL variable names for sampled SQL calls. The variable names will then be substituted in place of the `:H` place holders when the SQL text is displayed. When Db2V is selected, Db2 and Db2+ are automatically included.

Db2X

This option is used to activate the static Db2 explain extractor during measurement. When selected, Application Performance Analyzer will extract static EXPLAIN information for observed SQL statements that were bound in a package or plan with the EXPLAIN(YES) option. See [Db2 EXPLAIN report](#) for more details.

CDb2

This option is used to activate the collateral Db2 extractor during measurement. When selected, Application Performance Analyzer measures Db2 activity in other address spaces when that activity is invoked by this original Db2 request; for example calls to stored procedures and user-defined functions. In the R02 Observation List, the collateral Db2 measurements are created separately and are grouped under this observation request. When CDb2 is selected, Db2 and Db2+ are automatically included. The CDb2 extractor is only available when your installation has enabled the WLM intercept in Application Performance Analyzer. Your installer might have chosen to limit access to this data extractor, as CDb2 causes each Db2 call and WLM call to be intercepted to collect additional data. This can have a small impact on the performance of the target address space.

IMS

This option is used to collect information about IMS (DL/I) calls. IMS information is reported in the I01, and I03 through I15 reports.

IMS+

This option is used to collect additional IMS information, allowing exact DL/I call counts, DL/I service times, and CPU times to be measured and reported in the I02, and I16 through I21 reports. When IMS+ is selected, IMS is automatically included. Your installer might have chosen to limit access to this data extractor, as IMS+ causes each DL/I call to be intercepted to collect additional data. This might have a small impact on the performance of the target address space. You should be careful when using this feature with other products that also intercept DL/I calls because unpredictable results might occur.

Java

This option is used to collect detailed information about Java calls. Java information is reported in the J series of reports.

MQ

This option is used to collect information about MQ interface calls (both dynamic and static) in Batch, IMS and CICS application programs. This extractor is not used to measure the MQ address space itself. MQ information is reported in the Q series of reports.

MQ+

You can select MQ+ option by specifying a forward slash (/). Selecting MQ+ option activates the MQ+ Data Extractor during the measurement. To clear the MQ+ option, specify blank. MQ+ is an MQ measurement option where the precise number of MQ calls, the exact MQ service time and CPU time by MQ call is counted. When you select the MQ+ option, Application Performance Analyzer captures the data that is required to produce the MQ+ timeline and service time reports

Q11 through Q14. This might have a small impact on the performance of the target address space. Be careful when you use the MQ+ feature with other products that also intercept MQ calls because unpredictable results might occur. Activating the MQ+ option automatically activates the MQ option.

Ada

This option is used to collect information about Adabas calls. There are no special Adabas reports. Adabas calls are reported under the ADABAS category in several reports. The C08 CPU Usage Referred Attribution report can also be used to see the Attribution offset for Adabas calls and to source map the program. The Ada extractor is only available when your installation has enabled Adabas in Application Performance Analyzer.

Nat

This option is used to collect information about Natural calls. Natural calls are reported in the C10 report. The Nat extractor is only available when your installation has enabled Natural in Application Performance Analyzer.

WAS

This option is used to collect information about WebSphere Application Services requests. The WAS extractor is available only when your installation has enabled WebSphere Application Services in Application Performance Analyzer. Refer to the WAS checklist in Chapter 1 of the *Application Performance Analyzer Customization Guide* for the steps to enable WebSphere Application Services. Your installer might have chosen to limit access to this data extractor.

The Job Name field on Panel 1 must contain the name of a WebSphere Application Services controller address space. The controller is not actually sampled, since no application code runs in it. Instead, all WebSphere Application Services requests processed by the controller are recorded in the sample file and reported in the B01 to B10 reports. If during measurement of the controller, one or more servant regions become active, and the Application Performance Analyzer WLM Intercept has been enabled during installation, the servant region activity will be measured and reported in separate child observation sessions. You may select any of the following extractors when WAS is selected: CICS, Db2, Db2+, CDb2, Db2V, Db2X, MQ, MQ+, and JAVA. However, these extractors are only enabled for the WebSphere Application Services servant observation sessions.

SRB

This option is used to collect detailed information about Service Request Block (SRB) activity during the measurement. When you select the option, the SRB measurement reports are generated. When measuring a DDF address space, the Db2+ and SRB extractors are mutually exclusive.

Maximum number of trace entries (Db2+, IMS+ and MQ+)

These fields are displayed only when your installation has configured Application Performance Analyzer to display them. Otherwise, your installation default is used.

For Db2+, enter the value (in thousands) to limit the number of Db2+ SQL call interceptions for which full details will be written to the sample file. Collecting full details on every interception allows the F02 Timeline report to report exact times for all SQL calls. The F02 report will be truncated at the number of calls specified in this field. The Db2+ data extractor continues to collect the data it requires for the other reports for the duration of the measurement. The value is entered in thousands of calls to be recorded and cannot exceed the default value specified for Db2IMaxTraceSize during Application Performance Analyzer installation. The default value is displayed in this field for NEW observation requests.

For IMS+, enter the value (in thousands) to limit the number of IMS+ DLI call interceptions for which full details will be written to the sample file. Collecting full details on every interception allows the I02 and I03 Timeline reports to report exact times for all DLI calls and IMS transactions. The I02 and I03 reports will be truncated at the number of calls specified in this field. The IMS+ data extractor continues to collect the data it requires for the other reports for the duration of the measurement. The value is entered in thousands of calls to be recorded and cannot exceed the default value specified for IMSIMaxTraceSize during Application Performance Analyzer installation. The default value is displayed in this field for NEW observation requests.

For MQ+, enter the value in thousands to limit the number of MQ call interceptions for which full details are written to the sample file. By collecting full details on every interception, exact times for all MQ calls can be reported in MQ+ reports. The Q11 report is truncated at the number of calls that are specified in this field. The MQ+ data extractor continues to collect the data that it requires for the other reports during the measurement. The value is entered in thousands of calls to be recorded. And the value cannot exceed the default value that is specified for MQIMaxTraceSize during Application Performance Analyzer installation. The default value is displayed in this field for NEW observation requests.

Automatic Report Generation (ARG)

The Automatic Report Generation Feature (ARG) enables you to request the automatic generation of observation reports immediately upon completion of a successful observation session. Specify a dataset name and optional member name containing JCL and PRINT control statements that will be used to submit the batch job to generate the reports.

ARG DSN

Specifies the dataset name for Automatic Report Generation. This dataset might be partitioned or physical sequential, and it must have a record format that is fixed length and LRECL=80. The dataset or member contains the complete JCL stream to create observation reports. The JCL stream will be submitted after the observation completes.

Member

Specifies a member name of a PDS for Automatic Report Generation. The member must reside in a PDS that contains the fixed length, LRECL=80 records. The member contains the complete JCL stream to create observation reports. The JCL stream will be submitted after the observation completes.

See *hlq.SCAZSAMP(CAZARG)* for a sample ARG member.

Specify L for load libraries, D for directories

Specify either L or D to indicate whether Application Performance Analyzer is to search load libraries or directories.

Libraries

Specify up to 10 load libraries to be searched by Application Performance Analyzer for external symbol information. These are applicable only when sampled modules are fetched from dynamically allocated load libraries. See [“Specifying additional libraries ” on page 26](#) for more information.

Directories

Specify up to 440 bytes of HFS directory path names to be searched by Application Performance Analyzer, each separated by one or more spaces. These are applicable only when sampled HFS programs have relative path names.

Specifying additional libraries

It is sometimes necessary to specify additional libraries for Application Performance Analyzer to use to resolve sampled addresses to CSECT plus offset, instead of load module plus offset.

When one program issues a LOAD or LINK macro to fetch other load modules, they are typically loaded from STEPLIB or JOBLIB or a LINKLIST library. In this case Application Performance Analyzer will find them automatically during sampling.

However, the LOAD macro can be coded to reference a DCB for which a load library was OPENed. The library might have been allocated to a temporary DDNAME and after the LOAD is done, the DCB is closed and the DDNAME released. In this situation, Application Performance Analyzer has no way of determining what load library the module came from. Hence, it is unable to get CSECT (EBE) information. This would prevent such modules from being source mapped.

Panel 3 – Multi-steps

This panel is not applicable when measuring specific Db2 stored procedures or user-defined functions.

Panel 3 is used to specify that multiple job steps are to be measured. You can specify up to 20 steps, using the same specification rules described for single step measurements entered on panel 1. For more information, see “Panel 3 input fields” on page 27.

Panel 3 is shown here. In this example, three steps have been selected by StepName.

```

File  View  Navigate  Help
-----
R03: Schedule New Measurement                               Row 00001 of 00021
Command ==> _____ Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
o 2. Options              4. Active Jobs    6. Sysplex        8. Sched Options
-----
Panel 3. Measure Multiple Steps

Enter data here to measure multiple steps. Separate measurement files will
be produced for each step. '*' in the first StepNo selects all steps.

StepNo  Program  StepName  ProcStep  StepNo  Program  StepName  ProcStep
-----  -
----  -      IDC01_    -          ----  -      PGM0003_  -
----  -      PGM0005_  -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -
----  -      -          -          ----  -      -          -

```

Panel 3 input fields

Each step specification has a group of four fields. These four fields follow exactly the same rules as the step fields in panel 1.

Step Specification Field Group

The job step to be measured is specified by a group of four fields (Step Number, Step Program, Step Name, ProcStepName). To identify the step, you can specify one of the following:

- Step Number by itself
- Step Program by itself
- Step Name by itself
- Step Name and ProcStepName

Step No.

If Step No. is specified, the other three step fields (Step Program, Step Name, and ProcStepName) must be left blank.

Step No. specifies the numeric step number. Specify an asterisk (*) in the first Step No. field to indicate that all steps in the job are to be measured.

Step Program

If Step Program is specified, the other three step fields (Step No., Step Name, and ProcStepName) must be left blank.

Program Step specifies the name of the program coded in the PGM = parameter of the EXEC statement for the step you want to measure.

Step Name

If Step Name is specified, then Step Number, and Step Program must be left blank. You can specify Step Name by itself or in combination with ProcStepName.

Step Name specifies the symbol coded in the name field of an EXEC PGM = statement or an EXEC PROC = statement. In the event that the ProcStep name field is also supplied, this field always identifies the symbol coded in an EXEC PROC = statement.

In the event that the ProcStep name field is left blank, and Step Name matches an EXEC PROC = statement, the first step within that proc will be measured.

If the step to be measured is not within a PROC, then Step Name specifies the symbol coded in the name field of an EXEC PGM = statement, and ProcStepName must not be specified.

ProcStepName

If ProcStepName is specified, then input must also be supplied in the Step Name field.

ProcStepName specifies the symbol coded in the name field of an EXEC PGM = statement that is part of a PROC.

Panel 4 – Active Jobs

Panel 4 is used to select active jobs from a list. You can enter a Prefix to limit the jobs listed. If you enter a Pattern in the Job name/Pattern field in panel 1, this will be entered as the Prefix in panel 4. This is an input field, you can change the prefix while in panel 4.

Panel 4 is shown here. In this example the prefix entered is “C*”.

```

File  View  Navigate  Help
-----
R03: Schedule New Measurement                               Row 00001 of 00019
Command ==> _____ Scroll ==> CSR

o 1. Job Information   o 3. Multi Steps      5. Subsystems      7. Schedule
o 2. Options          4. Active Jobs      6. Sysplex        8. Sched Options
-----
Panel 4. Active Jobs

Enter S to select an active job step to be measured.   Prefix . . C*_____

  JobName  Type  JobId  StepName  ASIDX  System  CPU%  SIO
  CATALOG  STC   N/A    CATALOG  0020   X235    0.00  0.00
  CICS22A  STC   STC01159  CICS22A  00AB   X235    2.18  0.00
  CICS22C  STC   STC03379  CICS22C  0190   X235    1.98  0.00
  CICS31A  STC   STC03246  CICS31A  00B5   X235    2.58  0.00
  CICS32A  STC   STC02104  CICS32A  0115   X235    2.58  0.00
  CONSOLE  STC   N/A      CONSOLE  0009   X235    0.00  0.00
  CSQ6MSTR STC   STC00454  CSQ6MSTR 0032   X235    5.95  0.00

```

Enter “S” beside the active job(s) you want to measure. You can select multiple active jobs to be measured simultaneously. The maximum number of jobs that can be selected is defined during the installation of Application Performance Analyzer. This feature is used to measure multiple active jobs at the same time, and is typically used for CICS and IMS multiple address space support.

When multiple jobs are selected, the selected jobs are listed in the lower half of the panel in Selected Jobs List. You add jobs to the Selected Jobs List by entering 'S' beside the active jobs in the upper half of the panel. Enter 'D' beside the active job in the lower half of the panel to remove jobs from the Selected Jobs List. When you return to Panel 1, the first job selected is displayed in the Jobname//Pattern field, and '(Active - Multiple Jobs Selected)' is displayed below the Jobname to indicate that multiple jobs are selected. Multiple jobs can be selected only in NEW requests, and are not valid for Threshold or Trigger requests.

Panel 4 is shown here with multiple CICS regions selected for measurement simultaneously.

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00011
Command ==> _____ Scroll ==> CSR
o 1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
  2. Options              o 4. Active Jobs    6. Sysplex        8. Sched Options
-----
Panel 4. Active Jobs                                     Input more data or ENTER to submit
Enter S to select an active job step to be measured.      Prefix . . CICS*_____

  JobName  Type  JobId  StepName  Procstep  ASIDX  System  CPU%  SIO
-  CICS31A  STC   STC02977  CICS31A  CICS   01AC   X235    1.08  0.00
-  CICS32A  STC   STC02278  CICS32A  CICS   0167   X235    1.08  0.00
-  CICS32B  STC   STC02122  CICS32B  CICS   0151   X235    0.72  0.00
-  CICS41A  STC   STC02300  CICS41A  CICS   016E   X235    1.44  0.00

Selected Jobs List
Enter D to remove an active job from the list.

  JobName  System
-  CICS32A  X235
-  CICS32B  X235

```

Panel 5 – Subsystems

Use this multi-purpose panel to specify further information about the measurement of CICS regions, IMS regions, specific Db2 stored procedures or user-defined functions, Db2 DDF address spaces and WebSphere (WAS) controllers. Panel 5 has three different appearances depending on the purpose of the measurement.

For a typical CICS, IMS or DDF measurement, Panel 5 displays mutually exclusive input fields that are specific to the CICS transactions and terminals, or IMS transaction, program and userid, or DDF filtering criteria.

- For CICS, you can specify the CICS transaction codes and terminals for which CICS measurement information is to be recorded. Limiting the CICS transactions and terminals you are interested in can have a significant impact on the resources consumed by the measurement process.
- For IMS, when you are measuring one MPP or IFP region, you can specify the IMS transaction, program and user ID for which measurement information is to be recorded.
- For DDF measurements, you can specify the Correlation Id, End User Id and/or Workstation Id for which measurement information is to be recorded.

For a multiple address space measurement, where a dash (-) is entered in the Jobname field in Panel 1, Panel 5 displays mutually exclusive input fields specific to Db2 stored procedures and user-defined functions, or IMS transactions that execute across multiple IMS regions.

- For Db2 multiple address space support, when you are measuring specific Db2 stored procedures or user-defined functions, you can specify the Db2 subsystem name or the Db2 group attach name, a P or F to identify the request, the schema name and the stored procedure or user-defined function name.
- For IMS multiple region support, when you are measuring an IMS transaction that executes across multiple MPP regions, you can specify the IMS subsystem name or IMSplex group name, and the IMS transaction name.

For a WebSphere measurement where the WAS extractor is selected in Panel 2, Panel 5 displays WebSphere filtering criteria. You can specify the request name, application name, and/or origin for which measurement information is to be recorded. You can also use this panel to filter out image activity and/or specific file extensions.

A sample panel 5 for CICS, an IMS region and DDF is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00030
Command ==> _____ Scroll ==> CSR_

o 1. Job Information    3. Multi Steps    5. Subsystems    7. Schedule
  2. Options            4. Active Jobs    6. Sysplex      8. Sched Options
-----
Panel 5. Subsystem Measurement Criteria

Specify up to 16 CICS trancodes for which measurement data is to be recorded.

  01 ____  02 ____  03 ____  04 ____  05 ____  06 ____  07 ____  08 ____
  09 ____  10 ____  11 ____  12 ____  13 ____  14 ____  15 ____  16 ____

Include CICS system transactions in measurement(Y/N): N

Wildcard character '*' can be specified at the end of a partial name.
'*' by itself specifies all transactions or terminals.

Specify up to 8 CICS terminal ids for which measurement data is to be recorded.

  01 ____  02 ____  03 ____  04 ____  05 ____  06 ____  07 ____  08 ____

Include CICS non-terminal transactions in measurement(Y/N): Y

Specify up to 8 CICS program names for which measurement data is to be recorded.

  01 _____  02 _____  03 _____  04 _____
  05 _____  06 _____  07 _____  08 _____

Enter IMS/TM selection parameters:

Transaction _____ Program Name _____ User ID _____

Specify filter criteria for DDF observation. Wildcards are accepted.

Correlation Id _____ or _ '/' for null (binary zero)
End User Id   _____ or _ '/' for null (binary zero)
Workstation Id _____ or _ '/' for null (binary zero)

```

A sample panel 5 for WebSphere is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00019
Command ==> _____ Scroll ==> CSR_

o 1. Job Information    3. Multi Steps    5. Subsystems    7. Schedule
o 2. Options            o 4. Active Jobs    6. Sysplex      8. Sched Options
-----
Panel 5. Subsystems Measurement Criteria

Enter any required WAS filter criteria.

Request name:
_____

Application name:
_____

Origin:
_____

Origin format: (use a slash to select one of the following)
_ IP address _ Host name _ Job name

Filter out image activity? (.gif .jpg etc): N (Y/N)

Filter out requests with these extensions:
_____

```

Panel 5 input fields

For a CICS measurement:

CICS Trancode

Specify a CICS transaction name or pattern. This identifies CICS transactions to be included in the measurement. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern. You can specify up to 16 names/patterns. Specify an asterisk (*) by itself to measure all transactions.

Include CICS System Txns

Specify Y or N to indicate if the measurement is to include data on CICS system transactions. (Normally set to No).

CICS Terminal ID

Specify a CICS terminal ID name or pattern. This identifies CICS terminals to be included in the measurement. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern. You can specify up to eight names/patterns. Specify an asterisk (*) by itself to measure all terminals.

Include CICS non-terminal transaction

Specify Y or N to indicate if the measurement is to include data on CICS non-terminal transactions.

CICS Program Name

Specify a CICS program name or name pattern. This identifies CICS program names to be included in the measurement. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern. You can specify up to eight names or patterns. Specify an asterisk (*) by itself to measure all program names.

For a single IMS region measurement:**IMS Transaction**

Specify an IMS transaction id or pattern. This identifies IMS transactions to be included in the measurement when measuring an IMS/MPP or IMS/IFP region. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern.

Any values in Transaction Id, Program Name and User ID are ANDed together to determine if a transaction should be included in the measurement.

IMS Program

Specify an IMS program name or pattern. This identifies IMS programs to be included in the measurement when measuring an IMS/MPP or IMS/IFP region. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern.

Any values in Transaction Id, Program Name and User ID are ANDed together to determine if a transaction should be included in the measurement.

IMS User ID

Specify a userid or pattern. This identifies that transactions initiated by the userid are to be included in the measurement when measuring an IMS/MPP or IMS/IFP region. You can also specify a partial name terminated by an asterisk (*) to indicate a wildcard pattern. Any values in Transaction Id, Program Name and User ID are ANDed together to determine if a transaction should be included in the measurement.

Note: When limiting the observation to specific IMS transactions, programs or users in an MPP or IFP region, Application Performance Analyzer samples only when the transactions are running. The observation continues to run for the requested duration.

For a Db2 DDF measurement:**Correlation Id**

Specify a Db2 correlation id or pattern. This identifies a Db2 correlation id to be included in the measurement when measuring a DDF address space. A correlation id of null (binary zero) may be specified by entering a '/' in the selection field next to the Correlation Id field. You may also specify a wildcard pattern using an asterisk (*) or a percent sign (%). An asterisk is used to indicate one or more characters that can appear in place of the asterisk. It can be used as a prefix

or a suffix, or both. Alternatively, a percent sign is used to indicate any single character, and can appear any number of times. Any values in Correlation Id, End User Id, and Workstation Id are ANDed together to determine if an SQL request is included in the measurement.

End User Id

Specify an end user id or pattern. This identifies an end user id to be included in the measurement when measuring a DDF address space. An end user id of null (binary zero) may be specified by entering a '/' in the selection field next to the End User Id field. You may also specify a wildcard pattern using an asterisk (*) or a percent sign (%). An asterisk is used to indicate one or more characters that can appear in place of the asterisk. It can be used as a prefix or a suffix, or both. Alternatively, a percent sign is used to indicate any single character, and can appear any number of times. Any values in Correlation Id, End User Id, and Workstation Id are ANDed together to determine if an SQL request should be included in the measurement.

Workstation Id

Specify a workstation id or pattern. This identifies a workstation id to be included in the measurement when measuring a DDF address space. A workstation id of null (binary zero) may be specified by entering a '/' in the selection field next to the Workstation Id field. You may also specify a wildcard pattern using an asterisk (*) or a percent sign (%). An asterisk is used to indicate one or more characters that can appear in place of the asterisk. It can be used as a prefix or a suffix, or both. Alternatively, a percent sign is used to indicate any single character, and can appear any number of times. Any values in Correlation Id, End User Id, and Workstation Id are ANDed together to determine if an SQL request should be included in the measurement.

For a Db2 stored procedure or user defined function measurement:

Db2 Subsystem

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in Panel 1. Specify a Db2 subsystem. This identifies the Db2 subsystem that will be used to run the stored procedure or user-defined function. This field is mutually exclusive with the Db2 Group Attach Name field.

Db2 Group Attach Name

Db2 Group Attach Name field is displayed only when you enter a dash (-) in the Job Name/Pattern field in panel 1. If you want to identify the Db2 group that will be used to run the stored procedure or user-defined function, specify a Db2 group attach name. The Db2 Group Attach Name field is mutually exclusive with the Db2 Subsystem field.

Specify procedure or function

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in Panel 1. Identify this request as a stored procedure or user-defined function. Enter P for stored procedure or F for a user-defined function.

Schema

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in Panel 1. Specify the schema name for this stored procedure or user-defined function. You can specify a schema name pattern; for example, a schema name prefix followed by an asterisk (*) or an asterisk by itself. Application Performance Analyzer will measure the first Db2 stored procedure or user-defined function executed by the Db2 subsystem that matches that schema name pattern and name concatenation. If a single asterisk is coded in both schema and name, Application Performance Analyzer will measure the first stored procedure or user-defined function executed by the Db2 subsystem.

Name

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in panel 1. Specify the name of the stored procedure or user-defined function. You can specify a name pattern; for example, a name prefix followed by an asterisk (*) or an asterisk by itself. Application Performance Analyzer will measure the first Db2 stored procedure or user-defined function executed by the Db2 subsystem that matches that schema name and name pattern concatenation. If a single asterisk is coded in both schema and name, Application Performance Analyzer will measure the first stored procedure or user-defined function executed by the Db2 subsystem.

For an IMS multiple region measurement:

IMS Subsystem Id

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in panel 1 to indicate an IMS MASS request. Specify an IMS subsystem. This identifies the IMS subsystem in which the IMS transaction you are measuring runs.

IMSPLEX Group Name

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in panel 1 to indicate an IMS MASS request. Specify the IMSPlex XCF group name. This identifies the IMSPlex where the IMS transaction will run. Either the CSL group name, which is defined by the IMSPLEX parameter in the DFSCGxxx member of the IMS proclib, prefixed by the characters "CSL", or the IMS Shared Queues group name, which is defined by the SQGROUP parameter in the DFSSQxxx member of the IMS proclib, can be specified. These parameters can also be found in the DFSDfxxx member of the IMS proclib. IMS Subsystem ID and IMSPLEX Group Name are mutually exclusive.

Transaction

This field is displayed only when a dash (-) is entered in the Job Name/Pattern field in panel 1 to indicate an IMS MASS request. Specify an IMS transaction code. This identifies the IMS transaction to be included in the measurement. All active MPP regions that are eligible to process the transaction code on the specified IMS subsystem are returned on panel 4.

For a WebSphere measurement:

Request name

This field is displayed only for WAS filter criteria. It is a string of non-blank characters up to 79 bytes long. A trailing asterisk can be used as a wildcard character. Embedded asterisks are not treated as wildcards. If the field is left blank, no filtering is applied. Otherwise, only WAS requests that match the request name filter will be written to the sample file.

Application name

This field is displayed only for WAS filter criteria. It is a string of non-blank characters up to 79 bytes long. A trailing asterisk can be used as a wildcard. Embedded asterisks are not treated as wildcards. If the field is left blank, no filtering is applied. Otherwise, only WAS requests that invoked an application that matches the filter will be written to the sample file.

Origin

This field is displayed only for WAS filter criteria. It is a string of non-blank characters up to 79 bytes long. It can be an IP address, a host name, or a job name. Only WAS requests that came from the specified origin will be written to the sample file. A trailing asterisk can be used as a wildcard character. If the field is left blank, no filtering is applied.

Origin format

This field is displayed only for WAS filter criteria. It is required if an origin filter is specified. Enter a slash against the type of origin filter:

IP address

The filter value must be a valid IPv4 or IPv6 address. If a wildcard is used, it can only appear after a dot separator (for IPv4) or a colon separator (for IPv6). For example:

```
207.245.47.*
2001:db8:85a3:0:*
```

However, a wildcard cannot be used with an IPv6 filter if it contains two consecutive colons. For example, the following filter value is invalid:

```
2001:db8:85a3::8a2e:*
```

This is because the two consecutive colons and the asterisk wildcard both represent a varying number of missing values.

Host name

The filter value can be from 1 to 79 non-blank characters. The characters are restricted to alpha-numeric, hyphen and underscore. A trailing asterisk can be used as a wildcard. WAS can sometimes show an IP address as a host name. To filter these, you must specify the filter value as an IP address, not a host name.

Job name

The filter value can be from 1 to 8 alpha-national characters. A trailing asterisk can be used as a wildcard.

Filter out image file activity

This field is displayed only for WAS filter criteria. It specifies whether or not requests for image files should be filtered out. Image files are identified by request names that end in any of the following file extensions:

```
.gif .jpg .jpeg .png .ico
```

Filter out requests with these file extensions

This field is displayed only for WAS filter criteria. It can be used to specify a series of file extensions, each separated by a space. Any requests for those file types will be filtered out. For example:

```
.css .pdf .txt
```

Any WAS request whose request name ends in one of the specified file extensions will be filtered out. Each file extension must begin with a period and must be followed by at least one non-blank character. Wildcards cannot be used in this filter.

Panel 6 – Sysplex

This panel is used to select a target Sysplex system from a list. You can also choose ALL systems, in which case the target job will be measured on the first system to run it. You cannot select ALL for active jobs. Selecting ALL is the same as entering an asterisk (*) in the System Name field on panel 1.

A sample panel 6 is shown here.

```
File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00010
Command ==> _____ Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems      7. Schedule
  2. Options              4. Active Jobs    6. Sysplex         8. Sched Options
-----
Panel 6. Sysplex

Target System.      'S' to select one option from the list (scrollable):
- ALL      All Sysplex members eligible
- SYSA
- SYSB
- SYSE
- XS02
- XS03
- XS05
```

Panel 7 – Schedule

This panel is not applicable when measuring specific Db2 stored procedures or user-defined functions.

This panel is used to generate a schedule for repetitions of future measurements. A maximum of 105 future scheduled measurement entries is allowed.

The panel is shown here before any future schedule data has been entered:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

o 1. Job Information   o 3. Multi Steps   o 5. Subsystems   7. Schedule
o 2. Options           4. Active Jobs   6. Sysplex       8. Sched Options
-----
Panel 7. Schedule
Date/time of first in sequence      Measurement repetitions
Date (yy mm dd) . __ __ __
Time (hh mm) . . __ __
After . . . __ days __ minutes

Use this panel to specify a schedule for repetitions of the measurement.
Input the above fields and press ENTER to generate dates and times for
each of the measurements. These dates/times will be shown below in a
scrollable table which you can add to by repeating this input process.

```

Using this panel to create a future schedule is explained in the example below. Note that there are also important fields on panel 8 related to future schedules. If it is not known when the job will run, use panel 8 to specify how many times to repeat the measurement.

Example of creating a Future Schedule

If a user wanted to measure a job every Wednesday night at 8:00 pm, and every Friday night at 11:00 pm, for 10 weeks, starting on Wednesday Dec. 8, 2004, it would be set up like this:

1. Enter the first Wednesday date in the Date (yy mm dd) field: 04 12 08.
2. Enter 10 in the Repeat __ times field.
3. Enter 20:00 in the Time (hh mm) field.
4. Enter 7 in the After __ days field. (To indicate that it repeats each 7 days).

The screen would look like this:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

o 1. Job Information   o 3. Multi Steps   o 5. Subsystems   7. Schedule
o 2. Options           4. Active Jobs   6. Sysplex       8. Sched Options
-----
Panel 7. Schedule
Date/time of first in sequence      Measurement repetitions
Date (yy mm dd) . 04 12 08
Time (hh mm) . . 20 00
After . . . 7 days __ minutes

Use this panel to specify a schedule for repetitions of the measurement.
Input the above fields and press ENTER to generate dates and times for
each of the measurements. These dates/times will be shown below in a
scrollable table which you can add to by repeating this input process.

```

Then press Enter to generate the schedule, it will appear at the bottom of the panel like this:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

o 1. Job Information   o 3. Multi Steps   o 5. Subsystems   o 7. Schedule
o 2. Options           4. Active Jobs   6. Sysplex       8. Sched Options

-----
Panel 7. Schedule
Date/time of first in sequence      Measurement repetitions
Date (yy mm dd) . __ __ __         Repeat . . __ times
Time (hh mm) . . __ __             After . . . __ days __ minutes

Measurement Schedule (/ for line command list, UP/DOWN to scroll)
SeqN  Date/Time      Status
0001  Wed Dec-08-04 20:00 Pending ADD
0002  Wed Dec-15-04 20:00 Pending ADD
0003  Wed Dec-22-04 20:00 Pending ADD
0004  Wed Dec-29-04 20:00 Pending ADD
0005  Wed Jan-05-05 20:00 Pending ADD
0006  Wed Jan-12-05 20:00 Pending ADD
0007  Wed Jan-19-05 20:00 Pending ADD
0008  Wed Jan-26-05 20:00 Pending ADD
0009  Wed Feb-02-05 20:00 Pending ADD
0010  Wed Feb-09-05 20:00 Pending ADD
***** End of Schedule *****

```

Now enter similar data for the Friday night schedule like this:

5. Enter the first Friday date in the Date (yy mm dd) field: 04 12 10.
6. Enter 10 in the Repeat __ times field.
7. Enter 23:00 in the Time (hh mm) field.
8. Enter 7 in the After __ days field. (To indicate that it repeats each 7 days).

Press Enter and your Friday dates will appear with the Wednesday dates already generated like this:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

o 1. Job Information   o 3. Multi Steps   o 5. Subsystems   o 7. Schedule
o 2. Options           4. Active Jobs   6. Sysplex       8. Sched Options

-----
Panel 7. Schedule
Date/time of first in sequence      Measurement repetitions
Date (yy mm dd) . __ __ __         Repeat . . __ times
Time (hh mm) . . __ __             After . . . __ days __ minutes

Measurement Schedule (/ for line command list, UP/DOWN to scroll)
SeqN  Date/Time      Status
0001  Wed Dec-08-04 20:00 Pending ADD
0002  Fri Dec-10-04 23:00 Pending ADD
0003  Wed Dec-15-04 20:00 Pending ADD
0004  Fri Dec-17-04 23:00 Pending ADD
0005  Wed Dec-22-04 20:00 Pending ADD
0006  Fri Dec-24-04 23:00 Pending ADD
0007  Wed Dec-29-04 20:00 Pending ADD
0008  Fri Dec-31-04 23:00 Pending ADD
0009  Wed Jan-05-05 20:00 Pending ADD
0010  Fri Jan-07-05 23:00 Pending ADD
0011  Wed Jan-12-05 20:00 Pending ADD
0012  Fri Jan-14-05 23:00 Pending ADD
0013  Wed Jan-19-05 20:00 Pending ADD
0014  Fri Jan-21-05 23:00 Pending ADD
0015  Wed Jan-26-05 20:00 Pending ADD
0016  Fri Jan-28-05 23:00 Pending ADD
0017  Wed Feb-02-05 20:00 Pending ADD
0018  Fri Feb-04-05 23:00 Pending ADD
0019  Wed Feb-09-05 20:00 Pending ADD
0020  Fri Feb-11-05 23:00 Pending ADD
***** End of Schedule *****

```

Your schedule dates have now all been generated. Also see panel 8 below for additional data regarding future schedules.

Note: If you are entering a multiple job request (using the % wildcard in the job name field), then you can only set one date and time. No repetitions are allowed.

Panel 7 input fields

First Schedule Date

Specify a starting date for a new sequence of recurring schedule date/time entries.

Schedule Repeat Count

Specify a repeat count. This is the number of measurement recurrences to be generated and added to the schedule. The maximum value that can be entered in this field is 99. Application Performance Analyzer will accept a schedule with up to 105 repeats.

To generate a schedule with more than 99 repeats, you must generate two schedules for the same request. After generating the repeats for the first schedule, remain in Panel 7 and generate another schedule for the remaining repeats.

First Schedule Time

Specify a starting time for a new sequence of recurring schedule date/time entries.

Interval in Days

Specify the interval, in days, between each measurement recurrence to be added to the schedule.

Interval in Minutes

Specify the interval, in minutes, between each measurement recurrence to be added to the schedule.

Panel 8 – Sched Options

This panel is not applicable when measuring specific Db2 stored procedures or user-defined functions.

The available fields on panel 8 vary depending on whether “Y” or “N” is entered in the Measure active job (Y/N) field, and whether or not a future schedule has been entered on panel 7.

No Future Schedule and Active YES

When there is no future schedule, and “Y” is entered in the Measure active job (Y/N) field, then no additional fields will appear on panel 8. In this case, specifying “Y” here is an alternative to selecting an active job from a list in panel 4. If you use this method to specify that a job is active, then the jobname entered in panel 1 must be currently active, otherwise the request will fail.

An example of panel 8 for a single occurrence of an active job (i.e., with no future schedule) is shown here:

```
File View Navigate Help
-----
R03: Schedule New Measurement                      Row 00001 of 00004
Command ==>                                     Scroll ==> PAGE

o 1. Job Information      3. Multi Steps      5. Subsystems  7. Schedule
  2. Options              4. Active Jobs    6. Sysplex    8. Sched Options

-----
Panel 8. Schedule Options

Specify if the job is active and is to be measured immediately (Y) or if
IBM APA for z/OS is to wait for the job to be submitted (N):

Measure active job (Y/N) . . . . Y
```

No Future Schedule and Active NO

When there is no future schedule, and “N” is entered in the Measure active job (Y/N) field, then the field Times to Repeat and Within interval (minutes, days or weeks) will appear.

An example of panel 8 for a single occurrence of an inactive job (i.e., with no future schedule) is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00011
Command ==> ----- Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems  7. Schedule
  2. Options              4. Active Jobs      6. Sysplex    8. Sched Options
-----
Panel 8. Schedule Options

Specify if the job is active and is to be measured immediately (Y) or if
IBM APA for z/OS is to wait for the job to be submitted (N):

Measure active job (Y/N) . . . . N

    Times to repeat measurement . __      If the job runs more than once.

    Within interval (minutes) . . ____      Maximum 999 minutes.
    or within interval (days) . . ____      Maximum 22 days.
    or within interval (weeks) . . ____      Maximum 3 weeks.

```

Future Schedule and Active YES

When entering a future schedule request, selecting “Y” for active means that the job is expected to be active when the measurement takes place. The fields Number of times to retry and Retry interval (minutes) will appear.

An example of panel 8 for an active job with a future schedule is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00007
Command ==> ----- Scroll ==> PAGE

o 1. Job Information      3. Multi Steps      5. Subsystems  o7. Schedule
  2. Options              4. Active Jobs      6. Sysplex    o8. Sched Options
-----
Panel 8. Schedule Options                                Input more data or ENTER to submit

Specify if the job to be measured will be active when the scheduling occurs
(e.g. a CICS region) or pending (a batch job).

Job will be active (Y/N) . . . . Y

    Number of times to retry . . . __      Indicate retry action if job is not
    Retry interval (minutes) . . . __      active at the time of scheduling.

```

Future Schedule and Active NO

When entering a future schedule request, selecting “N” for not active means that the request will wait for the job to start. In this case three additional fields will appear: Expire after (minutes), Times to repeat measurement, and Within interval (minutes).

An example of panel 8 for an inactive job with a future schedule is shown here:

```

File View Navigate Help
-----
R03: Schedule New Measurement                               Row 00001 of 00010
Command ==> ----- Scroll ==> CSR

o 1. Job Information      3. Multi Steps      5. Subsystems  o 7. Schedule
  2. Options              4. Active Jobs      6. Sysplex    8. Sched Options
-----
Panel 8. Schedule Options

Specify if the job to be measured will be active when the scheduling occurs
(e.g. a CICS region) or pending (a batch job).

Job will be active (Y/N) . . . . N

    Expire after (minutes) . . . ____      Number of minutes from schedule time
                                           to wait for job to be submitted.

    Times to repeat measurement . __      If the job runs more than once.
    Within interval (minutes) . . ____

```

Panel 8 input fields

Job Active (Y/N)

Specify Y to indicate the job is active and the measurement is to begin immediately. Specify N to indicate that the job is pending (a batch job) and Application Performance Analyzer is to wait for its execution.

If you have specified a recurring schedule for the measurement, then this field indicates the expected status of the job at the time the measurement is scheduled.

Expire after

This applies to a schedule of recurring measurements for a job that is not expected to be active at scheduling time (a batch job). It specifies the length of the interval during which Application Performance Analyzer is to check for the job before expiring the schedule item. Specify the length of the interval in minutes.

Times to Repeat

This applies to measurement of a job that is not active (pending). Known as the RUNAGAIN count, it specifies the number of times the measurement is to be repeated if the job is rerun. This can be used as an alternative to specifying a schedule on panel 7 if the exact date and time of each run is not known.

Optionally, a time interval can be specified, within which the job must run to be measured again. Use this to ensure that a good measurement is captured in the event that the job is cancelled or abends and is then rerun. If you have specified a schedule in panel 7, then you must provide a time interval for the repeat measurements.

Within Interval

This applies to measurement of a job that is not active (pending). Specify the interval the Application Performance Analyzer started task is to check for reruns of the job. Use this to ensure that a good measurement is captured in the event that the job is cancelled or abends and is then rerun. If you have specified a schedule in panel 7, then you must provide a time interval for the repeat measurements.

In the case of a single occurrence of a batch job, use this when the exact time the job will be executed is unknown or varies. Measurements that have a future schedule associated with the job will accommodate an interval of up to 999 minutes only. Measurements for a single occurrence of a job (i.e., no future schedule) will accommodate an interval of either 999 minutes, 22 days or 3 weeks.

Times to Retry

This applies to a schedule of recurring measurements for a job that is expected to be active at the time the measurement is scheduled. Indicate the number of times Application Performance Analyzer is to check again for the job in the event that it was not active. The 'Retry Interval' field specifies the interval between retries.

Retry Interval

This applies to a schedule of recurring measurements for a job that is expected to be active at the time the measurement is scheduled. It specifies an action to be taken if the job is not active at the schedule time. Indicate the interval between each check for the job being active. The 'Number of Times to Retry' field specifies how many times the retry is to occur.

Entering a Threshold Monitor request

Overview

Threshold monitor requests are used to initiate an observation on job-steps that exceed a user-defined threshold. You can create the threshold monitor request by using the TNEW command, which specifies the criteria that Application Performance Analyzer uses to initiate the observation. You can set up a single-step threshold monitor request to initiate an observation for a single job-step. You can also set up a multi-step threshold monitor request to initiate an observation for all steps in a job that exceed the criteria. The same criteria are used for all job steps.

Threshold monitor requests can be used to trigger the measurement of another job by entering the Trigger (TR) command on the threshold measurement. In this case, when the threshold criteria are exceeded for a single job-step, Application Performance Analyzer also begins executing the trigger request. In the case of a multi-step threshold request, only the first step that exceeds the threshold criteria initiates the trigger request.

Threshold monitor requests cannot be created for measuring specific Db2 Stored Procedures and IMS multiple address space measurements.

It is important that you are already familiar with the preceding information in this chapter before you use the threshold monitor feature. The threshold monitor request process uses most of the panels that are described in the previous sections, and the information is not repeated here.

Using the TNEW command

The TNEW primary command is used to enter a new Observation Request, which will start only when specified threshold criteria have been satisfied for the target job-step or job-steps.

The criteria are:

- CPU Time
- Elapsed Time
- EXCP Count

Setting Threshold Requirements panels

The Set Threshold Requirements panel group is very similar to the standard Schedule New Measurement panel group. To measure all steps in the job that meet the threshold criteria you must enter an asterisk (*) in the Step No field of Panel 1 – Job Information. Multi-Step and Schedule information is not used for Threshold Monitor requests, so these panels are not available. Panel 3 - Criteria is specific to Threshold Monitor request. After entering the standard data to describe the measurement request, you must enter the Threshold Criteria.

Panel 3 - Criteria

After entering the data to describe the measurement request, you use the Criteria panel to specify the Threshold Criteria which will trigger the measurement to run. The panel 3 Criteria panel is shown here.

In this example, when CPU time exceeds 30 seconds, and EXCP count exceeds 20000, the measurement will be triggered.

```

File View Navigate Help
-----
R03: Set Threshold Requirements                               Row 00001 of 00005
Command ==> _____ Scroll ==> CSR
o 1. Job Information   o 3. Criteria       o 5. Subsystems
  2. Options           4. Active Jobs     6. Sysplex
-----
Panel 3. Threshold Criteria

Enter Threshold Criteria

      CPU Time Exceeds (min:sec) . . . 30
      Elapsed Time Exceeds (min:sec) .
      EXCP Count Exceeds . . . . . 20000

If you enter more than one threshold criteria field, then all the
criteria must be met for the measurement to be triggered.
```

Panel 3 input fields

CPU Time Exceeds

Enter the threshold amount of CPU time, if the target job-step exceeds this amount of CPU time, the measurement will be triggered.

You can specify the value in seconds or in minutes and seconds. To specify the threshold CPU time in minutes and seconds, separate the minutes value from the seconds value using a colon.

Examples:

- 135 specifies 135 seconds
- 2:15 specifies 2 minutes and 15 seconds
- 2: specifies 2 minutes

Elapsed Time Exceeds

Enter the threshold amount of Elapsed time, if the target job-step exceeds this amount of Elapsed time, the measurement will be triggered.

You can specify the value in seconds or in minutes and seconds. To specify the threshold Elapsed time in minutes and seconds, separate the minutes value from the seconds value using a colon.

Examples:

- 135 specifies 135 seconds
- 2:15 specifies 2 minutes and 15 seconds
- 2: specifies 2 minutes

EXCP Count Exceeds

Enter the threshold EXCP count. If the target job-step exceeds this EXCP count, the measurement will be triggered.

Note: : If you enter more than one threshold criteria field, then all the criteria must be met for the measurement to be triggered.

Note: If the target job executes, and the threshold criteria are not met, the threshold measurement request is canceled.

Entering a Trigger request

Overview

The trigger request feature is used to allow the start of one scheduled measurement to trigger an additional measurement called the Trigger measurement. For example, you might want to have the beginning of a batch job-step measurement initiate a measurement of a particular CICS region. You must enter the original scheduled measurement request first, and then the trigger measurement.

A threshold request can be used to trigger another measurement. For example, you might want a job-step that exceeds the threshold criteria to also initiate a measurement of a particular CICS region. In the case of a multi-step threshold request, only the first step that exceeds the threshold criteria initiates the trigger request.

A trigger request cannot be created to measure a specific Db2 Stored Procedure and multiple IMS address spaces.

It is important to be familiar with the preceding information in this chapter before using the Trigger feature. The Trigger request process uses most of the panels described in the previous sections and the information is not repeated here.

Using the TR line command

The original scheduled measurement request is identified by entering the TR line command on it in the R02 Observation Session List panel. This displays the panels for entering the measurement request information for the trigger request.

The Set Trigger Requirements panel group is very similar to the standard Schedule New Measurement panel group. The differences are that Multi-Step and Schedule information is not used for Trigger

requests, so these panels are not available. For information on panels used to specify Trigger requests, refer to the preceding sections in this chapter.

Chapter 3. Performance analysis reports

This section describes the Performance Analysis Reports. Some basic concepts are covered, and the base reports (those not pertaining to a data extractor) are described.

For Performance Analysis Reports pertaining to a specific data extractor (CICS, IMS, Db2, etc.), refer to the chapter for the specific data extractor.

For information about ...	See ...
General concepts required for interpreting these reports	“Performance analysis basics” on page 44
Report categories and codes	“Report categories and codes” on page 46
S01 Measurement profile	“S01 - Measurement profile” on page 51
S02 Load module attributes	“S02 - Load module attributes” on page 65
S03 Load module summary	“S03 - Load module summary” on page 66
S04 TCB summary	“S04 - TCB summary” on page 68
S05 Memory usage timeline	“S05 - Memory usage timeline” on page 70
S06 Data space usage timeline	“S06 - Data space usage timeline” on page 71
S07 TCB execution summary	“S07 - TCB execution summary” on page 73
S08 Processor utilization summary	“S08 - Processor utilization summary” on page 74
S09 Measurement analysis	“S09 - Measurement analysis” on page 77
S10 Observation Session Messages	“S10 - Observation Session Messages” on page 78
C01 CPU usage by category	“C01 - CPU usage by category” on page 79
C02 CPU usage by module	“C02 - CPU usage by module” on page 87
C03 CPU usage by code slice	“C03 - CPU usage by code slice” on page 91
C04 CPU usage timeline	“C04 - CPU usage timeline” on page 94
C05 CPU Usage by task/category	“C05 - CPU usage by task/category” on page 97
C06 CPU Usage by task/module	“C06 - CPU usage by task/module” on page 104
C07 CPU usage by procedure	“C07 - CPU usage by procedure” on page 108
C08 CPU usage referred attribution	“C08 - CPU usage referred attribution” on page 112
C09 CPU Usage by PSW/object code	“C09 - CPU usage by PSW/object code” on page 118
C10 CPU Usage by Natural Program	“C10 - CPU Usage by Natural Program” on page 121
W01 WAIT time by task/category	“W01 - WAIT time by task/category” on page 124
W02 WAIT time by module	“W02 - WAIT time by task/module” on page 129
W03 WAIT time referred attribution	“W03 - WAIT time referred attribution” on page 132

For information about ...	See ...
W04 WAIT time by task ENQ/RESERVE	“W04 - WAIT time by task ENQ/RESERVE” on page 136
W05 WAIT time by tape DDNAME	“W05 - WAIT time by tape DDNAME” on page 139
D01 DASD usage by device	“D01 - DASD usage by device” on page 141
D02 DASD usage by DDNAME	“D02 - DASD usage by DDNAME” on page 143
D03 DASD usage by data set	“D03 - DASD usage by data set” on page 146
D04 data set attributes	“D04 - Data set attributes” on page 147
D05 DASD EXCP summary	“D05 - DASD EXCP summary” on page 150
D06 DASD VSAM statistics	“D06 - DASD VSAM statistics” on page 152
D07 DASD activity timeline	“D07 - DASD activity timeline” on page 155
D08 DASD I/O wait time	“D08 - DASD I/O wait time” on page 157
D09 VSAM buffer pool usage	“D09 - VSAM buffer pool usage” on page 161
G01 Coupling facility summary	“G01 - Coupling facility summary” on page 163
G02 Coupling facility mean times	“G02 - Coupling facility mean times” on page 164
G03 Coupling facility total times	“G03 - Coupling facility total times” on page 165
K01 CPU SRB Usage by SRB Type	“K01 - CPU SRB Usage by SRB Type” on page 166
K02 CPU SRB Usage by PSW/ObjCode	“K02 - CPU SRB Usage by PSW/ObjCode” on page 171
V01 Measurement variance summary	“V01 - Measurement variance summary” on page 174
V02 CICS variance summary	“V02 - CICS variance summary” on page 176
V03 Db2 variance summary	“V03 - Db2 variance summary” on page 178
V04 IMS variance summary	“V04 - IMS variance summary” on page 183

Performance analysis basics

Some of the concepts that you need to understand in order to effectively interpret the Application Performance Analyzer performance analysis reports are explained here.

Sampling and system states

During an Application Performance Analyzer observation session, activity in the target address space is sampled at the frequency and for the duration which was specified when the session was requested. Each observation results in data being recorded which describes an observed System State. The essence of the analysis reports is the aggregation of System States and attribution of these aggregates to various System Objects. For example, CPU Executing is a type of System State and a Load Module is a type of System Object; a report might quantify observations of CPU Executing and attribute these quantities to various Load Modules. By mapping observed system states to system objects, the analysis reports provide a meaningful picture of how resources are consumed.

Types of system states

Each observation, or “sample,” interrupts and momentarily “freezes” system activity in the target address space. Information about the state of the interrupted process (or, often, in the case of a multi-CPU system, processes) is recorded. System states that can be observed are:

- CPU Executing
- CPU Waiting
- Queued

It is important to understand that an observation session measures activity in a single address space. When we refer to system states like “CPU Waiting” or “CPU Unavailable” these states are with respect to the target address space only.

CPU Executing

A CPU was executing machine instructions for the task when the observation was made. Information about where (in what program) execution was taking place is captured. Application Performance Analyzer also determines, and records, whether execution was in Linear or Parallel mode. Linear mode refers to a state in which one, and only one, task was executing instructions. Parallel mode refers to a state in which more than one task was executing concurrently. Parallel mode occurs when two or more CPUs were executing instructions for the target address space at the same time.

CPU Waiting

A task was in a wait state. The task was waiting for an event (such as completion of an I/O operation) to occur.

Queued

The “Queued” state refers to a task (TCB) that was observed as dispatchable but was not executing instructions because no CPU was available. A measurement showing a high percentage of queued observations could imply an overall shortage of CPU resources. This would also occur in an address space in which the number of dispatchable tasks exceeds the number of physical CPUs.

Unavailability of memory can also cause the Queued state.

System objects

System Objects are objects to which quantified observations of systems states can be attributed. The following are the basic system objects:

- Load Modules
- TCBs
- DD Names
- DASD Volumes
- SVCs
- MQ Queue Names

Quantities expressed as percentages

The performance analysis reports express most quantified data as percentages. In most cases, absolute values (for example, actual number of observations in which execution was in Db2 services) would not, by themselves, be particularly meaningful. This is because the total number of samples chosen for an observation session is somewhat arbitrary. The percentage of activity attributed to a system object, on the other hand, provides a much better measure of the impact of that system object on performance. Furthermore, when expressed as percentages, quantification is likely to remain roughly equal if the sampling frequency and duration parameters are varied.

In order to effectively interpret the performance analysis reports it is important that you understand how these percentages are computed. The formulae vary depending upon what type of system activity is reported.

CPU Time Percentage

The percentage expresses the ratio of attributed CPU to the total CPU time observed. This is computed by dividing the number of attributed “CPU EXECUTING” observations by the total number of “CPU EXECUTING” observations and multiplying that number by 100.

Note that observations of CPU Waiting and CPU Unavailable are excluded from the calculation. The objective is to report the relative demand placed on CPU resources by system objects.

I/O Activity Percentage of Time

The percentage reported for I/O activity expresses the ratio of time attributed I/O operations were active to the total observation session elapsed time. Consider an example in which 10,000 observations were made during a 60 second interval. Suppose during 1,500 of these observations, I/O was found to be active for a file with DDNAME=SYSIN. 15 percent would be reported as the I/O activity percentage of time attributed to SYSIN.

Parallel Activity

Application Performance Analyzer will report information about parallel activity. Examples of parallel activity are:

I/O activity concurrent CPU execution is observed.

Concurrent I/O activity is observed for multiple devices.

Concurrent CPU execution is observed. This is only possible on a system with multiple CPUs (a multiprocessor).

Margin of error

A margin of error value is displayed in various reports. The value is expressed as a percentage and represents a 95 percent confidence interval. What this means is that in 95 percent of cases (19 out of 20 times) a repetition of the same measurement will produce results within +/- the indicated number of percentage points. This value is based entirely on the size of a sample population and reflects only the statistical error that can be expected from the sample size. It does not take into account any effects caused by biased sample collection.

Color coding of graphs

Application Performance Analyzer makes extensive use of bar graphs to illustrate resource usage. The graphs are color coded as follows:

Table 1. Color coding of graphs	
Graph Color	Purpose
Green	CPU active
Yellow	CPU wait
White	Resources (memory, dataspace)
Red	DASD I/O
Blue	Service time

Note: Report titles indicate each report's purpose. Color coding is included for emphasis, but color is not required to interpret information.

Report categories and codes

Application Performance Analyzer reports are each assigned a three-character code consisting of a one-letter prefix followed by a two-digit number. The prefix indicates which category the report belongs to, and the number is a sequence number within that category.

When you are viewing a report, you can enter another report's three-character code on the command line and that report will also open.

The categories and reports are listed here:

<i>Table 2. Report categories and prefixes</i>		
Prefix	Category	Reports
A	Admin/Miscellaneous	A01 Source Program Mapping A02 Request Printed Reports A03 Java Source Mapping A04 Source Mapping Dataset List A05 Source Mapping Common List
S	Statistics/Storage	S01 Measurement Profile S02 Load Module Attributes S03 Load Module Summary S04 TCB Summary S05 Memory Usage Timeline S06 Data Space Usage Timeline S07 TCB Execution Summary S08 Processor Utilization Summary S09 Measurement Analysis S10 Observation Session Messages
C	CPU usage analysis	C01 CPU Usage by Category C02 CPU Usage by Module C03 CPU Usage by Code Slice C04 CPU Usage by Timeline C05 CPU Usage Task/Category C06 CPU Usage Task/Module C07 CPU Usage by Procedure C08 CPU Usage Referred Attribution C09 CPU Usage by PSW/Object Code C10 CPU Usage by Natural Program
D	DASD I/O analysis	D01 DASD Usage by Device D02 DASD Usage by DDName D03 DASD Usage by data set D04 data set Attributes D05 DASD EXCP Summary D06 DASD VSAM Statistics D07 DASD Activity Timeline D08 DASD I/O Wait Time D09 VSAM Buffer Pool Usage
G	Coupling facility	G01 Coupling Facility Summary G02 Coupling Facility Mean Times G03 Coupling Facility Total Times
K	SRB measurement	K01 CPU SRB Usage by SRB Type K02 CPU SRB Usage by PSW/ObjCode

Table 2. Report categories and prefixes (continued)

Prefix	Category	Reports
W	CPU WAIT analysis	W01 Wait Time by Category W02 Wait Time by Module W03 Wait Time Referred Attribution W04 Wait Time by task ENQ/RESERVE W05 Wait Time by Tape DDNAME
I	IMS measurement	I01 IMS Measurement Profile I02 IMS DL/I DL/I Call Timeline I03 IMS Transaction Timeline I04 IMS Txn Activity Timeline I05 IMS CPU Usage by PSB I06 IMS CPU Usage by Transaction I07 IMS CPU Usage by DL/I Call I08 IMS WAIT Time by PSB I09 IMS WAIT Time by Transaction I10 IMS WAIT Time by DL/I Call I11 IMS DL/I Activity by PSB I12 IMS DL/I Activity by Txn I13 IMS DL/I Activity by DL/I Call I14 IMS PSB/PCB Attributes I15 IMS DL/I Call Attributes I16 IMS Transaction Service Times I17 IMS Transaction DL/I Counts I18 IMS CPU/Svc Time by DL/I Call I19 IMS CPU/Svc Time by PSB I20 IMS CPU/Svc Time by Txn I21 IMS CPU/Svc Time by PCB I22 IMS Region Transaction Summary
E	CICS measurement	E01 CICS Session Statistics E02 CICS CPU and Use Counts by Pgm E03 CICS CPU Usage by Txn E04 CICS Mean Service Time by Txn E05 CICS Total Service Time by Txn E06 CICS Service Time by Task ID E07 CICS Wait by Txn E08 CICS mean service time by terminal ID E09 CICS total service time by terminal ID E10 CICS Mean Service Time by user ID E11 CICS Total Service Time by user ID E12 CICS CPU/Service Time by Txn

Table 2. Report categories and prefixes (continued)

Prefix	Category	Reports
X	Multiple address space measurement	X01 CICS Mean Service Time by Txn X02 CICS Total Service Time by Txn X03 CICS Mean Service Time by Term X04 CICS Total Service Time by Term X05 Combined Db2 IMS MQ Timeline X06 IMS MASS Region Summary X07 Db2 Stored Procedures Summary
F	Db2 measurement	F01 Db2 Measurement Profile F02 Db2 SQL Activity Timeline F03 Db2 SQL Activity by DBRM F04 Db2 SQL Activity by Statement F05 Db2 SQL Activity by Plan F06 Db2 SQL Statement Attributes F07 Db2 SQL Wait Time by DBRM F08 Db2 SQL Wait Time by Statement F09 Db2 SQL Wait Time by Plan F10 Db2 SQL CPU/Svc Time by DBRM F11 Db2 SQL CPU/Svc Time by Stmt F12 Db2 SQL CPU/Svc Time by Plan F13 Db2 SQL Threads Analysis F14 Db2 CPU Usage by Plan/Proc F15 Db2 SQL CPU/Svc Time by Rq Loc F16 Db2 SQL CPU/Svc Time by Enclave F17 Db2 SQL CPU/Svc Time by Corrid F18 Db2 SQL CPU/Svc Time by Wkstn F19 Db2 SQL CPU/Svc Time by EndUsr F30 Db2 Class 3 Wait Times
Q	MQ measurement	Q01 MQ Activity Summary Q02 MQ CPU Usage by Queue Q03 MQ CPU Usage by Request Q04 MQ CPU Usage by Txn Q05 MQ Serv Time by Queue Q06 MQ Serv Time by Request Q07 MQ Serv Time by Txn Q08 MQ Wait Time by Queue Q09 MQ Wait Time by Request Q10 MQ Wait Time by Txn Q11 MQ+ Activity Timeline Q12 MQ+ CPU/SVC Time by Queue Q13 MQ+ CPU/SVC Time by Request Q14 MQ+ CPU/SVC Time by Txn

Table 2. Report categories and prefixes (continued)

Prefix	Category	Reports
J	Java Measurement	<p>J01 Java summary and attributes</p> <p>J02 Java Heap usage timeline</p> <p>J03 Java CPU usage by thread</p> <p>J04 Java CPU usage by package</p> <p>J05 Java CPU usage by class</p> <p>J06 Java CPU usage by method</p> <p>J07 Java CPU usage by call path</p> <p>J09 Java service time by package</p> <p>J10 Java service time by class</p> <p>J11 Java service time by method</p> <p>J12 Java service time by call path</p> <p>J14 Java wait time by package</p> <p>J15 Java wait time by class</p> <p>J16 Java wait time by method</p> <p>J17 Java wait time by call path</p>
V	Variance reports	<p>V01 Measurement Variance Summary</p> <p>V02 CICS Variance Summary</p> <p>V03 Db2 Variance Summary</p> <p>V04 IMS Variance Summary</p>
H	HFS Analysis	<p>H01 HFS Service Time by Path Name</p> <p>H02 HFS Service Time by Device</p> <p>H03 HFS File Activity</p> <p>H04 HFS File Attributes</p> <p>H05 HFS Device Activity</p> <p>H06 HFS Device Attributes</p> <p>H07 HFS Activity Timeline</p> <p>H08 HFS Wait Time by Path Name</p> <p>H09 HFS Wait Time by Device</p> <p>H10 HFS Service Time by Request</p> <p>H11 HFS Wait Time by Request</p>

Table 2. Report categories and prefixes (continued)

Prefix	Category	Reports
B	WebSphere	B01 WAS Summary B02 WAS Activity B03 WAS Activity by Origin B04 WAS Activity by Servant B05 WAS EJB Activity B06 WAS EJB Activity by Origin B07 WAS EJB Activity by Servant B08 WAS Servlet/JSP Activity B09 WAS Servlet/JSP by Origin B10 WAS Servlet/JSP by Servant B11 WAS/CICS Calls B12 WAS/Db2 Calls B13 Async Work Requests B14 Async Work by Work Mgr B15 Async Work by Servant B16 WOLA Inbound Requests B17 WOLA Inbound by Origin B18 WOLA Inbound by Servant B19 WOLA Outbound Requests B20 WOLA Outbound by Register B21 WOLA Outbound by Servant

S01 - Measurement profile

Usage

Use this report to see a general overview of the measurement. This is a good report to examine first when analyzing a measurement. It provides an at-a-glance summary of various aspects of the measurement data and helps you choose which other reports to concentrate on. The first section of this report consists of a series of mini performance graphs illustrating various types of activity that was measured. This is followed by a section that reports measurement values.

Performance graphs

These are histograms quantifying measurement data. To the right of each graph, report codes of reports that show related and more detailed information are displayed. You can display the report by skipping the cursor to one of these fields and by pressing the ENTER key.

Overall CPU activity

This graph is omitted for DDF measurements.

Under heading	This is displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. This number is sometimes slightly smaller than the total number of samples. Only those samples in which any TCBs existed are included in this count. Non-TCB samples can occur very early in a job step when the system is still initializing the step.
CPU Active	The number of samples the CPU was actively processing one or more TCBs. This value represents the percentage of time CPU activity was occurring in the address space.
WAIT	The number of samples all TCBs were in a WAIT.
Queued	The number of samples no CPU activity was taking place because no resources (CPU or memory) were available to service the address space. At least one TCB was dispatchable and not in a WAIT.

CPU usage distribution

This graph is omitted for DDF measurements.

Under Heading	This is Displayed
CPU Active	The number of observations of CPU active TCBs. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. This value is different from the “samples” value reported in the “Overall CPU Activity” graph because multiple concurrent CPU active TCBs (multiple CPUs executing concurrently) are counted separately here. This quantification represents the overall consumption of CPU time.
Application	The number of observations of CPU active TCBs while executing in application modules.
System	The number of observations of CPU active TCBs while executing in system modules.
Db2 SQL	The number of observations of CPU active TCBs while servicing SQL requests.
Data Mgmt	The number of observations of CPU active TCBs while servicing data management requests.
Unresolved	The number of observations of CPU active TCBs while executing in addresses that could not be resolved to module names.
IMS DLI Call	The number of observations of CPU active TCBs while servicing IMS DLI requests.

Most CPU active modules

This graph is omitted for DDF measurements.

Under Heading	This is Displayed
CPU Active	The number of observations of CPU active TCBs. This number represents 100% of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. This value is different from the 'samples' value reported in the 'Overall CPU Activity' graph because multiple concurrent CPU active TCBs (multiple CPUs executing concurrently) are counted separately here. This quantification represents the overall consumption of CPU time.
Module	Five lines appear showing the five most CPU active load modules. The number of CPU active observations for each of these modules and its percentage of the total number of CPU active observations is shown.

Most CPU active CSECTs

This graph is omitted for DDF measurements.

Under Heading	This is Displayed
CPU Active	The number of observations of CPU active TCBs. This number represents 100% of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. This value is different from the 'samples' value reported in the 'Overall CPU Activity' graph because multiple concurrent CPU active TCBs (multiple CPUs executing concurrently) are counted separately here. This quantification represents the overall consumption of CPU time.
CSECT	Five lines appear showing the five most CPU active CSECTs (control sections) and their corresponding module names. The number of CPU active observations for each of these CSECTs and its percentage of the total number of CPU active observations is shown.

CPU modes

This graph is omitted for DDF measurements.

Under Heading	This is Displayed
CPU Active	The number of observations of CPU active TCBs. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. This value is different from the "samples" value reported in the "Overall CPU Activity" graph because multiple concurrent CPU active TCBs (multiple CPUs executing concurrently) are counted separately here. This quantification represents the overall consumption of CPU time.
Supv Mode	The number of observations of CPU active TCBs while the system was in supervisor (privileged) mode (usually system routines).
Prob Mode	The number of observations of CPU active TCBs while the system was in problem state. Applications normally execute in problem state.
In SVC	The number of observations of CPU active TCBs while the system was executing in an SVC (supervisor call) routine.
AMODE 24	The number of observations of CPU active TCBs while the system was in 24 bit addressing mode.
AMODE 31	The number of observations of CPU active TCBs while the system was in 31 bit addressing mode.

Under Heading	This is Displayed
AMODE 64	The number of observations of CPU active TCBs while the system was in 64 bit addressing mode.
User Key	The number of observations of CPU active TCBs while the system was in user storage key (key 8).
System Key	The number of observations of CPU active TCBs while the system was in a system storage protection key.

Most active IMS PSBs

This graph is shown only if IMS measurement data was recorded. It shows the most active IMS PSBs. Up to five IMS PSBs are reported.

Under Heading	This is Displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.
IMS PSB Name	An IMS PSB name is shown and the number of samples in which processing of DLI calls under this PSB was observed. The percentage and the graph represent the proportion of the overall measurement time during which DLI calls were being serviced under this PSB.
Most Active DLI Calls	This graph is shown only if IMS measurement data was recorded. It shows the most active IMS DLI calls. Up to five DLI calls are reported.

Most active DLI calls

This graph is shown only if IMS measurement data was recorded. It shows the most active IMS DLI calls. Up to five DLI calls are reported.

Under Heading	This is Displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.
DLI Call	A DLI call identified by three fields: a unique sequence number assigned to the DLI call; its DLI function code; and its PCB name. The percentage and the graph represent the proportion of samples in which processing of this DLI call was observed. The percentage and the graph represent the proportion of the overall measurement time during which all executions of this DLI call were being serviced.

Most active Db2 plans

This graph is shown only if Db2 measurement data was recorded. It shows the most active Db2 plan names. Up to five Db2 plans are reported.

Under Heading	This is Displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data and is used as the divisor to compute the percentages shown for each Package or DBRM.

Under Heading	This is Displayed
Db2 Package or DBRM Name	The number of samples SQL servicing was occurring against SQL statements defined in the indicated Package or DBRM.

Most active packages/DBRMs

This graph is shown only if Db2 measurement data was recorded. It shows the most active Db2 Packages/DBRMs. Up to 5 Db2 Package names or DBRM names are reported. A DBRM name is shown instead of a Package name in the event the DBRM was bound directly to the Plan instead of to a Package.

Under Heading	This is Displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data and is used as the divisor to compute the percentages shown for each Package or DBRM.
Db2 Package or DBRM Name	The number of samples SQL servicing was occurring against SQL statements defined in the indicated Package or DBRM.

Most active SQL statements

This graph is shown only if Db2 measurement data was recorded. It shows the most active Db2 SQL statements. Up to five SQL statements are reported.

Under Heading	This is Displayed
Samples	The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data and is used as the divisor to compute the percentages shown for each SQL statement.
DBRM: Statement SQL Function	The number of samples SQL servicing was occurring for the indicated SQL statement. The DBRM name, the statement number and the type of SQL statement are shown.

Measurement values

This section of the report shows various values relating to the measurement. These appear under the following categories:

- Request parameters
- Measurement environment
- Measurement statistics
- CPU consumption

Request parameters

These values were established when the measurement was requested.

Under Heading	This is Displayed
Request number	The unique 5-digit identifier assigned to the measurement.
Description	A description specified when the measurement was requested.
Sample File DSN	The data set name of the measurement file. A plus sign (+) before the data set name indicates this name was specified on the SAMPDSN keyword of an observation request created through the Application Performance Analyzer batch interface.

Under Heading	This is Displayed
Retention	The date upon which the measurement file is to be deleted by Application Performance Analyzer.
Data extractors	The specified data extractors (Db2, CICS, etc.)
Db2+ Max trace #	Maximum Db2+ trace entries that are specified when the measurement was requested.
IMS+ Max trace #	Maximum IMS+ trace entries that are specified when the measurement was requested.
MQ+ Max trace #	Maximum MQ+ trace entries that are specified when the measurement was requested.
IMS Subsystem Id	The specified IMS subsystem Id. This field displays for IMS multiple address space requests only.
IMS Tran Code	The specified IMS transaction code. This field displays for IMS multiple address space requests and IMS single region requests.
IMS Program Name	The specified IMS program name. This field displays for IMS single region requests only.
IMS User Id	The specified IMS user Id. This field displays for IMS single region requests only.
Specific Db2 Parms	A 'P' is displayed when the request was specified for a Db2 Stored Procedure. An 'F' is displayed when the request was specified for a Db2 user-defined function. This field displays for Db2 multiple address space requests only.
Db2 Subsystem	The Db2 subsystem Id that was specified for the stored procedure or user-defined function. This field displays for Db2 multiple address space requests only.
Schema	The schema name that was specified for the stored procedure or user-defined function. This field displays for Db2 multiple address space requests only.
Name	The name that was specified for the stored procedure or user-defined function. This field displays for Db2 multiple address space requests only.
Time of request	The time of day the request was made.
Requesting user	The TSO user ID of the user that requested the measurement.
Date of request	The date upon which the request was made.
Job name	The name of the job that was specified to be measured.
Step name/number	The step name or step number that was specified to be measured, if applicable.
Step program	The name of the step program that was specified to be measured, if applicable.
Number of samples	The number of samples specified.
Duration	The specified measurement duration.
Active/pending	Indicates whether the measurement request specified an active job (an immediate measurement) or one that was to run later when execution of the job step is detected.
Proc step name	The procedure step name, if specified.

Under Heading	This is Displayed
Delay time	The number of seconds specified for which the start of the measurement was to be delayed from the start of the job step.
CICS Filters	CICS subsystem measurement criteria that is specified when the measurement was requested.
DDF Filters	Db2 DDF subsystem measurement criteria that is specified when the measurement was requested.
IMS MASS	IMS subsystem measurement criteria that is specified when the measurement was requested.
Db2 Stored Procedure	Db2 Stored Procedure subsystem measurement criteria that is specified when the measurement was requested.

Measurement environment

Values relating to the environment in which the measurement took place are reported here.

Under Heading	This is Displayed
Job name	The name of the measured job.
Job number	The job number of the measured job assigned by JES.
Step name	The name of the measured step.
ASID/ASIDX	The ASID (address space ID) and ASIDX (address space ID in hexadecimal) of the measured job.
Job User ID	The user ID which the job ran under.
Region size <16MB	The region size in the 24 bit address range.
Region size >16mb	The region size above the 24 bit address range.
Step program	The name of the measurement step program (specified in the EXEC JCL statement).
Region type	The type of region (Batch, TSO, IMS, CICS, etc.) measured.
Service Class Name	The service class name that is assigned to the measured job.
System ID	The system identifier of the system on which the measurement took place.
SMFID	The SMF ID assigned to the system on which the measurement took place.
O/S Level	The operating system and level.
APA vers.	The version of Application Performance Analyzer that performed the measurement.
IBM APA APAR	The APAR number of Application Performance Analyzer started task that was active when this measurement was performed.
Db2 subsystem name	The Db2 subsystem name if it is connected.
Db2 attach type	The type of Db2 attachment, if Db2 data recorded.
General CPUs	The number of CPUs in the system on which the measurement took place. This does not include specialty CPUs.
Specialty CPUs	The number of specialty CPUs in the system on which the measurement took place.

Under Heading	This is Displayed
CPU rate factor	The factor used to determine CPU performance.
MIPS per CPU	The speed, in machine instructions per second, of one CPU. This is derived using the CPU rate factor.
CPU model	The CPU model number.
SUs per second	The number of service units per CPU second.
HiperDispatch	With HiperDispatch=Y, work can be managed across fewer logical processors. A concept of maintaining a working set of processors that are required to handle the workload is introduced.
Max MT mode	The maximum multi-threading (MT) mode that can be supported by both the hardware and this IPL of z/OS.
CP MT mode	The multi-threading mode (MT) for general Cps.
zIIP MT mode	The multi-threading mode (MT) for zIIPs.

Measurement statistics

Under Heading	This is Displayed
Start time	The time at which the measurement was initiated.
End time	The time at which the measurement ended.
Start date	The date upon which the measurement was initiated.
End date	The date upon which the measurement ended.
Total samples	The total number of samples taken during the measurement.
Sampling rate	The overall sampling rate expressed in samples per second.
CPU/WAIT samples	The number of samples in which CPU activity was observed or all TCBs were in wait state. Excluded from this count are samples in which no CPU activity was observed and one or more TCBs were dispatchable.
TCB samples	The number of samples in which TCBs existed. This number might be slightly smaller than the total number of samples. This occurs when some samples were taken at the beginning of a job step before the step initialization had completed.
Overall CPU	The average system CPU utilization percentage during the measurement period. It is obtained from the field CCVUTILP, which is the system CPU utilization as viewed by the System Resource Manager (SRM). Thus, it is the CPU utilization for this z/OS image.
Overall zAAP CPU	The average CPU Utilization percentage for the zAAP processor(s) during the measurement period. It is obtained from field, CCVUTILI, which is the zAAP CPU Utilization as viewed by the System Resource Manager (SRM).
Overall zIIP CPU	The average CPU Utilization percentage for the zIIP processor(s) during the measurement period. It is obtained from field, CCVUTILS, which is the zIIP CPU Utilization as viewed by the System Resource Manager(SRM). When the processor has the zAAP on zIIP feature, zAAP time will also show in this field.
Duration	The duration of the measurement in minutes and seconds.

Under Heading	This is Displayed
Report dataspace	The size of the dataspace used to load the sample file and create indexes for reporting. This field is reported in megabytes.
Sample dataspace	The size of the dataspace used to record measurement data while sampling. This is the total uncompressed size reported in megabytes.
Meas significance	The ratio of the number of CPU/WAIT samples to the number of TCB samples. This is a measure of the quality of the measurement data. A low value indicates that CPU resources were unavailable to service the job step.
CPU queued samples	The number of samples in which no activity was occurring in the address space due to the unavailability of CPU resources.
Pages in	The number of page-in operations that occurred during the measurement interval.
Pages out	The number of page-out operations that occurred during the measurement interval.
EXCPs	The number of EXCPs processed during the measurement interval.

CPU consumption

This section is omitted for DDF measurements.

Under Heading	This is Displayed
CPU active samples	The number of samples in which CPU activity (one or more CPUs) was observed.
CPU active time	The percentage of the measurement interval CPU activity was observed.
CPU wait samples	The number of samples in which all TCBs were in wait state.
CPU wait time	The percentage of the measurement interval all TCBs were in wait state.
CPU time TCB	The number of CPU seconds consumed in TCB mode during the measurement interval.
CPU time SRB	The number of CPU seconds consumed in SRB mode during the measurement interval. This does not include any SRB time consumed by the Application Performance Analyzer measurement task.
Service units	The number of service units based on the CPU TCB and CPU SRB consumption.
Measurement SRB	The number of CPU seconds in SRB mode consumed by the Application Performance Analyzer measurement task in the measured address space.

zIIP CPU consumption

This section is always displayed.

Under Heading	This is Displayed
zIIP CPU Time	The number of CPU seconds consumed on zIIP processors during the measurement interval.
zIIP time on CP	The number of CPU seconds consumed on a standard processor for zIIP eligible work.

Under Heading	This is Displayed
Norm. Factor	The normalization factor is used to express zIIP CPU time in the time a regular CP would have used for the same work. Multiply the zIIP CPU time by this number, then divide by 256.
zIIP Normalized	The zIIP CPU time displayed as a normalized CPU time.

zAAP/zCBP CPU consumption

This section is displayed when zAAP/zCBP time has been recorded.

Under Heading	This is Displayed
zAAP/zCBP CPU time	The number of CPU seconds consumed on zAAP/zCBP processors during the measurement interval.
zAAP/zCBP Time on CP	The number of CPU seconds consumed on a standard processor for zAAP/zCBP eligible work.
Norm. Factor	The normalization factor is used to express zAAP/zCBP CPU time in the time a regular CP would have used for the same work. Multiply the zAAP/zCBP CPU time by this number, then divide by 256.
Normalized Time	The zAAP/zCBP CPU time displayed as a normalized CPU time.

DDF CPU consumption

This section is shown for DDF measurements only.

Under Heading	This is Displayed
Task CPU time	The number of seconds of CPU time used by the enclave SRB dispatchable unit for all measured DDF SQL calls.
Enclave CPU time	The number of seconds of CPU time used by all dispatchable units in an enclave for all measured DDF SQL calls.
zIIP time	The number of seconds of zIIP time used by all measured DDF SQL calls.
zIIP on CP time	The number of seconds of CPU time on a standard processor for zIIP-eligible work used by all measured DDF SQL calls.

WLM Client Enclave consumption

This section is shown for Db2 parallel queries only.

Under Heading	This is Displayed
Client SRB time	The number of seconds of CPU time used by the enclave SRB dispatchable unit for all measured Db2 parallel queries.
Total TCB time	The sum of CPU time in seconds used by client SRB enclaves and TCB CPU time.

Enclave CPU

This section is displayed when Enclave CPU time has been recorded.

Under Heading	This is Displayed
zIIP CPU Time	The number of CPU seconds of Enclave zIIP time consumed in the target address space during the measurement interval. This is "normalized" time.
zAAP/zCBP CPU Time	The number of CPU seconds of Enclave zAAP/zCBP time consumed in the target address space during the measurement interval. This is "normalized" time.
Norm. Factor	The normalization factor is used to express zIIP/zAAP/zCBP CPU time in the time a regular CP would have used for the same work. Multiply the zIIP/zAAP/zCBP CPU time by this number, then divide by 256.
On CP time	The number of CPU seconds of Enclave time consumed on a standard processor for zAAP/zCBP eligible work.

Virtual Storage Map

The Virtual Storage Map shows the virtual storage address ranges for each storage type in the z/OS system at the time of the measurement.

Under Heading	This is Displayed
Start Address	The starting address of the virtual storage range for this storage type.
End Address	The ending address of the virtual storage range for this storage type.
Length	The length of the virtual storage range for this storage type.

Sample reports

A sample report is shown here, it is divided into three segments as it is scrolled down.

File View Navigate Help

S01: Measurement Profile (01392/CICS55A)
Command ==>

Row 00001 of 00135
Scroll ==> CSR

+Overall CPU Activity -----+ +Reports: -----+									
Samples	10,000	100.0%	'	'	'	'	'	C01	C02
CPU Active	5,659	56.5%	00000000000					C07	C03
WAIT	4,316	43.1%	000000000					W01	W02
Queued	25	0.2%	0						C05
+-----+ +-----+									
+CPU Usage Distribution -----+ +Reports: -----+									
CPU Active	8,686	100.0%	'	'	'	'	'	C01	C05
Application	262	3.0%	0						C08
System	7,684	88.4%	000000000000000000						W01
Db2 SQL	0	0.0%							
Data Mgmt	605	6.9%	0						
Unresolved	135	1.5%	0						
IMS DLI Call	0	0.0%							
+-----+ +-----+									
+Most CPU Active Modules -----+ +Reports: -----+									
CPU Active	8,686	100.0%	'	'	'	'	'	C02	
DFHSIP	2,984	34.3%	000000						
DSNIDM	1,058	12.1%	00						
DSNXGRDS	1,000	11.5%	00						
IDA019R0	378	4.3%	0						
IWMX2RXF	369	4.2%	0						
+-----+ +-----+									
+Most CPU Active CSECTs -----+ +Reports: -----+									
CPU Active	8,686	100.0%	'	'	'	'	'	C02	
DFHTRPX in DFHSIP	2,416	27.8%	00000						
DSNIOST2 in DSNIDM	424	4.8%	0						
IDAX19R1 in IDA019R0	378	4.3%	0						
IWMXDRXF in IWMX2RXF	369	4.2%	0						
DFHERM in DFHERM	289	3.3%	0						
+-----+ +-----+									

Scrolling down, sample report S01 continued:

S01: Measurement Profile (01392/CICS55A)

Row 00037 of 00135

Command ==>

Scroll ==> CSR

+CPU Modes				+Reports:	
Active CPU	8,686	100.0%		S08	
Supv Mode	3,528	40.6%	00000000		
Prob Mode	5,158	59.3%	00000000000		
In SVC	194	2.2%	0		
AMODE 24	0	0.0%			
AMODE 31	3,280	37.7%	00000000		
AMODE 64	5,406	62.2%	0000000000000		
User Key	4,783	55.0%	00000000000		
System Key	3,903	44.9%	00000000		

+Request parameters			
Request number	01392		
Description	S01 display		
Sample file DSN	BCAZ.CAZ1420.ASG02.R01392.CICS55A.SF		
Retention	Retain until deleted by user		
Data extractors	CICS,MQ,CICS+,MQ+		
Db2+ Max trace #	100K		
IMS+ Max trace #	100K		
MQ+ Max trace #	100K		
-----+-----			
Requesting user	ASG02	Nbr of samples	10,000
Time of request	20:41:31	Duration	60 sec
Date of request	Mon Aug-31-2020	Active/pending	Active
Job name	CICS55A	Proc step name	n/a
Step name/number	n/a	Delay time	none
Step program	n/a		
-----+-----			
CICS Filters			
Trancodes	RDDR DBDR		
Terminal ids	*		
System trans	N		
Non-term trans	Y		
-----+-----			

Scrolling down, sample report S01 continued:

File View Navigate Help

S01: Measurement Profile (01392/CICS55A)				Row 00073 of 00135	
Command ==>				Scroll ==> CSR	
+Measurement environment -----+					
Job name	CICS55A	Region size <16MB	9,192K		
Job number	STC08394	Region size >16MB	1,679,360K		
Step name	CICS55A	Step program	DFHSIP		
Proc step name		Region type	CICS TS 5.5		
ASID/ASIDX	108 / 006C	Service Class Name	STCLOM		
Job User ID	START2				
+-----+					
System ID	S0W1	IBM APA Version	14.2.4		
SMFID	S0W1	IBM APA APAR	PH27212		
O/S level	z/OS 02.04.00	Db2 subsystem name			
IMS system id		Db2 Attach type	n/a		
+-----+					
General CPUs	3	CPU model	1090		
Specialty CPUs	1	CPU rate factor	18,674		
MIPS per CPU	17	SUs per second	856.8		
HiperDispatch	N	Max MT mode	1		
+-----+					
+Measurement statistics -----+					
Start time	20:41:31	Start date	Mon Aug-31-2020		
End time	20:42:31	End date	Mon Aug-31-2020		
+-----+					
Total samples	10,000	Duration	59.99 sec		
Sampling rate	166.69 per sec	Report dataspace	17.24MB		
CPU/WAIT samples	9,975	Sample dataspace	67.94MB		
TCB samples	10,000	Meas significance	99.75%		
CPU queued samples	25				
+-----+					
Pages in	0	Overall CPU	53.41%		
Pages out	0	Overall zAAP CPU	0.00%		
EXCPs	26	Overall zIIP CPU	1.96%		
+-----+					

Scrolling down, sample report S01 continued:

File View Navigate Help

S01: Measurement Profile (01392/CICS55A)				Row 00107 of 00135	
Command ==>				Scroll ==> CSR	
+CPU consumption -----+					
CPU active samples	5,659	CPU time TCB	30.79 sec		
CPU active time	56.59%	CPU time SRB	0.94 sec		
CPU WAIT samples	4,316	Service Units	27,186		
CPU WAIT time	43.16%	Measurement SRB	15.49 sec		
+-----+					
+Virtual Storage Map -----+					
	Start Address	End Address	Length		
HV-Shared	00000200_00000000	- 0001FFFF_FFFFFFFF	510T	0G	
HV-Common	000001EF_80000000	- 000001FF_FFFFFFFF	0T	66G	
HV-Pvt	00000008_00000000	- 000001EF_7FFFFFFF	1T	926G	
Reserved	00000000_80000000	- 00000007_FFFFFFFF	0T	30G	
EPvt	19800000	7FFFFFFF	1640M	0K	
ECSA	07244000	197FFFFF	293M	752K	
EMLPA	07241000	07243FFF	0M	12K	
EFLPA	0723E000	07240FFF	0M	12K	
EPLPA	0346C000	0723DFFF	61M	840K	
ESQA	01DBE000	0346BFFF	22M	696K	
ENUC RW	01D6F000	01DBDFFF	0M	316K	
NUC RO	00FDD000	01D6EFFF	13M	583K	
NUC RW	00FD3000	00FDCAAF	0M	38K	
SQA	00E50000	00FD2FFF	1M	524K	
PLPA	00C8D000	00E4FFFF	1M	780K	
MLPA	00C8C000	00C8CFFF	0M	4K	
CSA	00900000	00C8BFFF	3M	560K	
Pvt	00006000	008FFFFF	8M	1000K	
PSA/SYS	00000000	00005FFF	0M	24K	
+-----+					

S02 - Load module attributes

This report lists information about each of the load modules for which activity was measured during the observation session. Various attributes of each of the modules are reported.

You can specify SETUP options (use the SETUP command) to exclude the following information from the report:

- ESD (External Symbol Dictionary) information.
- Modules loaded in PLPA.
- Modules loaded in the NUCLEUS.

A sample screen is shown here:

```
File View Navigate Help
-----
S02: Load Module Attributes - 0327/TSTJOB1          Row 00001 of 01699
Command ==> _____ Scroll ==> CSR

SORT by name enter: SN, by load address: SA, by size: SS, by loadlib: SL
Information reported for 153 load modules. (SETUP has excluded 105 modules).

Module Information for ISFMAIN
  Load Address      08B74D90 to 08B75FFF
  Module Size       4,720
  Attributes        REUS,RENT,APFLIB
  Module Location   JPA
  Loadlib DDNAME    -LNKLST-
  Load Library      ISF.SISFLOAD

ESD Information for ISFMAIN
  External  Offset  Length  Start Addr  End Addr
ISFMAIN    0000000  4714   08B74D90  08B75FF9

Module Information for ISFVTBL
  Load Address      08D6E480 to 08EDDFFF
  Module Size       1,506,176
  Attributes        REUS,RENT,APFLIB
  Module Location   JPA
```

You can place your cursor on the SORT field and enter any of the following four sort codes to re-sort the report:

- SN By Name
- SA By Load Address
- SS By Size
- SL By Loadlib

SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```

File View Navigate Help
+-----+-----+
S | Options for Load Module Attributes | 001 of 00957
C |                                     | 11 ==> CSR
  | Enter "/" to select an option
S |   - Omit display of ESD information | ib: SL
I |   - Omit Nucleus modules from report
M |   - Omit PLPA modules from report
  |   - Omit repeating modules from report
  |
E |
+-----+-----+

```

Use these options to trim down your report by omitting information that you are not interested in. You can omit ESD information, Nucleus modules, PLPA Modules, or modules that have been reloaded at a new address but have the same name and size.

S03 - Load module summary

This report lists the load modules for which activity was measured during the observation session. For further details about a particular module, enter the “++” line command.

A sample report is shown here:

```

File View Navigate Help
-----
S03: Load Module Summary (2133/TSTJOB1) Row 00001 of 00124
Command ==> Scroll ==> PAGE

Module   Locn   Address   Count   Size(bytes)  Attributes  DDName   Load Library
CEEBCINIT JPA    0000B088   1        61,304      RU RN     -VLF-
CEEPLPKA PLPA   043C3000   1       1,967,824
COFMMTGR NUC    012D2D10   1          752
COFMSCHK PLPA   03D0B3D8   1         3,112
CSVEXPR  PLPA   0296C000   1       31,448
CSVGETMD NUC    010FF180   1       17,544
CSVLLSCH NUC    010DAE40   1         1,848
CSVLLTCH NUC    010D82E0   1         8,232
CSVSYNCH NUC    012F8CA0   1         1,936
CSVXLOAD NUC    012FD0C0   1         2,448
CTXRSMGR NUC    0130BF68   1         9,024
IAXGT    NUC    016B7370   1         7,512
IAXPI    NUC    017378D8   1         2,976
IAXPN    NUC    0173E958   1         3,752
IAXPQ    NUC    01744310   1         7,168
IAXPS    NUC    00FFE3F0   1         6,224
IAXVF    NUC    017C4AD0   1       14,320

```

Detail line descriptions

Each line reports values under the following headings:

- Module
- Locn
- Address
- Count
- Size(bytes)
- Attributes
- DDName
- Load Library

Module

This is the module name.

Location

This is the location where the module was loaded — JPA, PLPA, or NUCLEUS. JPA is displayed in green. All other locations are displayed in red.

Address

This is the address where the module was loaded. If it is below the line, it is displayed in yellow, above the line addresses are displayed in green.

Count

The number of unique instances of the load module observed at the indicated address. This value exceeds 1 if the module was loaded, deleted and then loaded again. A high value could indicate the module was loaded (and deleted) excessively and could be causing a performance problem.

Size

This is the size of the module in bytes.

Attributes

This is the attributes of the module – RU=reusable, RN=reentrant, APF=APF-authorized.

DDName

This is the DDName of the load library from which the module was loaded.

Load Library

This is the data set name of the load library from which the module was loaded.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here:

on objects

Cmd	When Applied To Object	Action
?	Load Module	Display context help information.
++	Load Module	Show additional details.

on headings

Cmd	When Applied To Object	Action
?	Load Module	Display context help information.
SN	Module	Sort report by module name.
SS	Module	Sort report by module size.
SA	Module	Sort report by module load address.
SL	Module	Sort report by module load library

SETUP options

The following SETUP option can be selected with the SETUP primary command:

Combine repeating entries in report

You can choose to combine repeating entries in the report. When selected, entries whose module name or path name, address and size are identical will be combined into one entry. The count field is updated to reflect the true number of such entries sampled.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
Module Information for IGG0191A
  Load Address      00D89000 to 00D8CE7F
  Module Size       16,000
  Attributes        NOREUS,NORENT
  Module Location   PLPA
  Program Group     MVS System
  Subgroup          MVS Services
  Function          Data Management services

ESD Information for IGG0191A
  External  Offset  Length  Start Addr  End Addr
  IGG0191A  000000   2292   00D89000   00D898F3
  IGG0196I  0008F8    932   00D898F8   00D89C9B
  IGG0196A  000CA0   1186   00D89CA0   00D8A141
  IGG0196Q  001148   1984   00D8A148   00D8A907
  IGG0191N  001908   2700   00D8A908   00D8B393
  IGG0191Y  002398    668   00D8B398   00D8B633
  IGG0191B  002638   3254   00D8B638   00D8C2ED
  IGG0196B  0032F0   1040   00D8C2F0   00D8C6FF
  IGG0191I  003700   1352   00D8C700   00D8CC47
  IGG0193I  003C58    564   00D8CC48   00D8CE7B
+-----+

```

S04 - TCB summary

Overview

A list of all TCBs (Tasks) which were active at any time during the observation session is reported. The list is arranged in hierarchical sequence with ATTACHED subtasks indented relative to the parent tasks that performed the ATTACH functions.

A sample TCB Summary report is shown here:

```

File View Navigate Help
-----
S04: TCB Summary (0756/TSTJOB1)                               Row 00001 of 00005
Command ==> _____ Scroll ==> CSR_

TCB_Name                Address  Samples  CPU Active  CPU WAIT  Queued
IEAVAR00-002            8FE0A8      0
> IEAVTSDT-003          8FFE88      0
> IEESB605-004          8FFBF8      0
  > IEFIIC-005           8FB7F0      0
    > LPPFRAYV4-001      8FB330    3996      75.75%     8.23%    16.01%

```

Detail line descriptions

Each line reports values under the following headings.

- TCB Name
- Address
- Samples
- CPU Active
- CPU WAIT
- Queued

TCB Name

This is the name of the program associated with the task; the one specified to the ATTACH function. An index value is also appended to the name. This is a sequence number that Application Performance Analyzer assigned to each unique TCB that it observed. The value is useful for distinguishing between more than one TCB with the same name (same program ATTACHed).

For CICS measurements that have the CICS data extractor selected, the TCB mode will be displayed for CICS TCBs. This will immediately follow the TCB name.

Address

This is the address of the TCB. Only 6 hexadecimal digits are shown as TCBs always reside below the 16MB line.

Samples

This is the number of samples in which the TCB was observed.

CPU Active

This is the number of samples in which the CPU was active (instruction execution was in progress) in this TCB.

CPU WAIT

This is the number of samples in which the Task was waiting.

Queued

This is the number of samples in which the TCB was observed in Queued status; it was ready to execute but no CPU was available.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	TCB Name	Display context help information.
++	TCB Name	Show additional details.
C01	TCB Name	Display C01 report subset.
C02	TCB Name	Display C02 report subset.
C03	TCB Name	Display C03 report subset.

This report does not have any line commands on headings.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > LPFRAYV4-001          8FB330      3996      75.75%      8.23% 1 |
+-----+

TCB Information for LPFRAYV4-001

Nbr of Samples          3996
Active CPU Samples      3027  =====
WAIT Samples           329   ==
Queued CPU Samples      640   =====

Session CPU Time        17.778 seconds
Accumulated CPU Time    17.778 seconds
Task ATTACHed by        IEFIIC-005
Time to ATTACH           *UNKNOWN*

```

S05 - Memory usage timeline

Overview

This timeline analysis breaks the observation session duration into a number of (approximately) fixed-length, chronological time intervals. Each line represents one of these intervals. By default, 15 intervals are reported, each representing approximately the same number of samples. This illustrates any progressive resource usage trends. The value under the heading Storage quantify the number of Page Frames, which were allocated to the address space during the interval.

A sample Memory Usage Timeline report is shown here:

```

File View Navigate Help
-----
S05: Memory Usage Timeline (0644/TSTJOB1)          Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

SEQN    Seconds    Storage <----1380K-----2530K-->
*.....+.....+.....+.....+.....+.....+.....+.....+.....+.....*
0001      0.069     1548K  =====
0002      0.205     1660K  =====
0003      0.256     2040K  =====
0004      0.180     2040K  =====
0005      0.184     2040K  =====
0006      0.209     2104K  =====
0007      0.201     2144K  =====
0008      0.205     2188K  =====
0009      0.205     2280K  =====
0010      0.209     2380K  =====
0011      0.227     2404K  =====
0012      0.201     2432K  =====
0013      0.193     2408K  =====
0014      0.214     2176K  =====
0015      0.111     1556K  =====

```

Detail line descriptions

Each line reports values under the following headings:

- SEQN
- Seconds
- Storage

SEQN

This is the sequence number of the interval. Intervals are numbered 0001, 0002, etc.

Seconds

This is the duration of the interval in seconds.

Storage

This is the amount of central storage allocated to the address space. In other words, Real Storage (or “Page Frames”). This is an effective measurement of the address space's demand on central storage. The value is expressed in units of kilobytes (1024 bytes). Each line shows the maximum value observed during the particular interval. These page frames include paged-in storage for conventional allocations (for example, obtained by GETMAIN) as well as Dataspaces and Hiperspaces.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	SEQN (sampling interval)	Display context help information.
++	SEQN (sampling interval)	Show additional details.
C01	SEQN (sampling interval)	Display C01 report subset.
C02	SEQN (sampling interval)	Display C02 report subset.
C03	SEQN (sampling interval)	Display C03 report subset.

This report does not have any line commands on headings.

SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```
File View Navigate Help
-----
S | Options for Memory Usage Timeline | =====
C |                                  | 001 of 00015
  |                                  | ==> CSR
S | Number of Intervals . . . . . 15 |
  | This is the number of equal time intervals within |
  | the duration of the measurement that are to be   |
  | reported. Each report line will show measurement |
  | information for one interval.                     |
0 |                                                  |
0 |                                                  |
0 |                                                  |
0 |                                                  |
+-----+
```

Number of Intervals

Use this option to change the number of equal time intervals that are reported.

S06 - Data space usage timeline

Overview

This timeline analysis breaks the observation session duration into a number of (approximately) fixed-length, chronological time intervals. Each line represents one of these intervals. By default, 15 intervals are reported, each representing approximately the same number of samples. This illustrates any

A sample of the Data Space Usage Timeline report is shown here:

Detail line descriptions

- SEQN
- Seconds
- Storage

This is the amount of virtual storage allocated to the address space for user-key Data Spaces. The value is expressed in units of kilobytes (1024 bytes). Each line shows the maximum value observed during the particular interval.

Cmd	When Applied To Object	Action
?	SEQN (sampling interval)	Display context help information.
++	SEQN (sampling interval)	Show additional details.
C01	SEQN (sampling interval)	Display C01 report subset.
C02	SEQN (sampling interval)	Display C02 report subset.
C03	SEQN (sampling interval)	Display C03 report subset.

This report does not have any line commands on headings.

SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```
- +-----+=====
S | Options for Data Space Usage Timeline          | 001 of 00015
C |                                                  |    ==> CSR
  | Number of Intervals . . . . . _15
S |   This is the number of equal time intervals within
O |   the duration of the measurement that are to be
O |   reported. Each report line will show measurement
O |   information for one interval.
  |
- +-----+
```

Number of Intervals

Use this option to change the number of equal time intervals that are reported.

S07 - TCB execution summary

Overview

A list of all TCBs (Tasks) which were active at any time during the observation session is reported. The list is arranged in hierarchical sequence with ATTACHed subtasks indented relative to the parent tasks that performed the ATTACH functions.

A sample screen is shown here:

```
File View Navigate Help
```

```
S07: TCB Execution Summary (0656/TSTJOB1) Row 00001 of 00019  
Command ==> _____ Scroll ==> CSR
```

	--- CPU Time ---		
<u>TCB_Name</u>	<u>Measured</u>	<u>TCBTotals</u>	<-- Measurement Interval -->
<u>IEAVAR00-001</u>	0.0 Sec	2.3 Sec	System TCB - Not Measured
> <u>IEAVTSDT-002</u>	0.0 Sec	0.0 Sec	System TCB - Not Measured
> <u>IEESB605-003</u>	0.0 Sec	1.2 Sec	System TCB - Not Measured
> <u>IKJEFT01-004</u>	0.0 Sec	0.3 Sec	=====
>> <u>IKJEFT02-005</u>	0.0 Sec	0.4 Sec	=====
>>> <u>IKJEFT09-006</u>	0.0 Sec	0.0 Sec	=====
>>>> <u>ISPF-007</u>	0.9 Sec	32.3 Sec	=====
>>>>> <u>ISPTASK-008</u>	0.0 Sec	8.5 Sec	=====
>>>>> <u>ISPTASK-009</u>	8.2 Sec	21.0 Sec	=====
>>>>>> <u>EX-010</u>	0.1 Sec	0.3 Sec	=====
>>>>>>> <u>ALTLIB-015</u>	0.0 Sec	0.0 Sec	=
>>>>>>>> <u>FREE-016</u>	0.0 Sec	0.0 Sec	=
>>>>>>>>> <u>CALL-011</u>	0.1 Sec	0.2 Sec	=====
>>>>>>>>>> <u>PMSEL-12</u>	3.9 Sec	42.3 Sec	=====
>>>>>>>>>>> <u>EXEC-013</u>	0.1 Sec	0.8 Sec	=
>>>>>>>>>>>> <u>CALL-014</u>	0.0 Sec	0.2 Sec	=
>>>>>>>>>>>>> <u>ALLOC-017</u>	0.1 Sec	0.1 Sec	=
>>>>>>>>>>>>>> <u>ALLOC-018</u>	0.1 Sec	0.1 Sec	=
>>>>>>>>>>>>>>> <u>ALLOC-019</u>	0.1 Sec	0.1 Sec	=

Detail line descriptions

Each line represents reports values under the following headings:

- TCB Name

- CPU Time – Measured
- CPU Time – TCBTotal
- Measurement Interval

TCB Name

This is the name of the program associated with the task; the one specified to the ATTACH function. An index value is also appended to the name. This is a sequence number that Application Performance Analyzer assigned to each unique TCB that it observed. The value is useful for distinguishing between more than one TCB with the same name (same program ATTACHed).

For CICS measurements that have the CICS data extractor selected, the TCB mode will be displayed for CICS TCBs. This will immediately follow the TCB name.

CPU Time – Measured

This reports the amount of CPU time used by the Task for the duration of the observation session. This is accurate to within the span of two sample intervals.

CPU Time – TCBTotal

This reports the amount of accumulated CPU time used by the Task since the Task was started up to the time of the end of the observation session. This is accurate to within one sample interval.

Measurement Interval

A graph is plotted here showing the span of time within the observation session interval the Task was active.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

on objects

Cmd	When Applied To Object	Action
?	TCB Name	Display context help information.
++	TCB Name	Show additional details.
C01	TCB Name	Display C01 report subset.
C02	TCB Name	Display C02 report subset.
C03	TCB Name	Display C03 report subset.

S08 - Processor utilization summary

Usage

Use this report to see a breakdown of CPU states observed during the measurement.

Quantification

Each detail line reports the number of active CPU samples for an indicated CPU state. This is also expressed as a percentage of the total number of active CPU samples.

The CPU states are not all mutually exclusive. Overlaps in the counts reported in different detail lines will occur.

Under Heading	This is Displayed
Storage key n	The number of active CPU samples in the indicated storage protect key. A value of 8 indicates user (application) key. Other values usually indicate execution is in a system routine.
Problem state	The number of active CPU samples in problem state. This is the usual state for application programs.
Supervisor state	The number of active CPU samples in supervisor state. This mode allows execution of privileged instructions. This typically indicates execution in an operating system routine.
Execution in SVC	The number of active CPU samples while executing in SVC (Supervisor Call) modules.
Execution in real mode	The number of active CPU samples in real mode. There are no normal operating conditions under which this mode can occur. The value should always be zero indicating execution in virtual mode.
Primary-space mode	The number of active CPU samples in which the ASC (Address- Space Control) bits indicate execution in primary-space mode.
Access-register mode	The number of active CPU samples in which the ASC (Address- Space Control) bits indicate execution in Access-register (AR) mode.
Secondary-space mode	The number of active CPU samples in which the ASC (Address-Space Control) bits indicate execution in secondary-space mode.
Home-space mode	The number of active CPU samples in which the ASC (Address- Space Control) bits indicate execution in home-space mode.
Execution on processor n	The number of active CPU samples in which instructions were being executed by the indicated processor or CPU address. Processors in a multi-CPU system are numbered 0,1,2,3 ... etc. The physical core ID and when applicable, the Vertical Priority (Low/Medium/High) will be shown. Also specialty processors such as zIIP will be identified.
In private storage ABOVE	The number of active CPU samples in which instructions were located in private storage above the 16MB boundary.
In private storage BELOW	The number of active CPU samples in which instructions were located in private storage below the 16MB boundary.
In common storage ABOVE	The number of active CPU samples in which instructions were located in common storage above the 16MB boundary.
In common storage BELOW	The number of active CPU samples in which instructions were located in common storage below the 16MB boundary.
Execution in AMODE 24	The number of active CPU samples in which instructions were being executed in AMODE 24.
Execution in AMODE 31	The number of active CPU samples in which instructions were being executed in AMODE 31.
Execution in AMODE 64	The number of active CPU samples in which instructions were being executed in AMODE 64.

Core IDs Quantification

This section is modelled on the Core ID section of the "/D M=CORE" command output. See message IEE174I in "z/OS MVS System Messages" for a full explanation of all of the codes that are used.

Table 3. Core IDs Quantification	
Under Heading	This is Displayed
CORE	The core identifier.
Status	<p>The first character is W when the core is being managed by WLM, otherwise blank.</p> <p>The second character is the status of the core, which can be one of the following:</p> <ul style="list-style-type: none">+ indicates the core is online.- indicates the core is offline./ indicates the core is in a mixed stateN indicates the core is neither online nor able to be configured online. <p>The third character is the type of core which can be:</p> <ul style="list-style-type: none">blank The core is a standard CP.A The core is an IBM Z Application Assist Processor.I The core is an IBM Z Integrated Information Processor.
CPU RANGE	This is the range of CPU addresses that are allocated to the core.
V.Priority	<p>The HIPERDISPATCH vertical-ness of the core:</p> <ul style="list-style-type: none">H The core is classified as a vertical high core.M The core is classified as a vertical medium core.L The core is classified as a vertical low core.

Sample reports

A sample report is shown here.

```

File View Navigate Help
-----
S08: Processor Utilization Summary (01383/TSTJ0B1)          Row 00001 of 00046
Command ==>                                                Scroll ==> CSR

Processor states for the CPU usage measurements

Processor State          Nbr of Samples  Percentage

Storage key 0            13             1.22%
Storage key 5             2             0.18%
Storage key 7             1             0.09%
Storage key 8           1,044           98.49%

Problem state            1,044           98.49%
Supervisor state         16             1.50%

Execution in SVC         16             1.50%

Execution in real-mode    0             0.00%

Primary-space mode       1,060          100.00%
Access-register mode      0             0.00%
Secondary-space mode      0             0.00%
Home-space mode           0             0.00%

Execution on processor 0   373           35.18%   CoreID=0 High
Execution on processor 2   328           30.94%   CoreID=1 High
Execution on processor 4   359           33.86%   CoreID=2 High   zIIP

In private storage ABOVE   595           56.13%
In private storage BELOW    0             0.00%
In common storage ABOVE    461           43.49%
In common storage BELOW     4             0.37%

Execution in AMODE 24       0             0.00%
Execution in AMODE 31     1,057          99.71%
Execution in AMODE 64       3             0.28%

```

Table of CORE IDs

CORE	Status	CPU Range	V.Priority
0000	+	0000-0001	H
0001	+	0002-0003	H
0002	+I	0004-0005	H
0003	+I	0006-0007	H
0004	+I	0008-0009	H

S09 - Measurement analysis

Usage

This report presents various textual statements, each representing an observation made about some aspect of execution of the measured job. The purpose of each of these observations is to provide a synoptic analysis of an area of resource usage and, in some cases, suggest where some performance improvement opportunities might exist.

It is important that you analyze these observations in the context of how you would expect the measured job to perform. Some of the statements in this report might draw your attention to aspects of resource consumption that is perfectly normal for the job. For example, high CPU consumption might be noted in a certain module in a situation where you would actually expect high CPU usage in that module.

Sample reports

A sample report is shown here.

```

File View Navigate Help
-----
S09: Measurement Analysis (9458/TSTJOB1)          Row 00001 of 00031
Command ==> _____ Scroll ==> CSR

This report presents various textual statements pertaining to specific
aspects of application performance observed during the measurement
session. Each statement identifies areas of activity and resource
consumption or causes of execution delay and suggests areas where
performance improvement opportunities might exist.

+-----+
| 1. Small CPU sample size |
| This measurement recorded a relatively small number of active CPU |
| observations. Some figures shown in CPU usage reports may have a high |
| margin of error. Keep this in mind when analyzing these reports. |
+-----+

+-----+
| 2. System CPU overhead |
| A high percentage of CPU activity was observed in system service |
| routines. This indicates high system overhead. The level of system |
| overhead might be normal for the type of job being measured or it might |
| be an indication of a performance problem. |
| See reports:   C01 C02 |
+-----+

```

S10 - Observation Session Messages

Usage

Use this report to display messages that are issued on behalf of the observation session. These include error, warning, informational, and diagnostic messages.

The report consists of three levels: Category, Message ID, and Message Text. The Category and Message ID levels may be expanded or contracted by using the '+' and '-' line commands respectively.

Expanding the category level exposes the Message ID information for each message issued under that category.

Expanding a Message ID level, exposes the message text associated with that message ID. The message text may be displayed in one of four colors:

- Red for Severe and Error level messages
- Yellow for Warning level messages
- Turquoise for Informational level messages
- Blue for Diagnostic level messages

Diagnostic level messages are only issued when the APA started task is configured with DiagLevel of five or higher.

Entering the '+' or '-' line command on the Name title will expand or contract all entries at all levels of the report.

Category Descriptions

The messages are grouped by the following categories:

- REQ - Sampling Request Messages. This category contains all messages issued before sampling starts and while sampling is underway for the request. These messages provide information on the status of the observation session.
- DATW - DataWriter Messages. This category provides status and exception information on the allocation and creation of the observation data set.

- **ESDE - External Symbol Dictionary Extractor Messages.** This category contains all messages issued by the External Symbol Dictionary Extractor. These messages provide status and exception information on the retrieval of External Symbol Dictionary data for observed modules.
- **HVXT - Db2 Host Variable Extractor Messages.** This category contains all messages issued by the Db2 Host Variable Extractor. These messages report status and exception information related to the resolution of Db2 host variable names from the corresponding :H host variable markers found in SQL statements that were observed during sampling. This category of messages will only be present if the Db2V extractor has been selected when the observation request was created.
- **Other - Non-categorized Messages.** This category contains all messages that do not fall under any of the above categories.

SETUP options

Enter the SETUP primary command to select options for this report. The following popup will be displayed:

```
+-----+
| S10 - Report SETUP Window |
| Options for Observation Session Messages |
|
| Enter "/" to select an option |
| / Display messages with a message level of S'or'E' |
| / Display messages with a message level of W' |
| / Display messages with a message level of I' |
| - Display messages with a message level of D' |
+-----+
```

Display messages with a message level of 'S' or 'E'

Use this option to display severe level and error level messages.

Display messages with a message level of 'W'

Use this option to display warning level messages.

Display messages with a message level of 'I'

Use this option to display informational level messages.

Display messages with a message level of 'D'

Use this option to display diagnostic level messages.

C01 - CPU usage by category

Overview

This report analyzes measured CPU consumption. It attributes CPU consumption to the following general categories:

- **APPLCN** – Application Code
- **SYSTEM** – System/OS Services
- **Db2SQL** – SQL Processing
- **DATAMG** – Data Management (DASD) Requests
- **IMSDLI** – IMS DL/I call processing
- **ADABAS** – Adabas requests
- **Natural** – Natural Processing

In addition, any execution measured at locations for which no load module name could be determined is attributed to a category:

- **NOSYMB** – No Module Name Found

A sample report is shown below. When the report is first displayed, only the top level of the hierarchy is visible. To expand any of these categories to show the next hierarchical level, you can type the “+” line command on the detail line. You can also enter the “+” line command on the Name heading to expand the entire report to show all detail lines in all hierarchical levels.

File View Navigate Help			
C01: CPU Usage by Category (0638/TSTJOB01)			Row 00001 of 00004
Command ==>			Scroll ==> CSR
Name	Description	Percent of CPU time * 10.00%	±1.8%
		*....1....2....3....4....5....6....7....8	
APPLCN	Application Code	54.36	=====
SYSTEM	System/OS Services	44.30	=====
DATAMG	Data Mgmt Processing	1.03	=
NOSYMB	No Module Name	0.29	

Detail line descriptions

Each line represents a System Object – an object to which measured activity is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

Category

Category is the top level in the hierarchy. CPU consumption is categorized as APPLCN, SYSTEM, DB2SQL, DATAMG, IMSDLI, ADABAS, Natural, or NOSYMB.

DPA Group

Within a category – usually the SYSTEM category – load modules can be further arranged into Descriptive Program Attribution (DPA) groups. These are functional groups like: IMS, Db2, MVS™, SVC, etc.

By entering a '+' on the SYSTEM category line:

File View Navigate Help			
C01: CPU Usage by Category (0638/TSTJOB01)			Row 00001 of 00004
Command ==>			Scroll ==> CSR
Name	Description	Percent of CPU time * 10.00%	±1.8%
		*....1....2....3....4....5....6....7....8	
APPLCN	Application Code	54.36	=====
+SYSTEM	System/OS Services	44.30	=====
DATAMG	Data Mgmt Processing	1.03	=
NOSYMB	No Module Name	0.29	

The list of objects in this category is expanded to the next level of the hierarchy to include DPA groups:

File View Navigate Help			
C01: CPU Usage by Category (0638/TSTJOB01)			Row 00001 of 00009
Command ==>			Scroll ==> CSR
Name	Description	Percent of CPU time * 10.00%	±1.8%
		*....1....2....3....4....5....6....7....8	
APPLCN	Application Code	54.36	=====
SYSTEM	System/OS Services	44.30	=====
→ SVC	SVC Routines	42.14	=====
→ MVS	MVS System	2.06	==
→ NUCLEUS	Nucleus Modules	0.06	
→ IMS	IMS Subsystem	0.03	
DATAMG	Data Mgmt Processing	1.03	==
NOSYMB	No Module Name	0.29	

Note: Using the SETUP primary command, you can specify aggregation of modules into Group or Subgroup. Subgroup offers a more granular, less inclusive categorization than Group.

In this sample screen Subgroup has been selected in SETUP, note that the SVC group has now been replaced with SVC subgroups (a subgroup for each SVC type.)

File View Navigate Help			
C01: CPU Usage by Category (0638/TSTJ0B01)		Row 00001 of 00012	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±1.8%
*....1....2....3....4....5....6....7....8			
APPLCN	Application Code	54.36	=====
SYSTEM	System/OS Services	44.30	=====
→ SVCTYPE1	Type 1 System SVC	18.94	=====
→ SVCTYPE3	Type 3 System SVC	10.38	=====
→ SVCTYPE4	Type 4 System SVC	8.72	=====
→ SVCTYPE2	Type 2 System SVC	4.09	=====
→ MVS	MVS System	2.06	=====
→ NUCLEUS	Nucleus Modules	0.06	=====
→ IMS	IMS Subsystem	0.03	=====
DATAMG	Data Mgmt Processing	1.03	=====
NOSYMB	No Module Name	0.29	=====

Name Column

The symbolic name of the Group/Subgroup appears under this heading.

Description Column

A Group/Subgroup description appears under this heading.

CPU Percent Column

The aggregation of activity measured under the named Group/Subgroup appears under this heading as a percentage of CPU time.

Load Module

A load module line appears under a Group/Subgroup line, under a Category line, or under an SVC line.

For example, to see the load modules under the Group/Subgroup line CICS, enter + on the CICS object:

File View Navigate Help			
C01: CPU Usage by Category (0621/TSTJ0B01)		Row 00001 of 00014	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8			
SYSTEM	System/OS Services	93.67	=====
→ +ICS	CICS Services	47.43	=====
→ SVCTYPE1	Type 1 System SVC	22.43	=====
→ MVS	MVS System	5.42	=====
→ NUCLEUS	Nucleus Modules	5.27	=====
→ SVCTYPE2	Type 2 System SVC	5.12	=====
→ LEBASE	LE Base Modules	3.61	=====
→ USERSVC	User/Vendor SVC	1.95	=====
→ Db2	Db2 Services	1.95	=====
→ SM	Storage Manager	0.30	=====
→ LECOBOL	LE COBOL component M	0.15	=====
NOSYMB	No Module Name	6.02	=====
APPLCN	Application Code	0.30	=====

The CICS Group has now been expanded to show load modules in the next hierarchical level:

File View Navigate Help			
C01: CPU Usage by Category (0621/TSTJOB01)		Row 00001 of 00014	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	+1.8%
SYSTEM	System/OS Services	93.67	=====
→ CICS	CICS Services	47.43	=====
→ DFHSIP	CICS Services	22.89	=====
→ DFHAPLI	CICS Services	3.46	==
→ DFHPGDM	PG domain - intia	3.46	==
→ DFHFCVS	File access VSAM r	2.86	=
→ DFHZCB	VTAM working set m	2.86	=
→ DFHAIP	CICS Services	2.40	=
→ DFHMNDML	CICS Services	1.35	=
→ DFHMCX	BMS fast path modu	1.35	=
→ DFHZCP	Terminal managemen	1.05	=
→ DFHFCCR	File control file	0.90	=
→ DFHAPSM	AP domain - transa	0.75	=

Name Column

The load module name appears under this heading.

Description Column

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

CPU Percent Column

The measured CPU execution for this Load Module appears under this heading.

CSECT (Control Section)

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer was able to find ESD (External Symbol Dictionary) information, during the measurement process, for a load module, these items will appear under the load module and the measured activity will be attributed to them.

Name Column

The CSECT name appears under this heading.

Description Column

This will display “CSECT in xxxxxxxx” where xxxxxxxx is the name of the load module to which the CSECT belongs.

SVC (Supervisor Call)

This line shows attribution of measured activity during execution of an MVS Supervisor Call.

Name Column

“SVC” followed by a 3-digit decimal SVC number (000 to 255) appears under this heading. For example — 'SVC120'.

Description Column

A description of the SVC service, or the name of the macro which invokes the SVC appears under this heading. For example: “GETMAIN/FREEMAIN.”

SQL Statement

This item attributes measured activity to a Db2 SQL statement.

Name Column

A sequence number is assigned by Application Performance Analyzer to each unique SQL statement observed during the measurement. This sequence number is shown in the name field. It is possible for some sequences numbers to be missing (sequence gaps) from the report. This will occur if a sequence number was assigned to SQL statements but no CPU activity was measured for these statements.

Description Column

The name of the program that issued the SQL request followed by the precompiler statement number (enclosed in parentheses) is shown here. This is followed by the SQL function (e.g. SELECT, INSERT, COMMIT).

DL/I Call

This item attributes measured activity to an IMS DL/I call.

Name Column

A sequence number is assigned to each unique DL/I call statement observed during the measurement. This sequence number is shown in the name field.

Description Column

The DL/I function code appears followed by the PCB name followed by the relative PCB number in parentheses. The location of the call, in *csect+offset* format, follows.

Adabas Call

This item attributes measured activity to an Adabas call.

Name Column

A sequence number is assigned to each unique Adabas call statement observed during the measurement. This sequence number is shown in the name field.

Description Column

The name of the program that issued the Adabas request and the offset within the program, followed by the Adabas command code that was issued, is displayed in this field. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.

Natural Program

This item is present for each Natural program. This is a first-level detail line in the Natural category.

Name Column

The name of the Natural program is shown in this field.

Description Column

The name of the Natural library from which the Natural program was obtained.

Natural Statement

This item is present for each Natural statement sampled. This is a second-level detail line in the Natural category.

Name Column

4 digit key for the line which is the Natural statement number for which cpu activity is reported.

Description Column

The description of the line: "stmt #", followed by the Natural statement number for which cpu activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis.

Unresolved Address

This item attributes measurement activity to a range of addresses for which a corresponding load module name could not be determined.

Name Column

Activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format "HHHHHxxx" where HHHHH are the 5 high order hexadecimal digits of the address. For example: '08915xxx' means the range from 08915000 to 08915FFF.

Description Column

"Unresolved Address" appears under this heading.

Subset reports

This report can generate subset reports for any detail line. By entering a report code on a detail line, a pop-up subset report is displayed for this item. The item selected is scaled to 100 percent. The available subset reports are listed below in "Line commands, on objects."

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call, and Natural Program.	Display context help information.
++	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call, and Natural Program.	Show additional details.
+	Category, Load Module, SVC, SQL command, DLI call, Adabas call, and Natural Program.	Expand to reveal next level.
–	Category, Load Module, SVC, SQL command, DLI call, Adabas call, and Natural Program.	Collapse to hide next level.
SV	SV Category, SVC, SQL command, DLI call, Adabas call, and Natural Program.	Sort next level by value.
SN	Category, SVC, SQL command, DLI call, Adabas call, and Natural Program.	Sort next level by name.
M	Load Module, CSECT.	Display load module information.
P	Load Module, CSECT, SQL command, DLI call, Adabas call.	Display source program mapping.
C01	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call.	Display C01 report subset.
C02	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call.	Display C02 report subset.
C03	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call.	Display C03 report subset.
C08	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call.	Display C08 report subset.
C09	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call.	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Name, Description, Percent CPU	Display context help information.

Cmd	When Applied To Object	Action
+	Name	Expand to reveal all entries.
+	Description	Expand field size.
+	Percent CPU	Zoom in scale.
–	Name	Collapse to show only first level.
–	Description	Reduce field size.
–	Percent CPU	Zoom out scale.
SV	Name	Sort next level by value.
SN	Name	Sort next level by name.

SETUP options

File View Navigate Help

```

C01 - Report SETUP Window (00723/CICS56A)
Command ==> Scroll ==> CSR
Options for CPU Analysis by Category

Enter "/" to select an option
/ Report modules by "Group". Unselect to report
  by "SubGroup". Group is a higher level (more
  inclusive) categorization than SubGroup.

/ Show the Db2SQL category in which CPU time
  attributed to SQL processing is shown.

/ Show the DATAMG category in which CPU time
  attributed to data management is shown.

/ Show the IMSDLI category in which CPU time
  attributed to DLI processing is shown.

/ Show the ADABAS category in which CPU time
  attributed to ADABAS processing is shown.

/ Show the Natural category in which CPU time
  attributed to Natural processing is shown.

- Filter by CICS transactions and Terminals as
  specified in panel 5, Subsystems.

Minimum CPU Percentage . . . . . 0.00
  This is the minimum percentage of CPU activity
  measured for which an item is to be included in
  the report.

```

The following SETUP options can be selected with the SETUP primary command:

Reporting by Group / SubGroup

This option allows you to aggregate modules into Group or SubGroup. SubGroup offers a more granular, less inclusive categorization than Group. For example, when reporting by Group, all SVCs would be reported under the "SVC" Group. When reporting by SubGroup, SVCs would be reported under SubGroups such as SVCTYPE1, SVCTYPE2, etc.

Show the Db2SQL category

This shows activity attributed to Db2 SQL statements. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category. This is not available for CICS measurements.

Show the DATAMG category

This shows activity attributed to data management functions, which include basic access functions such as READ and WRITE. Processing of OPEN and CLOSE functions is not included in this category. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

Show the IMSDLI category

This shows activity attributed to IMS DLI calls. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

Show the ADABAS category

When the Adabas extractor is on, this shows activity attributed to Adabas requests. If it is not selected, the activity is included in the appropriate system modules in the SYSTEM category.

Show the Natural category

When the Natural extractor is on, this shows activity attributed to Natural requests. If it is not selected, the activity is included in the appropriate system modules in the SYSTEM category.

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Minimum CPU percentage

You can set this option to eliminate modules where the CPU percentage is below a certain threshold.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File  View  Navigate  Help
+-----+
+----- The following report line was selected -----+
| > SVCTYPE1  Type 1 System SVC      4.78 00          |
+-----+

Calculation Details
CPU measurements                139
Grouped under                   Type 1 System SVC
Total CPU measurements          2,906
Percent in category             4.78%

Processor states for the CPU usage measurements

Processor State                  Nbr of
                                Samples  Percentage

Storage key 0                   111      79.85%
Storage key 6                    5       3.59%
Storage key 8                   23      16.54%

Problem state                    1       0.71%
Supervisor state                138     99.28%

Execution in SVC                 139     100.00%

Execution in real-mode           0       0.00%

Primary-space mode              139     100.00%
Access-register mode            0       0.00%
Secondary-space mode            0       0.00%
Home-space mode                 0       0.00%

Execution on processor 0         80     57.55%
Execution on processor 1         59     42.44%

In private storage ABOVE        1       0.71%
In private storage BELOW        0       0.00%
In common storage ABOVE         82     58.99%
In common storage BELOW         56     40.28%

Execution in AMODE 24            0       0.00%
Execution in AMODE 31          139     100.00%
Execution in AMODE 64            0       0.00%

```

C02 - CPU usage by module

Overview

This report analyzes measured CPU consumption. It attributes CPU consumption to load modules.

In addition, any execution measured at locations for which no load module name could be determined is attributed to hexadecimal address ranges.

A sample report as it is initially displayed, with no expansion, is shown here:

```

File View Navigate Help
-----
C02: CPU Usage by Module (0656/TSTJOB01) Row 00001 of 00207
Command ==> ----- Scroll ==> CSR

```

Name	Description	Percent of CPU time * 10.00%	±1.1%
		*....1....2....3....4....5....6....7....8	
ISRSUPC	Application Progr	39.34	=====
C0020	Application Progr	14.57	=====
IGG0193B	QSAM/BSAM Process	3.57	==
IGDDCFSR	Storage Managemen	3.25	==
ISPMMAIN	Application Progr	2.66	=
C0325	Application Progr	2.47	=
ISPSUBS	Application Progr	2.44	=
C0200	Application Progr	2.16	=
IOSVSSCQ	Nucleus Routine	1.99	=
IAXPQ	Nucleus Routine	1.94	=
IAXVF	Nucleus Routine	1.83	=
IAXVP	Nucleus Routine	1.58	=
IEAVESVC	Supervisor Contro	1.56	=
IECVEXCP	Execute channel p	1.48	=
C0399	Application Progr	1.38	=
C0310	Application Progr	0.92	

Detail line descriptions

Each line represents a System Object – an object to which measured activity is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

Load Module

Name

Column the load module name appears under this heading.

Description Column

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

CSECT (Control Section)

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer was able to find ESD (External Symbol Dictionary) information, during the measurement process, for a load module, these items will appear under the load module and the measured activity will be attributed to them.

A sample report with the second hierarchical level (CSECT) displayed is shown here:

```

File View Navigate Help
-----
C02: CPU Usage by Module (0656/TSTJOB01) Row 00005 of 00220
Command ==> ----- Scroll ==> CSR

```

Name	Description	Percent of CPU time * 2.50%	±1.1%
		*....1....2....3....4....5....6....7....8....9	
ISPMMAIN	Application Progr	2.66	=====
→ ISPMBP	CSECT in ISPMAI	1.26	===
→ ISPMBX	CSECT in ISPMAI	0.52	=
→ ISPMOB	CSECT in ISPMAI	0.37	=
→ ISPMBW	CSECT in ISPMAI	0.32	=
→ ISPMUL	CSECT in ISPMAI	0.07	
→ ISPMRO	CSECT in ISPMAI	0.05	
→ ISPMCO	CSECT in ISPMAI	0.01	
→ ISPMTB	CSECT in ISPMAI	0.01	
→ ISPMUX	CSECT in ISPMAI	0.01	
→ ISPMBY	CSECT in ISPMAI	0.01	
C0325	Application Progr	2.47	=====
→ C0325	CSECT in C03	2.47	=====
ISPSUBS	Application Progr	2.44	=====
C0200	Application Progr	2.16	=====

Name Column

The CSECT name appears under this heading.

Description Column

This will display “CSECT in xxxxxxxx” where xxxxxxxx is the name of the load module to which the CSECT belongs.

Unresolved Address

This item attributes measurement activity to a range of addresses for which a corresponding load module name could not be determined.

Name Column

Activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format “HHHHHxxx” where HHHHH are the 5 high order hexadecimal digits of the address. For example: '08915xxx' means the range from 08915000 to 08915FFF.

Description Column

“Unresolved Address” appears under this heading.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Load Module, CSECT, Unresolved Address	Display context help information.
++	Load Module, CSECT, Unresolved Address	Show additional details.
+	Load Module	Expand to reveal next level.
–	Load Module	Collapse to hide next level.
M	Load Module, CSECT	Display load module information.
P	Load Module, CSECT	Display source program mapping.
C09	Load Module, CSECT, Unresolved Address	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Name, Description, Percent CPU	Display context help information.
+	Name	Expand to reveal all entries
+	Description	Expand field size.
+	Percent CPU	Zoom in scale.
–	Name	Collapse to show only first level.
–	Description	Reduce field size.
–	Percent CPU	Zoom out scale.
SV	Name	Sort next level by value.
SN	Name	Sort next level by name.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File  View  Navigate  Help
-----
+----- The following report line was selected -----+
| IDA019L1  Virtual I/O (VIO) 16.53 00000000          |
+-----+

Calculation Details
CPU measurements                215
In load module                  IDA019L1
Total CPU measurements         1,300
Percent in category             16.53%

Processor states for the CPU usage measurements

Processor State                  Nbr of Samples  Percentage
Storage key 8                   215             100.00%
Problem state                   215             100.00%
Supervisor state                0              0.00%
Execution in SVC                0              0.00%
Execution in real-mode          0              0.00%
Primary-space mode              215             100.00%
Access-register mode            0              0.00%
Secondary-space mode            0              0.00%
Home-space mode                 0              0.00%
Execution on processor 0        118             54.88%
Execution on processor 1        97             45.11%
In private storage ABOVE        0              0.00%
In private storage BELOW        0              0.00%
In common storage ABOVE         215             100.00%
In common storage BELOW         0              0.00%
Execution in AMODE 24           0              0.00%
Execution in AMODE 31           215             100.00%
Execution in AMODE 64           0              0.00%

```

SETUP options

```
File View Navigate Help
+-----+
C02 - Report SETUP Window (00723/CICS56A)
Command ==> Scroll ==> CSR
Options for CPU Usage by Module

- Filter by CICS transactions and Terminals as
  specified in panel 5, Subsystems.

Minimum CPU Percentage . . . . . 0.00
  This is the minimum percentage of CPU activity
  measured for which an item is to be included in
  the report.
```

The following SETUP option can be selected with the SETUP primary command:

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Minimum CPU percentage

You can set this option to eliminate modules where the CPU percentage is below a certain threshold.

C03 - CPU usage by code slice

Overview

This report attributes CPU usage to Code Slices. A code slice is a range of storage addresses containing executable object code. You can use this report to pinpoint the exact locations of hot spots – segments of code where CPU consumption is particularly high. You can use SETUP to adjust the resolution of the report by varying the size of the code slice.

Two types of detail line are shown:

- Code Slice
- Code Address

Initially, only the Code slice lines are visible. You can expand a Code Slice line (using the “+” line command) to reveal its subordinate Code Address lines. Initially, report lines are arranged in descending sequence by CPU activity. The most active items appear at the top. You can also sort by address by entering the “SA” line command either on the Address title field or on one of the first level report line address fields.

A sample report, as it is initially displayed, is shown here:

```
File View Navigate Help
-----
C03: CPU Usage by Code Slice (0656/TSTJOB01) Row 00001 of 01127
Command ==> _____ Scroll ==> CSR

Address  Size  Location  Percent of CPU time * 10.00% ±1.1%
*....1....2....3....4....5....6....7....8..
00D0B1F0   64  ASMFPSRH+0A80  20.90 =====
08A45CC0   64  C0020+1CC0    3.50 ==
00D0D000   64  ASMFRLDN+0080  3.23 ==
00D0F480   64  ASMFRLDN+2500  3.09 ==
08A45300   64  C0020+1300    2.21 =
```

If you wanted to expand, for example, the third line, enter the “+” line command:

```
File View Navigate Help
-----
C03: CPU Usage by Code Slice (0656/TSTJOB01) Row 00001 of 01127
Command ==> _____ Scroll ==> CSR

Address  Size  Location  Percent of CPU time * 10.00% ±1.1%
*....1....2....3....4....5....6....7....8..
00D0B1F0   64  ASMFPSRH+0A80  20.90 =====
08A45CC0   64  C0020+1CC0    3.50 ==
+0D0D000   64  ASMFRLDN+0080  3.23 ==
00D0F480   64  ASMFRLDN+2500  3.09 ==
08A45300   64  C0020+1300    2.21 =
```

The subordinate Code Address lines would then be displayed:

```

File View Navigate Help
-----
C03: CPU Usage by Code Slice (0656/TSTJ0B01) Row 00001 of 01131
Command ==> ----- Scroll ==> CSR
Address Size Location Percent of CPU time * 10.00% ±1.1%
*....1....2....3....4....5....6....7....8..
00D0B1F0 64 ASMFPSRH+0A80 20.90 =====
08A45CC0 64 C0020+1CC0 3.50 ==
00D0D000 64 ASMFRLDN+0080 3.23 ==
→ 00D0D000 ASMFRLDN+0080 2.30 =
→ 00D0D026 ASMFRLDN+00A6 0.51
→ 00D0D036 ASMFRLDN+00B6 0.42

00D0F480 64 ASMFRLDN+2500 3.09 ==

```

Remember, you can also expand an entire report by typing “+” on the first heading, in this report it would be the Address heading.

Detail line descriptions

Code Slice

This line represents a block (or “slice”) of contiguous bytes of object code for which CPU execution is quantified. The number of times CPU execution was observed within this block is expressed as a percentage of the total number of CPU execution observations.

The hexadecimal address of the beginning of the slice is shown under the Address heading. The size of the slice, in bytes, is shown under the Size heading. If possible, the address of the beginning of the slice is expressed in the form CSECT+offset, or Module+offset, under the Location heading.

Source program mapping can be accessed from this line by entering a “p” line command.

Code Address

These lines are displayed as subordinate lines under the appropriate Code Slice line and show individual addresses at which execution was observed. The number of times execution was observed at such an address is expressed as a percentage of the total number of CPU execution observations.

Source program mapping can be accessed from this line by entering a “p” line command.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to view a pop-up menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Code Slice, Code Address	Display context help information.
++	Code Slice, Code Address	Show additional details.
+	Code Slice	Expand to reveal next level.
–	Code Slice	Collapse to hide next level.
SV	Code Slice	Sort next level by value.
SA	Code Slice	Sort next level by address.
M	Code Slice	Display load module information.
P	Code Slice, Code Address	Display source program mapping.
C09	Code Slice, Code Address	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Address, Size, Percent CPU	Display context help information.
+	Address	Expand to reveal all entries.
+	Percent CPU	Zoom in scale.
–	Address	Collapse to show only first level.
–	Percent CPU	Zoom out scale.
SV	Address	Sort next level by value.
SA	Address	Sort next level by address.

SETUP options

```
File View Navigate Help
+-----+
| C03 - Report SETUP Window (00723/CICS56A) |
| Command ==>                               | Scroll ==> CSR |
| Options for CPU Usage by Code Slice      |
|                                           |
| - Filter by CICS transactions and Terminals as |
|   specified in panel 5, Subsystems.         |
|                                           |
| Code Slice Size (in Bytes) . . . . . 64    |
| A Code Slice is a block of storage containing |
| object code. This report shows the percentage of |
| CPU activity observed in each code slice. Use this |
| setting to vary the code slice size.         |
|                                           |
| Minimum CPU Percentage . . . . . 0.00      |
| This is the minimum percentage of CPU activity |
| measured in a code slice that is to be reported. |
+-----+
```

The following SETUP options can be selected with the SETUP primary command:

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Code slice size

Use this to adjust the size of the Code Slice to be reported.

Minimum CPU percentage

You can set this option to eliminate Code Slice entries from the report, where the CPU percentage is below a certain threshold.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

FileViewNavigateHelp

More: +

+----- The following report line was selected -----+

| 00FF04A0 56 CPUREL 9.84 00000 |

+-----+

Calculation Details

CPU measurements 128

Address range 00FF04A0 to 00FF04D7

Total CPU measurements 1,300

Percent in category 9.84%

Processor states for the CPU usage measurements

Processor StateNbr of SamplesPercentage

Storage key 0128100.00%

Problem state00.00%

Supervisor state128100.00%

Execution in SVC128100.00%

Execution in real-mode00.00%

Primary-space mode128100.00%

Access-register mode00.00%

Secondary-space mode00.00%

Home-space mode00.00%

Execution on processor 07457.81%

Execution on processor 15442.18%

In private storage ABOVE00.00%

In private storage BELOW00.00%

In common storage ABOVE00.00%

C04 - CPU usage timeline

Overview

This timeline analysis breaks the observation session duration into a number of (approximately) fixed-length, chronological time intervals. Each line represents one of these intervals. By default, 15 intervals are reported, each representing approximately the same number of samples. This illustrates any progressive CPU usage trends, such as blocks of intensive consumption or long periods of waits. The percentage value and the graph quantify CPU usage for an interval. The percentage is derived by dividing the number of samples CPU activity was observed by the number of samples in the interval. This, effectively, is the percentage of time the CPU was executing instructions.

A sample CPU Usage Timeline report is shown here:

```

File View Navigate Help
-----
C04: CPU Usage Timeline (0656/TSTJOB01) Row 00001 of 00015
Command ==> ----- Scroll ==> CSR

SEQN    Seconds    Sig    Percent of Interval * 10.00% ±1.1%
      *....1....2....3....4....5....6....7....8....9....*
0001    10.324    69%    19.08 =====
0002     9.114    64%    49.55 =====
0003     8.667    70%    70.82 =====
0004     9.153    83%    43.65 =====
0005     9.161    77%    39.36 =====
0006     9.094    70%    35.46 =====
0007     8.791    75%    41.95 =====
0008     7.424    89%    12.18 =====
0009     6.988    76%    63.63 =====
0010     6.741    71%    64.83 =====
0011     6.475    75%    70.12 =====
0012     6.467    73%    68.43 =====
0013     6.465    71%    67.03 =====
0014     6.422    75%    70.42 =====
0015     6.446    72%    64.60 =====

```

Detail line descriptions

Each line represents reports values under the following headings:

- SEQN
- Seconds
- Sig

SEQN

This is the sequence number of the interval. Intervals are numbered 0001, 0002, etc. You can create a subset of report C01, C02, or C03 from this line by entering the report code as a line command. A pop-up window of the report will be displayed, and the subset of data used for the report will be the samples from this interval.

Seconds

This is the duration of the interval in seconds.

Sig

This quantifies the significance of the measurement for the interval. This is the percentage of samples in the interval the address space was not Queued – either CPU consumption or WAIT state was observed.

Subset reports

This report can generate subset reports for any detail line. By entering a report code on a detail line, a pop-up subset report is displayed for this item. The item selected is scaled to 100 percent. The available subset reports are listed below in “Line commands, on objects.”

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	SEQN (sampling interval)	Display context help information.
++	SEQN (sampling interval)	Show additional details.
C01	SEQN (sampling interval)	Display C01 report subset.

C05 - CPU usage by task/category

Overview

This report analyzes measured CPU consumption. It shows, for each Task (TCB), the percentage of the total CPU time measured in that Task. Under each task, this information is shown under the following general categories:

APPLCN

Application Code

SYSTEM

System/OS Services

DATAMG

Data Management (DASD) Requests

Db2SQL

SQL Processing

IMSDLI

IMS DL/I Calls

IMSDLI

IMS DL/I Calls

ADABAS

Adabas requests

Natural

Natural Processing

In addition, any activity observed at locations for which no load module name could be determined is attributed to a category:

NOSYMB

No Module Name Found

A sample report is shown below. When the report is first displayed, only the top level of the hierarchy (Tasks) is visible. Often there will only be one task, however this example has many. To expand a task to show the next hierarchical level, you can type the “+” line command on the detail line. You can also enter the “+” line command on the Name heading to expand the entire report to show all detail lines in all hierarchical levels.

File View Navigate Help			
C05: CPU Usage by Task/Category (0711/TSTJOB01)		Row 00001 of 00041	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
DFHKETCB-001	TCB=008DA6B8	32.07	=====
DFHKETCB-012	TCB=008C2068	13.16	=====
DFHKETCB-008	TCB=008DAA68	2.57	=
IEAVAR00-002	TCB=008FE0A8	0.00	
IEAVTSDT-003	TCB=008FFE88	0.00	
DFSPAT00-024	TCB=008BC210	0.00	
DFSPAT00-025	TCB=008B9E88	0.00	
DFHSIP-005	TCB=008F69F8	0.00	
DFSPAT00-026	TCB=008B9CD8	0.00	
DFHKETCB-009	TCB=008C2E88	0.00	
DFSPAT00-027	TCB=008B9A30	0.00	
DFHKETCB-011	TCB=008C2750	0.00	
DFSPAT00-028	TCB=008B9788	0.00	
CSQCSERV-014	TCB=008BDE88	0.00	
DFSPAT00-029	TCB=008B94E0	0.00	
CSQCSERV-016	TCB=008BDA60	0.00	

Detail line descriptions

Each line represents a System Object – an object to which CPU time is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

Task

This is the highest level object in the report. Each active Task is reported. The percentage of the total measured CPU time which was measured in this Task is reported. A SETUP option is available which specifies that all Tasks – including inactive tasks – are to be displayed.

Name Column

The name of the program specified in the ATTACH macro that started the task as well as the TCB index number is shown.

Description Column

The TCB address is shown. For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address.

Category

Activity within a Task is categorized as APPLCN, SYSTEM, DATAMG, Db2SQL, IMSDLI, ADABAS, Natural, or NOSYMB.

DPA Group

Within a category – usually the SYSTEM category – load modules can be further arranged into Descriptive Program Attribution (DPA) groups. These are functional groups like: IMS, Db2, MVS, SVC, etc. By entering a “+” on the SYSTEM category line:

File View Navigate Help			

C05: CPU Usage by Task/Category (0711/TSTJOB01)			Row 00001 of 00045
Command ==>			Scroll ==> CSR

Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
→ +SYSTEM	System/OS Servic	52.19	=====
→ APPLCN	Application Code	0.00	
→ DATAMG	Data Mgmt Proces	0.00	

The list of objects in this category is expanded to the next level of the hierarchy to include DPA groups:

File View Navigate Help			

C05: CPU Usage by Task/Category (0711/TSTJOB01)			Row 00001 of 00048
Command ==>			Scroll ==> CSR

Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
→ SYSTEM	System/OS Servic	52.19	=====
→ SVC	SVC Routines	51.13	=====
→ CICS	CICS Subsystem	0.60	
→ MVS	MVS System	0.45	
→ APPLCN	Application Code	0.00	
→ DATAMG	Data Mgmt Proces	0.00	

Note: Note Using the SETUP primary command, you can specify aggregation of modules into Group or Subgroup. Subgroup offers a more granular, less inclusive categorization than Group.

In this sample screen Subgroup has been selected in SETUP, note that the SVC group has now been replaced with SVC subgroups (a subgroup for each SVC type.)

File View Navigate Help			
C05: CPU Usage by Task/Category (0711/TSTJ0B01)		Row 00001 of 00014	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
→ SYSTEM	System/OS Servic	52.19	=====
→ SVCTYPE1	Type 1 System	24.81	=====
→ SVCTYPE2	Type 2 System	14.22	=====
→ SVCTYPE4	Type 4 System	7.11	===
→ SVCTYPE3	Type 3 System	4.99	==
→ CICS	CICS Subsystem	0.60	
→ MVS	MVS System	0.45	
→ APPLCN	Application Code	0.00	
→ DATAMG	Data Mgmt Proces	0.00	

Name Column

The symbolic name of the Group/Subgroup appears under this heading.

Description Column

A Group/Subgroup description appears under this heading.

Load Module

A load module line appears under a Group/Subgroup line, under a Category line, or under an SVC line.

For example, to see the load modules under the Group/Subgroup line MVS, enter “+” on the MVS object:

File View Navigate Help			
C05: CPU Usage by Task/Category (0711/TSTJ0B01)		Row 00001 of 00014	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
→ SYSTEM	System/OS Servic	52.19	=====
→ SVCTYPE1	Type 1 System	24.81	=====
→ SVCTYPE2	Type 2 System	14.22	=====
→ SVCTYPE4	Type 4 System	7.11	===
→ SVCTYPE3	Type 3 System	4.99	==
→ CICS	CICS Services	0.60	
→ +VS	MVS Services	0.45	
→ APPLCN	Application Code	0.00	
→ DATAMG	Data Mgmt Proces	0.00	

The MVS Group has now been expanded to show load modules in the next hierarchical level:

File View Navigate Help			
C05: CPU Usage by Task/Category (0711/TSTJ0B01)		Row 00001 of 00016	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±3.8%
*....1....2....3....4....5....6....7....8.			
DFHKETCB-007	TCB=008DAD90	52.19	=====
→ SYSTEM	System/OS Servic	52.19	=====
→ SVCTYPE1	Type 1 System	24.81	=====
→ SVCTYPE2	Type 2 System	14.22	=====
→ SVCTYPE4	Type 4 System	7.11	===
→ SVCTYPE3	Type 3 System	4.99	==
→ CICS	CICS Services	0.60	
→ +VS	MVS Services	0.45	
→ IGG0CLA0	Data Managem	0.30	
→ IGVVSM31	Virtual Stor	0.15	

Name Column

The load module name appears under this heading.

Description Column

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

CSECT (Control Section)

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer was able to find ESD (External Symbol Dictionary) information, during the measurement process, for a load module, these items will appear under the load module and the measured activity will be attributed to them.

Name Column

The CSECT name appears under this heading.

Description Column

This will display "CSECT in xxxxxxxx" where xxxxxxxx is the name of the load module to which the CSECT belongs.

Source program mapping can be accessed from this line by entering a "p" line command.

SVC (Supervisor Call)

This line shows attribution of measured activity during execution of an MVS Supervisor Call.

Name Column

"SVC" followed by a 3-digit decimal SVC number (000 to 255) appears under this heading. For example, "SVC120."

Description Column

A description of the SVC service, or the name of the macro which invokes the SVC appears under this heading. For example: "GETMAIN/FREEMAIN."

DDNAME

These lines appear under the DATAMG category and indicate the DDNAME of a file to which CPU usage is attributed. The quantification indicates CPU time consumed in data management routines.

Data Management Request

These lines appear under DDNAME lines and show a further breakdown of CPU usage for the DDNAME to the specific I/O request statements.

SQL Statement

This item attributes measured activity to a Db2 SQL statement.

Name Column

A sequence number is assigned to each unique SQL statement observed during the measurement. This sequence number is shown in the name field. It is possible for some sequence numbers to be missing (sequence gaps) from the report. This will occur if a sequence number was assigned to SQL statements but no CPU activity was measured for these statements.

Description Column

The name of the program that issued the SQL request followed by the precompiler statement number (enclosed in parentheses) is shown here. This is followed by the SQL function (e.g. SELECT, INSERT, COMMIT).

DL/I Call

This item attributes measured activity to an IMS DL/I call.

Name Column

A sequence number is assigned to each unique DL/I call statement observed during the measurement. This sequence number is shown in the name field.

Description Column

The DL/I function code appears followed by the PCB name followed by the relative PCB number in parentheses. The location of the call, in *csect+offset* format, follows.

Adabas Call

This item attributes measured activity to an Adabas call.

Name Column

A sequence number is assigned to each unique Adabas call statement observed during the measurement. This sequence number is shown in the name field.

Description Column

The name of the program that issued the Adabas request and the offset within the program, followed by the Adabas command code that was issued, is displayed in this field. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.

Natural Program

This item is present for each Natural program. This is a first-level detail line in the Natural category.

Name Column

The name of the Natural program is shown in this field.

Description Column

The name of the Natural library from which the Natural program was obtained.

Natural Statement

This item is present for each Natural statement sampled. This is a second-level detail line in the Natural category.

Name Column

4 digit key for the line which is the Natural statement number for which cpu activity is reported.

Description Column

The description of the line: "stmt #", followed by the Natural statement number for which cpu activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis.

Unresolved Address

This item attributes measurement activity to a range of addresses for which a corresponding load module name could not be determined.

Name Column

Activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format "HHHHHxxx" where HHHHH are the 5 high order hexadecimal digits of the address. For example: "08915xxx" means the range from 08915000 to 08915FFF.

Description Column

"Unresolved Address" appears under this heading.

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Task, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call, and Natural Program	Display context help information.
++	Task, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call, and Natural Program	Show additional details.
+	Task, Category, Load Module, SVC SQL command, DLI call, Adabas call, and Natural Program	Expand to reveal next level.

Cmd	When Applied To Object	Action
–	Task, Category, Load Module, SVC SQL command, DLI call, Adabas call, and Natural Program	Collapse to hide next level.
SV	Task, Category, SVC, SQL command, DLI call, Adabas call, and Natural Program	Sort next level by value.
SN	Task, Category, SVC, SQL command, DLI call, Adabas call, and Natural Program	Sort next level by name.
M	Load Module, CSECT	Display load module information.
P	Load Module, CSECT, SQL command, DLI call, Adabas call	Display source program mapping.
C09	Category, Load Module, SVC, CSECT, SQL command, Unresolved Address, DLI call, Adabas call	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Name, Description, Percent CPU	Display context help information.
+	Name	Expand to reveal all entries.
+	Description	Expand field size.
+	Percent CPU	Zoom in scale.
–	Name	Collapse to show only first level.
–	Description	Reduce field size.
–	Percent CPU	Zoom out scale.
SV	Name	Sort next level by value.
SN	Name	Sort next level by name.

SETUP options

```
File View Navigate Help
+-----+
| C05 - Report SETUP Window (00723/CICS56A) |
| Command ==>                               | Scroll ==> CSR |
| Options for CPU Analysis by Category       |
|
| Enter "/" to select an option
| / Report modules by "Group". Unselect to report
|   by "SubGroup". Group is a higher level (more
|   inclusive) categorization than SubGroup.
|
| / Include "inactive" tasks in the report. An
|   inactive task is one for which there were no
|   observations of CPU consumption.
|
| / Show the Db2SQL category in which CPU time
|   attributed to SQL processing is shown.
|
| / Show the DATAMG category in which CPU time
|   attributed to data management is shown.
|
| / Show the IMSDLI category in which CPU time
|   attributed to DLI processing is shown.
|
| / Show the ADABAS category in which CPU time
|   attributed to ADABAS processing is shown.
|
| / Show the Natural category in which CPU time
|   attributed to Natural processing is shown.
|
| - Filter by CICS transactions and Terminals as
|   specified in panel 5, Subsystems.
+-----+
```

The following SETUP options can be selected with the SETUP primary command:

Reporting by Group / SubGroup

This option allows you to aggregate modules into Group or SubGroup. SubGroup offers a more granular, less inclusive categorization than Group. For example, when reporting by Group, all SVCs would be reported under the "SVC" Group. When reporting by SubGroup, SVCs would be reported under SubGroups such as SVCTYPE1, SVCTYPE2, etc.

Include inactive tasks

You can choose to include or eliminate inactive tasks from the report. An inactive task is one for which there were no observations of CPU consumption.

Show the Db2SQL category

You can choose to show the Db2SQL category in which CPU time attributed to SQL processing is shown.

Show the DATAMG category

This shows activity attributed to data management functions, which include basic access functions such as READ and WRITE. Processing of OPEN and CLOSE functions is not included in this category. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

Show the IMSDLI category

This shows activity attributed to IMS DLI calls. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

Show the ADABAS category

This shows activity attributed to Adabas requests. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

Show the Natural category

When the Natural extractor is on, this shows activity attributed to Natural requests. If it is not selected, the activity is included in the appropriate system modules in the SYSTEM category.

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File  View  Navigate  Help
-----
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|  > CAZ00080      Application Pr  4.73 00      |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+

Calculation Details
CPU measurements          34
In load module            CAZ00080
Total CPU measurements    718
Percent in category       4.73%

Processor states for the CPU usage measurements

Processor State           Nbr of Samples  Percentage
Storage key 0             34           100.00%
Problem state             0             0.00%
Supervisor state          34           100.00%
Execution in SVC          0             0.00%
Execution in real-mode    0             0.00%
Primary-space mode        34           100.00%
Access-register mode      0             0.00%
Secondary-space mode      0             0.00%
Home-space mode           0             0.00%
Execution on processor 0   10           29.41%
Execution on processor 1   24           70.58%
In private storage ABOVE  34           100.00%
In private storage BELOW  0             0.00%
In common storage ABOVE   0             0.00%
In common storage BELOW   0             0.00%
Execution in AMODE 24      0             0.00%
Execution in AMODE 31     34           100.00%
Execution in AMODE 64      0             0.00%

```

C06 - CPU usage by task/module

Overview

This report analyzes measured CPU consumption. It shows, for each Task (TCB), the percentage of the total CPU time measured in that Task. Under each task, a further breakdown of CPU consumption is shown by load modules.

In addition, any execution measured at locations for which no load module name could be determined is attributed to hexadecimal address ranges.

Detail line descriptions

Each line represents a System Object, an object to which measured activity is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

Task

This is the highest level object in the report. Each active Task is reported. The percentage of the total measured CPU time which was measured in this Task is reported. A SETUP option is available which specifies that all Tasks - including inactive tasks - are to be displayed.

Name Column

The name of the program specified in the ATTACH macro that started the task as well as the TCB index number is shown.

Description Column

The TCB address is shown. For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address.

Load Module

Name Column

The load module name appears under this heading.

Description Column

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

CSECT (Control Section)

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer was able to find ESD (External Symbol Dictionary) information, during the measurement process, for a load module, these items will appear under the load module and the measured activity will be attributed to them.

Name Column

The CSECT name appears under this heading.

Description Column

This will display “CSECT in xxxxxxxx” where xxxxxxxx is the name of the load module to which the CSECT belongs.

Unresolved Address

This item attributes measurement activity to a range of addresses for which a corresponding load module name could not be determined.

Name Column

Activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format “HHHHHxxx” where HHHHH are the 5 high order hexadecimal digits of the address. For example: “08915xxx” means the range from 08915000 to 08915FFF.

Description Column

“Unresolved Address” appears under this heading.

Sample reports

A sample report is shown below. When the report is first displayed, only the top level of the hierarchy (Tasks) is visible. Often there will only be one task, however this example has many. To expand a task to show the next hierarchical level, you can type the “+” line command on the detail line. You can also enter the “+” line command on the Name heading to expand the entire report to show all detail lines in all hierarchical levels.

File View Navigate Help			
C06: CPU Usage by Task/Module (0711/TSTJOB01)		Row 00001 of 00021	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±2.3%%
*....1....2....3....4....5....6....7....8.			
PMSEL-012	TCB=008B8318	46.65	=====
ISPTASK-008	TCB=008B8D90	11.87	=====
PMSEL-021	TCB=008B8318	11.18	=====
ISPF-007	TCB=008E1190	10.70	=====
EXEC-017	TCB=008B8A50	5.13	=====
EX-018	TCB=008B8A50	3.21	=====
CALL-014	TCB=008A0B50	2.51	=====
CALL-011	TCB=008A0130	1.92	=====
CALL-020	TCB=008A0130	1.76	=====
EX-010	TCB=008B8B48	1.28	=====
EXEC-013	TCB=008A0E68	1.07	=====
ALTLIB-019	TCB=008A00F0	0.96	=====
ALTLIB-015	TCB=008A00F0	0.90	=====
FREE-016	TCB=008A00F0	0.80	=====
IEAVAR00-001	TCB=008FE0A8	0.00	=====
IEAVTSDT-002	TCB=008FFE88	0.00	=====
IEESB605-003	TCB=008FFBF8	0.00	=====

Here is a sample with the first task fully expanded: Line commands:

File View Navigate Help			
C06: CPU Usage by Task/Module (0694/TSTJOB01)		Row 00001 of 01111	
Command ==>		Scroll ==> CSR	
Name	Description	Percent of CPU time * 10.00%	±2.3%%
*....1....2....3....4....5....6....7....8.			
PMSEL-012	TCB=008B8318	46.65	=====
→ C0200	Application Prog	9.84	=====
→ C0200	CSECT in C0	9.84	=====
→ C0020	Application Prog	7.86	=====
→ C0020	CSECT in C0	7.86	=====
→ BKNCESUP	Application Prog	2.88	=====
→ BKNCESUP	CSECT in BKNCE	2.35	=====
→ BKNSTFMT	CSECT in BKNCE	0.53	=====
→ IGDDCFSR	Storage manageme	2.30	=====
→ IAXVF	Nucleus Routine	2.08	=====
→ IARVFRMN	Real storage m	2.08	=====
→ C0010	Application Prog	1.65	=====
→ C0010	CSECT in C0	1.65	=====
→ IAXVP	Nucleus Routine	1.33	=====
→ IARVPGTI	Real storage m	1.33	=====
→ IGWLHLS	DFSMS	0.96	=====
→ IGWLHRLS	DFSMS	0.32	=====
→ IGWLHAJB	DFSMS	0.16	=====

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Task, Load Module, CSECT, Unresolved Address	Display context help information.
++	Task, Load Module, CSECT, Unresolved Address	Show additional details.
+	Task, Load Module	Expand to reveal next level.
-	Task, Load Module	Collapse to hide next level.

Cmd	When Applied To Object	Action
SV	Task	Sort next level by value.
SN	Task, Category	Sort next level by name.
M	Load Module, CSECT	Display load module information.
P	Load Module, CSECT	Display source program mapping.
C09	Load Module, CSECT, Unresolved Address	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Name, Description, Percent CPU	Display context help information.
+	Name	Expand to reveal all entries.
+	Description	Expand field size.
+	Percent CPU	Zoom in scale.
–	Name	Collapse to show only first level.
–	Description	Reduce field size.
–	Percent CPU	Zoom out scale.
SV	Name, Description, Percent CPU	Sort next level by value.
SN	Name, Description, Percent CPU	Sort next level by name.

SETUP options

```

File View Navigate Help
+-----+
| C06 - Report SETUP Window (00723/CICS56A) |
| Command ==>                               | Scroll ==> CSR |
| Options for CPU Usage by Task/Category    |
|
| Enter "/" to select an option
| / Include "inactive" tasks in the report. An
|   inactive task is one for which there were no
|   observations of CPU consumption.
|
| - Filter by CICS transactions and Terminals as
|   specified in panel 5, Subsystems.
|
+-----+

```

The following SETUP option can be selected with the SETUP primary command:

Include inactive tasks

You can choose to include or eliminate inactive tasks from the report. An inactive task is one for which there were no observations of CPU consumption.

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+
| > CAZ00080 Application Pr 4.73 00 |
+-----+-----+-----+-----+-----+-----+

Calculation Details
CPU measurements          34
In load module            CAZ00080
Total CPU measurements    718
Percent in category       4.73%

Processor states for the CPU usage measurements

Processor State           Nbr of Samples Percentage
Storage key 0             34      100.00%
Problem state             0        0.00%
Supervisor state          34      100.00%
Execution in SVC          0        0.00%
Execution in real-mode    0        0.00%
Primary-space mode        34      100.00%
Access-register mode      0        0.00%
Secondary-space mode      0        0.00%
Home-space mode           0        0.00%
Execution on processor 0   10      29.41%
Execution on processor 1   24      70.58%
In private storage ABOVE  34      100.00%
In private storage BELOW  0        0.00%
In common storage ABOVE   0        0.00%
In common storage BELOW   0        0.00%
Execution in AMODE 24     0        0.00%
Execution in AMODE 31     34      100.00%
Execution in AMODE 64     0        0.00%
```

C07 - CPU usage by procedure

Usage

Use this report to see quantification of CPU usage at the source program procedure level.

Quantification

Each report line quantifies CPU usage as a percentage. Each percentage represents the ratio of CPU consumption observed for the reported item to the total CPU consumption measured in the address space.

Detail line hierarchy

C07 displays detail lines at a single level. Up to four types of detail lines are reported.

```

Level 1      Source Procedure
Level 1      Source Procedure
Level 1      Source Procedure
...
Level 1      APPLCN Category
Level 1      SYSTEM Category
Level 1      NOSYMB Category

```

Detail line descriptions

Source procedure detail line

This identifies a source program procedure and quantifies CPU usage attributed to the procedure. The source procedure detail lines are displayed only when the source program or programs are mapped and loaded. There are two ways to map and load the source program. You can use the A01 panel, or you can open any other Application Performance Analyzer report that supports the 'P' line command and use the 'P' line command to map and load the source before opening the C07 report. When the source is mapped and loaded, the source procedure details lines are displayed and the source can be viewed using the 'P' line command. See [Chapter 13, "Source program mapping," on page 645](#) for more details.

Under Heading	This is Displayed
Program	The name of the CSECT in the module containing the source procedure.
Procedure Name	The name of the source procedure.
Percent of CPU Time	The percentage of CPU time consumed during execution in the source procedure.

APPLCN Category detail line

Any execution measured in application programs that could not be associated with a source program procedure is quantified in this detail line. No further breakdown of this category is reported. Use report C01 to see further details.

SYSTEM Category detail line

Any execution measured in system programs that could not be associated with a source program procedure is quantified in this detail line. No further breakdown of this category is reported. Use report C01 to see further details.

NOSYMB Category detail line

Any execution measured at addresses that could not be associated with a load module is quantified in this detail line. No further breakdown of this category is reported. Use report C01 to see further details.

Sample reports

A sample report is shown here:

```

File View Navigate Help
-----
C07: CPU Usage by Procedure (0757/TSTJOB01)          Row 00001 of 00009
Command ==> ----- Scroll ==> CSR

Program      Procedure Name      Percent of CPU time * 10.00% ±2.5%
*....1....2....3....4....5....6....7....8
LPFRAYV4     B300-PROCESS-ACCTS      32.86 =====
LPFRAYV4     A200-CALCULATE-RTE      16.60 =====
LPFRAYV4     A100-CALCULATE-MTX      11.22 =====
LPFRAYV4     B300-EXIT                0.53
LPFRAYV4     A200-EXIT                0.46
LPFRAYV4     A100-EXIT                0.06

SYSTEM       System/OS Services      37.45 =====
APPLCN       No Procedure Mapped     0.79

```

Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

on objects

Cmd	When Applied To Object	Action
?	Program, Category	Display context help information.
++	Program, Category	Show additional details.
M	Program	Display load module information.
P	Program	Display source program mapping.
C09	Program, Category	Display C09 report subset.

on headings

Cmd	When Applied To Object	Action
?	Program, Procedure Name, Percent CPU	Display context help information.
+	Procedure name	Expand field size.
+	Percent CPU	Zoom in scale.
–	Procedure name	Reduce field size.
–	Percent CPU	Zoom out scale.
SV	Program, Procedure Name, Percent CPU	Sort next level by value.
SN	Program, Procedure Name, Percent CPU	Sort next level by name.

SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

File View Navigate Help

```
+-----+
| C07 - Report SETUP Window (00723/CICS56A)
| Command ==>                               Scroll ==> CSR
| Options for CPU Analysis by Procedure
|
| Enter "/" to select an option
| /  Omit procedures for which no CPU activity was
|    measured. Unselect to report all procedure
|    names.
|
| -  Filter by CICS transactions and Terminals as
|    specified in panel 5, Subsystems.
+-----+
```

By default, only those procedures for which CPU activity was measured are displayed. Deselect this option to display all procedure names.

Omit procedures with no CPU activity

By default, only those procedures for which CPU activity was measured are displayed. Deselect this option to display all procedure names.

Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
```

```
+----- The following report line was selected -----+  
| LPFRAYV4 B300-PROCESS-ACCTS      59.95 00000000000000000000000000000000 |  
+-----+
```

Calculation Details

Data management CPU measurements	4,820
In load module	LPFRAYV4
Executing routine	B300-PROCESS-ACCTS
Total CPU measurements	8,040
Percent in category	59.95%

Processor states for the CPU usage measurements

Processor State	Nbr of Samples	Percentage
Storage key 8	4,820	100.00%
Problem state	4,820	100.00%
Supervisor state	0	0.00%
Execution in SVC	0	0.00%
Execution in real-mode	0	0.00%
Primary-space mode	4,820	100.00%
Access-register mode	0	0.00%
Secondary-space mode	0	0.00%
Home-space mode	0	0.00%
Execution on processor 0	2,818	58.46%
Execution on processor 1	2,002	41.53%
In private storage ABOVE	4,820	100.00%
In private storage BELOW	0	0.00%

C08 - CPU usage referred attribution

Usage

Use this report to see attribution of CPU usage measured in system modules referred back to the points of invocation in application modules. A SETUP option is available to display the system modules at the highest level, with a breakdown of the application programs that invoked them.

Quantification

Each report line quantifies CPU usage as a percentage. Each percentage represents the ratio of CPU consumption observed for the reported item to the total CPU consumption measured in the address space.

Detail line hierarchy

The first level detail line shows an application module to which CPU usage in system modules has been attributed. You can expand each line to reveal additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

- ```

Level 1 Application Module
 Level 2 CSECT in application module
 Level 3 Offset in CSECT
 Level 3 Source statement
 Level 4 System module

```



**Level 5** CSECT in System module  
**Level 4** Unresolved address

The optional SETUP shows the system modules that have referred attribution with additional levels to show which application programs invoked them. You can expand each line to reveal additional hierarchical levels of detail (see Expanding Report Lines).

The hierarchy is illustrated here:

**Level 1** System module  
  **Level 2** CSECT in System module  
    **Level 3** Application Module  
      **Level 4** CSECT in application module  
        **Level 5** Offset in CSECT  
          **Level 5** Source statement  
**Level 1** Unresolved address

## Detail line descriptions

### Application module

This identifies an application module to which attribution of CPU usage in system routines has been referred. During the measurement, Application Performance Analyzer determined that execution in system modules was initiated by a system request statement (such as a CALL) with an invocation point in the identified application module.

| Under Heading       | This is Displayed                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------|
| Name                | Name of application load module in which CPU usage measured in system modules was attributed.                  |
| Description         | Functional description of the load module if one is available. Otherwise, “Application Program” is shown here. |
| Percent of CPU Time | The percentage of attributed system module CPU usage referred back to this application module.                 |

### CSECT in application module

These lines appear under the application module detail line. Each one reports an external name (CSECT) within the application module in which invocation points for attributed CPU execution reside.

| Under Heading       | This is Displayed                                                                 |
|---------------------|-----------------------------------------------------------------------------------|
| Name                | Name of CSECT in which CPU usage measured in system modules was attributed.       |
| Description         | CSECT in loadmodname appears here.                                                |
| Percent of CPU Time | The percentage of attributed system module CPU usage referred back to this CSECT. |

### Offset in CSECT

These lines appear under the CSECT detail line. Each one reports a return address offset – the point in the CSECT at which control is returned from the attributed system services CPU usage. This identifies the address of the application statement.

| Under Heading | This is Displayed                                                                                   |
|---------------|-----------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset of the return point in the CSECT of the system execution invocation request. |

| Under Heading       | This is Displayed                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------|
| Description         | “Offset in csectname” appears here.                                                                     |
| Percent of CPU Time | The percentage of CPU time measured in this system routine for the indicated invocation/return address. |

## Source statement

One or more lines showing the source statement appear at the same level as the Offset in CSECT detail line. This appears only when the source program has been mapped and loaded. For more information, see Chapter 13, “Source program mapping,” on page 645.

## System Module

This line identifies a system module in which CPU usage was measured and attributed to the reported application module.

| Under Heading       | This is Displayed                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The name of a system module in which CPU usage was measured and referred back to the application module under which this line appears. |
| Description         | Functional description of the system module.                                                                                           |
| Percent of CPU Time | The percentage of CPU time measured in this system routine for the invocation/return address under which this line appears.            |

## CSECT in System Module

This line identifies a CSECT within a system module in which CPU usage was measured and attributed to the reported application module.

| Under Heading       | This is Displayed                                                                                                                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Name                | The name of the CSECT in which CPU usage was measured and referred back to the application module under which this line appears. |
| Description         | Functional description of the CSECT.                                                                                             |
| Percent of CPU Time | The percentage of CPU time measured in this system CSECT for the invocation/return address under which this line appears.        |

## Unresolved address

This line identifies an unresolved address in which CPU usage was measured and attributed to the reported application module.

| Under Heading       | This is Displayed                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name                | An unresolved address range in which CPU usage was measured and referred back to the application module under which this line appears. |
| Description         | “Unresolved Address”                                                                                                                   |
| Percent of CPU Time | The percentage of CPU time measured in this address range.                                                                             |

## Sample reports

A sample report is shown here. This has been expanded to the third level, and the source has been mapped and loaded. (It can be expanded further to show details of the modules.)

```

File View Navigate Help

C08: CPU Usage Referred Attribution (3598/TSTJOB01) Row 00001 of 00027
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±1.0%%
 *....1....2....3....4....5....6....7....8.
SAMPLE1 Application Program 88.37 =====
→ SAMPLE1 CSECT in SAMPLE1 88.37 =====
 → 000854 Attribution Offset 35.06 =====
 > Source statement in: Sample1Mainline
 > Open Input SalesActivityFile

 → 00088A Attribution Offset 24.23 =====
 > Source statement in: Sample1Mainline
 > Open OUTPUT SalesReportFile

 → 000918 Attribution Offset 14.22 =====
 > Source statement in: Sample1Mainline
 > Close SalesActivityFile

 → 000936 Attribution Offset 13.89 =====
 > Source statement in: Sample1Mainline
 > Close SalesReportFile

 → 000814 Attribution Offset 0.73
 > Source statement in: Sample1Mainline
 > Inspect B tallying C for all '**'replacing all '**'

 → 000A72 Attribution Offset 0.20
 > Source statement in: ProcessSalesRecord
 > Read SalesActivityFile

```

A sample report using the SETUP option is shown here. It reports attribution from the system modules and CSECTs to the application programs that called them

```

File View Navigate Help

C08: CPU Usage Referred Attribution (3598/TSTJOB01) Row 00001 of 00011
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±5.4%
 *....1....2....3....4....5....6....7....8.
IGZCPAC COBPACK 14.70 =====
→ IGZCIN1 INSPECT library 14.41 =====
 → SAMPLE1 CICS Samples 14.41 =====
 → SAMPLE1 CSECT in SAMPLE1 14.41 =====
 → 0008B4 Attribution Of 5.29 ===
 → 000936 Attribution Of 5.00 ===
 → 000832 Attribution Of 4.11 ==
 → IGZCDSP DISPLAY OS 0.29
 → SAMPLE1 CICS Samples 0.29
 → SAMPLE1 CSECT in SAMPLE1 0.29
 → 000952 Attribution Of 0.29

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                           | Action                            |
|-----|----------------------------------------------------------------------------------|-----------------------------------|
| ?   | Application Module, CSECT, Attribution Offset, System Module, Unresolved Address | Display context help information. |
| ++  | Application Module, CSECT, Attribution Offset, System Module, Unresolved Address | Show additional details.          |

| Cmd | When Applied To Object                                                           | Action                           |
|-----|----------------------------------------------------------------------------------|----------------------------------|
| +   | Application Module, CSECT, Attribution Offset                                    | Expand to reveal next level.     |
| -   | Application Module, CSECT, Attribution Offset, System Module, Unresolved Address | Collapse to hide next level .    |
| M   | Application Module, CSECT, System Module, Unresolved Address                     | Display load module information. |
| P   | CSECT, Attribution Offset                                                        | Display source program mapping.  |
| C09 | Application Module, CSECT, Attribution Offset, System Module, Unresolved Address | Display C09 report subset.       |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale .                   |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window will be displayed:

```

File View Navigate Help
+-----+
| C08 - Report SETUP Window (00723/CICS56A) |
| Command ==> | Scroll ==> CSR |
| Options for CPU Referred Attribution |
|
| Enter "/" to select an option
| - Select to report attribution from the System
| module to the application programs that
| called it. Unselect to show attribution from
| the application program to the system module.
|
| - Filter by CICS transactions and Terminals as
| specified in panel 5, Subsystems.
|
+-----+

```

### Attribution to Application/System

Select to report attribution from the System module to the application programs that called it.  
Unselect to show attribution from the application program to the system module.

## Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help

+----- The following report line was selected -----+
| > 0005BE Attribution Offset 7.23 0000 |
+-----+

Calculation Details
CPU measurements attributed to services 582
In the csect LPFRAYV4
Return offset 0005BE
Total CPU measurements 8,040
Percent in category 7.23%

Source Statement in: PROCEDURE-DIVISION
 write VSAM-record

Processor states for the CPU usage measurements

Processor State Nbr of Samples Percentage

Storage key 0 303 52.06%
Storage key 8 279 47.93%

Problem state 257 44.15%
Supervisor state 325 55.84%

Execution in SVC 325 55.84%

Execution in real-mode 0 0.00%

Primary-space mode 582 100.00%
Access-register mode 0 0.00%
Secondary-space mode 0 0.00%
Home-space mode 0 0.00%

Execution on processor 0 302 51.89%
Execution on processor 1 280 48.10%

In private storage ABOVE 0 0.00%
In private storage BELOW 0 0.00%
In common storage ABOVE 420 72.16%
In common storage BELOW 162 27.83%

Execution in AMODE 24 0 0.00%
Execution in AMODE 31 582 100.00%
Execution in AMODE 64 0 0.00%

```

| File                     | View  | Navigate | Help    |
|--------------------------|-------|----------|---------|
| In private storage ABOVE | 1     | 0.02%    | More: - |
| In private storage BELOW | 31    | 0.92%    |         |
| In common storage ABOVE  | 2,222 | 66.48%   |         |
| In common storage BELOW  | 1,088 | 32.55%   |         |
| Execution in AMODE 24    | 192   | 5.74%    |         |
| Execution in AMODE 31    | 3,150 | 94.25%   |         |
| Execution in AMODE 64    | 0     | 0.00%    |         |

## C09 - CPU usage by PSW/object code

Use this report to see information about sampled CPU execution at the machine-instruction level. This report is most useful when used in Subset Analysis mode to provide more detailed analysis for a particular quantification. You can display this report by entering the “C09” line command on an eligible CPU usage report detail line. The C09 report will show you information about the executed machine instructions.

### Quantification

Each report line quantifies CPU usage as a percentage. Each percentage represents the ratio of CPU consumption observed for the reported item to the total CPU consumption measured in the address space.

### Detail line hierarchy

The first level detail line shows a PSW (program status word) address value that Application Performance Analyzer recorded when it made an active CPU observation. Each repeated CPU usage observation at the same PSW address is accumulated and reported as a single detail line.

In addition to the PSW address value, Application Performance Analyzer creates a separate first-level detail line if any of the following values are different:

- Execution in problem or supervisor mode
- Address mode (AMODE) 24, 31 or 64
- Address-space control: primary-space, AR mode, secondary-space or homespace
- PSW key
- SVC number if execution was in a supervisor call
- Object code at the PSW address

You can expand the first level detail line to show the object code at the PSW address. Object code is reported in the form of disassembled machine instructions. Application Performance Analyzer displays a line for each machine instruction from 12 bytes of object code captured during the measurement. The PSW address points to the sixth byte of the 12 bytes, so the first instructions reported are the ones that preceded the sampled instruction. When alternate disassembly are available (depending upon the assumed start address), they are listed under the subheading of "Alternate Disassembly".

### Detail line descriptions

#### PSW address line

One line appears for each unique PSW address. By default, these are sorted in descending sequence by CPU activity.

| Under Heading | This is Displayed                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address       | The PSW address of the sampled instruction.                                                                                                                                                                                       |
| Module        | The load module name at the sampled address, or 'Unknown' if Application Performance Analyzer was unable to determine the module name.                                                                                            |
| AM            | The address mode (AMODE): 24, 31 or 64.                                                                                                                                                                                           |
| S/P           | The SVC number if execution was in a supervisor call or S or P followed by the storage key. “S” indicates supervisor mode and “P” indicates problem mode. For example, “P8” indicates execution in problem mode in storage key 8. |

| Under Heading       | This is Displayed                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS                  | The address space control mode. AR indicates access-register mode, SS indicates secondary-space mode and HS indicates home-space mode. Blanks are shown for primary-space mode.                                                                                                                                                                                                                |
| ASID                | The ASID (address space ID) in hexadecimal of the address space that acquired the storage at the PSW address. This is shown only if the storage was acquired by an address space other than the measured one – a foreign address space. One example of this is the processing of an SQL request. Execution often occurs in load modules fetched into storage by one of the Db2 address spaces. |
| Percent of CPU Time | The percentage of CPU time observed at the indicated address.                                                                                                                                                                                                                                                                                                                                  |

## Machine instruction line

Each line shows one machine instruction in disassembled format. These lines pertain to the PSW address line shown above. When alternate disassembly are available (depending upon the assumed start address), they are listed under the subheading of "Alternate Disassembly".

## Sample reports

A sample report is shown here. The first entry has been expanded with the “+” line command.

File View Navigate Help

C09: CPU Usage by PSW/Object Code (2133/TSTJOB01) Row 00001 of 00018  
Command ==> Scroll ==> CSR

| Address         | Module     | AM   | S/P  | AS   | ASID | Percent of CPU Time * 10.00%        | ±1.6% |
|-----------------|------------|------|------|------|------|-------------------------------------|-------|
|                 |            |      |      |      |      | *....1....2....3....4....5....6.... |       |
| 17801392        | - LPFRAYVS | 31   | P8   |      |      | 98.2                                | ===== |
| → LPFRAYVS+05D6 |            | 47F0 | B240 |      |      | BC 15,576(,R11)                     |       |
| → LPFRAYVS+05DA |            | FA20 | 9820 | A06C |      | AP 2080(3,R9),108(1,R10)76(,R11)    |       |
| 178012E4        | + LPFRAYVS | 31   | P8   |      |      | 0.48                                |       |
| 17801360        | + LPFRAYVS | 31   | P8   |      |      | 0.25                                |       |
| 17801416        | + LPFRAYVS | 31   | P8   |      |      | 0.23                                |       |
| 17801302        | + LPFRAYVS | 31   | P8   |      |      | 0.15                                |       |
| 17801312        | + LPFRAYVS | 31   | P8   |      |      | 0.15                                |       |
| 178012C4        | + LPFRAYVS | 31   | P8   |      |      | 0.12                                |       |
| 17801342        | + LPFRAYVS | 31   | P8   |      |      | 0.10                                |       |
| 178012F0        | + LPFRAYVS | 31   | P8   |      |      | 0.07                                |       |
| 17801362        | + LPFRAYVS | 31   | P8   |      |      | 0.05                                |       |
| 178012C6        | + LPFRAYVS | 31   | P8   |      |      | 0.05                                |       |
| 1780129A        | + LPFRAYVS | 31   | P8   |      |      | 0.02                                |       |
| 1780137A        | + LPFRAYVS | 31   | P8   |      |      | 0.02                                |       |
| 178012C0        | + LPFRAYVS | 31   | P8   |      |      | 0.02                                |       |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Address                | Display context help information. |
| ++  | Address                | Show additional details.          |

| Cmd | When Applied To Object | Action                           |
|-----|------------------------|----------------------------------|
| +   | Address                | Expand to reveal next level.     |
| -   | Address                | Collapse to hide next level .    |
| M   | Address                | Display load module information. |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Address, Percent CPU   | Display context help information.  |
| +   | Address                | Expand to reveal all entries.      |
| +   | Percent CPU            | Zoom in scale.                     |
| –   | Address                | Collapse to show only first level. |
| –   | Percent CPU            | Zoom out scale.                    |
| SV  | Address                | Sort next level by value.          |
| SA  | Address                | Sort next level by address.        |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window will be displayed:

```
File View Navigate Help
+-----+
| C09 - Report SETUP Window (00723/CICS56A) |
| Command ==> | Scroll ==> CSR |
| Options for CPU Analysis by PSW/ObjCode |
|
| Enter "/" to select an option
|
| - Filter by CICS transactions and Terminals as
| specified in panel 5, Subsystems.
|
+-----+
```

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:



```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| 18802338 + LPFRAYV4 31 P8 50.44 000000000000000000000000 |
+-----+

Calculation Details
CPU measurements 4,056
PSW address 18802338
Total CPU measurements 8,040
Percent in category 50.44%

PSW Information
PSW Address 18802338
Module Name LPFRAYV4
CSECT Name LPFRAYV4
Module+Offset LPFRAYV4+1748
CSECT+Offset LPFRAYV4+1748
Addressing Mode (AMODE) 31 bit
Address Space Control Primary Space
Problem/Supervisor Mode Problem Mode

Machine Instructions
LPFRAYV4+1744 47F0 B0C2 BC 15,194(,R11)
LPFRAYV4+1748 FA20 A830 9075 AP 2096(3,R10),117(1,R9) <- PSW add

```

## C10 - CPU Usage by Natural Program

Use this report to see how CPU time was consumed by execution of Natural programs. The Natural data extractor must be turned on during the measurement in order to produce this report.

### Quantification

Each report line quantifies time measured as a percentage of total time, the percentage represents the ratio of the number of CPU active measurements in the indicated Natural object to the total number of CPU active observations.

### Detail line hierarchy

An unexpanded report shows a line for each Natural Program. The name field shows the Natural program name. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 Natural program
Level 2 Natural statement

```

### Detail line descriptions

#### Natural Program detail line

This is the first-level detail line.

| Under Heading       | This is Displayed                                                                      |
|---------------------|----------------------------------------------------------------------------------------|
| Program             | The Natural program name for which CPU activity is reported.                           |
| Library             | The name of the library or folder from which the Natural program was obtained.         |
| Percent of CPU Time | The percentage of CPU time consumed during execution in the indicated Natural program. |

## Natural statement detail line

This is the second-level detail line.

| Under Heading       | This is Displayed                                                                                                                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Program             | The four digit Natural statement number for which CPU activity is reported, this will be "0000" for CPU activity for which a statement number could not be determined.                                  |
| Library             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the statement is within an INCLUDE member, the INCLUDE member name is displayed. |
| Percent of CPU Time | The percentage of CPU time consumed during execution in the indicated Natural statement.                                                                                                                |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

+-----+-----+-----+-----+-----+-----+-----+-----+-----+
C10: CPU Usage by Natural Program (0236/TSTJOB01) Row 00001 of 00022
Command ==> ----- Scroll ==> CSR
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Program Library Percent of CPU Time * 10.00% ±1.9%
*....1....2....3....4....5....6....7....8....9
NATPGM1 SYSLIB 99.67 =====
→ 0010 stmt # 10 38.42 =====
→ 0020 stmt # 20 27.77 =====
→ 0090 stmt # 90 24.93 =====
→ 0120 stmt # 120 8.53 =====

NATPGM2 SYSLIB 0.16
→ 2985 stmt # 2985 0.05
→ 3687 stmt # 3687 0.02

NATPGM3 SYSLIB 0.08
→ 0183 stmt # 183 0.05
→ 0621 stmt # 621 0.02
+-----+-----+-----+-----+-----+-----+-----+-----+

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object     | Action                               |
|-----|----------------------------|--------------------------------------|
| ?   | Program, Natural statement | Display context help information.    |
| ++  | Program, Natural statement | Show additional details.             |
| +   | Program                    | Expand to reveal next level.         |
| -   | Program                    | Collapse to hide next level.         |
| SV  | Program                    | Sort next level by value.            |
| SN  | Program                    | Sort next level by statement number. |

## on headings

| Cmd | When Applied To Object        | Action                               |
|-----|-------------------------------|--------------------------------------|
| ?   | Program, Library, Percent CPU | Display context help information.    |
| +   | Program                       | Expand to reveal all entries.        |
| +   | Library                       | Expand field size.                   |
| +   | Percent CPU                   | Zoom in scale.                       |
| –   | Program                       | Collapse to show only first level.   |
| -   | Library                       | Reduce field size.                   |
| –   | Percent CPU                   | Zoom out scale.                      |
| SV  | Program, Library, Percent CPU | Sort next level by value.            |
| SN  | Program, Library, Percent CPU | Sort next level by statement number. |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window will be displayed:

```
File View Navigate Help
+-----+
| C10 - Report SETUP Window (08184/CICS56A) |
| Command ==> | Scroll ==> CSR |
| Options for CPU Analysis by PSW/ObjCode |
|
| Enter "/" to select an option
|
| - Filter by CICS transactions and Terminals as
| specified in panel 5, Subsystems.
|
+-----+
```

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

|                                                      |                       |                   |
|------------------------------------------------------|-----------------------|-------------------|
| File View Navigate Help                              |                       |                   |
| +----- The following report line was selected -----+ |                       |                   |
| 0010                                                 | stmt # 10 38.42 ===== |                   |
| +-----                                               |                       |                   |
| Calculation Details                                  |                       |                   |
| CPU measurements                                     |                       | 1,700             |
| Total CPU measurements                               |                       | 3,949             |
| Percent of total                                     |                       | 38.42%            |
| Processor states for the CPU usage measurements      |                       |                   |
| <u>Processor State</u>                               | <u>Nbr of Samples</u> | <u>Percentage</u> |
| Storage key 8                                        | 1                     | 0.05%             |
| Storage key 9                                        | 1,699                 | 99.94%            |
| Problem state                                        | 1,700                 | 100.00%           |
| Supervisor state                                     | 0                     | 0.00%             |
| Execution in SVC                                     | 0                     | 0.00%             |
| Execution in real-mode                               | 0                     | 0.00%             |
| Primary-space mode                                   | 1,700                 | 100.00%           |
| Access-register mode                                 | 0                     | 0.00%             |
| Secondary-space mode                                 | 0                     | 0.00%             |
| Home-space mode                                      | 0                     | 0.00%             |
| Execution on processor 0                             | 1,700                 | 100.00%           |
| In private storage ABOVE                             | 1,700                 | 100.00%           |
| In private storage BELOW                             | 0                     | 0.00%             |
| In common storage ABOVE                              | 0                     | 0.00%             |
| In common storage BELOW                              | 0                     | 0.00%             |

## W01 - WAIT time by task/category

### Overview

This report analyzes measured CPU WAIT time. It shows, for each Task (TCB), the percentage of elapsed time the Task was observed to be in a WAIT. Under each task, this information is shown under the following general categories:

#### APPLCN

Application Code

#### SYSTEM

System/OS Services

#### DATAMG

Data Management (DASD) Requests

#### Db2SQL

SQL Processing

#### IMSDLI

IMS DL/I calls

#### ADABAS

Adabas requests

In addition, any WAIT time observed at locations for which no load module name could be determined is attributed to a category:

#### NOSYMB

No Module Name Found

The Task (TCB) name is the object at the top level of the hierarchy for this report, and is the only object visible when the report is first displayed.

A sample report is shown here, as it would appear when it is first displayed:

| File View Navigate Help                    |              |                              |       |
|--------------------------------------------|--------------|------------------------------|-------|
| W01: WAIT Time by Category (0651/TSTJOB01) |              | Row 00001 of 00009           |       |
| Command ==>                                |              | Scroll ==> CSR               |       |
| Name                                       | Description  | Percent of CPU time * 10.00% | ±2.3% |
| ISPTASK-008                                | TCB=008B8D90 | 99.65                        | ===== |
| PMSEL-012                                  | TCB=00893528 | 99.58                        | ===== |
| ISPF-007                                   | TCB=008E1190 | 99.18                        | ===== |
| ISPTASK-009                                | TCB=008B8738 | 16.54                        | ===== |
| EXEC-013                                   | TCB=008A67C0 | 1.01                         | =     |
| ALLOC-017                                  | TCB=008A67C0 | 0.06                         |       |
| ALLOC-015                                  | TCB=008A67C0 | 0.05                         |       |
| ALLOC-016                                  | TCB=008A67C0 | 0.04                         |       |
| CALL-014                                   | TCB=008A6390 | 0.00                         |       |

You can expand the entire report to show all detail lines at all hierarchical levels by entering the “+” line command on the Name heading.

## Detail line descriptions

Each line represents a System Object – an object to which WAIT time is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

### Task

This is the highest level object in the report. Each active Task is reported. The percentage of the measurement time interval the task was observed to be WAITing is reported.

**Note:** A SETUP option is available which specifies that all Tasks – including inactive tasks – are to be displayed.

### Name Column

The name of the program specified in the ATTACH macro that started the task as well as the TCB index number is shown.

### Description Column

The TCB address is shown. For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address.

### Category

WAIT time within a Task is categorized as APPLCN, SYSTEM, DATAMG, IMSDLI, Db2SQL, ADABAS or NOSYMB.

### DPA Group

Within a category – usually the SYSTEM category – load modules can be further arranged into Descriptive Program Attribution (DPA) groups. These are functional groups like: IMS, Db2, VSAM.

**Note:** A SETUP option is available from which you can specify aggregation of modules into Group or Subgroup. Subgroup offers a more granular, less inclusive categorization than Group. Application Performance Analyzer uses the module name to locate descriptive information in its DPA tables.

### Name Column

The symbolic name of the Group/Subgroup appears under this heading.

### Description Column

A Group/Subgroup description appears under this heading.

### Load Module

A load module line appears under a Group/Subgroup line, under a Category line, or under an SVC line.

### Name Column

The load module name appears under this heading.

**Description Column**

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

**CSECT (Control Section)**

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer were able to find ESD (External Symbol Dictionary) information, during the measurement process, for a load module, these items will appear under the load module and the measured WAIT time will be attributed to them.

**Name Column**

The CSECT name appears under this heading.

Description Column This will display “CSECT in xxxxxxxx” where xxxxxxxx is the name of the load module to which the CSECT belongs.

**SVC (Supervisor Call)**

This line shows attribution of measured WAIT time during execution of an MVS Supervisor Call.

**Name Column**

“SVC” followed by a 3-digit decimal SVC number (000 to 255) appears under this heading. For example, “SVC120.”

**Description Column**

A description of the SVC service, or the name of the macro which invokes the SVC appears under this heading. For example, “GETMAIN/FREEMAIN.”

**SQL Statement**

This item attributes WAIT activity to a Db2 SQL statement.

**Name Column**

A sequence number is assigned to each unique SQL statement observed during the measurement. This sequence number is shown in the name field. It is possible for some sequences numbers to be missing (sequence gaps) from the report. This will occur if a sequence number was assigned to SQL statements but no WAIT activity was measured for these statements.

**Description Column**

The name of the program that issued the SQL request followed by the precompiler statement number (enclosed in parentheses) is shown here. This is followed by the SQL function (for example, SELECT, INSERT, COMMIT).

**DL/I Call**

This item attributes WAIT activity to an IMS DL/I call.

**Name Column**

A sequence number is assigned to each unique DL/I call statement observed during the measurement. This sequence number is shown in the name field.

**Description Column**

The DL/I function code appears followed by the PCB name followed by the relative PCB number in parentheses. The location of the call, in *csect+offset* format, follows.

**Adabas Call**

This item attributes WAIT activity to an Adabas call.

**Name Column**

A sequence number is assigned to each unique Adabas call statement observed during the measurement. This sequence number is shown in the name field.

**Description Column**

The name of the program that issued the Adabas request and the offset within the program, followed by the Adabas command code that was issued, is displayed in the field. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.

### Unresolved Address

This item attributes measurement WAIT time to a range of addresses for which a corresponding load module name could not be determined.

### Name Column

WAIT time observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format “HHHHHxxx” where HHHHH are the 5 high order hexadecimal digits of the address. For example, “08915xxx” means the range from 08915000 to 08915FFF.

### Description Column

“Unresolved Address” appears under this heading.

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                      | Action                            |
|-----|-------------------------------------------------------------|-----------------------------------|
| ?   | Task, Category, Load Module, SVC, CSECT, Unresolved Address | Display context help information. |
| ++  | Task, Category, Load Module, SVC, CSECT, Unresolved Address | Show additional details.          |
| +   | Task, Category, Load Module, SVC                            | Expand to reveal next level.      |
| –   | Task, Category, Load Module, SVC                            | Collapse to hide next level.      |
| SV  | Task, Category, SVC                                         | Sort next level by value.         |
| SN  | Task, Category, SVC                                         | Sort next level by name.          |
| M   | Load Module, CSECT                                          | Display load module information.  |
| P   | Load Module, CSECT                                          | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object          | Action                             |
|-----|---------------------------------|------------------------------------|
| ?   | Name, Description, Percent WAIT | Display context help information.  |
| +   | Name                            | Expand to reveal all entries.      |
| +   | Description                     | Expand field size.                 |
| +   | Percent CPU                     | Zoom in scale.                     |
| –   | Name                            | Collapse to show only first level. |
| –   | Description                     | Reduces field size                 |
| –   | Percent CPU                     | Zoom out scale.                    |
| SV  | Name                            | Sort next level by value.          |
| SN  | Name                            | Sort next level by name.           |

## SETUP options

```
File View Navigate Help
+-----+
| W01 - Report SETUP Window (00723/CICS56A) |
| Command ==> | Scroll ==> CSR |
| Options for WAIT Time by Task/Category |
|
| Enter "/" to select an option
| / Report modules by "Group". Unselect to report
| by "SubGroup". Group is a higher level (more
| inclusive) categorization than SubGroup.
|
| / Include "inactive" tasks in the report. An
| inactive task is one for which there were no
| observations of CPU consumption.
|
| / Show the Db2SQL category in which Wait time
| attributed to SQL processing is shown.
|
| / Show the DATAMG category in which Wait time
| attributed to data management is shown.
|
| / Show the IMSDLI category in which Wait time
| attributed to DLI processing is shown.
|
| / Show the ADABAS category in which Wait time
| attributed to ADABAS processing is shown.
|
| - Filter by CICS transactions and Terminals as
| specified in panel 5, Subsystems.
|
+-----+
```

The following SETUP options can be selected with the SETUP primary command:

### Reporting by Group / SubGroup

This option allows you to aggregate modules into Group or SubGroup. SubGroup offers a more granular, less inclusive categorization than Group. For example, when reporting by Group, all SVCs would be reported under the "SVC" Group. When reporting by SubGroup, SVCs would be reported under SubGroups such as SVCTYPE1, SVCTYPE2, etc.

### Include inactive tasks

You can choose to include or eliminate inactive tasks from the report. An inactive task is one for which there were no observations of CPU consumption.

### Show the Db2SQL category

This shows activity attributed to Db2 SQL statements. If it is not selected, the activity is included in the appropriate system modules in the SYSTEM category. This category is not applicable for CICS measurements.

### Show the DATAMG category

This shows activity attributed to data management functions, which include basic access functions such as READ and WRITE. Processing of OPEN and CLOSE functions is not included in this category. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

### Show the IMSDLI category

This shows activity attributed to IMS DLI calls. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category.

### Show the ADABAS category

This shows activity attributed to Adabas requests. If it is not selected, the activity is included in the appropriate system modules in the SYSTEM category.

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.



## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| ISPF-007 TCB=008DFA10 98.66 00000000000000000000000000000000 |
+-----+
Calculation Details
Wait measurements 9,866
Task ISPF-007
Total measurements 10,000
Percent of total 98.66%
```

## W02 - WAIT time by task/module

### Overview

This report analyzes measured CPU WAIT time. It shows, for each Task (TCB), the percentage of elapsed time the Task was observed to be in a WAIT. Under each task, a further breakdown of wait time is shown by load modules.

In addition, any wait time measured at locations for which no load module name could be determined is attributed to hexadecimal address ranges.

### Detail line descriptions

Each line represents a System Object - an object to which measured activity is attributed. These lines are arranged hierarchically. You can expand a line (using the “+” line command) to reveal a breakdown into subordinate objects. Each type of object shown in this report is described here:

#### Task

This is the highest level object in the report. Each active Task is reported. The percentage of the total measured CPU time which was measured in this Task is reported. A SETUP option is available that specifies that all Tasks, including inactive tasks, are to be displayed.

#### Name Column

The name of the program specified in the ATTACH macro that started the task as well as the TCB index number is shown.

#### Description Column

The TCB address is shown. For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address.

#### Load Module

##### Name Column

The load module name appears under this heading.

##### Description Column

If a DPA functional description is found for the module name, it is reported under this heading. Otherwise “Application Program” is displayed.

#### CSECT (Control Section)

These lines can appear as subordinate, breakdown items under a load module line. If Application Performance Analyzer was able to find ESD (External Symbol Dictionary) information, during the

measurement process, for a load module, these items will appear under the load module and the measured wait time will be attributed to them.

#### Name Column

The CSECT name appears under this heading.

#### Description Column

This will display “CSECT in xxxxxxxx” where xxxxxxxx is the name of the load module to which the CSECT belongs.

#### Unresolved Address

This item attributes wait time to a range of addresses for which a corresponding load module name could not be determined.

#### Name Column

Activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format “HHHHHxxx” where HHHHH are the 5 high order hexadecimal digits of the address. For example: “08915xxx” means the range from 08915000 to 08915FFF.

#### Description Column

“Unresolved Address” appears under this heading. A sample report is shown here. File

A sample report is shown here.

| File View Navigate Help                  |              |                                            |       |
|------------------------------------------|--------------|--------------------------------------------|-------|
| W02: WAIT Time by Module (0651/TSTJOB01) |              | Row 00001 of 00017                         |       |
| Command ==>                              |              | Scroll ==> CSR                             |       |
| Name                                     | Description  | Percent of Time in WAIT * 10.00% ±0.8%     |       |
|                                          |              | *....1....2....3....4....5....6....7....8. |       |
| IKJEFT01-004                             | TCB=008FF6E0 | 100.00                                     | ===== |
| IKJEFT02-005                             | TCB=008E1640 | 100.00                                     | ===== |
| IKJEFT09-006                             | TCB=008E1328 | 100.00                                     | ===== |
| EX-010                                   | TCB=008B84DB | 100.00                                     | ===== |
| CALL-011                                 | TCB=008B8248 | 100.00                                     | ===== |
| ISPTASK-008                              | TCB=008B8D90 | 99.65                                      | ===== |
| PMSEL-012                                | TCB=00893528 | 99.58                                      | ===== |
| ISPF-007                                 | TCB=008E1190 | 99.18                                      | ===== |
| ISPTASK-009                              | TCB=008B8738 | 16.54                                      | ===== |
| EXEC-013                                 | TCB=008A67C0 | 1.01                                       | =     |
| ALLOC-017                                | TCB=008A67C0 | 0.06                                       |       |
| ALLOC-015                                | TCB=008A67C0 | 0.05                                       |       |
| ALLOC-016                                | TCB=008A67C0 | 0.04                                       |       |
| IEAVAR00-001                             | TCB=008FE0A8 | 0.00                                       |       |
| IEAVTSDT-002                             | TCB=008FFE88 | 0.00                                       |       |
| IEESB605-003                             | TCB=008FFBF8 | 0.00                                       |       |
| CALL-014                                 | TCB=008A6390 | 0.00                                       |       |

A sample report with a task fully expanded is shown here.

```

File View Navigate Help

W02: WAIT Time by Module (0651/TSTJ0B01) Row 00001 of 00086
Command ==> ----- Scroll ==> CSR
Name Description Percent of Time in WAIT * 10.00% ±0.8%
*....1....2....3....4....5....6....7....8.
ISPTASK-009 TCB=008B8738 16.54 =====
→ ISPSUBS Application Prog 11.21 =====
→ ISPCDI CSECT in ISPSU 8.86 =====
→ ISPCAT CSECT in ISPSU 2.21 =
→ ISPCCT CSECT in ISPSU 0.09
→ ISPPDP CSECT in ISPSU 0.04
→ IGG019BB Data Management 4.57 ===
→ IGG019BB CSECT in IGG01 4.57 ===
→ IGG0CLHA Data Management 0.25
→ IGG0CLXA CSECT in IGG0C 0.25
→ IEAVEWAT Task management 0.18
→ IGC001 CSECT in IEAVE 0.18
→ IGC018 Supervisor Contr 0.17
→ SVC018 CSECT in IGC01 0.17
→ IGC0013I Supervisor Contr 0.12
→ ICVDSD03 CSECT in IGC00 0.07
→ ICVCMI03 CSECT in IGC00 0.04

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object                       | Action                            |
|-----|----------------------------------------------|-----------------------------------|
| ?   | Task, Load Module, CSECT, Unresolved Address | Display context help information. |
| ++  | Task, Load Module, CSECT, Unresolved Address | Show additional details.          |
| +   | Task, Load Module                            | Expand to reveal next level.      |
| –   | Task, Load Module                            | Collapse to hide next level.      |
| SV  | Task                                         | Sort next level by value.         |
| SN  | Task                                         | Sort next level by name.          |
| M   | Load Module, CSECT                           | Display load module information.  |
| P   | Load Module, CSECT                           | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object          | Action                             |
|-----|---------------------------------|------------------------------------|
| ?   | Name, Description, Percent WAIT | Display context help information.  |
| +   | Name                            | Expand to reveal all entries.      |
| +   | Description                     | Expand field size.                 |
| +   | Percent CPU                     | Zoom in scale.                     |
| –   | Name                            | Collapse to show only first level. |
| –   | Description                     | Reduce field size.                 |

| Cmd | When Applied To Object | Action                    |
|-----|------------------------|---------------------------|
| –   | Percent CPU            | Zoom out scale.           |
| SV  | Name                   | Sort next level by value. |
| SN  | Name                   | Sort next level by name.  |

## SETUP options

File View Navigate Help

```

+-----+
| W02 - Report SETUP Window (00723/CICS56A) |
| Command ==> Scroll ==> CSR |
| Options for WAIT Time by Task/Module |
| |
| Enter "/" to select an option |
| / Include "inactive" tasks in the report. An |
| inactive task is one for which there were no |
| observations of CPU consumption. |
| |
| - Filter by CICS transactions and Terminals as |
| specified in panel 5, Subsystems. |
| |
+-----+

```

The following SETUP options can be selected with the SETUP primary command:

### Include inactive tasks

You can choose to include or eliminate inactive tasks from the report. An inactive task is one for which there were no observations of CPU consumption.

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
| +-----+ The following report line was selected +-----+ |
| | ISPF-007 TCB=008DFA10 98.66 00000000000000000000000000000000 | |
| +-----+ |
| Calculation Details |
Wait measurements	9,866
Task	ISPF-007
Total measurements	10,000
Percent of total	98.66%
+-----+	
+-----+

```

## W03 - WAIT time referred attribution

## Usage

Use this report to see attribution of WAIT time. WAITs issued in system modules are referred back to the points of invocation in application modules.

## Quantification

Each report line quantifies WAIT time as a percentage. Each percentage represents the ratio of time in WAIT to the elapsed time of the measurement.

## Detail line hierarchy

The first level detail line shows a task (TCB). For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address. The second level detail line shows an application module to which WAIT time in system modules has been attributed. You can expand each line to reveal additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 Task
 Level 2 Application Module
 Level 3 CSECT in application module
 Level 4 Offset in CSECT
 Level 4 Source statement
 Level 5 System module
 Level 6 CSECT in System module
 Level 5 Unresolved address
```

## Detail line descriptions

### Application module

This identifies an application module to which attribution of WAIT time in system routines has been referred. During the measurement, Application Performance Analyzer determined that WAIT in system modules was initiated by a system request statement (such as a CALL) with an invocation point in the identified application module.

| Under Heading           | This is Displayed                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------|
| Name                    | Name of application load module in which WAIT time observed in system modules was attributed.                  |
| Description             | Functional description of the load module if one is available. Otherwise, “Application Program” is shown here. |
| Percent of Time in WAIT | The percentage of attributed system module WAIT time referred back to this application module.                 |

### CSECT in application module

These lines appear under the application module detail line. Each one reports an external name (CSECT) within the application module in which invocation points for attributed WAIT reside.

| Under Heading | This is Displayed                                                           |
|---------------|-----------------------------------------------------------------------------|
| Name          | Name of CSECT in which WAIT time observed in system modules was attributed. |
| Description   | CSECT in loadmodname appears here.                                          |

| Under Heading           | This is Displayed                                                                 |
|-------------------------|-----------------------------------------------------------------------------------|
| Percent of Time in WAIT | The percentage of attributed system module WAIT time referred back to this CSECT. |

## Offset in CSECT

These lines appear under the CSECT detail line. Each one reports a return address offset – the point in the CSECT at which control is returned from the attributed system services WAIT. This identifies the address of the application statement.

| Under Heading           | This is Displayed                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------------------------|
| Name                    | The hexadecimal offset of the return point in the CSECT of the system execution invocation request.      |
| Description             | “Offset in csectname” appears here.                                                                      |
| Percent of Time in WAIT | The percentage of WAIT time observed in this system routine for the indicated invocation/return address. |

## Source statement

One or more lines showing the source statement appear at the same level as the Offset in CSECT detail line. This appears only when the source program has been mapped and loaded. See [Chapter 13, “Source program mapping,”](#) on page 645 for more information.

## System module

This line identifies a system module in which WAIT was observed and attributed to the reported application module.

| Under Heading           | This is Displayed                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name                    | The name of a system module in which WAIT time was measured and referred back to the application module under which this line appears. |
| Description             | Functional description of the system module.                                                                                           |
| Percent of Time in WAIT | The percentage of WAIT time observed in this system routine for the invocation/return address under which this line appears.           |

## CSECT in System module

This line identifies a CSECT within a system module in which wait time was measured and attributed to the reported application module.

| Under Heading           | This is Displayed                                                                                                                |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Name                    | The name of the CSECT in which wait time was measured and referred back to the application module under which this line appears. |
| Description             | Functional description of the CSECT.                                                                                             |
| Percent of Time in WAIT | The percentage of WAIT time measured in this system CSECT for the invocation/return address under which this line appears.       |

## Unresolved address

This line identifies an unresolved address in which WAIT time was observed and attributed to the reported application module.

| Under Heading           | This is Displayed                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name                    | An unresolved address range in which WAIT time was measured and referred back to the application module under which this line appears. |
| Description             | “Unresolved Address”                                                                                                                   |
| Percent of Time in WAIT | The percentage of WAIT time observed in this address range.                                                                            |

## Sample reports

A sample report is show here, it has been expanded four levels.

```

File View Navigate Help

W03: WAIT Referred Attribution by Task (1917/TSTJOB01) Row 00001 of 00053
Command ==> ----- Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±0.9%%
 *....1....2....3....4....5....6....7....8.
LPFRAYVS-001 TCB=008EA1C0 39.68 =====
→ LPFRAYVS Regression test3 39.11 =====
→ LPFRAYVS CSECT in LPFRA 39.11 =====
→ 0005AA Attribution 35.76 =====
 > Source statement in: PROCEDURE-DIVISION
 > write VSAM-record

 → IDA019L1 Virtual I/ 35.76 =====
 → 0004C0 Attribution 2.72 =
 > Source statement in: PROCEDURE-DIVISION
 > OPEN OUTPUT VSAM1-FILE

 → IGG0CLHA Data Manag 2.48 =
 → IDA019L1 Virtual I/ 0.23
 → IGC0013I Supervisor 0.00
 → 00065A Attribution 0.34
 > Source statement in: PROCEDURE-DIVISION
 > close VSAM1-FILE

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                              | Action                            |
|-----|---------------------------------------------------------------------|-----------------------------------|
| ?   | Task, Load Module, CSECT, Offset, System Module, Unresolved Address | Display context help information. |
| ++  | Task, Load Module, CSECT, Offset, System Module, Unresolved Address | Show additional details.          |
| +   | Task, Load Module, Offset                                           | Expand to reveal next level.      |
| –   | Task, Load Module, Offset                                           | Collapse to hide next level.      |
| SV  | Task                                                                | Sort next level by value.         |
| SN  | Task                                                                | Sort next level by name.          |
| M   | Load Module, CSECT, System Module                                   | Display load module information.  |
| P   | CSECT, Offset                                                       | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object          | Action                             |
|-----|---------------------------------|------------------------------------|
| ?   | Name, Description, Percent WAIT | Display context help information.  |
| +   | Name                            | Expand to reveal all entries.      |
| +   | Description                     | Expand field size.                 |
| +   | Percent WAIT                    | Zoom in scale.                     |
| –   | Name                            | Collapse to show only first level. |
| –   | Description                     | Reduce field size.                 |
| –   | Percent WAIT                    | Zoom out scale.                    |
| SV  | Name                            | Sort next level by value.          |
| SN  | Name                            | Sort next level by name.           |

## SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

File View Navigate Help

```
+-----+
| W03 - Report SETUP Window (00723/CICS56A) |
| Command ==> Scroll ==> CSR |
| Options for WAIT Referred Attribution by Task |
|
| Enter "/" to select an option |
| / Include "inactive" tasks in the report. An |
| inactive task is one for which there were no |
| observations of CPU consumption. |
|
| - Filter by CICS transactions and Terminals as |
| specified in panel 5, Subsystems. |
+-----+
```

### Include Inactive Tasks

You can include or eliminate inactive tasks from the report. An inactive task is one for which there were no observation of CPU consumption.

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## W04 - WAIT time by task ENQ/RESERVE

### Usage

Use this report to view the wait time, QNAME and RNAME resulting from ENQueue or RESERVE requests.

Level 1 shows the MVS TCB (Task Control Block). The Name field identifies the attached subtask load module as well as a sequence number (Task Index). The Task/TCB address is shown in the Description field.



When expanded, level 2 shows a line for each unique ENQueue or RESERVE request. The Name column shows the QNAME and the description column shows the RNAME of the request. The RNAME can be up to 255 bytes. The full RNAME is shown in the detail window.

## Quantification

Each report line quantifies wait time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an ENQueue/RESERVE request was in a wait state to the total number of samples.

## Detail line hierarchy

An unexpanded report shows a line for each MVS task for which ENQueue or RESERVE activity was sampled. You can expand each line to reveal an additional hierarchical level of detail.

The hierarchy is illustrated here:

**Level 1** TCB Task  
**Level 2** ENQueue/RESERVE

## Detail line descriptions

### TCB Task detail line

This is the first-level detail line.

| Under Heading           | This is Displayed                                                                                                                                                              |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                    | The name of the program specified in the ATTACH macro that started the task as well as the TCB index number.                                                                   |
| Description             | The TCB address is shown. For CICS measurements that have the CICS data extractor selected, the TCB mode is displayed for CICS TCBs. This immediately follows the TCB address. |
| Percent of Time in WAIT | The percentage of the measurement interval time during which the task was waiting on an ENQueue/RESERVE.                                                                       |

### ENQueue/ RESERVE detail line

This is the second-level detail line.

| Under Heading           | This is Displayed                                                                                                                 |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Name                    | The QNAME is shown.                                                                                                               |
| Description             | The RNAME is shown. Only 40 characters are shown. If the RNAME is longer, the full name can always be found in the Detail window. |
| Percent of Time in WAIT | The percentage of the measurement interval time during which the indicated ENQueue/RESERVE was waiting.                           |

## Sample reports

A sample report is show here, it has been expanded to the second level.

```

File View Navigate Help

W04: Wait Time by Task ENQ/RESERVE (5331/TSTJOB01) Row 00001 of 00013
Command ==> ----- Scroll ==> CSR

Name Description Percent of Time in WAIT * 5.00% ±0.5%
*....1....2....3....4....5....6....7
ISPF-007 TCB=008DF5E8 6.95 =====
→ ISPFEDIT ADS04.ISPF.ISPPROF 2.78 ===
→ SYSZRACF SYS1.RACFDS 2.78 ===
→ SPFEDIT USR01.SIMPLIST.TABLES 1.39 =

ISPTASK-008 TCB=008DF2D0 4.17 ====
→ SYSVTOC BKNSM2 1.39 =
→ SPFEDIT USR01.SIMPLIST.L200708 1.39 =
 .LOG
→ SYSZRACF SYS1.RACFDS 1.39 =

EXEC-016 TCB=008AAE88 2.78 ===
→ SYSZRACF SYS1.RACFDS 2.78 ===

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Task, ENQ/RESERVE      | Display context help information. |
| ++  | Task, ENQ/RESERVE      | Show additional details.          |
| +   | Task                   | Expand to reveal next level.      |
| –   | Task                   | Collapse to hide next level.      |
| SV  | Task                   | Sort next level by value.         |
| SN  | Task                   | Sort next level by name.          |

### on headings

| Cmd | When Applied To Object          | Action                             |
|-----|---------------------------------|------------------------------------|
| ?   | Name, Description, Percent WAIT | Display context help information.  |
| +   | Name                            | Expand to reveal all entries.      |
| +   | Description                     | Expand field size.                 |
| +   | Percent WAIT                    | Zoom in scale.                     |
| –   | Name                            | Collapse to show only first level. |
| –   | Description                     | Reduce field size.                 |
| –   | Percent WAIT                    | Zoom out scale.                    |
| SV  | Name                            | Sort next level by value.          |
| SN  | Name                            | Sort next level by name.           |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window will be displayed:

```
File View Navigate Help
+-----+
| W04 - Report SETUP Window (00723/CICS56A) |
| Command ==> Scroll ==> CSR |
| Options for Wait Time by Task ENQ/RESERVE |
| |
| Enter "/" to select an option |
| / Include "inactive" tasks in the report. An |
| inactive task is one for which there were no |
| observations of CPU consumption. |
| |
| - Filter by CICS transactions and Terminals as |
| specified in panel 5, Subsystems. |
+-----+
```

### Include Inactive Tasks

You can include or eliminate inactive tasks from the report. An inactive task is one for which there were no observation of CPU consumption.

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
| +-----+ The following report line was selected +-----+ |
| | SYSZRACF SYS1.RACFDS 2.78 = | | |
| +-----+ |
| Calculation Details |
Wait measurements	834
Total measurements	30,000
Percent of total	2.78%
QNAME	SYSZRACF
RNAME	SYS1.RACFDS
+-----+
```

## W05 - WAIT time by tape DDNAME

### Usage

Use this report to view the wait time resulting from requests for tape mounts.

This report displays one line for each unique DDNAME for which tape mount waits occurred. The DDNAME column specifies the DDNAME for the tape and the device column specifies the device number for the tape unit.

## Quantification

Each report line quantifies wait time measured as a percentage of total time. The percentage represents the ratio of the number of samples for which a wait for a tape mount was observed and the total number of samples.

## Detail line descriptions

### DDNAME detail line

| Under Heading           | This is Displayed                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------|
| DDNAME                  | The DDNAME name.                                                                                                |
| Device                  | The device number for the tape unit.                                                                            |
| Percent of Time in WAIT | The percentage of the measurement interval time during which the indicated DDNAME was waiting for a tape mount. |

## Sample reports

A sample report is show here.

```
File View Navigate Help

W05: Wait Time by Tape DDNAME (5508/TSTJOB01) Row 00001 of 00011
Command ==> _____ Scroll ==> PAGE

DDNAME Device Percent of Time in WAIT * 10.00% ±58.8%
 1....2....3....4....5....6....7....8....9....
SYSUT2 590 66.66 =====
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDNAME                 | Display context help information. |
| ++  | DDNAME                 | Show additional details.          |

### on headings

| Cmd | When Applied To Object       | Action                            |
|-----|------------------------------|-----------------------------------|
| ?   | DDNAME, Device, Percent WAIT | Display context help information. |
| SV  | DDNAME, Device, Percent WAIT | Sort next level by value.         |
| SN  | DDNAME, Device, Percent WAIT | Sort next level by name.          |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window will be displayed:

File View Navigate Help

```
+-----+
| W05 - Report SETUP Window (00723/CICS56A) |
| Command ==> | Scroll ==> CSR |
| Options for Wait Time by Tape DDNAME |
|
| Enter "/" to select an option
|
| - Filter by CICS transactions and Terminals as
| specified in panel 5, Subsystems.
|
+-----+
```

### Filter by CICS transaction and terminal

This option filters the report based on the CICS filtering parameters that are chosen in Panel 5 of the original request. When this option is selected, this report shows only the activity that is related to the filter criteria. If it is not selected, the report is unfiltered. By default, this option is not selected.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

File View Navigate Help

```
+-----+-----+ The following report line was selected -----+
| SYSUT2 590 66.66 |
+-----+-----+
| Calculation Details |
Wait measurements	2
Total measurements	3
Percent of total	66.66%
+-----+-----+
```

## D01 - DASD usage by device

**Note:** This report also covers TAPE I/O.

### Overview

This report shows how much I/O time was used by each DASD (direct access storage device) or tape device for which activity was measured during the observation session. The quantification is based on the

number of samples activity on the device was observed. This is expressed as a percentage of the total number of samples.

Two types of detail lines are shown:

- Volume
- Cylinder Address (for DASD)

Initially, only the Volume lines are visible. You can expand a Volume line (using the “+” line command) to reveal its subordinate Cylinder Address lines.

A sample report is shown here, it has been fully expanded:

```

File View Navigate Help

D01: DASD Usage Time by Device (0618/TSTJOB01) Row 00001 of 00006
Command ==> ----- Scroll ==> CSR

Volume>Cyl Unit-Dev>DD Percent of Time * 10.00% ±2.2%
 *....1....2....3....4....5....6....7....8..
BKNSM2 0A93-3390 8.90 ====
→ Cyl 00BA VSAM1 8.85 ====
→ Cyl 0007 VSAM1 0.05

BKNSM1 0A92-3390 1.25 ==
→ Cyl 0086 INFILE 1.25 ==

```

## Detail line descriptions

### Volume

This shows the VOLSER value for a DASD or TAPE device for which I/O activity was measured.

### Cylinder Address

These lines appear when the “+” line command is used to expand a Volume line. Each line shows a particular DASD cylinder and further breaks down the measurement by file into quantification by specific cylinders.

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object   | Action                            |
|-----|--------------------------|-----------------------------------|
| ?   | Volume, Cylinder Address | Display context help information. |
| ++  | Volume, Cylinder Address | Show additional details.          |
| +   | Volume                   | Expand to reveal next level.      |
| –   | Volume                   | Collapse to hide next level.      |
| SV  | Volume                   | Sort next level by value.         |
| SN  | Volume                   | Sort next level by name.          |

### on headings

| Cmd | When Applied To Object                | Action                            |
|-----|---------------------------------------|-----------------------------------|
| ?   | Volume>Cyl, Unit-Dev>DD, Percent Time | Display context help information. |
| +   | Volume>Cyl                            | Expand to reveal all entries.     |

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| +   | Unit-Dev>DD            | Expand field size.                 |
| +   | Percent Time           | Zoom in scale.                     |
| –   | Volume>Cyl             | Collapse to show only first level. |
| –   | Unit-Dev>DD            | Reduce field size.                 |
| –   | Percent Time           | Zoom out scale.                    |
| SV  | Volume>Cyl             | Sort next level by value.          |
| SN  | Volume>Cyl             | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected +-----+
| BKNSM2 0A99-3390 45.09 000000000000000000000000 |
+-----+
Calculation Details
Data management CPU measurements 138
Device address 0A99
Volume serial number BKNSM2
I/O unit type DASD
Device 3390
Total CPU measurements 306
Percent of total 45.09%
+-----+

```

## SETUP options

The following SETUP option can be selected with the SETUP primary command:

### Minimum percentage of time

You can set this option to eliminate reporting of I/O where the percentage of time is below a certain threshold.

## D02 - DASD usage by DDNAME

**Note:** This report also covers TAPE I/O.

## Overview

This report shows how much DASD or TAPE I/O time was measured for each file that was open during the observation session. The quantification is based on the number of samples activity on the file was observed. This is expressed as a percentage of the total number of samples.

Two types of detail line are shown:

- DDNAME
- Cylinder Address (for DASD)

Initially, only the DDNAME lines are visible. You can expand a DDNAME line (using the “+” line command) to reveal its subordinate Cylinder Address lines.

A sample report is shown here, it has been fully expanded:

```

File View Navigate Help

D02: DASD Usage Time by DDNAME (0618/TSTJOB01) Row 00001 of 00006
Command ==> ----- Scroll ==> CSR

DDNAME>Cyl Volume>Unit Percent of Time * 10.00% ±2.2%
 *....1....2....3....4....5....6....7....8..
VSAM1-02 BKNSM2 8.90 =====
→ Cyl 00BA 0A93-3390 8.85 =====
→ Cyl 0007 0A93-3390 0.05

INFILE BKNSM1 1.25 ==
→ Cyl 0086 0A92-3390 1.25 ==

```

## Detail line descriptions

### DDNAME

This represents a file which was open during the observation session. If the same DDNAME is open (and closed) multiple times during the session, it is suffixed with an instance number to indicate this.

### Cylinder Address

These lines appear when the “+” line command is used to expand a DDNAME line. Each line shows a particular DASD cylinder and further breaks down the measurement by file into quantification by specific cylinders.

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object   | Action                            |
|-----|--------------------------|-----------------------------------|
| ?   | DDName, Cylinder Address | Display context help information. |
| ++  | DDName, Cylinder Address | Show additional details.          |
| +   | DDName                   | Expand to reveal next level.      |
| –   | DDName                   | Collapse to hide next level.      |
| SV  | DDName                   | Sort next level by value.         |
| SN  | DDName                   | Sort next level by name.          |

### on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | DDName>Cyl, Unit–Dev>DD, Percent Time | Display context help information.  |
| +   | DDName>Cyl                            | Expand to reveal all entries.      |
| +   | Volume>Unit                           | Expand field size.                 |
| +   | Percent Time                          | Zoom in scale.                     |
| –   | DDName>Cyl                            | Collapse to show only first level. |
| –   | Volume>Unit                           | Reduce field size.                 |
| –   | Percent Time                          | Zoom out scale.                    |
| SV  | DDName>Cyl                            | Sort next level by value.          |



| Cmd | When Applied To Object | Action                   |
|-----|------------------------|--------------------------|
| SN  | DDName>Cyl             | Sort next level by name. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help

+----- The following report line was selected -----+
| VSAM1 BKNSM2 45.09 00000000000000000000000000000000 |
+-----+
More: +

Calculation Details
Data management CPU measurements 138
I/O unit type DASD
Servicing I/O requests for DD Name VSAM1
Total CPU measurements 306
Percent of total 45.09%

VSAM file VSAM1 OPENed at 7:27:14.84 Friday Oct 7 2005

DDNAME VSAM1
Open Intent KEY,DIR,OUT
Dataset Name USER1.DATA.TESTPF.DAT
Storage Class BKNSMS
Device Type 3390
% Free Bytes in CI 10%
Volume Serial BKNSM2
CI Size 8,192
Record Size (LRECL) 80
Number of Extents 1
SHAREOPTIONS (1 3)
Organization KSDS
CIs per CA 78
Free CIs per CA 11
Free Bytes per CI 819
% Free CIs in CA 15%
Strings 1
DATA Buffers 2
INDEX Buffers 1

 Initial Last

 CI Splits 0
 CA Splits 0
 Logical Records 8
 Deleted Records 1
 Insrted Records 0
 Retrved Records 1
 Updated Records 0
 Bytes Free Space 1,908,736
 Number of EXCPs 13

 0
 0
 7,282
 1
 0
 1
 0
 1,327,104
 7,287
```

|                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |         |        |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|--------|--|
| File View Navigate Help                                                                                                                                                                                                                                                                                                                                                                                                         |        |         |        |  |
| +----- Index Component of VSAM1 -----+<br>  Dataset Name USER1.DATA.TESTPF.IDX<br>  Storage Class BKNSMS<br>  Device Type 3390<br>  % Free Bytes in CI 0%<br>  Volume Serial BKNSM2<br>  CI Size 1,024<br>  Record Size (LRECL) 1,017<br>  Number of Extents 1<br>  SHAREOPTIONS (1 3)<br>  Organization KSDS<br>  CIs per CA 33<br>  Free CIs per CA 0<br>  Free Bytes per CI 0<br>  % Free CIs in CA 0%<br>+-----+<br>More: - |        |         |        |  |
| CI Splits                                                                                                                                                                                                                                                                                                                                                                                                                       | 0      | Initial | Last   |  |
| CA Splits                                                                                                                                                                                                                                                                                                                                                                                                                       | 0      |         | 0      |  |
| Logical Records                                                                                                                                                                                                                                                                                                                                                                                                                 | 1      |         | 1      |  |
| Deleted Records                                                                                                                                                                                                                                                                                                                                                                                                                 | 0      |         | 0      |  |
| Insrted Records                                                                                                                                                                                                                                                                                                                                                                                                                 | 0      |         | 0      |  |
| Retrved Records                                                                                                                                                                                                                                                                                                                                                                                                                 | 0      |         | 0      |  |
| Updated Records                                                                                                                                                                                                                                                                                                                                                                                                                 | 0      |         | 71     |  |
| Bytes Free Space                                                                                                                                                                                                                                                                                                                                                                                                                | 32,768 |         | 32,768 |  |
| Number of EXCPs                                                                                                                                                                                                                                                                                                                                                                                                                 | 4      |         | 75     |  |

# SETUP options

The following SETUP option can be selected with the SETUP primary command:

## Minimum percentage of time

You can set this option to eliminate reporting of I/O where the percentage of time is below a certain threshold.

# D03 - DASD usage by data set

**Note:** This report also covers TAPE I/O.

## Overview

This report shows how much DASD or TAPE I/O time was used by each data set for which activity was measured during the observation session. The quantification is based on the number of samples activity on the device was observed. This is expressed as a percentage of the total number of samples.

Two types of detail line are shown:

- Data set
- DDNAME

Initially, only the data set lines are visible. You can expand a data set line (using the “+” line command) to reveal its subordinate DDNAME lines.

A sample report is shown here, it has been fully expanded:

```
File View Navigate Help

D03: DASD Usage Time by Dataset (0618/TSTJOB01) Row 00001 of 00005
Command ==> ----- Scroll ==> CSR

Dataset Name>DDName Percent of Time * 10.00% ±2.2%
 *....1....2....3....4....5....6....7....8..
USER1.DATA.TESTPF 8.90 ====
→ VSAM1-02 BKNSM2 8.90 ====

USER1.TESTPF2.INFILE 1.25 ==
→ INFILE BKNSM1 1.25 ==
```

## Detail line descriptions

### Data set

This shows the name of a data set that was open at some point during the observation session.

### DDNAME

This line shows a DDNAME corresponding to the data set name. There could be multiple entries under a data set if the data set was open more than once (concurrently or serially) with different DDNAMEs. If the same DDNAME is open (and closed) multiple times for the data set, it is suffixed with an instance number to indicate this.

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Data set Name, DDName  | Display context help information. |



```

File View Navigate Help

D04: Dataset Attributes (0618/TSTJOB01) Row 00001 of 00105
Command ==> _____ Scroll ==> CSR

```

SORT by: DDname enter SF, by Dataset Name enter SD.  
 Dataset information reported for 4 Files.

Non-VSAM file OUTFILE OPENed at 6:45:30.18 Monday Jan 26 2004

|                      |                            |
|----------------------|----------------------------|
| DDNAME               | OUTFILE                    |
| Open Intent          | OUTPUT                     |
| Dataset Name         | USER1.TESTPF2.OUTFILE      |
| Device Type          | 3390 Number of Extent 3    |
| Volume Serial        | BKNSM1 Dataset Organiza PS |
| Block Size (BLKSIZE) | 27,930 RECFM FIXED BLOCKED |
| Record Size (LRECL)  | 133 Data Buffers 0         |

Non-VSAM file INFILE OPENed at 6:45:30.53 Monday Jan 26 2004

|                      |                            |
|----------------------|----------------------------|
| DDNAME               | INFILE                     |
| Open Intent          | INPUT                      |
| Dataset Name         | USER1.TESTPF2.INFILE       |
| Device Type          | 3390 Number of Extent 1    |
| Volume Serial        | BKNSM1 Dataset Organiza PS |
| Block Size (BLKSIZE) | 13,300 RECFM FIXED BLOCKED |
| Record Size (LRECL)  | 133                        |

Scrolling down in this example shows some VSAM file information.

```

File View Navigate Help

D04: Dataset Attributes (0618/TSTJOB01) Row 00026 of 00105
Command ==> _____ Scroll ==> CSR

```

VSAM file VSAM1(1) OPENed at 6:45:33.66 Monday Jan 26 2004

|                     |                       |                  |           |
|---------------------|-----------------------|------------------|-----------|
| DDNAME              | VSAM1                 |                  |           |
| Open Intent         | KEY,DIR,OUT,RST       |                  |           |
| Dataset Name        | USER1.DATA.TESTPF.DAT |                  |           |
| Storage Class       | BKNSMS                |                  |           |
| Device Type         | 3390                  |                  |           |
| % Free Bytes in CI  | 10%                   | Initial          | Last      |
| Volume Serial       | BKNSM2                | CI Splits        | 0         |
| CI Size             | 8,192                 | CA Splits        | 0         |
| Record Size (LRECL) | 80                    | Logical Records  | 0         |
| Number of Extents   | 1                     | Deleted Records  | 0         |
| SHAREOPTIONS        | (1 3)                 | Insrted Records  | 0         |
| Organization        | KSDS                  | Retrvd Records   | 0         |
| CI's per CA         | 78                    | Updated Records  | 0         |
| Free CI's per CA    | 11                    | Byter Free Space | 1,916,928 |
| Free Bytes per CI   | 819                   | Number of EXCPs  | 2         |
| % Free CI's in CA   | 15%                   |                  |           |
| Strings             | 0                     |                  |           |
| DATA Buffers        | 0                     |                  |           |
| INDEX Buffers       | 0                     |                  |           |

This example shows the index component:

```

File View Navigate Help

D04: Dataset Attributes (2133/TSTJOB01) Row 00060 of 00116
Command ==> Scroll ==> CSR
Index Component of VSAM1(1)

Dataset Name USER1.DATA.TESTPF.IDX
Storage Class BKNSMS
Device Type 3390
% Free Bytes in CI 0%
Volume Serial BKNSM2 CI Splits 0 0
CI Size 1,024 CA Splits 0 0
Record Size (LRECL) 1,017 Logical Records 0 0
Number of Extents 1 Deleted Records 0 0
SHAREOPTIONS (1 3) Insrted Records 0 0
Organization KSDS Retrved Records 0 0
CIs per CA 33 Updated Records 0 0
Free CIs per CA 0 Bytes Free Space 33,792 33,792
Free Bytes per CI 0 Number of EXCPs 1 1
% Free CIs in CA 0%

```

When available to Application Performance Analyzer, the following additional DASD statistics are displayed in D04, and in the detail windows of other DASD reports:

- Average Response Time
- Average Pending Time
- Average Disconnect Time
- Average Connect Time
- Average Queued Time
- Total I/Os
- Cache Candidates
- Cache Hits
- Write Candidates
- Write Hits

This example shows some of the additional DASD statistics:

```

File View Navigate Help

D04: Dataset Attributes (4167/AGM01G) Row 00005 of 00125
Command ==> Scroll ==> CSR
VSAM file BNCSTFL OPENed at 16:19:58.25 Tuesday Aug 25 2009

DDNAME BNCSTFL
Open Intent KEY,DIR,SEQ,OUT
Dataset Name BNET.CICS22C.BNCSTFL.DATA
Storage Class BKNDATA
Device Type 3390
% Free Bytes in CI 0%
Volume Serial BKNA91+ CI Splits 0 0
 BKNA93
CI Size 8,192 CA Splits 0 0
Record Size (LRECL) 516 Logical Records 14 14
Number of Extents 1 Deleted Records 0 0
SHAREOPTIONS (4 3) Insrted Records 0 0
Organization KSDS Retrved Records 15,858,330 15,918,231
CIs per CA 12 Updated Records 1 1
Free CIs per CA 0 Bytes Free Space 90,112 90,112
Free Bytes per CI 0 Number of EXCPs 7,991,951 8,051,851
% Free CIs in CA 0%
Strings 1 String Waits 0
DATA Buffers 2 String Waits HWM 0
INDEX Buffers 1
Avg Response Time 0.0256 Avg Pending Time 0.0000
Avg Disconnect Time 0.0000 Avg Connect Time 0.0128
Avg Queued Time 0.0000 Total I/Os 59,900
Cache Candidates 59,900 Cache Hits 59,900

```

You can place your cursor on the SORT field and enter any of the following sort codes to re-sort the report:

- SF By DDName
- SD By Data set name

## D05 - DASD EXCP summary

---

**Note:** This report also covers TAPE I/O.

### Usage

Use this report to see a summary of the number of EXCPs for each open data set.

### Quantification

Each report line shows EXCP counts for a DDNAME. The EXCP count at the time the file was first observed to be open and the count at the time the file was last observed to be open are reported. The difference between these two values is also reported; this is the number of EXCPs occurring during the measurement interval.

### Detail line hierarchy

There is only one detail line level in this report.

### Detail line descriptions

#### EXCP counts

Each detail line shows the following information.

| Under Heading      | This is Displayed                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDNAME             | The DDNAME of the file. If multiple OPENs occurred for the DDNAME, a separate line is reported for each "instance." A sequence number is appended to the DDNAME indicating the instance.                                                                                                                                                                    |
| Type               | The type of file (VSAM, Non-VSAM, Tape, etc.)                                                                                                                                                                                                                                                                                                               |
| Concat             | The concatenation number. A value (+0, +1, +2 ...) appears here to indicate the data set position in a concatenation. A value of 'RMT' indicates this is a remote CICS VSAM dataset.                                                                                                                                                                        |
| At Start           | The EXCP count for the data set when first observed. For VSAM data sets, the system maintains this count for the life of the file. For non-VSAM, this only reflects EXCPs during the step.                                                                                                                                                                  |
| At End             | The EXCP count for the data set when last observed. For VSAM data sets, the system maintains this count for the life of the file. For non-VSAM, this only reflects EXCPs during the step.                                                                                                                                                                   |
| During Measurement | <p>The number of EXCPs for the measurement duration. This is computed as the difference between the "At Start" count and the "At End" count.</p> <p><b>Note:</b> The system maintains EXCP counts at the data set level. If a data set had more than one file open concurrently under different DDNAMEs, then overlapping EXCP counts will be reported.</p> |

### Sample reports

A sample report is shown here:

| File View Navigate Help                |            |        |          |                    |                                    |  |
|----------------------------------------|------------|--------|----------|--------------------|------------------------------------|--|
| D05: DASD EXCP Summary (0647/TSTJOB01) |            |        |          | Row 00001 of 00082 |                                    |  |
| Command ==>                            |            |        |          | Scroll ==> CSR     |                                    |  |
| DDNAME                                 | Type       | Concat | At Start | At End             | Number of EXCPs During Measurement |  |
| SAMPIN                                 | Non-VSAM   |        | 0        | 30                 | 30                                 |  |
| ISPMLIB                                | Non-VSAM   | +2     | 22       | 26                 | 4                                  |  |
| ISP07053                               | Non-VSAM   |        | 19       | 21                 | 2                                  |  |
| SYS00117                               | VSAM-DATA  |        | 3648     | 3649               | 1                                  |  |
|                                        | VSAM_INDEX |        | 41       | 42                 | 1                                  |  |
| SYS00116                               | VSAM-DATA  |        | 2        | 3                  | 1                                  |  |
|                                        | VSAM_INDEX |        | 1        | 2                  | 1                                  |  |
| ISP07078-3                             | Non-VSAM   |        | 35       | 37                 | 2                                  |  |
| ISP07073                               | Non-VSAM   |        | 4        | 5                  | 1                                  |  |
| ISP07074                               | Non-VSAM   |        | 20       | 21                 | 1                                  |  |
| ISP07078-1                             | Non-VSAM   |        | 34       | 35                 | 1                                  |  |
| ISP07078-2                             | Non-VSAM   |        | 34       | 35                 | 1                                  |  |
| ISPPROF                                | Non-VSAM   |        | 50       | 50                 | 0                                  |  |
| ISPPLIB                                | Non-VSAM   | +0     | 0        | 0                  | 0                                  |  |
| ISPTLIB                                | Non-VSAM   | +2     | 0        | 0                  | 0                                  |  |
| ISPPLIB                                | Non-VSAM   | +2     | 6        | 6                  | 0                                  |  |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| ++  | DDName                 | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| SV  | DDName                 | Sort next level by value.         |
| SN  | DDName                 | Sort next level by name.          |

## SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

|                         |                                              |              |
|-------------------------|----------------------------------------------|--------------|
| File View Navigate Help |                                              |              |
| -----                   |                                              |              |
| D                       | Options for DASD EXCP Summary                | 001 of 00107 |
| C                       |                                              | 11 ==> CSR   |
|                         | Enter "/" to select an option                |              |
| D                       | - Omit files for which no EXCPs were counted |              |
|                         | during the measurement interval. Unselect to |              |
| S                       | include all files.                           | asurement    |
| I                       |                                              | 82           |
|                         |                                              | 0            |

Select this option to omit files from the report for which no I/O activity was observed. Deselect this option to display all files.

# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+
| INFILE | Non-VSAM | 0 | 14 | 14 |
+-----+-----+-----+-----+-----+-----+
Non-VSAM file INFILE OPENed at 6:45:30.53 Monday Jan 26 2004
DDNAME INFILE
Open Intent INPUT
Dataset Name USER1.TESTPF2.INFILE
Device Type 3390 Nbr of Extents 1
Volume Serial BKNSM1 Dataset Org PS
Block Size (BLKSIZE) 13,300 RECFM FIXED BLOCKED
Record Size (LRECL) 133 Data Buffers 0
```

# D06 - DASD VSAM statistics

## Usage

Use this report to see file access statistics for each open VSAM data set.

## Quantification

Each report line shows a VSAM DDNAME and its associated file access statistics.

## Detail line hierarchy

There is only one detail line level in this report.

## Detail line descriptions

### VSAM statistics

Each detail line shows the following information.

| Under Heading | This is Displayed                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDNAME        | The DDNAME of the file. If multiple OPENs occurred for the DDNAME, a separate line is reported for each “instance.” A sequence number is appended to the DDNAME indicating the instance. |
| Retrvd        | The number of records retrieved from the file during the measurement interval.                                                                                                           |
| Added         | The number of new records added to the file during the measurement interval.                                                                                                             |
| Insrtd        | The number of records inserted during the measurement interval. This count is also included in the 'added' record count.                                                                 |
| Deletd        | The number of records deleted from the file during the measurement interval.                                                                                                             |



| Under Heading | This is Displayed                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Updatd        | The number of updates to existing records during the measurement interval.                                                                                                      |
| EXCPs         | The number of EXCPs during the measurement interval.                                                                                                                            |
| FreeSpc       | The change, in bytes, to the amount of free space during the measurement interval. This is shown as a plus or minus value to indicate if the free space increased or decreased. |
| CISplts       | The change in the number of CI splits during the measurement interval. This is shown as a plus or minus value to indicate if the number of CI splits increased or decreased.    |
| CASplts       | The change in the number of CA splits during the measurement interval. This is shown as a plus or minus value to indicate if the number of CA splits increased or decreased.    |

## Sample reports

A sample report is shown here:

| File View Navigate Help                   |                                 |       |         |        |        |                    |                 |           |
|-------------------------------------------|---------------------------------|-------|---------|--------|--------|--------------------|-----------------|-----------|
| D06: DASD VSAM Statistics (0650/TSTJOB01) |                                 |       |         |        |        | Row 00001 of 00006 |                 |           |
| Command ==>                               |                                 |       |         |        |        | Scroll ==> CSR     |                 |           |
| DDNAME                                    | Logical Records During Interval |       |         |        |        |                    | +/- During Inte |           |
|                                           | Retrvd                          | Added | Insrted | Deletd | Updatd | EXCPs              | FreeSpc         | CISplts C |
| FILEA                                     | 749                             | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |
| DFHLCD                                    | 0                               | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |
| DFHGCD                                    | 0                               | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |
| DFHTEMP                                   | 0                               | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |
| DFHINTRA                                  | 0                               | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |
| DFHLRq                                    | 0                               | +0    | 0       | 0      | 0      | 0                  | +0              | +0        |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| ++  | DDName                 | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| SV  | DDName                 | Sort next level by value.         |
| SN  | DDName                 | Sort next level by name.          |

# SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```
File View Navigate Help
+-----+
D | Options for DASD VSAM Statistics 001 of 00006
C | 11 ==> CSR
 | Enter "/" to select an option
 | - Omit files for which no EXCPs were counted - During Inte
D | during the measurement interval. Unselect to Spc CIsplits C
 | include all files.
+-----+
```

Select this option to omit from the report files for which no activity took place. Deselect this option to display all files.

# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| VSAM1-02 BKNSM2 8.90 ==+
+-----+

VSAM file FILEA OPENed at 13:04:47.81 Tuesday Mar 2 2004

DDNAME FILEA
Open Intent KEY,DSN,DIR,SEQ,SKP,OUT,NLW,LSR SHRPOOL=1
Dataset Name BNET.CICS22A.FILEA.DATA
Storage Class BKNDATA
Device Type 3390
% Free Bytes in CI 0%
Volume Serial BKNA91 CI Splits 0
CI Size 18,432 CA Splits 0
Record Size (LRECL) 80 Logical Records 44
Number of Extents 1 Deleted Records 0
SHAREOPTIONS (1 3) Insrted Records 0
Organization KSDS Retrved Records 117,704
CIs per CA 3 Updated Records 0
Free CIs per CA 0 Byter Free Space 36,864
Free Bytes per CI 0 Number of EXCPs 29
% Free CIs in CA 0%
Strings 1
DATA Buffers 1
INDEX Buffers 1

Index Component of FILEA

Dataset Name BNET.CICS22A.FILEA.INDEX
Storage Class BKNSMS
Device Type 3390
% Free Bytes in CI 0%
Volume Serial BKNA91 CI Splits 0
CI Size 512 CA Splits 0
Record Size (LRECL) 505 Logical Records 1
Number of Extents 1 Deleted Records 0
```

|                                                 |       |                  |           |           |
|-------------------------------------------------|-------|------------------|-----------|-----------|
| File View Navigate Help                         |       |                  |           |           |
| -----+-----                                     |       |                  |           |           |
| SHAREOPTIONS                                    | (2 3) | Insrted Records  | 0         | More: - + |
| Organization                                    | KSDS  | Retrved Records  | 0         | 0         |
| CIs per CA                                      | 49    | Updated Records  | 0         | 0         |
| Free CIs per CA                                 | 0     | Byter Free Space | 24,576    | 24,576    |
| Free Bytes per CI                               | 0     | Number of EXCPs  | 35        | 35        |
| % Free CIs in CA                                | 0%    |                  |           |           |
| Shared Resource Pool Information for LSR Pool 1 |       |                  |           |           |
| Type (Data/Index)                               | DATA  | Reads            | Initial 1 | Last 1    |
| Buffer Size                                     | 512   | Reads Avoided    | 0         | 228       |
| Buffers                                         | 8     | User Writes      | 0         | 0         |
| Hiperspace Buffers                              | 0     | Non-user Writes  | 0         | 0         |

## D07 - DASD activity timeline

**Note:** This report also covers TAPE I/O.

### Usage

Use this report to see, for each file, how I/O activity was distributed over the measurement interval.

### Quantification

A graph, in bar chart format, is displayed for each DDNAME. The horizontal axis represents the measurement interval which spans 50 columns. Each column represents an equal 1/50th sub-interval of time. A scale is shown at the bottom of the graph indicating the percentage of time progression in the overall interval.

In each column, a vertical graph shows (roughly) how much I/O activity took place during the sub-interval. If any I/O activity did take place, a vertical bar of 1, 2, 3, 4 or 5 characters, extending upward from the scale, is displayed indicating the percentage of time in the sub-interval I/O was observed.

### Detail line descriptions

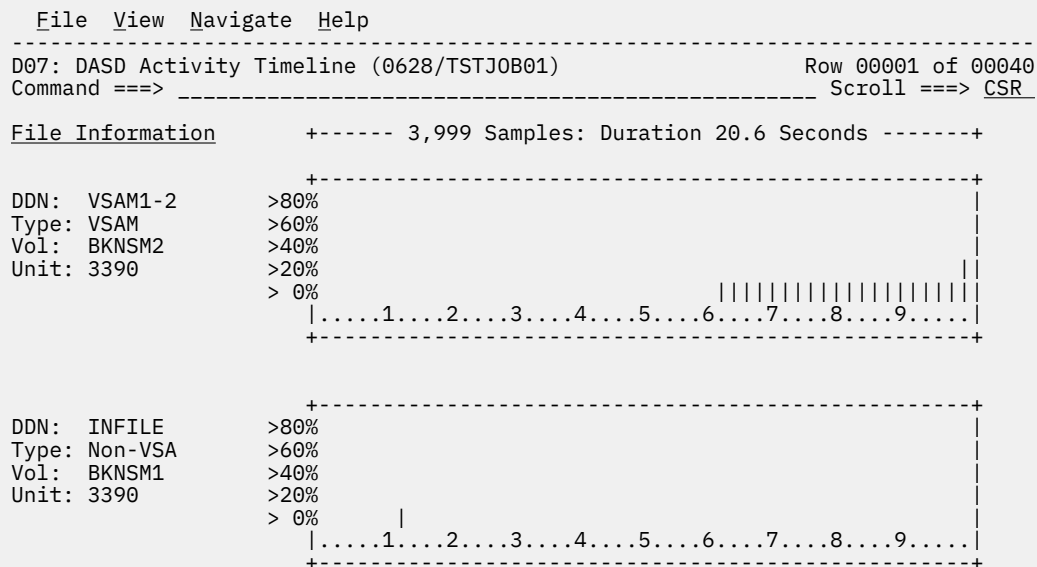
#### File I/O activity distribution

A group of lines is shown for each reported file. Some information about the file appears to the left and a bar chart to the right.

| Under Heading              | This is Displayed                                                                                                                                                                                                                      |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| File Information           | File Information The following information is shown for each file. <ul style="list-style-type: none"> <li>• The DDNAME</li> <li>• Type of file (VSAM, non-VSAM, Tape, etc.)</li> <li>• Volser</li> <li>• Unit (device type)</li> </ul> |
| nnnn Samples: Duration ... | A graph showing the distribution of I/O activity over the measurement interval.                                                                                                                                                        |

### Sample reports

A sample of the report is shown here:



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| ++  | DDName                 | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DDName                 | Display context help information. |
| SV  | DDName                 | Sort next level by value.         |
| SN  | DDName                 | Sort next level by name.          |

## SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```

File View Navigate Help
+-----+
D | Options for DASD Activity Timeline | 001 of 00000
C | | 11 ==> CSR
 | Enter "/" to select an option
 | / Omit files for which no I/O was observed
 | during the measurement interval. Unselect
 | to include all files.
 |
+-----+

```

Select this option to omit from the report files for which no activity took place. This is the default option. Deselect this option to display all files, which will typically result in the display of numerous empty graphs.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| INFILE Non-VSAM 0 14 14|
+-----+
Non-VSAM file INFILE OPENed at 6:45:30.53 Monday Jan 26 2004

DDNAME INFILE
Open Intent INPUT
Dataset Name USER1.TESTPF2.INFILE
Device Type 3390 Nbr of Extents 1
Volume Serial BKNSM1 Dataset Org PS
Block Size (BLKSIZE) 13,300 RECFM FIXED BLOCKED
Record Size (LRECL) 133 Data Buffers 5

```

## D08 - DASD I/O wait time

### Usage

Use this report to examine delays resulting from waits during DASD I/O operations. Note: This report is not applicable to CICS.

### Quantification

Samples are counted in which the following conditions were observed:

- All TCBs (tasks) are in WAIT state
- One (or more) TCB is waiting for completion of a DASD I/O request

The number of samples satisfying these conditions divided by the total number of samples represents the percentage of time the step was waiting for completion of DASD I/O. These percentages are computed and reported by DDNAME.

## Detail line hierarchy

An unexpanded D08 report shows a line for each DDNAME causing a delay in execution while waiting for DASD I/O activity to complete. You can expand each line to reveal additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 DDNAME
 Level 2 File I/O Request
 Level 3 Supervisor Call (SVC)
 Level 4 Module
 Level 5 CSECT

 Level 2 File I/O Request
 Level 3 Module
 Level 4 CSECT

 Level 2 Supervisor Call (SVC)
 Level 3 Module
 Level 4 CSECT
```

## Detail line descriptions

### DDNAME

This line identifies the DDNAME of a file for which delays due to wait for I/O completion were observed.

| Under Heading   | This is Displayed                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------|
| Description     | The volume ID (VOLSER) for the DDNAME. For a multivolume data set, the first volume is displayed.                    |
| Percent of Time | The percentage of the measurement interval time the step was waiting for completion of I/O for the indicated DDNAME. |

### File I/O request

This line identifies the file request macro that caused a wait for I/O completion.

| Under Heading   | This is Displayed                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------|
| Name            | The DASD I/O macro function (GET, PUT, CHECK, etc.) that caused the wait.                                           |
| Description     | The address of the macro (return address) in CSECT+offset format.                                                   |
| Percent of Time | The percentage of the measurement interval time the step was waiting for completion of I/O for the indicated macro. |

### Load module

This line identifies the data management load module in which the wait occurred.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| Name            | Name of load module in which WAIT request was issued.                                       |
| Description     | Functional description of the load module if one is available.                              |
| Percent of Time | The percentage of the measurement interval time the step was waiting for completion of I/O. |

## CSECT

This line identifies the CSECT in the data management load module in which the wait occurred.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| Name            | Name of CSECT in which WAIT request was issued.                                             |
| Description     | Functional description of the CSECT if one is available.                                    |
| Percent of Time | The percentage of the measurement interval time the step was waiting for completion of I/O. |

## Supervisor Call (SVC)

This line identifies an SVC (Supervisor Call) that issued the wait.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| Name            | Name of SVC (Supervisor Call) in which WAIT request was issued.                             |
| Description     | Functional description of the SVC.                                                          |
| Percent of Time | The percentage of the measurement interval time the step was waiting for completion of I/O. |

## Sample reports

A sample of the report as it is first displayed is shown here:

```
File View Navigate Help

D08: DASD I/O Wait Time (0099/TSTJOB01) Row 00001 of 00006
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±3.5%
 *....1....2....3....4....5....6....7....8.
VSOUT1 BKNSM1 7.07 ====
VSOUT2 BKNSM1 5.05 ===
VSOUT3 BKNSM1 3.03 ==
VSINP4 BKNSM1 1.26 =
QSOUT5 BKNSM1 0.25
QSINP6 BKNSM1 0.12
```

Here is a sample of the report which has been fully expanded by entering the “+” line command on the Name heading:

```
File View Navigate Help

D08: DASD I/O Wait Time (0099/TSTJOB01) Row 00001 of 00030
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±3.5%
 *....1....2....3....4....5....6....7....8.
VSOUT1 BKNSM1 7.07 ====
→ PUT U0053+C8 7.07 ====
→ IDA019L1 Virtual I/O (VI 7.07 ====
→ IDA019R3 CSECT in IDA0 7.07 ====

VSOUT2 BKNSM1 5.05 ===
→ PUT U0053+194 5.05 ===
→ IDA019L1 Virtual I/O (VI 5.05 ===
→ IDA019R3 CSECT in IDA0 4.80 ==
→ IDA019RZ CSECT in IDA0 0.25

VSOUT3 BKNSM1 3.03 =
→ PUT U0053+266 3.03 =
→ IDA019L1 Virtual I/O (VI 3.03 =
→ IDA019R3 CSECT in IDA0 3.03 =
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                            | Action                            |
|-----|---------------------------------------------------|-----------------------------------|
| ?   | DDName, File I/O Request, Load Module, CSECT, SVC | Display context help information. |
| ++  | DDName, File I/O Request, Load Module, CSECT, SVC | Show additional details.          |
| +   | DDName, File I/O Request, Load Module, SVC        | Expand to reveal next level.      |
| –   | DDName, File I/O Request, Load Module, SVC        | Collapse to hide next level.      |
| SV  | DDName, File I/O Request                          | Sort next level by value.         |
| SN  | DDName, File I/O Request                          | Sort next level by name.          |
| M   | Load Module, CSECT                                | Display load module information.  |
| P   | CSECT                                             | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object             | Action                             |
|-----|------------------------------------|------------------------------------|
| ?   | DDName                             | Display context help information.  |
| +   | Name                               | Expand to reveal all entries.      |
| +   | Description                        | Expand field size.                 |
| +   | Percent CPU                        | Zoom in scale.                     |
| –   | Name                               | Collapse to show only first level. |
| –   | Description                        | Reduce field size.                 |
| –   | Percent of Time                    | Zoom out scale.                    |
| SV  | Name, Description, Percent of Time | Sort next level by value.          |
| SN  | Name, Description, Percent of Time | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:



|                                                        |        |                  |           |           |
|--------------------------------------------------------|--------|------------------|-----------|-----------|
| File View Navigate Help                                |        |                  |           |           |
| +----- The following report line was selected -----    |        |                  |           | More: +   |
| VSAM1                                                  | BKNSM2 | 4.04 00          |           |           |
| +-----                                                 |        |                  |           |           |
| Calculation Details                                    |        |                  |           |           |
| Data management CPU measurements                       |        | 124              |           |           |
| I/O unit type                                          |        | DASD             |           |           |
| Servicing I/O requests for DD Name                     |        | VSAM1            |           |           |
| Total measurements                                     |        | 3,063            |           |           |
| Percent of total                                       |        | 4.04%            |           |           |
| VSAM file VSAM1 OPENed at 7:27:14.84 Friday Oct 7 2005 |        |                  |           |           |
| DDNAME VSAM1                                           |        |                  |           |           |
| Open Intent KEY,DIR,OUT                                |        |                  |           |           |
| Dataset Name USER1.DATA.TESTPF.DAT                     |        |                  |           |           |
| Storage Class BKNSMS                                   |        |                  |           |           |
| Device Type 3390                                       |        |                  |           |           |
| % Free Bytes in CI                                     | 10%    |                  | Initial   | Last      |
| Volume Serial                                          | BKNSM2 | CI Splits        | 0         | 0         |
| CI Size                                                | 8,192  | CA Splits        | 0         | 0         |
| Record Size (LRECL)                                    | 80     | Logical Records  | 8         | 7,282     |
| Number of Extents                                      | 1      | Deleted Records  | 1         | 1         |
| SHAREOPTIONS                                           | (1 3)  | Insrted Records  | 0         | 0         |
| Organization                                           | KSDS   | Retrved Records  | 1         | 1         |
| CIs per CA                                             | 78     | Updated Records  | 0         | 0         |
| Free CIs per CA                                        | 11     | Bytes Free Space | 1,908,736 | 1,327,104 |
| Free Bytes per CI                                      | 819    | Number of EXCPs  | 13        | 7,287     |
| % Free CIs in CA                                       | 15%    |                  |           |           |
| Strings                                                | 1      |                  |           |           |
| DATA Buffers                                           | 2      |                  |           |           |
| INDEX Buffers                                          | 1      |                  |           |           |
| Index Component of VSAM1                               |        |                  |           |           |

|                                    |        |                  |         |         |
|------------------------------------|--------|------------------|---------|---------|
| File View Navigate Help            |        |                  |         |         |
|                                    |        |                  |         | More: - |
| Dataset Name USER1.DATA.TESTPF.IDX |        |                  |         |         |
| Storage Class BKNSMS               |        |                  |         |         |
| Device Type 3390                   |        |                  |         |         |
| % Free Bytes in CI                 | 0%     |                  | Initial | Last    |
| Volume Serial                      | BKNSM2 | CI Splits        | 0       | 0       |
| CI Size                            | 1,024  | CA Splits        | 0       | 0       |
| Record Size (LRECL)                | 1,017  | Logical Records  | 1       | 1       |
| Number of Extents                  | 1      | Deleted Records  | 0       | 0       |
| SHAREOPTIONS                       | (1 3)  | Insrted Records  | 0       | 0       |
| Organization                       | KSDS   | Retrved Records  | 0       | 0       |
| CIs per CA                         | 33     | Updated Records  | 0       | 71      |
| Free CIs per CA                    | 0      | Bytes Free Space | 32,768  | 32,768  |
| Free Bytes per CI                  | 0      | Number of EXCPs  | 4       | 75      |
| % Free CIs in CA                   | 0%     |                  |         |         |

## D09 - VSAM buffer pool usage

### Usage

Use this report to see information about activity in VSAM LSR buffer pools.

A buffer pool number can be associated with a VSAM file. This is indicated in the Open Intent field in any reports that show detailed file information. For example, report D04 might show the following:

```
KEY,DSN,DIR,SEQ,SKP,OUT,NLW,LSR SHRPOOL=1
```

This indicates the file uses shared buffer pool number 1. Refer to report D09 to examine how effectively the buffer pool was able to reduce the I/O activity for the associated file(s).

For each buffer pool, activity is quantified for each buffer size and type (DATA or INDEX component). The buffer size corresponds to the CI size for the associated file component. VSAM will choose buffers which are at least as large as and closest in size to the CI size.

## Quantification

The following values are reported.

| Under Heading      | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type               | DATA or INDEX. This indicates if the buffers are for VSAM DATA or INDEX components                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Buffer Size        | The buffer size, in bytes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Buffers            | The number of buffers in virtual storage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Hiperspace Buffers | The number of buffers in Hiperspace.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Reads              | The number of physical reads to the file. This is the number of reads that could not be avoided because no buffer contained a copy of the CI. Three values are shown: "Initial," which is the value at the start of the measurement interval; "Last," which is the value at the end; and "Difference," which is the difference between the other two values. The difference between the two values represents the activity for the duration of the interval.                                                                                                  |
| Reads Avoided      | The number of avoided reads (look-asides). This is the number of reads avoided because copies of the referenced CIs were found in the buffer pool. Three values are shown: "Initial," which is the value at the start of the measurement interval; "Last," which is the value at the end; and "Difference," which is the difference between the other two values. The difference between the two values represents the activity for the duration of the interval. High values indicate the buffer pool was effective in causing I/O operations to be avoided. |
| User Writes        | The number of physical writes performed to the file at the request of the user program. Three values are shown: "Initial," which is the value at the start of the measurement interval; "Last," which is the value at the end; and "Difference," which is the difference between the other two values. The difference between the two values represents the activity for the duration of the interval.                                                                                                                                                        |
| Non-user Writes    | The number of forced physical writes performed to the file. Three values are shown: "Initial," which is the value at the start of the measurement interval; "Last," which is the value at the end; and "Difference," which is the difference between the other two values. The difference between the two values represents the activity for the duration of the interval.                                                                                                                                                                                    |

## Sample reports

A sample of the report is shown here:

```

File View Navigate Help

D09: VSAM Buffer Pool Usage (5096/TSTJOB01) Row 00001 of 00022
Command ==> _____ Scroll ==> CSR

```

#### Shared Resource Pool Information for LSR Pool 1

|                    |       |                 | <u>Initial</u> | <u>Last</u> | <u>Difference</u> |
|--------------------|-------|-----------------|----------------|-------------|-------------------|
| Type (Data/Index)  | INDEX | Reads           | 1              | 1           | 0                 |
| Buffer Size        | 512   | Reads Avoided   | 260279         | 270299      | 10020             |
| Buffers            | 5     | User Writes     | 0              | 0           | 0                 |
| Hiperspace Buffers | 0     | Non-user Writes | 0              | 0           | 0                 |
| Type (Data/Index)  | DATA  | Reads           | 576            | 609         | 33                |
| Buffer Size        | 8192  | Reads Avoided   | 259704         | 269691      | 9987              |
| Buffers            | 5     | User Writes     | 0              | 0           | 0                 |
| Hiperspace Buffers | 0     | Non-user Writes | 0              | 0           | 0                 |
| Type (Data/Index)  | INDEX | Reads           | 0              | 0           | 0                 |
| Buffer Size        | 8192  | Reads Avoided   | 0              | 0           | 0                 |
| Buffers            | 5     | User Writes     | 0              | 0           | 0                 |
| Hiperspace Buffers | 0     | Non-user Writes | 0              | 0           | 0                 |
| Type (Data/Index)  | DATA  | Reads           | 0              | 0           | 0                 |
| Buffer Size        | 20480 | Reads Avoided   | 0              | 0           | 0                 |
| Buffers            | 5     | User Writes     | 0              | 0           | 0                 |
| Hiperspace Buffers | 0     | Non-user Writes | 0              | 0           | 0                 |

## G01 - Coupling facility summary

### Usage

Use this report to see a summary of the coupling facility data collected during the observation session.

### Facility summary

Fields under this heading summarize the storage and usage of the coupling facility by facility name. The facility name is listed in the heading.

| Under Heading                   | This is Displayed                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------|
| CF Storage                      | Total coupling facility storage                                                                            |
| CF Storage Used                 | Total used coupling facility storage.                                                                      |
| CF Dump Storage                 | Total coupling facility storage dump space.                                                                |
| CF Storage for Structures       | Total coupling facility storage used by structures.                                                        |
| Subchannel Contention Count     | Count of times a free subchannel was not available for synchronous immediate operations.                   |
| Subchannel Contention Time uSec | Amount of time in microseconds waiting for a free subchannel for synchronous immediate operations (u-sec). |
| Failed Request Count            | Count of the number of summed times – for unsuccessful operations.                                         |
| Failed Request Time uSec        | Summed service time of unsuccessful operations (u-sec).                                                    |
| Number of Processors            | Number of processors used by the coupling facility.                                                        |
| Processor Utilization           | Processor utilization of coupling facility processors expressed as a percentage of the sampling time.      |

### Sample reports

A sample report is shown here:

```

File View Navigate Help

G01: Coupling Facility Statistics (0003/TSTJOB01) Row 00001 of 00023
Command ==> ----- Scroll ==> CSR

Facility Summary - CFCC1
CF Storage 74,496K
CF Storage Used 9,216K
CF Dump Storage 2,048K
CF Storage for Structures 7,168K
Subchannel Contention Count 0
Subchannel Contention Time uSec 0
Failed Request Count 0
Failed Request Time uSec 0
Number of Processors 1
Processor Utilization 0%

Facility Summary - CFCCC2
CF Storage 74,496K
CF Storage Used 2,048K
CF Dump Storage 2,048K
CF Storage for Structures 0K
Subchannel Contention Count 0
Subchannel Contention Time uSec 0
Failed Request Count 0
Failed Request Time uSec 0
Number of Processors 1
Processor Utilization 51%

```

## G02 - Coupling facility mean times

### Usage

Use this report to see an analysis of how time was spent by the Coupling Facility during the observation session. Expand a Coupling Facility report line to see a further breakdown by structure name within the facility name.

### Quantification

Each report line quantifies time as arithmetic means for each measured facility. The means are calculated by dividing the total of all time spent servicing the facility by its number of requests. The means are expressed in units of micro-seconds.

### Detail line hierarchy

An unexpanded G02 report shows a line for each facility name in the Coupling Facility. You can expand each line to reveal an additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```

Level 1 Facility Name
Level 2 Structure Name

```

### Detail line descriptions

#### Facility detail line

This is the first-level detail line. Each line shows information about a facility name in the coupling facility.

| Under Heading   | This is Displayed                                              |
|-----------------|----------------------------------------------------------------|
| Name            | The facility name.                                             |
| Requests - Sync | The number of synchronous operations to the coupling facility. |

| Under Heading     | This is Displayed                                                                           |
|-------------------|---------------------------------------------------------------------------------------------|
| Requests - Asynch | The number of asynchronous operations to the coupling facility.                             |
| Requests - Queued | The number of queued operations to the coupling facility.                                   |
| Requests - Delay  | The number of operations to the coupling facility that were delayed for dump serialization. |
| uSeconds - Sync   | Mean micro-seconds service time per synchronous operation to the coupling facility.         |
| uSeconds - Asynch | Mean micro-seconds service time per asynchronous operation to the coupling facility.        |
| uSeconds - Queued | Mean micro-seconds service time for operations queued for the coupling facility.            |
| uSeconds - Delay  | Mean micro-seconds service time for operation delays for dump serialization.                |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

G02: Coupling Facility Mean Service Times (0003/TSTJOB01) Row 00001 of 00002
Command ==> _____ Scroll ==> CSR

 ---- Number of Requests ---- ----- Mean uSeconds -----
Name Sync Asynch Queued Delay Sync Asynch Queued Delay
CFCC1 4112 0 0 0 1 0 0 0
CFCC2 0 0 0 0 0 0 0 0

```

## G03 - Coupling facility total times

### Usage

Use this report to see an analysis of how time was spent by the Coupling Facility during the observation session. Expand a Coupling Facility report line to see a further breakdown by structure name within the facility name.

### Quantification

Each report line quantifies total time for each measured facility. The totals are the sum of all structures within the facility name. The totals are expressed in units of microseconds.

### Detail line hierarchy

An unexpanded G03 report shows a line for each facility name in the Coupling Facility. You can expand each line to reveal an additional hierarchical level of detail (using the “+” line command). The hierarchy is illustrated here:

```

Level 1 Facility Name
Level 2 Structure Name

```

### Detail line descriptions

## Facility detail line

This is the first-level detail line. Each line shows information about a facility name in the coupling facility.

| Under Heading     | This is Displayed                                                                           |
|-------------------|---------------------------------------------------------------------------------------------|
| Name              | The facility name.                                                                          |
| Requests - Sync   | The number of synchronous operations to the coupling facility.                              |
| Requests - Asynch | The number of asynchronous operations to the coupling facility.                             |
| Requests - Queued | The number of queued operations to the coupling facility.                                   |
| Requests - Delay  | The number of operations to the coupling facility that were delayed for dump serialization. |
| uSeconds - Sync   | Total micro-seconds service time per synchronous operation to the coupling facility.        |
| uSeconds - Async  | Total micro-seconds service time per asynchronous operation to the coupling facility.       |
| uSeconds - Queued | Total micro-seconds service time for operations queued for the coupling facility.           |
| uSeconds - Delay  | Total micro-seconds service time for operation delays for dump serialization.               |

## Sample reports

A sample report is shown here:

```
File View Navigate Help

G03: Coupling Facility Total Service Times (0003/TSTJ0B01) Row 00001 of 00002
Command ==> ----- Scroll ==> CSR

Name ---- Number of Requests ---- Total uSeconds -----
 Sync Asynch Queued Delay Sync Asynch Queued Delay
CFCC1 4112 0 0 0 4352 0 0 0
CFCC2 0 0 0 0 0 0 0 0
```

## K01- CPU SRB Usage by SRB Type

### Usage

Use this report to see how Service Request Block (SRB) units of work spend CPU time.

### Quantification

Each report line shows the normalized percentage of CPU time for zIIP, zAAP, and GPU processors, and the total. The normalization factor is used to express the CPU percentages of zAAP and zIIP as a percentage that a regular GPU uses for the same work. The percentage is multiplied by the normalization factor and then divided by 256.

### Detail Line Hierarchy

An unexpanded report shows sampled SRBs that are grouped by SRB type. The SRB types are:

- CLIENT - A CLIENT SRB is a preemptable SRB that runs in an address space but executes work on behalf of some other address spaces, which is called the client address space. All CLIENT SRBs are preemptable, but for the purpose of this report they are classified as CLIENT instead of PREEMPTABLE.

- **ENCLAVE** - An ENCLAVE SRB is an SRB that is scheduled into an enclave so that WLM and ENCLAVE can manage the SRB. All ENCLAVE SRBs are preemptable, but for the purpose of this report they are classified as ENCLAVE instead of PREEMPTABLE.
- **PREEMPTABLE** - PREEMPTABLE SRBs can be preempted by higher priority units of work.
- **FULLXM** - A FULLXM SRB receives a copy of the scheduling program's dispatchable unit access list, and it receives control in the scheduling program's current cross memory environment. FULLXM SRBs might also be MANAGED, but for the purpose of this report they are classified as FULLXM instead of MANAGED.
- **MANAGED** - A managed SRB (Global or Local) is created by IEAMSCHD. MANAGED might also be FULLXM, but type FULLXM instead of MANAGED is used .
- **NON-PREEMPT** - A NON-PREEMPT SRB cannot be preempted by other work units irrespective of their priority.

You can expand each line to reveal an additional hierarchical level of detail by using the + line command. The hierarchy is illustrated here:

```

Level 1 SRB Type
 Level 2 SRB EPA instance
 Level 3 SRB Execution Module
 Level 4 SRB Execution CSECT

```

## Detail Line Descriptions

### SRB Type detail line

This is the first-level detail line. Each line is for a specific SRB type as detailed in the previous section.

| Under Heading                    | This is Displayed                                                                 |
|----------------------------------|-----------------------------------------------------------------------------------|
| Name                             | An abbreviated description of the SRB type.                                       |
| Description                      | A full description of the SRB type.                                               |
| zIIP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zIIP processors for this SRB type. |
| zAAP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zAAP processors for this SRB type. |
| GPU - Normalized % of CPU Time   | The total normalized percentage of CPU time on GPU processors for this SRB type.  |
| Total - Normalized % of CPU Time | The total normalized percentage of CPU time on all processors for this SRB type.  |

### SRB EPA instance detail line

This is the second-level detail line that is shown directly under the SRB Type detail line. This line represents each unique SRB EPA and priority.

| Under Heading | This is Displayed                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of load module that contains the SRB EPA. If the load module cannot be resolved, the address of the entry point of the SRB is displayed.       |
| Description   | If a DPA functional description is found for the module name, the description is reported under this heading. Otherwise 'Application SRB' is displayed. |

| Under Heading                    | This is Displayed                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------------|
| zIIP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zIIP processors for this SRB in the load module with the EPA. |
| zAAP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zAAP processors for this SRB in the load module with the EPA. |
| GPU - Normalized % of CPU Time   | The total normalized percentage of CPU time on GPU processors for this SRB in the load module with the EPA.  |
| Total - Normalized % of CPU Time | The total normalized percentage of CPU time on all processors for this SRB in the load module with the EPA.  |

### SRB Execution Module detail line

This is a third-level detail line that is shown directly under the SRB EPA instance detail line. This line represents a unique load module at this level.

| Under Heading                    | This is Displayed                                                                                                                                                                                                                                                           |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                             | The load module name that contains the SRB EPA. If the address is not resolved, NOSYMB is displayed.                                                                                                                                                                        |
| Description                      | If a DPA functional description is found for the executing module name, the description is reported under this heading. Otherwise, 'Application Program' is displayed if the program is not in the DPA tables. If the address is unresolved, 'No Module Name' is displayed. |
| zIIP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zIIP processors for this SRB in the executing load module.                                                                                                                                                                   |
| zAAP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zAAP processors for this SRB in the executing load module.                                                                                                                                                                   |
| GPU - Normalized % of CPU Time   | The total normalized percentage of CPU time on GPU processors for this SRB in the executing load module.                                                                                                                                                                    |
| Total - Normalized % of CPU Time | The total normalized percentage of CPU time on all processors for this SRB in the executing load module.                                                                                                                                                                    |

### SRB Execution CSECT detail line

This is a fourth-level detail line that is shown directly under the SRB Execution Module detail line. This line represents a csect in a load module. For unresolved addresses, activity for a 4k range of addresses is recorded.



| Under Heading                    | This is Displayed                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                             | The executing CSECT in the load module at the third level. The activity observed in a 4096 (4K) byte range of addresses is reported in an Unresolved Address line. This range is expressed in the format 'HHHHHxxx' where HHHHH are the 5 high order hexadecimal digits of the address. For example: '08915xxx' means the range from 08915000 to 08915FFF. |
| Description                      | If a DPA functional description is found for the module name, the description is reported under this heading. If the name of the CSECT is not in the DPA tables, 'CSECT in MMMMMMMM' is displayed where MMMMMMMM is the name of load module from level 3. For unresolved addresses, 'Unresolved Address' is displayed.                                     |
| zIIP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zIIP processors for this CSECT in the load module at the third level.                                                                                                                                                                                                                                       |
| zAAP - Normalized % of CPU Time  | The total normalized percentage of CPU time on zAAP processors for this CSECT in the load module at the third level.                                                                                                                                                                                                                                       |
| GPU - Normalized % of CPU Time   | The total normalized percentage of CPU time on GPU processors for this CSECT in the load module at the third level.                                                                                                                                                                                                                                        |
| Total - Normalized % of CPU Time | The total normalized percentage of CPU time on all processors for this CSECT in the load module at the third level.                                                                                                                                                                                                                                        |

## Sample reports

A sample report that is expanded to level two is shown here.

```

K01: CPU SRB Usage by SRB Type (0072/DBBGDIST) Row 00001 of 00024
Command ==> ----- Scroll ==> CSR
----- Normalized % of CPU Time -----
Name Description zIIP zAAP GPU Total
ENCLAVE Enclave SRBs 41.59 0.00 50.06 91.65
± DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 21.89 0.00 26.66 48.55
→DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 0.00 0.00 1.75 1.75
→DSNVSRX Agent Services Manager 19.69 0.00 20.04 39.73
→DSNVSRX Agent Services Manager 0.00 0.00 1.48 1.48
→DSNVSRX Agent Services Manager 0.00 0.00 0.02 0.02
→DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 0.00 0.00 0.07 0.07
→DSNVSRX Agent Services Manager 0.00 0.00 0.02 0.02
PREEMPTABLE Preemptable SRBs 0.29 0.00 6.68 6.97
→DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 0.00 0.00 2.98 2.98
→DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 0.00 0.00 0.56 0.56
→DSNVSRX Agent Services Manager 0.00 0.00 2.64 2.64
→DSNVSRX Agent Services Manager 0.29 0.00 0.44 0.73
→DSNVSRX Agent Services Manager 0.00 0.00 0.02 0.02
→DSNVGEPL Asmc Global Entry Point List (nonexecutable Csect) 0.00 0.00 0.02 0.02
NON-PREEMPT Non-Preemptable SRB 0.00 0.00 0.59 0.59
→BPXINLPA OS/390 UNIX System Services 0.00 0.00 0.51 0.51
→IEA0TI00 Supervisor Control 0.00 0.00 0.07 0.07

```

## Line commands

The following tables summarize the line commands that are available in this report, and the objects and headings to which they apply. You can always enter a “/” on any input field to popup a menu of line commands that are available for that field.

| Table 4. on objects |                                                                       |                                   |
|---------------------|-----------------------------------------------------------------------|-----------------------------------|
| Cmd                 | When Applied To:                                                      | Action                            |
| ?                   | SRB Type, SRB EPA Instance, SRB Execution Module, SRB Execution CSECT | Display context help information. |
| ++                  | SRB Type, SRB EPA Instance, SRB Execution Module, SRB Execution CSECT | Display additional details.       |
| +                   | SRB Type, SRB EPA Instance, SRB Execution Module                      | Expand to reveal next level.      |
| –                   | SRB Type, SRB EPA Instance, SRB Execution Module                      | Collapse to hide next level.      |
| SV                  | SRB Type, SRB EPA Instance, SRB Execution Module                      | Sort next level by value.         |
| SN                  | SRB Type, SRB EPA Instance, SRB Execution Module                      | Sort next level by name           |
| M                   | SRB EPA Instance, SRB Execution Module, SRB Execution CSECT           | Display load module information   |

| Table 5. on headings |                         |                                    |
|----------------------|-------------------------|------------------------------------|
| Cmd                  | When Applied To Heading | Action                             |
| +                    | Name                    | Expand to reveal all entries.      |
| –                    | Name                    | Collapse to show only first level. |
| SV                   | Name                    | Sort next level by value.          |
| SN                   | Name                    | Sort next level by name.           |

## Detail Window

You can enter “++” or the **Enter** key on any line to display a popup window that contains additional information. A sample detail window for this report is shown here:

|                                                                |                                                    |                    |              |
|----------------------------------------------------------------|----------------------------------------------------|--------------------|--------------|
| K01 - DETAIL Window (0072/DBBGDIST)                            |                                                    | Row 00001 of 00111 |              |
| Command ==>                                                    |                                                    | Scroll ==> CSR     |              |
| +----- The following report line was selected -----+           |                                                    |                    |              |
| ± DSNVGEPL Asmc Global Entry Point List 21.89 0.00 26.66 48.55 |                                                    |                    |              |
| +-----+                                                        |                                                    |                    |              |
| SRB Attributes                                                 |                                                    |                    |              |
| SRB EPA                                                        | DSNVGEPL+10010                                     |                    |              |
| SRB Type                                                       | Enclave SRBs                                       |                    |              |
| Major Prty                                                     | 00F6                                               |                    |              |
| Minor Prty                                                     | 0000                                               |                    |              |
| Calculation Details                                            |                                                    |                    |              |
| zIIP/zAAP Normalization Factor                                 | 3,245/256                                          |                    |              |
|                                                                | Actual                                             | Normalized         | Normalized % |
|                                                                | Measurements                                       | Measurements       | of Total CPU |
| Divisor Calculation                                            |                                                    |                    |              |
| (SETUP option: TCB+SRB)                                        |                                                    |                    |              |
| Total SRB measurements                                         | 2,457                                              | 4,021              | 99.25        |
| Total TCB measurements                                         | 30                                                 | 30                 | 0.74         |
| Total for Divisor                                              | 2,487                                              | 4,051              | 100.00       |
| SRB measurements(for selected report line)                     |                                                    |                    |              |
| zIIP measurements                                              | 70                                                 | 887                | 21.89        |
| zAAP measurements                                              | 0                                                  | 0                  | 0.00         |
| GPU measurements                                               | 1,080                                              | 1,080              | 26.66        |
| Total SRB measurements                                         | 1,150                                              | 1,967              | 48.55        |
| Module Information for DSNVGEPL                                |                                                    |                    |              |
| Load Address                                                   | 13F35000 to 13F58FFF                               |                    |              |
| Module Size                                                    | 147,456                                            |                    |              |
| Module Location                                                | CSA                                                |                    |              |
| Program Group                                                  | Db2 Subsystem                                      |                    |              |
| Subgroup                                                       | Agent Services Manager                             |                    |              |
| Function                                                       | Asmc Global Entry Point List (nonexecutable Csect) |                    |              |

## SETUP Options

A SETUP option is available. With this option, you can specify that calculate CPU percentages as a percentage of both TCB and SRB counts instead of SRB counts only.

## K02- CPU SRB Usage by PSW/ObjCode

### Usage

Use this report to see information about sampled SRB CPU execution at the machine instruction level.

## Quantification

Each report line quantifies SRB CPU usage as a percentage. Each percentage represents the ratio of SRB CPU consumption that is observed for the reported item to the total SRB CPU consumption that is measured in the address space.

## Detail Line Hierarchy

The first level detail line displays a PSW (Program Status Word) address value that the Measurement Task records when it actively observes SRB CPU. The SRB CPU usage observation at the same PSW address is accumulated and reported as a single detail line. In addition to the PSW address value, a separate first level detail line is created if any of the following values are different:

- Execution in problem or supervisor mode
- Address mode (AMODE) 24, 31 or 64
- Address-space control: primary-space, AR mode, secondary-space or home-space
- PSW key
- SVC number if execution was in a supervisor call
- Object code at the PSW address

You can expand the first level detail line by using the + line command to display the object code at the PSW address. Object code is reported in the form of disassembled machine instructions. The Measurement Task displays a line for each machine instruction from 12 bytes of object code captured during the measurement. The PSW address points to the 6th byte of the 12 bytes; therefore, the first instructions that are reported precede the sampled instruction.

If alternate disassemblies are available, which depend upon the assumed start address, the disassemblies are listed with a subheading of "Alternate Disassembly".

## Detail Line Descriptions

### PSW Address Line

Each unique PSW address has one line. By default, the lines are sorted in descending sequence by SRB CPU activity.

| Under Heading | This is Displayed                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address       | The PSW address of the sampled instruction.                                                                                                                                                                                                                    |
| Module        | The load module name at the sampled address. If the Measurement Task cannot determine the module name, 'Unknown' is displayed.                                                                                                                                 |
| AM            | The address mode (AMODE): 24, 31 or 64.                                                                                                                                                                                                                        |
| S/P           | If execution is in a supervisor call, the SVC number is displayed. Or S or P that is followed by the storage key is displayed. S indicates supervisor mode and P indicates problem mode. For example, P8 indicates execution in problem mode in storage key 8. |
| AS            | The address space control mode. AR indicates access-register mode, SS indicates secondary-space mode and HS indicates home-space mode. Blanks are displayed for primary-space mode.                                                                            |

| Under Heading           | This is Displayed                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASID                    | If the storage was acquired by an address space other than the measured one or a foreign address space, the ASID (address space id) in the hexadecimal of the address space that acquired the storage at the PSW address is displayed. For example, the processing of an SQL request. Execution occurs in load modules fetched into storage by one of the Db2 address spaces. |
| Percent of SRB CPU Time | The percentage of SRB CPU time that is observed at the indicated address.                                                                                                                                                                                                                                                                                                     |

## Machine Instruction line

Each line displays one machine instruction in disassembled format. These lines relate to the PSW address lines that are shown above. If alternate disassemblies are available, which depend upon the assumed start address, they are listed under the subheading of "Alternate Disassembly".

## Sample reports

A sample report is shown here.

```

K02: CPU SRB Usage by PSW/ObjCode (0072/DBBGDIST) Row 00001 of 07878
Command ==> ----- Scroll ==> CSR

Address Module AM S/P AS ASID Percent of CPU Time * 10.00% ±2.0%
 *....1....2....3....4....5....6....7..
014FC526 IRARMINT 31 S0 1.50

→IRARMIO1+0392 AD03 0250 STOSM 592(R0),3
→IRARMIO1+0396 18D5 LR R13,R5
→IRARMIO1+0398 A7F4 0057 BRC R15,87

012EDAF6 IEAVEPSS 31 S0 1.42

→IEAVEPSS+0AD0 98BC D040 LM R11,R12,64(R13)
→IEAVEPSS+0AD4 07FE BCR R15,R14
→IEAVEPSS+0AD6 0DC0 BASR R12,R0
→IEAVEPSS+0AD8 A7CA 0918 AHI R12,2328

```

## Line commands

The following tables summarize the line commands that are available in this report, and the objects and headings to which they apply. You can always enter a "/" on any input field to popup a menu of line commands that are available for that field.

| Table 6. on objects |                  |                                   |
|---------------------|------------------|-----------------------------------|
| Cmd                 | When Applied To: | Action                            |
| ?                   | Address          | Display context help information. |
| +                   | Address          | Expand to reveal next level.      |
| –                   | Address          | Collapse to hide next level.      |
| M                   | Address          | Display load module information.  |

Table 7. on headings

| Cmd | When Applied To Heading | Action                             |
|-----|-------------------------|------------------------------------|
| ?   | Address, Percent CPU    | Display context help information.  |
| +   | Address                 | Expand to reveal all entries.      |
| +   | Percent CPU             | Zoom in scale.                     |
| –   | Address                 | Collapse to show only first level. |
| –   | Percent CPU             | Zoom outscale.                     |
| SV  | Address                 | Sort next level by value.          |
| SA  | Address                 | Sort next level by address.        |

## Detail Window

You can enter “++” or the **Enter** key on any line to display a popup window that contains additional information. A sample detail window for this report is shown here:

```

+-----+-----+-----+-----+-----+-----+
| K02 - DETAIL Window (0072/DBBGDIST) | Row 00001 of 00025 |
+-----+-----+-----+-----+-----+-----+
| +-----+-----+-----+-----+-----+-----+ |
| | 014FC526 IRARMINT 31 S0 1.50 | |
| +-----+-----+-----+-----+-----+-----+ |
+-----+-----+-----+-----+-----+-----+

Calculation Details
 CPU measurements 37
 PSW address 014FC526
 Total CPU measurements 2,457
 Percent of total 1.50%

PSW Information
 PSW Address 014FC526
 Module Name IRARMINT
 Module Description System resources manager (SRM)
 CSECT Name IRARMIO1
 Module+Offset IRARMINT+136E
 CSECT+Offset IRARMIO1+0396
 Addressing Mode (AMODE) 31 bit
 Address Space Control Primary Space
 Problem/Supervisor Mode Supervisor Mode

Machine Instructions
 IRARMIO1+0392 AD03 0250 STOSM 592(R0),3
 IRARMIO1+0396 18D5 LR R13,R5 <- PSW address
 IRARMIO1+0398 A7F4 0057 BRC R15,87

```

## V01 - Measurement variance summary

### Usage

Use this report to analyze variances between multiple separate measurements. To gain access to variance reporting, issue the “V” line command from the Observation Session List. The “V” line command selects the base measurement for comparison. Prior to entering the line command you must previously tag at least one measurement by entering the “T” line command in the Observation Session List. Up to 20 measurements can be tagged at one time. This report quantifies variances between tagged measurements and the base measurement.

## Measurements analyzed

The first segment of the V01 report lists the measurements analyzed in the report. Each measurement is assigned a two-digit sequential reference number. This segment of the report identifies each of the measurements and their reference number.

The measurement identified by reference number 01 is the "base" measurement, the measurement to which the other measurements are compared. Throughout this report, measurements are identified by their reference numbers.

## Variances

A percentage value is displayed under the heading "Variance" in various segments of this report. Its value quantifies the variance between a particular performance figure for the compared measurement and the corresponding value for the base measurement. A plus (+) value indicates a higher value than the base measurement and a minus (-) value indicates a lower value. The value is the percentage by which the compared measurement figure exceeds (+) or is less than (-) the corresponding base measurement value. Any value exceeding 999 percent is reported as "999%." The magnitude of the value is also represented graphically by a string of greater-than or less-than symbols.

### CPU time TCB

This report segment compares the TCB CPU times that were recorded by the operating system during the measurement sessions.

### CPU time SRB

This report segment compares the SRB CPU times that were recorded by the operating system during the measurement sessions.

### EXCP requests

This report segment compares the number of EXCPs that were processed during the measurement sessions.

### Service units

This report segment compares the number of service units recorded by the operating system during the measurement sessions.

### Percentage of CPU active samples

This report segment compares the percentage of samples during which one or more TCBs was executing CPU instructions.

### Percentage of WAIT samples

This report segment compares the percentage of samples during which all TCBs were in WAIT state.

### Percentage of queued samples

This report segment compares the percentage of samples during which no CPU activity was taking place but one or more TCBs was suspended and waiting to be dispatched.

## Sample reports

A sample report is shown here:

```

File View Navigate Help

V01: Measurement Variance Summary (2312/TSTJOB01) Row 00001 of 00059
Command ==> _____ Scroll ==> CSR

```

The Following Measurements are Analyzed

| Ref | ReqNum | Job Name | Date        | Time  | Description |
|-----|--------|----------|-------------|-------|-------------|
| 01  | 02312  | TSTJOB01 | Mar-30-2007 | 10:54 | Test 2      |
| 02  | 02311  | TSTJOB01 | Mar-30-2007 | 10:52 | Test 1      |

#### CPU Time TCB

| Ref | CPU Time TCB | Variance |
|-----|--------------|----------|
| 01  | 11.41 sec    |          |
| 02  | 11.73 sec    | + 2 %    |

#### CPU Time SRB

| Ref | CPU Time SRB | Variance |
|-----|--------------|----------|
| 01  | 1.52 sec     |          |
| 02  | 1.61 sec     | + 5 %    |

#### EXCP Requests

| Ref | EXCP Requests | Variance |
|-----|---------------|----------|
| 01  | 7,721         |          |
| 02  | 7,710         | - 0 %    |

#### Service Units

| Ref | Service Units | Variance |
|-----|---------------|----------|
| 01  | 7,721         |          |
| 02  | 7,710         | + 3 %    |

#### Percentage of CPU Active Samples

| Ref | --- Sample Count --- |       | Percentage | Variance |
|-----|----------------------|-------|------------|----------|
|     | CPU Active           | Total |            |          |
| 01  | 2,171                | 4,136 | 52.51%     |          |
| 02  | 2,452                | 4,790 | 51.21%     | - 2 %    |

#### Percentage of WAIT Samples

| Ref | --- Sample Count --- |       | Percentage | Variance |
|-----|----------------------|-------|------------|----------|
|     | TCB WAIT             | Total |            |          |
| 01  | 1,739                | 4,136 | 42.06%     |          |
| 02  | 1,979                | 4,790 | 41.33%     | - 1 %    |

#### Percentage of Queued Samples

| Ref | --- Sample Count --- |       | Percentage | Variance  |
|-----|----------------------|-------|------------|-----------|
|     | Queued               | Total |            |           |
| 01  | 224                  | 4,136 | 5.41%      |           |
| 02  | 357                  | 4,790 | 7.45%      | + 37 % >> |

## V02 - CICS variance summary



## Usage

Use this report to analyze variances in CICS data between multiple measurements. To gain access to CICS variance reporting, issue the “V” line command on a CICS measurement from the Observation Session List. The “V” line command selects the base measurement for comparison. Prior to entering the “V” line command you must previously have tagged at least one CICS measurement by entering the “T” line command in the Observation Session List. Up to 20 measurements can be tagged at one time. This report will quantify CICS data variances between tagged measurements and the base measurement.

## Measurements analyzed

The first segment of the V02 report lists the measurements analyzed in the report. Each measurement is assigned a two digit sequential reference number. This segment of the report identifies each of the measurements and their reference number.

The measurement identified by reference number 01 is the “base” measurement, which is the one to which the other measurements are compared. Throughout this report, measurements are identified by their reference numbers.

## Variances

A percentage value is displayed under the heading "Variance" in various segments of this report. Its value quantifies the variance between a particular performance figure for the compared measurement and the corresponding value for the base measurement. A plus (+) value indicates a higher value than the base measurement and a minus (-) value indicates a lower value. The value is the percentage by which the compared measurement figure exceeds (+) or is less than (-) the corresponding base measurement value. Any value exceeding 999 percent is reported as "999%." The magnitude of the value is also represented graphically by a string of greater-than or less-than symbols.

## CICS Transaction Statistics

This report segment displays the starting and ending task number in each measurement, the number of transactions counted and observed, and compares the transaction rate per second between measurements.

## Mean Execution Time

This report segment compares the mean execution time of all CICS transactions sampled during the measurement sessions

## Mean Suspend Time

This report segment compares the mean suspend time of all CICS transactions sampled during the measurement sessions.

## Mean CICS Dispatch Delay Time

This report segment compares the mean CICS dispatch delay time of all CICS transactions sampled during the measurement sessions.

## Mean MVS Dispatch Delay Time

This report segment compares the mean MVS dispatch delay time of all CICS transactions sampled during the measurement sessions.

## Mean Service Time

This report segment compares the mean service time of all CICS transactions sampled during the measurement sessions.

## Sample reports

The following sample report shows the variances between a base CICS measurement and 3 tagged CICS measurements.

V02: CICS Measurement Variance Summary (5592/CICS32A)

Row 00001 of 00064

The Following Measurements are Analyzed

| Ref | ReqNum | Job Name | Date        | Time  | Description       |
|-----|--------|----------|-------------|-------|-------------------|
| 01  | 05592  | CICS32A  | Aug-09-2010 | 12:36 | Variance 1 (Base) |
| 02  | 05593  | CICS32A  | Aug-09-2010 | 12:39 | Variance 2        |
| 03  | 05594  | CICS32A  | Aug-09-2010 | 12:41 | Variance 3        |
| 04  | 05595  | CICS32A  | Aug-09-2010 | 12:42 | Variance 4        |

### CICS Transaction Statistics

| Ref | -Task Number- | --Transaction-- | Rate          | Variance  |
|-----|---------------|-----------------|---------------|-----------|
|     | Start End     | Count Obsvd     |               |           |
| 01  | 10,894 12,640 | 1,746 1,075     | 58.20 per sec |           |
| 02  | 15,236 17,408 | 2,172 1,054     | 74.89 per sec | + 28 % >> |
| 03  | 17,408 19,474 | 2,066 900       | 71.24 per sec | + 22 % >  |
| 04  | 19,580 21,251 | 1,671 908       | 57.62 per sec | - 0 %     |

### Mean Execution Time

| Ref | Time       | Variance |
|-----|------------|----------|
| 01  | 0.0225 sec |          |
| 02  | 0.0204 sec | - 9 %    |
| 03  | 0.0216 sec | - 4 %    |
| 04  | 0.0175 sec | - 22 % < |

### Mean Suspend Time

| Ref | Time       | Variance   |
|-----|------------|------------|
| 01  | 1.4997 sec |            |
| 02  | 1.0826 sec | - 27 % <<  |
| 03  | 1.2369 sec | - 17 % <   |
| 04  | 0.5693 sec | - 62 % <<< |

V02: CICS Measurement Variance Summary (5592/CICS32A)

Row 00039 of 00064

### Mean CICS Dispatch Delay Time

| Ref | Time       | Variance       |
|-----|------------|----------------|
| 01  | 0.0337 sec |                |
| 02  | 0.4190 sec | +999 % >>>>>>> |
| 03  | 0.3559 sec | +956 % >>>>>>> |
| 04  | 0.9112 sec | +999 % >>>>>>> |

### Mean MVS Dispatch Delay Time

| Ref | Time       | Variance |
|-----|------------|----------|
| 01  | 0.0051 sec |          |
| 02  | 0.0056 sec | + 9 %    |
| 03  | 0.0058 sec | + 13 % > |
| 04  | 0.0055 sec | + 7 %    |

### Mean Service Time

| Ref | Time       | Variance |
|-----|------------|----------|
| 01  | 1.5610 sec |          |
| 02  | 1.5276 sec | - 2 %    |
| 03  | 1.6202 sec | + 3 %    |
| 04  | 1.5035 sec | - 3 %    |

## V03 - Db2 variance summary

## Usage

Use this report to analyze variances in Db2 data between multiple measurements. To gain access to Db2 variance reporting, issue the “V” line command on a Db2 measurement from the Observation Session List. The “V” line command selects the base measurement for comparison. Prior to entering the “V” line command you must previously have tagged at least one Db2 measurement by entering the “T” line command in the Observation Session List. Up to 20 measurements can be tagged at one time. This report will quantify Db2 data variances between tagged measurements and the base measurement.

## Measurements analyzed

The first segment of the V03 report lists the measurements analyzed in the report. Each measurement is assigned a two digit sequential reference number. This segment of the report identifies each of the measurements and their reference number.

The measurement identified by reference number 01 is the “base” measurement, which is the one to which the other measurements are compared. Throughout this report, measurements are identified by their reference numbers.

## Variances

A percentage value is displayed under the heading "Variance" in various segments of this report. Its value quantifies the variance between a particular performance figure for the compared measurement and the corresponding value for the base measurement. A plus (+) value indicates a higher value than the base measurement and a minus (-) value indicates a lower value. The value is the percentage by which the compared measurement figure exceeds (+) or is less than (-) the corresponding base measurement value. Any value exceeding 999 percent is reported as "999%." The magnitude of the value is also represented graphically by a string of greater-than or less-than symbols.

## SQL calls sampled

This report segment displays the subsystem name and version of the Db2 subsystem being used, and compares the number of calls sampled during the measurement sessions.

## SQL observations

This report segment compares the number of samples taken while an SQL call was in-flight.

## SQL calls executed

This report segment compares the number of calls executed during the sample based on the REQCT count for the active threads.

## Avg SQL call rate

This report segment compares average SQL call rate per second.

## SQL calls counted

This report segment compares the number of calls counted by the Db2+ intercept during sampling. This segment is displayed for measurements with the Db2+ extractor active.

## SQL throughput

This report segment compares the throughput rate of the samples based on the number of calls made during the time that SQL was active in the sample.

## **SQL service time**

This report segment compares the total service time of the samples while an SQL call was active. This segment is displayed for measurements with the Db2+ extractor active.

## **SQL call max time**

This report segment compares the highest service time for an SQL call. This segment is displayed for measurements with the Db2+ extractor active.

## **SQL call min time**

This report segment compares the lowest service time for an SQL call. This segment is displayed for measurements with the Db2+ extractor active.

## **SQL CPU time**

This report segment compares the total CPU time used to process SQL calls. This segment is displayed for measurements with the Db2+ extractor active.

## **SQL call max CPU**

This report segment compares the highest CPU time for an SQL call. This segment is displayed for measurements with the Db2+ extractor active.

## **SQL call min CPU**

This report segment compares the lowest CPU time for an SQL call. This segment is displayed for measurements with the Db2+ extractor active.

## **Sample reports**

The following sample report shows the variances between a base Db2 measurement and 2 tagged Db2 measurements.

The Following Measurements are Analyzed

| <u>Ref</u> | <u>ReqNum</u> | <u>Job Name</u> | <u>Date</u> | <u>Time</u> | <u>Description</u> |
|------------|---------------|-----------------|-------------|-------------|--------------------|
| 01         | 05592         | CICS32A         | Aug-09-2010 | 12:36       | Variance 1 (Base)  |
| 02         | 05593         | CICS32A         | Aug-09-2010 | 12:39       | Variance 2         |
| 03         | 05594         | CICS32A         | Aug-09-2010 | 12:41       | Variance 3         |

-----  
SQL calls sampled

| <u>Ref</u> | <u>Subsys</u> | <u>Version</u> | <u>Calls<br/>Sampled</u> | <u>Variance</u> |
|------------|---------------|----------------|--------------------------|-----------------|
| 01         | DB9G          | 9.1.0          | 1,205                    |                 |
| 02         | DB9G          | 9.1.0          | 635                      | - 47 % <<       |
| 03         | DB9G          | 9.1.0          | 630                      | - 47 % <<       |

-----  
SQL observations

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 1,338        |                 |
| 02         | 726          | - 45 % <<       |
| 03         | 721          | - 46 % <<       |

-----  
SQL calls executed

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 5,871        |                 |
| 02         | 2,997        | - 48 % <<       |
| 03         | 2,997        | - 48 % <<       |

-----  
Avg SQL call rate

| <u>Ref</u> | <u>Rate</u>    | <u>Variance</u> |
|------------|----------------|-----------------|
| 01         | 195.70 per sec |                 |
| 02         | 100.23 per sec | - 48 % <<       |
| 03         | 100.23 per sec | - 48 % <<       |

-----  
Avg SQL call rate

| <u>Ref</u> | <u>Rate</u>    | <u>Variance</u> |
|------------|----------------|-----------------|
| 01         | 195.70 per sec |                 |
| 02         | 100.23 per sec | - 48 % <<       |
| 03         | 100.23 per sec | - 48 % <<       |

-----  
SQL calls counted

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 2,937        |                 |
| 02         | 1,500        | - 48 % <<       |
| 03         | 1,500        | - 48 % <<       |

-----  
SQL throughput

| <u>Ref</u> | <u>Rate</u>     | <u>Variance</u> |
|------------|-----------------|-----------------|
| 01         | 1505.38 per sec |                 |
| 02         | 1427.14 per sec | - 5 %           |
| 03         | 1427.14 per sec | - 5 %           |

-----  
SQL service time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 3.9691 sec  |                 |
| 02         | 2.2327 sec  | - 43 % <<       |
| 03         | 2.2025 sec  | - 44 % <<       |

-----  
SQL call max time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0174 sec  |                 |
| 02         | 0.0313 sec  | + 79 % >>>>     |
| 03         | 0.0157 sec  | - 9 %           |

-----  
SQL call max time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0174 sec  |                 |
| 02         | 0.0313 sec  | + 79 % >>>>     |
| 03         | 0.0157 sec  | - 9 %           |

-----  
SQL call min time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0003 sec  |                 |
| 02         | 0.0003 sec  |                 |
| 03         | 0.0003 sec  |                 |

-----  
SQL CPU time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 1.9055 sec  |                 |
| 02         | 0.9905 sec  | - 48 % <<       |
| 03         | 1.0115 sec  | - 46 % <<       |

-----  
SQL call max CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0033 sec  |                 |
| 02         | 0.0032 sec  | - 3 %           |
| 03         | 0.0033 sec  |                 |

-----  
SQL call min CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0002 sec  |                 |
| 02         | 0.0003 sec  | + 50 % >>>      |
| 03         | 0.0002 sec  |                 |

## V04 - IMS variance summary

---

### Usage

Use this report to analyze variances in IMS data between multiple measurements. The IMS+ extractor must be active in the selected measurements to display meaningful variance data. To gain access to IMS variance reporting, issue the "V" line command on an IMS measurement from the Observation Session List. The "V" line command selects the base measurement for comparison. Prior to entering the "V" line command you must previously have tagged at least one IMS measurement by entering the "T" line command in the Observation Session List. Up to 20 measurements can be tagged at one time. This report quantifies IMS data variances between tagged measurements and the base measurement.

### Measurements analyzed

The first segment of the V04 report lists the measurements analyzed in the report. Each measurement is assigned a two digit sequential reference number. This segment of the report identifies each of the measurements and their reference number.

The measurement identified by reference number 01 is the "base" measurement, which is the one to which the other measurements are compared. Throughout this report, measurements are identified by their reference numbers.

### Variances

A percentage value is displayed under the heading "Variance" in various segments of this report. Its value quantifies the variance between a particular performance figure for the compared measurement and the corresponding value for the base measurement. A plus (+) value indicates a higher value than the base

measurement and a minus (-) value indicates a lower value. The value is the percentage by which the compared measurement figure exceeds (+) or is less than (-) the corresponding base measurement value. Any value exceeding 999 percent is reported as "999%." The magnitude of the value is also represented graphically by a string of greater-than or less-than symbols.

## **Txn observations**

This report segment displays the subsystem name and version of the IMS subsystem being used, and compares the number of transactions sampled during the measurement sessions.

## **IMS Txns counted**

This report segment compares the number of transactions counted during the measurement sessions.

## **Transaction rate**

This report segment compares the transaction rate per second during the measurement sessions.

## **Txn throughput**

This report segment compares the transaction throughput rate per second based on the number of transactions counted by the transaction service time.

## **IMS Txn svc time**

This report segment compares the total service time while IMS transactions were active during the measurement sessions.

## **IMS Txn max svc**

This report segment compares the longest running IMS transaction during the measurement sessions.

## **IMS Txn min svc**

This report segment compares the shortest running IMS transaction during the measurement sessions.

## **IMS Txn CPU time**

This report segment compares the total CPU time used by all IMS transactions during the measurement sessions.

## **IMS Txn max CPU**

This report segment compares the highest CPU time for IMS transactions during the measurement sessions.

## **IMS Txn min CPU**

This report segment compares the lowest CPU time for IMS transactions during the measurement sessions.

## **DLI observations**

This report segment compares the number of samples taken while a DLI call was in-flight.

## **DLI call count**

This report segment compares the number of DLI calls counted during the measurement sessions.



### **DLI call rate**

This report segment compares the DLI call rate per second during the measurement sessions.

### **DLI call thruput**

This report segment compares the DLI call throughput rate per second based on the number of DLI calls counted by the DLI service time.

### **DLI svc time**

This report segment compares the total service time for DLI calls during the measurement sessions.

### **DLI max svc**

This report segment compares the longest running DLI call during the measurement sessions.

### **DLI min svc**

This report segment compares the shortest running DLI call during the measurement sessions.

### **DLI CPU time**

This report segment compares the total CPU time used by all DLI calls during the measurement sessions.

### **DLI max CPU**

This report segment compares the highest CPU time for a DLI call during the measurement sessions.

### **DLI min CPU**

This report segment compares the lowest CPU time for a DLI call during the measurement sessions.

## **Sample reports**

The following sample report shows the variances between a base IMS measurement and 1 tagged IMS measurement.

The Following Measurements are Analyzed

| <u>Ref</u> | <u>ReqNum</u> | <u>Job Name</u> | <u>Date</u> | <u>Time</u> | <u>Description</u> |
|------------|---------------|-----------------|-------------|-------------|--------------------|
| 01         | 05497         | IMSAMPP1        | Jul-06-2010 | 14:52       | IMS+ (2)           |
| 02         | 05498         | IMSAMPP1        | Jul-06-2010 | 14:57       | IMS+ (3)           |

-----  
Txn observations

| <u>Ref</u> | <u>Subsys</u> | <u>Version</u> | <u>Txns<br/>Sampled</u> | <u>Variance</u> |
|------------|---------------|----------------|-------------------------|-----------------|
| 01         | IMSA          | 10.1.0         | 35                      |                 |
| 02         | IMSA          | 10.1.0         | 17                      | - 51 % <<<      |

-----  
IMS Txns counted

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 27           |                 |
| 02         | 16           | - 40 % <<       |

-----  
Transaction rate

| <u>Ref</u> | <u>Rate</u>  | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 0.15 per sec |                 |
| 02         | 0.08 per sec | - 46 % <<       |

-----  
Txn throughput

| <u>Ref</u> | <u>Rate</u>    | <u>Variance</u> |
|------------|----------------|-----------------|
| 01         | 90.00 per sec  |                 |
| 02         | 160.00 per sec | + 77 % >>>>     |

-----  
IMS Txn svc time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.3463 sec  |                 |
| 02         | 0.1850 sec  | - 46 % <<       |

-----  
IMS Txn max svc

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0294 sec  |                 |
| 02         | 0.0213 sec  | - 27 % <<       |

-----  
IMS Txn min svc

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0019 sec  |                 |
| 02         | 0.0037 sec  | + 94 % >>>>     |

-----  
IMS Txn CPU time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.2175 sec  |                 |
| 02         | 0.1246 sec  | - 42 % <<       |

-----  
IMS Txn max CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0152 sec  |                 |
| 02         | 0.0120 sec  | - 21 % <        |

---

IMS Txn min CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0019 sec  |                 |
| 02         | 0.0023 sec  | + 21 % >        |

---

DLI observations

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 8            |                 |
| 02         | 3            | - 62 % <<<      |

---

DLI call count

| <u>Ref</u> | <u>Count</u> | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 204          |                 |
| 02         | 100          | - 50 % <<<      |

---

DLI call rate

| <u>Ref</u> | <u>Rate</u>  | <u>Variance</u> |
|------------|--------------|-----------------|
| 01         | 1.13 per sec |                 |
| 02         | 0.55 per sec | - 51 % <<<      |

---

DLI call thruput

| <u>Ref</u> | <u>Rate</u>     | <u>Variance</u> |
|------------|-----------------|-----------------|
| 01         | 2040.00 per sec |                 |
| 02         | 0.00 per sec    | -100 % <<<<     |

---

DLI svc time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.1201 sec  |                 |
| 02         | 0.0744 sec  | - 38 % <<       |

---

DLI max svc

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0128 sec  |                 |
| 02         | 0.0100 sec  | - 21 % <        |

---

DLI min svc

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0000 sec  |                 |
| 02         | 0.0000 sec  |                 |

---

DLI CPU time

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0484 sec  |                 |
| 02         | 0.0308 sec  | - 36 % <<       |

---

DLI max CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0019 sec  |                 |
| 02         | 0.0023 sec  | + 21 % >        |

---

DLI min CPU

| <u>Ref</u> | <u>Time</u> | <u>Variance</u> |
|------------|-------------|-----------------|
| 01         | 0.0001 sec  |                 |
| 02         | 0.0001 sec  |                 |



## Chapter 4. CICS performance analysis reports

This section describes the CICS Performance Analysis Reports.

| For information about ...                  | See ...                                                                    |
|--------------------------------------------|----------------------------------------------------------------------------|
| The CICS data extractor                    | <a href="#">“Overview of CICS data extractor” on page 189</a>              |
| E01 CICS session statistics                | <a href="#">“E01 - CICS session statistics” on page 191</a>                |
| E02 CICS CPU and use count by program      | <a href="#">“E02 - CICS CPU and use count by program” on page 193</a>      |
| E03 CICS CPU usage by transaction          | <a href="#">“E03 - CICS CPU usage by transaction” on page 195</a>          |
| E04 CICS mean service time by transaction  | <a href="#">“E04 - CICS mean service time by transaction” on page 202</a>  |
| E05 CICS total service time by transaction | <a href="#">“E05 - CICS total service time by Txn” on page 213</a>         |
| E06 CICS service time by task ID           | <a href="#">“E06 - CICS service time by task ID” on page 225</a>           |
| E07 CICS wait by transaction               | <a href="#">“E07 - CICS wait by Txn” on page 235</a>                       |
| E08 CICS mean service time by terminal ID  | <a href="#">“E08 - CICS mean service time by terminal ID” on page 237</a>  |
| E09 CICS total service time by terminal ID | <a href="#">“E09 - CICS total service time by terminal ID” on page 246</a> |
| E10 CICS mean service time by user ID      | <a href="#">“E10 - CICS mean service time by user ID” on page 255</a>      |
| E11 CICS total service time by user ID     | <a href="#">“E11 - CICS total service time by user ID” on page 263</a>     |
| E12 CICS CPU/service time by transaction   | <a href="#">“E12 - CICS CPU/service time by transaction” on page 271</a>   |

### Overview of CICS data extractor

In order to use the CICS Performance Analysis Reports, the CICS data extractor must be turned on when the Observation Request is entered. You must select the CICS data extractor in the Schedule New Measurement panel, and enter the transaction name(s) or patterns you want to observe. For more information on entering an observation request for CICS, see [“Panel 5 – Subsystems” on page 29](#).

There are two distinct types of data that Application Performance Analyzer gathers when the CICS extractor is active: Session statistics, and Transaction measurement data.

### Session statistics

This data is a summary of how much CICS related activity occurred in the region during the Observation Session. The activity measured is directly related to services requested by in-flight transactions. The data provides an indication on the load (or stress level) that transactions are placing on the region. In a region that is idle, almost all these numbers would be zero. Data for the majority of these statistics are gathered once at the start of the session and once at the end of the session. The statistics are then calculated by taking the delta of each set of data values.

## Transaction measurement data

There is one sample record created for each in-flight transaction during each sampling interval. A transaction is only sampled if it was specified when the Observation Request was created. For some reports the sample records are analyzed to produce CPU usage and Service Time by transaction. These reports describe the load that a transaction is placing on the CICS region.

The sample record consists of transaction state data captured during a sampling interval. This information is used to generate the Session Activity report. This report highlights the state of sampled transactions. State information includes:

1. Whether the transaction was running or suspended (active or not)
2. Module information where it was running
3. Module information where to be resumed if suspended
4. Information on the CICS service executing on behalf of the application (if applicable)

## CICS+ Extractor

---

CICS+ is a CICS measurement option (data extractor) in which the precise number of CICS transactions are counted during the measurement interval. It records the exact service time and CPU time for each transaction. This data is displayed in the E12 report only, and has no effect on the other CICS reports.

Activating the CICS+ option automatically activates the CICS option. The extractor applies to CICS TS 3.1 and above. Your installer may have chosen to limit access to this data extractor.

## Overview of CICS Multiple Address Space Support

---

CICS multiple address space (MASS) support allows you to measure and analyze multiple CICS regions simultaneously. Transaction data from multiple regions is merged to produce a set of 4 CICS reports showing multi-region activity. These reports are X01, X02, X03 and X04.

To enter CICS MASS observations:

1. Start a NEW request.
2. In Panel 1 – Job Information, enter either a Job name/Pattern with an asterisk (\*) or a multi-job measurement with a percent (%) for the CICS regions you want to measure.
3. In Panel 4 – Active Jobs, if you entered an asterisk (\*) in the Job Name/Pattern field, select the CICS regions from the list of active jobs presented. If you entered a percent (%) in the Job Name/Pattern field, the CICS regions that match the pattern are displayed. It is not necessary to select the CICS regions in this case, unless you want to limit the measurement to specific CICS regions. The maximum number of regions you are permitted to select is determined during the installation of Application Performance Analyzer.
4. In Panel 2 – Options, select the CICS data extractor.
5. Complete any other relevant panels for your request. You can specify further CICS measurement criteria in Panel 5 – Subsystems.

Once the NEW request is complete and submitted, Application Performance Analyzer creates and starts separate observation requests for each CICS region selected for measurement.

When the separate observation requests are completed, you can view the CICS MASS reports by using the tag (T) and report (S or R) commands.

- Tag up to 20 CICS region measurements to be included in the CICS MASS reports.
- Select one of the CICS region measurements for reporting, using the S or R command. This measurement does not have to be tagged.

In addition to the standard reports for the selected observation, Application Performance Analyzer generates the specific CICS MASS reports that show multi-region activity for all selected CICS regions.

### Usage

Use this report to see a summary of the CICS measurement data collected during the observation session.

**Note:** Be aware that a reset of CICS statistics, if done during the measurement interval, can invalidate some of the values reported here.

### Detail line descriptions

#### Environmental Information

Fields under this heading describe characteristics of the CICS environment.

##### CICS Release

The CICS version and release.

#### Transaction Statistics

Some CICS processing statistical values are shown under this heading.

##### First Transaction TaskId

The value of the CICS TaskId at the beginning of the observation session.

##### Last Transaction TaskId

The value of the CICS TaskId at the end of the observation session.

##### Number of TaskId Increments

The difference between the first and last CICS TaskId.

##### Number of Observed Transactions

The number of transactions with unique CICS TaskId values observed. If this value does not correspond to the number of increments, it could be an indication that not all executed transactions were measured. Some transactions could have been excluded as specified in the measurement request or transactions can be missed if a sampling rate is chosen that is slower than the transaction throughput rate.

##### Transaction Rate

The average number of transactions per second during the measurement interval.

##### Peak Active Transactions

The maximum number of concurrently active transactions observed during the measurement interval.

##### Peak Active Txns (Overall)

The maximum number of concurrently active transactions that occurred during the entire execution of the CICS region.

##### MaxTask

The maximum number of concurrent transactions CICS is configured for.

#### Mean Transaction Time

The average service time for the transactions observed during the measurement interval.

The service time consists of:

##### Execution Time

The time a CPU is processing the transaction.

##### Suspend Time

The time the transaction is suspended by CICS.

##### CICS Dispatch Delay Time

The time the transaction is delayed by CICS.

**MVS Dispatch Delay Time**

The time execution is delayed by the MVS dispatcher.

**Service Time**

The sum of the execution time, the suspend time, and the delay time.

**Service Statistics**

These are counts of service requests issued by CICS programs during the measurement interval:

- Program Requests
- Terminal Messages
- Storage Getmains
- Storage Freemains
- File I/O Requests
- Temporary Storage Requests
- Transient Data Requests
- Journal Write Requests

**Exception or Critical Conditions**

These are counts of certain exception or critical conditions that occurred during the measurement interval:

- System Dumps
- System Dumps Suppressed
- Transaction Dumps
- Transaction Dumps Suppressed
- Storage Violations
- Short on Storage occurrences
- Times at MaxTask
- Times at Class MaxTask

**Transaction Counts**

A list of each transaction code that was measured and the number of executions is shown here.

**Sample reports**

A sample report is shown here:



```

File View Navigate Help

E01: CICS Session Statistics (0866/CICS23A) Row 00001 of 00045
Command ==> ----- Scroll ==> CSR

Environmental Information
CICS Release CICS/TS 2.3

Transaction Statistics
First Transaction TaskId 0002089
Last Transaction TaskId 0002242
Number of TaskId Increments 153
Number of Observed Transactions 153
Transaction Rate (per sec) 2.18
Peak Active Txns (Observed) 1
Peak Active Txns (Overall) 2
MaxTask 5

Mean Transaction Time (Execution + Suspend + Delay = Service)
Execution Time 0.0727747
Suspend Time 0.232708
CICS Dispatch Delay Time 0.052427
MVS Dispatch Delay Time 0.018062
Service Time 0.375944

Service Statistics
Program Requests 536
Terminal Messages 305
Storage Getmains 3,295
Storage Freemains 3,279
File I/O Requests 0
Temporary Storage Requests 0
Transient Data Requests 0
Journal Write Requests 0

Exception or Critical Conditions
System Dumps 0
System Dumps Suppressed 0
Transaction Dumps 0
Transaction Dumps Suppressed 0
Storage Violations 0
Short on Storage occurrences 0
Times at MaxTask 0

```

```

File View Navigate Help

E01: CICS Session Statistics (0866/CICS23A) Row 00040 of 00047
Command ==> ----- Scroll ==> CSR

Transaction Counts

TranId Count
DNC1 151
CESN 2
CQRY 1
CATA 1

```

## E02 - CICS CPU and use count by program

### Usage

Use this report to get CPU usage and call counts for CICS programs that were executing during the observation session.

### Quantification

Each report line displays the number of times a program was called by CICS services. The report will not show any calls that use a direct method such as a BALR.

Each report line also shows the percentage of CPU usage attributable to the program. Each percentage represents the ratio of CPU consumption observed for the reported program to the total CPU consumption for all CICS programs.

A program name of "CICS" is used to quantify CPU consumption not directly attributable to a CICS program.

A CICS program in this report is a program that is defined in the CICS System Definition (CSD) dataset.

## Detail line hierarchy

The E02 shows one level, the detail lines cannot be expanded.

## Sample reports

A sample is shown here:

| File View Navigate Help                            |       |                                                  |                    |
|----------------------------------------------------|-------|--------------------------------------------------|--------------------|
| E02: CICS CPU and Use Counts by Pgm (3090/CICS23A) |       |                                                  | Row 00001 of 00016 |
| Command ==>                                        |       |                                                  | Scroll ==> CSR     |
| Name                                               | Calls | Percent of CPU Time * 10.00% ±1.5%               |                    |
|                                                    |       | *....1....2....3....4....5....6....7....8....9.. |                    |
| CICSDB2                                            | 300   | 36.82                                            | =====              |
| SAMPREAD                                           | 501   | 30.56                                            | =====              |
| DSN5CA0                                            | 30    | 10.05                                            | =====              |
| CSOCTRUE                                           | 0     | 4.09                                             | ==                 |
| DFHD2EX1                                           | 0     | 3.79                                             | ==                 |
| CICS                                               | 0     | 3.74                                             | ==                 |
| Db2DRVR                                            | 1     | 2.44                                             | =                  |
| READDRVR                                           | 1     | 2.29                                             | =                  |
| MQSAMP1                                            | 100   | 2.12                                             | =                  |
| MQDRVR                                             | 1     | 1.54                                             | =                  |
| SAMPBGN1                                           | 200   | 1.22                                             | =                  |
| CSQ4CVK1                                           | 100   | 1.09                                             | =                  |
| IMSDRVR                                            | 1     | 0.19                                             |                    |
| DFHEMTD                                            | 1     | 0.00                                             |                    |
| DFHEITMT                                           | 1     | 0.00                                             |                    |
| DFHEMTP                                            | 1     | 0.00                                             |                    |

## Detail line descriptions

### CICS program name detail line

This is the only level for the detail line. Each line shows information about a CICS program for which CPU consumption was measured.

| Under Heading       | This is Displayed                                                                                                       |
|---------------------|-------------------------------------------------------------------------------------------------------------------------|
| Name                | The CICS program name.                                                                                                  |
| Calls               | The number of times this program was called by another CICS program.<br>The call must be done by an EXEC CICS API call. |
| Percent of CPU Time | The percentage of CPU time consumed during execution of the program.                                                    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Load Module            | Display context help information. |
| ++  | Load Module            | Show additional details.          |
| M   | Load Module            | Display load module information.  |

## on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Name, Percent CPU      | Display context help information. |
| +   | Percent CPU            | Zoom in scale.                    |
| -   | Percent CPU            | Zoom out scale.                   |
| +   | Percent CPU            | Zoom in scale.                    |
| SV  | Name                   | Sort next level by value.         |
| SN  | Name                   | Sort next level by name.          |
| SC  | Name                   | Sort by call count.               |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| SAMPREAD 501 30.56 ===== |
+-----+

Call count at start: 3
Call count at end: 504
Difference: 501
Load count: 0
CPU active samples: 1,225
Total CPU active: 4,008

```

## E03 - CICS CPU usage by transaction

## Usage

Use this report to see how CPU consumption was distributed across the CICS transactions that were executing during the observation session.

Expand a CICS transaction report line to see a further breakdown by program, CICS command and SQL Request.

## Quantification

Each report line quantifies CPU usage as a percentage. Each percentage represents the ratio of CPU consumption observed for the reported item (transaction, program, CICS command or SQL request) to the

total CPU consumption measured in the address space. The sum of all the percentages will normally be less than 100 percent because only those CICS transactions being measured are quantified in the report. But the percentage is the portion of the total CICS region CPU consumption.

Similarly, any CICS region CPU overhead not attributable to CICS transactions will not be quantified in the report.

## Detail line hierarchy

An unexpanded E03 report shows a line for each CICS transaction for which CPU usage was measured. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
 Level 2 CICS Program
 Level 3 CICS Command
 Level 3 CICS Command

 ...

 Level 2 CICS Program
 Level 3 SQL Request
 Level 3 SQL Request

 ...

 Level 2 CICS Program
 Level 3 DL/I Request
 Level 3 DL/I Request

 Level 2 EXEC ADABAS
 Level 3 ADABAS Request
 Level 3 ADABAS Request

 ...

 Level 2 Natural Programs
 Level 3 Natural Program
 Level 3 Natural Program

 ...

 Level 2 CICS Program
 Level 3 Module
 Level 3 Module
 Level 3 System Services

 ...

 Level 2 CICS Program
 Level 3 Adabas Request
 Level 3 Adabas Request

 ...

 Level 2 System Services
 Level 3 Module
 Level 3 Module
 Level 3 System Services

 ...

```

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

```

File View Navigate Help

E03: CICS CPU Usage by Transaction (0817/CICS23A) Row 00001 of 00004
Command ===> _____ Scroll ===> CSR

Name NTxns/Description Percent of CPU time * 10.00% ±1.5%
 *....1....2....3....4....5....6....7
DNC1 327 77.22 =====
FINQ 295 8.35 =====

```

You can enter the “+” line command on a transaction to expand to the next level. A sample of the report with a transaction expanded to the second level of the hierarchy (CICS program) is shown here:

```

File View Navigate Help

E03: CICS CPU Usage by Transaction (0817/CICS23A) Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

Name NTxns/Description Percent of CPU time * 10.00% ±1.5%
 *....1....2....3....4....5....6....7
DNC1 327 77.22 =====
→ PFSAMPC EXEC SQL 35.01 =====
→ DFHD2EX1 CICS Program 16.38 =====
→ PFSAMPB EXEC SQL 8.14 =====
→ PFSAMPA EXEC SQL 3.59 ==
→ PFSAMPA CICS Program 3.54 ==
→ CICS System Services 3.11 ==
→ PFSAMPB CICS Program 3.02 ==
→ PFSAMPA EXEC CICS 2.05 =
→ PFSAMPC CICS Program 1.89 =
→ CEECCICS EXEC CICS 0.34
→ PFSAMPB EXEC CICS 0.09
FINQ 295 8.35 =====

```

You can enter the “+” line command on a program to expand to the next level. In the sample below, a line with description “EXEC SQL” has been expanded, showing the SQL commands:

```

File View Navigate Help

E03: CICS CPU Usage by Transaction (0817/CICS23A) Row 00001 of 00027
Command ==> _____ Scroll ==> CSR

Name NTxns/Description Percent of CPU time * 10.00% ±1.5%
 *....1....2....3....4....5....6....7
DNC1 327 77.22 =====
→ PFSAMPC EXEC SQL 35.01 =====
→ +1BE2 FETCH 13.29 =====
→ +662A FETCH 6.56 ==
→ +0F52 SELECT 3.36 ==
→ +6E9C SELECT 2.72 =
→ +1164 SELECT 2.33 =
→ +6C4C SELECT 1.89 =
→ +6248 SELECT 1.85 =
→ +1588 OPEN 1.55 =
→ +64D0 OPEN 0.89
→ +6752 CLOSE 0.29
→ +2348 CLOSE 0.22

```

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which CPU consumption was measured.

| Under Heading       | This is Displayed                                                        |
|---------------------|--------------------------------------------------------------------------|
| Name                | The CICS transaction code.                                               |
| NTxns               | The number of executions of the transaction.                             |
| Description         | If this is a recognized CICS transaction, a functional description.      |
| Percent of CPU Time | The percentage of CPU time consumed during execution of the transaction. |

### CICS program or system services detail line

This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be CICS command lines, SQL requests, DL/I requests or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading       | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The module name of the CICS program. If lines grouped under this line are CICS command lines, Db2 SQL, or IMS DLI calls, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                  |
| Description         | If lines grouped under this line are CICS command lines, this displays “EXEC CICS.” If lines grouped under this line are SQL request lines, this displays “EXEC SQL”. If lines grouped under this line are DL/I request lines, this displays “EXEC DLI”. Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if it is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |
| Percent of CPU Time | The percentage of CPU time consumed while executing in the identified program during execution of the transaction under which the line appears.                                                                                                                                                                                                                                                                                                                                                                                                                |

## CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This is in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description         | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                 |
| Percent of CPU Time | The percentage of CPU time consumed while executing the CICS command.                                                                                                                                                                                                                                                                                                                     |

## SQL Request detail line

These lines appear under a CICS Program detail line. Each one represents an SQL request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                                                                                                                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL call. This is in +xxxx format. This field is always displayed in red |
| Description         | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                           |
| Percent of CPU Time | The percentage of CPU time consumed while executing the SQL request.                                                                                             |

## DL/I Request detail line

These lines appear under a CICS Program detail line. Each one represents an IMS DL/I request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The hexadecimal offset in the identified CICS program of the return address of the EXEC DL/I call. This is in +xxxx format. This field is always displayed in red. |
| Description         | The DL/I function code followed by the PCB name.                                                                                                                   |
| Percent of CPU Time | The percentage of CPU time consumed while executing the DL/I request.                                                                                              |

## Active module detail line

These lines appear under a CICS Program detail line. Each one represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|
| Name                | The name of the module that was executing.                                                                                 |
| Description         | A functional description of the module if one is available.                                                                |
| Percent of CPU Time | The percentage of CPU time consumed while executing in the module within the grouping under which the detail line appears. |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                                                                                                                                                                           |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                     |
| Description         | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed. |
| Percent of CPU Time | The percentage of CPU time consumed while executing the Adabas request.                                                                                                                                                     |

## Natural Programs detail line

These lines appear under a CICS Program detail line. Each one represents processing for a Natural program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading       | This is Displayed                                                       |
|---------------------|-------------------------------------------------------------------------|
| Name                | This is the name of the Natural program for which processing occurred.  |
| Description         | The Natural library from which the Natural program was obtained.        |
| Percent of CPU Time | The percentage of CPU time consumed while executing Natural processing. |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                        | Action                            |
|-----|---------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Display context help information. |
| ++  | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Show additional details.          |
| +   | Transaction, Load Module                                      | Expand to reveal next level.      |
| –   | Transaction, Load Module                                      | Collapse to hide next level.      |
| SV  | Transaction, Load Module                                      | Sort next level by value.         |
| SN  | Transaction, Load Module                                      | Sort next level by name.          |
| M   | Load Module                                                   | Display load module information.  |
| P   | CICS Active Module, Command, CSECT, Seqno, DL/I Request       | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Sort next level by name.           |
| +   | Percent CPU                    | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce description field size.     |
| –   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here, this one is for a CICS command:



```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > +2C70 RETURN 0.72 |
+-----+

Calculation Details
CICS Transaction DNC1
CPU Measurements Servicing CICS Commands 21
Total Measurements 2906
Percent of total 0.72%

Command Attributes
CICS Command EXEC CICS RETURN
Issued in Load Module PFSAMPA
Return Offset in Module +2C90
Name of CSECT PFSAMPA
Return Offset in CSECT +2C70

The command execution measurement counts are
Executing (CPU active) 21
Suspended by CICS 0
Delayed
 CICS dispatch delay 0
 MVS delay (WAIT) 0
 MVS delay (Busy) 0

```

A sample detail window for an SQL command is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| → +84D6 SELECT 1,84 = |
+-----+

Calculation Details
CICS Transaction DNC1
CPU Measurements Servicing Db2 SQL 168
Total Measurements 1980
Percent of total 8.48%
These quantities represent measurements of CPU usage while
processing the indicated SQL requests.

SQL Statement Information
Subsystem name DSN1 Attach type SASS
Plan name PFSAMPA Plan BIND time Nov-28-04 14:11:17

DBRM name PSSAMPC DBRM token 17859595 06957A24
DBRM date/time Nov-25-04 14:49:42

Package ID PFSAMPC Location CABNETDb24
Collectn name PFSAMPX2 Pkg BIND time no data

SQL function SELECT Static/dynamic Static
Precmplr stmt# 3155 DBRM section# 20
CSECT/module PFSAMPC in PFSAMPC Offset of call 000084D6
Sample count 69 SQL req count 172
SQL CPU time 0.28 Service time 0.43

SQL Statement: SELECT *
 INTO : H ,
 : H : H ,
 : H : H
 FROM DEP
 WHERE XRATE = : H

```

## SETUP options

The following SETUP option can be selected with the SETUP primary command:

### Minimum CPU percentage

You can set this option to eliminate modules where the CPU percentage is below a certain threshold.

## E04 - CICS mean service time by transaction

---

### Usage

Use this report to see an analysis of how time was spent by the CICS transactions that were executing during the observation session. Expand a CICS transaction report line to see a further breakdown by program, CICS command, DL/I request and SQL request.

### Quantification

Each report line quantifies time as arithmetic means for each measured transaction. The means are calculated by dividing the total of all time spent servicing all occurrences of a transaction by its number of occurrences. The means are expressed in units of seconds. The mean service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E04 report shows a line for each measured CICS transaction. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL
Level 3 SQL Request
Level 3 SQL Request

Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request

Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request

Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement

Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services

Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...
```

### Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

| File View Navigate Help                           |     |       |             |                    |                             |           |
|---------------------------------------------------|-----|-------|-------------|--------------------|-----------------------------|-----------|
| E04: CICS Mean Service Time by Txn (0817/CICS23A) |     |       |             | Row 00001 of 00004 |                             |           |
| Command ==> _____                                 |     |       |             | Scroll ==> CSR     |                             |           |
| Name                                              |     | NTxns | Description | Error              | Mean Time in Seconds        |           |
|                                                   |     |       |             |                    | Execution + Suspend + Delay | = Service |
| DNC1                                              | 327 |       |             | ± 5.5%             | 0.103                       | 0.013     |
| FINQ                                              | 295 |       |             | ± 5.8%             | 0.012                       | 0.000     |
|                                                   |     |       |             |                    | 0.023                       | 0.140     |
|                                                   |     |       |             |                    | 0.011                       | 0.023     |

You can enter the “+” line command on a transaction to expand to the next level. A sample of the report with a transaction expanded to the second level of the hierarchy (CICS Program) is shown here:

| File View Navigate Help                           |     |       |                 |                    |                             |           |
|---------------------------------------------------|-----|-------|-----------------|--------------------|-----------------------------|-----------|
| E04: CICS Mean Service Time by Txn (0817/CICS23A) |     |       |                 | Row 00001 of 00004 |                             |           |
| Command ==> _____                                 |     |       |                 | Scroll ==> CSR     |                             |           |
| Name                                              |     | NTxns | Description     | Error              | Mean Time in Seconds        |           |
|                                                   |     |       |                 |                    | Execution + Suspend + Delay | = Service |
| DNC1                                              | 327 |       |                 | ± 5.5%             | 0.103                       | 0.013     |
| → PFSAMPC                                         |     |       | EXEC SQL        |                    | 0.046                       | 0.000     |
| → DFHD2EX1                                        |     |       | CICS Program    |                    | 0.021                       | 0.011     |
| → PFSAMPB                                         |     |       | EXEC SQL        |                    | 0.010                       | 0.000     |
| → CICS                                            |     |       | System Services |                    | 0.004                       | 0.000     |
| → PFSAMPA                                         |     |       | CICS Program    |                    | 0.004                       | 0.000     |
| → PFSAMPA                                         |     |       | EXEC SQL        |                    | 0.004                       | 0.000     |
| → PFSAMPB                                         |     |       | CICS Program    |                    | 0.004                       | 0.000     |
| → PFSAMPC                                         |     |       | CICS Program    |                    | 0.002                       | 0.000     |
| → PFSAMPA                                         |     |       | EXEC CICS       |                    | 0.002                       | 0.000     |
| → CEECCICS                                        |     |       | EXEC CICS       |                    | 0.000                       | 0.000     |
| → PFSAMPB                                         |     |       | EXEC CICS       |                    | 0.000                       | 0.000     |

You can enter the “+” line command on a program to expand to the next level. In the sample below, a line with description “EXEC SQL” has been expanded, showing the SQL commands:

| File View Navigate Help                           |     |       |             |                    |                             |           |
|---------------------------------------------------|-----|-------|-------------|--------------------|-----------------------------|-----------|
| E04: CICS Mean Service Time by Txn (0817/CICS23A) |     |       |             | Row 00001 of 00041 |                             |           |
| Command ==> _____                                 |     |       |             | Scroll ==> CSR     |                             |           |
| Name                                              |     | NTxns | Description | Error              | Mean Time in Seconds        |           |
|                                                   |     |       |             |                    | Execution + Suspend + Delay | = Service |
| DNC1                                              | 327 |       |             | ± 5.5%             | 0.103                       | 0.013     |
| → PFSAMPC                                         |     |       | EXEC SQL    |                    | 0.046                       | 0.000     |
| → +1BE2                                           |     |       | FETCH       |                    | 0.017                       | 0.000     |
| → +662A                                           |     |       | FETCH       |                    | 0.008                       | 0.000     |
| → +0F52                                           |     |       | SELECT      |                    | 0.004                       | 0.000     |
| → +6E9C                                           |     |       | SELECT      |                    | 0.003                       | 0.000     |
| → +1164                                           |     |       | SELECT      |                    | 0.003                       | 0.000     |
| → +6C4C                                           |     |       | SELECT      |                    | 0.002                       | 0.000     |
| → +6248                                           |     |       | SELECT      |                    | 0.002                       | 0.000     |
| → +1588                                           |     |       | OPEN        |                    | 0.002                       | 0.000     |
| → +64D0                                           |     |       | OPEN        |                    | 0.001                       | 0.000     |
| → +6752                                           |     |       | CLOSE       |                    | 0.000                       | 0.000     |
| → +2348                                           |     |       | CLOSE       |                    | 0.000                       | 0.000     |

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed          |
|---------------|----------------------------|
| Name          | The CICS transaction code. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Description   | If this is a recognized CICS transaction, a functional description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Error         | The margin of error for the mean values calculated by using the number of executions of the transaction as the sample size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Execution     | The mean time, in seconds, a CPU was actively executing for the transaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Suspend       | The mean time, in seconds, CICS had suspended execution of the transaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## CICS program or system services detail line

This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be either CICS command lines, SQL Request lines, DL/I Request lines or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, Db2 SQL, or IMS DLI calls, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NTxns         | If lines grouped under this line are CICS command lines, this displays “EXEC CICS”. If lines grouped under this line are SQL request lines, this displays “EXEC SQL”. If lines grouped under this line are DL/I request lines, this displays “EXEC DLI”. Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if it is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control.                                                                                                                                                                                                                                           |
| Description   | If this is a recognized CICS transaction, a functional description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Execution     | The mean time, in seconds, CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Suspend       | The mean time, in seconds, CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i>.</p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction control was under the CICS program identified in the Name column. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This is in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Execution     | The mean time, in seconds, CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction the CICS command was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## SQL request detail line

These lines appear under a CICS Program detail line. Each one represents an SQL request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The SQL request function — SELECT, FETCH, UPDATE, etc.                                                                                                               |
| Execution     | The mean time, in seconds, CPU execution was observed while the SQL request was being processed.                                                                     |
| Suspend       | The mean time, in seconds, CICS had suspended execution of the transaction while the SQL request was being processed.                                                |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## DL/I request detail line

These lines appear under a CICS Program detail line. Each one represents an IMS DL/I request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DL/I command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The DL/I function code followed by the PCB name.                                                                                                                      |
| Execution     | The mean time, in seconds, CPU execution was observed while the DL/I request was being processed.                                                                     |
| Suspend       | The mean time, in seconds, CICS had suspended execution of the transaction while the DL/I request was being processed.                                                |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction the DL/I request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Module/system services detail line

These lines appear under a CICS Program detail line. Each one represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, "CICS" is displayed in the name field and "System Services" in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or "CICS" if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. "System Services" is displayed if the module name could not be determined. |
| Execution     | The mean time, in seconds, for execution of the module within the grouping under which the detail line appears.                        |
| Suspend       | This field will contain a value of zero.                                                                                               |



| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The mean service time for the transaction the identified module was executing or delayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                                      |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                                  |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                             |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                        |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                              |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The heading, 'Natural' is displayed.                                                                                                                                                                                                                         |
| Description   | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution     | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object                                        | Action                            |
|-----|---------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Display context help information. |
| ++  | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Show additional details.          |
| +   | Transaction, Load Module                                      | Expand to reveal next level.      |
| –   | Transaction, Load Module                                      | Collapse to hide next level.      |
| SV  | Transaction, Load Module                                      | Sort next level by value.         |
| SN  | Transaction, Load Module                                      | Sort next level by name.          |
| M   | Load Module                                                   | Display load module information.  |
| P   | CICS Active Module, Command, CSECT, Seqno, DL/I Request       | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here, this one is for a CICS command:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| > +2C70 RETURN 0.000 0.000 0.000 0.000|
+-----+

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are mean times for the command for all executions of the
transaction and are calculated as follows:

(1) Times command observed in txn/program 26
(2) Duration of one sample interval 0.006003
(3) (1) × (2) = total time for command 0.156078
(4) Number of executions of transaction 342
(5) (3) ÷ (4) = mean time for the command 0.000456

Command Attributes
CICS Command EXEC CICS RETURN
Issued in Load Module PFSAMPA
Return Offset in Module +2C90
Name of CSECT PFSAMPA
Return Offset in CSECT +2C70

The command execution measurement counts are
Executing (CPU active) 21
Suspended by CICS 5
Delayed
 CICS dispatch delay 0
 MVS delay (WAIT) 0
 MVS delay (Busy) 0

```

A sample detail window for an SQL command is shown here:

```

File View Navigate Help
+----- The following report line was selected -----
| → +85D8 SELECT 0.001 0.000 0.000
+-----

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for execution of the
indicated Db2 SQL call while processing this transaction. The
quantities are mean times for the SQL call for all executions of the
transaction and are calculated as follows:

(1) Times SQL call observed in txn/program 93
(2) Duration of one sample interval 0.006003
(3) (1) x (2) = total time for SQL call 0.558279
(4) Number of execution of transaction 342
(5) (3) ÷ (4) = mean time for the SQL call 0.001632

SQL Statement Information
Subsystem name DSN1 Attach type SASS
Plan name PFSAMPA Plan BIND time Nov-28-04 14:11:17

DBRM name PSSAMPC DBRM token 17859595 06957A24
DBRM date/time Nov-25-04 14:49:42

Package ID PFSAMPC Location CABNETDb24
Collectn name PFSAMPX2 Pkg BIND time no data

SQL function SELECT Static/dynamic Static
Precmplr stmt# 3179 DBRM section# 21
CSECT/module PFSAMPC in PFSAMPC Offset of call 000085D8
Sample count 93 SQL req count 172
SQL CPU time 0.28 Service time 0.54

SQL Statement: SELECT *
 INTO : H ,
 : H : H ,
 : H : H
 FROM DEPT
 WHERE XRATE = : H

```

## E05 - CICS total service time by Txn

### Usage

Use this report to see an analysis of how time was spent by the CICS transactions that were measured during the observation session. Expand a CICS transaction report line to see a further breakdown by program and by CICS command.

### Quantification

Each report line quantifies total times for each measured transaction. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E05 report shows a line for each measured CICS transaction. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

```

```

Level 2 EXEC SQL
Level 3 SQL Request
Level 3 SQL Request
...
Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request
...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request
...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement
...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services
...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...

```

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                |
|---------------|--------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                       |
| NTxns         | The number of executions of the transaction.                                                     |
| Description   | If this is a recognized CICS transaction, a functional description.                              |
| Error         | The margin of error based on a sample population of the number of executions of the transaction. |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction.               |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction.                |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### CICS program or system services detail line

This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be either CICS command lines, SQL Request lines, DL/I Request lines or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, Db2 SQL, or IMS DLI calls, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                  |
| Description   | If lines grouped under this line are CICS command lines, this displays “EXEC CICS”. If lines grouped under this line are SQL request lines, this displays “EXEC SQL”. If lines grouped under this line are DL/I request lines, this displays “EXEC DLI”. Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if it is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |
| Execution     | The total time, in seconds, CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction control was under the CICS program identified in the Name column. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This is in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                 |
| Execution     | The total time, in seconds, CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                        |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                   |



| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the CICS command was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## SQL request detail line

These lines appear under a CICS Program detail line. Each one represents an SQL request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The SQL request function — SELECT, FETCH, UPDATE, etc.                                                                                                               |
| Execution     | The total time, in seconds, CPU execution was observed while the SQL request was being processed.                                                                    |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while the SQL request was being processed.                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## DL/I request detail line

These lines appear under a CICS Program detail line. Each one represents an IMS DL/I request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DL/I command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The DL/I function code followed by the PCB name.                                                                                                                      |
| Execution     | The total time, in seconds, CPU execution was observed while the DL/I request was being processed.                                                                    |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while the DL/I request was being processed.                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the DL/I request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### Module/system services detail line

These lines appear under a CICS Program detail line. Each one represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line appears.                       |
| Suspend       | This field will contain a value of zero.                                                                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fourth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the identified module was executing or delayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                                       |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                                   |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                             |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                        |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                              |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The heading, 'Natural' is displayed.                                                                                                                                                                                                                         |
| Description   | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution     | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

| File View Navigate Help                            |       |             |        |           |                    |           |
|----------------------------------------------------|-------|-------------|--------|-----------|--------------------|-----------|
| E05: CICS Total Service Time by Txn (0817/CICS23A) |       |             |        |           | Row 00001 of 00004 |           |
| Command ==> _____                                  |       |             |        |           | Scroll ==> CSR     |           |
| ----- Mean Time in Seconds -----                   |       |             |        |           |                    |           |
| Name                                               | NTxns | Description | Error  | Execution | + Suspend + Delay  | = Service |
| DNC1                                               | 327   |             | ± 5.5% | 33.736    | 4.419              | 45.805    |
| FINQ                                               | 295   |             | ± 5.8% | 3.649     | 0.000              | 7.029     |

You can enter the “+” line command on a transaction to expand to the next level. A sample of the report with a transaction expanded to the second level of the hierarchy (CICS Program) is shown here:

| File View Navigate Help                            |       |                 |        |           |                     |           |
|----------------------------------------------------|-------|-----------------|--------|-----------|---------------------|-----------|
| E05: CICS Total Service Time by Txn (0817/CICS23A) |       |                 |        |           | Row 00001 of 000015 |           |
| Command ==> _____                                  |       |                 |        |           | Scroll ==> CSR      |           |
| ----- Total Time in Seconds -----                  |       |                 |        |           |                     |           |
| Name                                               | NTxns | Description     | Error  | Execution | + Suspend + Delay   | = Service |
| DNC1                                               | 327   |                 | ± 5.5% | 33.736    | 4.419               | 7.649     |
| → PFSAMPC                                          |       | EXEC SQL        |        | 15.298    | 0.000               | 16.868    |
| → DFHD2EX1                                         |       | CICS Program    |        | 7.159     | 3.709               | 0.869     |
| → PFSAMPB                                          |       | EXEC SQL        |        | 3.559     | 0.000               | 0.949     |
| → CICS                                             |       | System Services |        | 1.359     | 0.089               | 2.799     |
| → PFSAMPA                                          |       | CICS Program    |        | 1.549     | 0.259               | 0.769     |
| → PFSAMPA                                          |       | EXEC SQL        |        | 1.569     | 0.000               | 0.539     |
| → PFSAMPB                                          |       | CICS Program    |        | 1.319     | 0.179               | 0.079     |
| → PFSAMPC                                          |       | CICS Program    |        | 0.829     | 0.139               | 0.000     |
| → PFSAMPA                                          |       | EXEC CICS       |        | 0.899     | 0.009               | 0.039     |
| → CEECCICS                                         |       | EXEC CICS       |        | 0.149     | 0.019               | 0.029     |
| → PFSAMPB                                          |       | EXEC CICS       |        | 0.039     | 0.009               | 0.000     |

You can enter the “+” line command on a program to expand to the next level. In the sample below, a line with description “EXEC SQL” has been expanded, showing the SQL commands:

| File View Navigate Help                            |       |             |        |           |                    |           |
|----------------------------------------------------|-------|-------------|--------|-----------|--------------------|-----------|
| E05: CICS Total Service Time by Txn (0817/CICS23A) |       |             |        |           | Row 00001 of 00027 |           |
| Command ==> _____                                  |       |             |        |           | Scroll ==> CSR     |           |
| ----- Total Time in Seconds -----                  |       |             |        |           |                    |           |
| Name                                               | NTxns | Description | Error  | Execution | + Suspend + Delay  | = Service |
| DNC1                                               | 327   |             | ± 5.5% | 33.736    | 4.419              | 7.649     |
| → PFSAMPC                                          |       | EXEC SQL    |        | 15.298    | 0.000              | 1.569     |
| → +1BE2                                            |       | FETCH       |        | 5.809     | 0.000              | 0.579     |
| → +662A                                            |       | FETCH       |        | 2.869     | 0.000              | 0.109     |
| → +0F52                                            |       | SELECT      |        | 1.469     | 0.000              | 0.239     |
| → +6E9C                                            |       | SELECT      |        | 1.189     | 0.000              | 0.129     |
| → +1164                                            |       | SELECT      |        | 1.019     | 0.000              | 0.189     |
| → +6C4C                                            |       | SELECT      |        | 0.829     | 0.000              | 0.109     |
| → +6248                                            |       | SELECT      |        | 0.809     | 0.000              | 0.079     |
| → +1588                                            |       | OPEN        |        | 0.679     | 0.000              | 0.059     |
| → +64D0                                            |       | OPEN        |        | 0.389     | 0.000              | 0.029     |
| → +6752                                            |       | CLOSE       |        | 0.129     | 0.000              | 0.019     |
| → +2348                                            |       | CLOSE       |        | 0.099     | 0.000              | 0.019     |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object                                        | Action                            |
|-----|---------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Display context help information. |
| ++  | Transaction, Load Module, CSECT, Command, Seqno, DL/I Request | Show additional details.          |
| +   | Transaction, Load Module                                      | Expand to reveal next level.      |
| –   | Transaction, Load Module                                      | Collapse to hide next level.      |
| SV  | Transaction, Load Module                                      | Sort next level by value.         |
| SN  | Transaction, Load Module                                      | Sort next level by name.          |
| M   | Load Module                                                   | Display load module information.  |
| P   | CICS Active Module, Command, CSECT, Seqno, DL/I Request       | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here, this one is for a CICS command:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| > +2C70 RETURN 0.126 0.030 0.000 0.156|
+-----+

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times command observed in txn/program 26
(2) Duration of one sample interval 0.006003
(3) (1) x (2) = total time for command 0.156078

Command Attributes
CICS Command EXEC CICS RETURN
Issued in Load Module PFSAMPA
Return Offset in Module +2C90
Name of CSECT PFSAMPA
Return Offset in CSECT +2C70

The command execution measurement counts are
Executing (CPU active) 21
Suspended by CICS 5
Delayed
 CICS dispatch delay 0
 MVS delay (WAIT) 0
 MVS delay (Busy) 0

```

A sample detail window for an SQL command is shown here:



```

File View Navigate Help
+----- The following report line was selected -----+
| → +6E9C SELECT 1.189 0.000 0.129
+-----+

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times SQL call observed in txn/program 132
(2) Duration of one sample interval 0.009999
(3) (1) x (2) = total time for SQL call 1.319868

SQL Statement Information
DBRM name PSSAMPC
DBRM token 17652081 1C3E933C
Precmplr stmt# 3179
SQL Call Module PFSAMPC
SQL Call CSECT PFSAMPC
SQL Call Offset 00006E9C
SQL Function SELECT
Subsystem name DSN1
Connection Type SASS
Package/Plan:
 Location CABNETDB24
 Collectn name PFSAMPC6
 Package ID PFSAMPC
 Plan name PFSAMPA

SQL Req Count 105

SQL Statement: SELECT *
 INTO : H ,
 : H : H ,
 : H : H
 FROM DEP
 WHERE XRATE = : H

```

## E06 - CICS service time by task ID

### Usage

Use this report to see a chronology of occurrences of CICS transactions. Expand a CICS transaction report line to see a separate line for each execution of the transaction. Expand a task number report line to see a further breakdown by program, CICS command, SQL request and DL/I request.

### Quantification

Each report line quantifies total times for each measured transaction. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E06 report shows a line for each measured CICS transaction. You can expand each line to reveal a line for each occurrence of the transaction.

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL

```

```

Level 3 SQL Request
Level 3 SQL Request
...
Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request
...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request
...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement
...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services
...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...

```

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                |
|---------------|--------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                       |
| NTxns         | The number of executions of the transaction.                                                     |
| Description   | If this is a recognized CICS transaction, a functional description.                              |
| Error         | The margin of error based on a sample population of the number of executions of the transaction. |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction.               |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction.                |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## CICS transaction number detail line

This detail line shows information about a single execution of the transaction.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The 'Task ID' of the transaction. This is a sequence number assigned to the transaction by CICS. CICS increments this value for each transaction execution. It serves as a unique transaction identifier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description   | The time of day at which the transaction was executed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Execution     | The total time, in seconds, CPU execution was observed while the transaction was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |

| Under Heading | This is Displayed                                                                            |
|---------------|----------------------------------------------------------------------------------------------|
| Service       | The total service time for the transaction. This includes execution, suspend and delay time. |

## CICS program or system services detail line

This is a third-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fourth-level lines shown under this item can be either CICS command lines, SQL request lines, DLI request lines or module lines.

If no CICS application program was dispatched, "CICS" is shown under the Name heading and "System Services" under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. "CICS" is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description   | If lines grouped under this line are CICS command lines, this displays "EXEC CICS." If lines grouped under this line are SQL request lines, this displays "EXEC SQL." If lines grouped under this line are DLI request lines, this displays "EXEC DLI." Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and "CICS Program" is displayed if it is not recognized; indicating this is likely an application program. "System Services" is displayed if no application program was in control.                                                                                                                                                                                                                                          |
| Execution     | The total time, in seconds, CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction control was under the CICS program identified in the Name column. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## CICS command detail line

detail line These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This is in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red.                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Execution     | The total time, in seconds, CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the CICS command was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## SQL request detail line

These lines appear under a CICS Program detail line. Each one represents an SQL request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The total time, in seconds, CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Suspend       | The total time, in seconds, CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Delay         | <p>The mean time, in seconds, execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## DLI request detail line

These lines appear under a CICS Program detail line. Each one represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The DLI function code followed by the PCB name.                                                                                                                      |
| Execution     | The total time, in seconds, CPU execution was observed while the DLI request was being processed.                                                                    |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                          |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the DLI request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Module/system services detail line

These lines appear under a CICS Program detail line. Each one represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line appears.                       |
| Suspend       | This field will contain a value of zero.                                                                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed. This is a fifth-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |
| Service       | The total service time for the transaction the identified module was executing or delayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                                       |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                                   |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                             |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                        |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                              |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.



| Under heading | This is displayed                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The heading, 'Natural' is displayed.                                                                                                                                                                                                                         |
| Description   | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution     | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

```

File View Navigate Help

E06: CICS Service Time by Task Id (0712/CICS23A) Row 00001 of 00003
Command ==> ----- Scroll ==> CSR

----- Total Time in Seconds -----
Name Count Description Error Execution + Suspend + Delay = Service
CKAM 1 ±99.9% 0.000 141.069 0.000 141.069
DNC1 72 ±11.9% 0.665 63.709 54.076 118.451
FINQ 174 ± 7.6% 1.576 0.035 73.506 75.118

```

By entering “+” on a transaction line, it is expanded into the CICS transaction occurrence detail line:

```

File View Navigate Help

E06: CICS Service Time by Task Id (0712/CICS23A) Row 00001 of 00177
Command ==> ----- Scroll ==> CSR

----- Total Time in Seconds -----
Name Count Description Error Execution + Suspend + Delay = Service
CKAM 1 ±99.9% 0.000 141.069 0.000 141.069
DNC1 72 ±11.9% 0.665 63.709 54.076 118.451
FINQ 174 ± 7.6% 1.576 0.035 73.506 75.118
→ 01531 16:34:50.97 0.000 0.000 0.361 0.361
→ 01533 16:34:51.87 0.000 0.000 0.513 0.513
→ 01534 16:34:53.55 0.000 0.000 0.303 0.303
→ 01536 16:34:53.99 0.000 0.000 0.490 0.490
→ 01537 16:34:54.92 0.000 0.000 0.256 0.256
→ 01539 16:34:55.30 0.035 0.000 0.490 0.525
→ 01540 16:34:56.39 0.000 0.000 0.482 0.482
→ 01541 16:34:58.06 0.000 0.000 0.397 0.397
→ 01542 16:34:58.60 0.000 0.000 0.408 0.408
→ 01544 16:34:59.08 0.000 0.000 0.432 0.432
→ 01545 16:34:59.99 0.023 0.000 0.280 0.303
→ 01547 16:34:00.48 0.011 0.000 0.361 0.373
→ 01548 16:34:00.92 0.000 0.000 0.443 0.443

```

## Line commands

### on objects

| Cmd | When Applied To Object             | Action                            |
|-----|------------------------------------|-----------------------------------|
| ?   | Transaction, Task ID, CICS Program | Display context help information. |
| ++  | Transaction, Task ID, CICS Program | Show additional details.          |
| +   | Transaction, Task ID, CICS Program | Expand to reveal next level.      |
| –   | Transaction, Task ID, CICS Program | Collapse to hide next level.      |
| SV  | Transaction, Task ID, CICS Program | Sort next level by value.         |
| SN  | Transaction, Task ID, CICS Program | Sort next level by name.          |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| DNC1 342 ± 5.4% 15.547 1.596 3.373 20.518|
+-----+

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for executions of
this transaction. The service time is the sum of execution time,
suspend time and delay time. The quantities are total times for all
executions of the transaction and are calculated as follows:

(1) Number of times transaction observed 3418
(2) Duration of one sample interval 0.006003
(3) (1) × (2) = total time for transaction 20.518254

The transaction execution measurement counts are
Executing (CPU active) 2590
Suspended by CICS 266
Delayed
 CICS dispatch delay 125
 MVS delay (WAIT) 0
 MVS delay (Busy) 437

Measurement counts for service requests made by this transaction
Program requests 51
Terminal messages 0
Getmain requests 10
Freemain requests 11
File I/O requests 0
File suspends 0
Temporary storage requests 0
Transient data requests 0
Dump system requests 0
Dump transaction requests 0
Journal requests 0
```

## E07 - CICS wait by Txn

### Usage

Use this report to see where CICS transactions were waiting. Expand a CICS transaction report line to see a further breakdown by resource name.

### Quantification

Each report line quantifies accumulated wait as a percentage. Each percentage represents the ratio of wait time observed for the reported item (transaction or resource), to the total number of wait observations measured in the address space. There can be many wait observations recorded for the same CICS sample.

### Detail line hierarchy

An unexpanded E07 report shows a line for each CICS transaction which was observed to be in a wait. You can expand each line to reveal additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
Level 2 Wait Resource
Level 2 CICS Dispatch Delay
Level 2 MVS Delay (Wait)
Level 2 MVS Delay (Busy)

```

...

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction which was observed in a wait.

| Under Heading     | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name              | The CICS transaction code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| NTxns/Description | The number of executions of the transaction, and if this is a recognized CICS transaction, a functional description.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Percent wait time | The percentage of wait observations for this transaction of the total number of wait observations for the region.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Delay             | <p>The mean time, in seconds, that execution of the transaction was delayed. This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS resource type or a wait type. The complete list of resource types is documented in the <i>CICS Transaction Server for z/OS Problem Determination Guide</i></p> <p>The most common wait types include:</p> <p><b>CICS</b><br/>The CICS region was busy processing other transactions and could not dispatch this transaction.</p> <p><b>MVSWait</b><br/>The entire region was in a wait for an MVS service.</p> <p><b>MVSBusy</b><br/>The MVS system was busy and did not dispatch the CICS region.</p> <p><b>CICSSusp</b><br/>The transaction has been suspended by CICS while waiting on a resource.</p> |

## Sample reports

A sample report is shown here, the transaction has been expanded to the second level.

```

File View Navigate Help

E07: CICS Wait by Txn (1623/CICS23A) Row 00001 of 00005
Command ==> Scroll ==> CSR

Name NTxns/Description Percent of CPU time * 10.00% ±1.5%
 *....1....2....3....4....5....6....7
DNC1 342 24.80 =====
→ MVSBusy MVS Delay (Busy) 13.09 =====
→ CICSSusp Suspend 7.51 ===
→ CICSDis CICS Dispatch Delay 4.14 ==
→ MVSWait MVS Delay (Wait) 0.04

```

## Line commands

### on objects

| Cmd | When Applied To Object          | Action                            |
|-----|---------------------------------|-----------------------------------|
| ?   | Transaction, Resource/Wait type | Display context help information. |
| ++  | Transaction, Resource/Wait type | Show additional details.          |
| +   | Transaction                     | Expand to reveal next level.      |
| –   | Transaction                     | Collapse to hide next level.      |
| SV  | Transaction                     | Sort next level by value.         |
| SN  | Transaction                     | Sort next level by name.          |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## E08 - CICS mean service time by terminal ID

### Usage

Use this report to see an analysis of how time was spent on CICS terminals that were executing during the observation session. Expand a CICS terminal report line to see a further breakdown by transaction, program, CICS command, DLI request and SQL request.

### Quantification

Each report line quantifies time as arithmetic means for all measured transactions on the terminal. The means are calculated by dividing the total of all time spent servicing all occurrences of transactions on the terminal by the number of occurrences. The means are expressed in units of seconds. The mean service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E08 report shows a line for each measured CICS terminal, and one line for all non-terminal-attached transactions. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL
Level 3 SQL Request
Level 3 SQL Request
...
```

```

Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request
...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request
...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement
...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services
...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...

```

## Detail line descriptions

### CICS terminal detail line

This is the first-level detail line. Each line shows information about a CICS terminal for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS terminal ID. This will be the terminal ID or N/A if a terminal ID was not available during the sample. A terminal might not be available because the transaction was running while not attached to the terminal, or the transaction was not attached to the terminal during initialization or termination. |
| NTxns         | The number of executions of transactions on this terminal.                                                                                                                                                                                                                                                          |
| Description   | This will either be terminal transaction or nonterminal transaction.                                                                                                                                                                                                                                                |
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions for this terminal as a sample size.                                                                                                                                                                            |
| Execution     | The mean time, in seconds, that a CPU was actively executing transactions on this terminal.                                                                                                                                                                                                                         |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of transactions on this terminal.                                                                                                                                                                                                                      |
| Delay         | <p>The mean time, in seconds, execution of the transactions on this terminal was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul>               |
| Service       | The mean service time for transactions on this terminal, including execution, suspend, and delay time.                                                                                                                                                                                                              |

## CICS transaction detail line

This is the second-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                           |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                         |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                                                                                                                                                                                      |
| Error         | The margin of error for the mean values calculated by using the number of executions of the transaction as the sample size.                                                                                                                                          |
| Execution     | The mean time, in seconds, a CPU was actively executing for the transaction.                                                                                                                                                                                         |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                     |
| Delay         | The mean time, in seconds, execution of the transaction was delayed.<br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li><li>• MVS WAIT</li></ul> |
| Service       | The mean service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                          |

## CICS program or system services detail line

This is a third-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fourth-level lines shown under this item can be either CICS command lines, SQL Request lines, DLI Request lines, or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description   | If lines grouped under this line are CICS command lines, the description displays “EXEC CICS.” If lines grouped under this line are SQL request lines, the description displays “EXEC SQL.” If lines grouped under this line are DLI request lines, the description displays “EXEC DLI.” Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if the CICS module name is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The mean time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                              |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                         |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time.                                                                                                                                                                                          |

## CICS command detail line

These lines appear under a CICS program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                         |
| Execution     | The mean time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                            |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                       |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                                   |
| Service       | The mean service time for the transaction the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                                 |



## SQL request detail line

These lines appear under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                        |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                      |
| Execution     | The mean time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                             |

## DLI request detail line

These lines appear under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                        |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                             |
| Execution     | The mean time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction the DLI request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                             |

## Module/system services detail line

These lines appear under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these

lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The mean time, in seconds, for execution of the module within the grouping under which the detail line appears.                        |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The mean time, in seconds, that the identified module was preempted by MVS.                                                            |
| Service       | The mean service time for the transaction the identified module was executing or delayed.                                              |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                               |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                           |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                      |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                 |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                    |
|---------------|--------------------------------------|
| Name          | The heading, 'Natural' is displayed. |

|             |                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution   | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend     | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay       | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service     | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

A sample report is shown here, the transaction has been expanded to the second level.

| File View Navigate Help                              |       |                   |        |           |                    |         |           |
|------------------------------------------------------|-------|-------------------|--------|-----------|--------------------|---------|-----------|
| E08: CICS Mean Service Time by Termid (2669/CICS23A) |       |                   |        |           | Row 00001 of 00005 |         |           |
| Command ==>                                          |       |                   |        |           | Scroll ==> CSR     |         |           |
| ----- Mean Time in Seconds -----                     |       |                   |        |           |                    |         |           |
| Name                                                 | NTxns | Description       | Error  | Execution | + Suspend          | + Delay | = Service |
| ET38                                                 | 342   | Terminal Attached | ± 5.4% | 0.044     | 0.008              | 0.004   | 0.057     |
| → DNC1                                               | 342   |                   | ± 5.4% | 0.044     | 0.008              | 0.004   | 0.057     |
| → DFHD2EX1                                           |       | CICS Program      |        | 0.013     | 0.003              | 0.000   | 0.018     |
| → PFSAMPA                                            |       | CICS Program      |        | 0.001     | 0.000              | 0.000   | 0.001     |
| → PFSAMPB                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.001     |
| → CICS                                               |       | System Services   |        | 0.001     | 0.000              | 0.000   | 0.001     |
| → PFSAMPC                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.001     |
| → PFSAMPA                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → CEECCICS                                           |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPB                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPC                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
|                                                      |       |                   |        |           |                    |         |           |
| ET40                                                 | 325   | Terminal Attached | ± 5.5% | 0.042     | 0.007              | 0.005   | 0.056     |
| → DNC1                                               | 325   |                   | ± 5.5% | 0.042     | 0.007              | 0.005   | 0.056     |
| → DFHD2EX1                                           |       | CICS Program      |        | 0.012     | 0.003              | 0.001   | 0.016     |
| → PFSAMPA                                            |       | CICS Program      |        | 0.001     | 0.000              | 0.000   | 0.001     |
| → PFSAMPB                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.001     |
| → PFSAMPC                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.001     |
| → CICS                                               |       | System Services   |        | 0.000     | 0.000              | 0.000   | 0.001     |
| → PFSAMPA                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPB                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → CEECCICS                                           |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPC                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
|                                                      |       |                   |        |           |                    |         |           |
| ET33                                                 | 122   | Terminal Attached | ± 9.0% | 0.043     | 0.009              | 0.005   | 0.057     |
| → DNC1                                               | 122   |                   | ± 9.0% | 0.043     | 0.009              | 0.005   | 0.057     |
| → DFHD2EX1                                           |       | CICS Program      |        | 0.004     | 0.001              | 0.000   | 0.006     |
| → PFSAMPC                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → CICS                                               |       | System Services   |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPA                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPB                                            |       | CICS Program      |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPA                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → PFSAMPB                                            |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |
| → CEECCICS                                           |       | EXEC CICS         |        | 0.000     | 0.000              | 0.000   | 0.000     |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                       | Action                            |
|-----|------------------------------------------------------------------------------|-----------------------------------|
| ?   | Terminal, Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | Terminal, Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | Terminal, Transaction, Load Module                                           | Expand to reveal next level.      |
| –   | Terminal, Transaction, Load Module                                           | Collapse to hide next level.      |
| SV  | Terminal, Transaction, Load Module                                           | Sort next level by value.         |
| SN  | Terminal, Transaction, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                                  | Display load module information.  |

| Cmd | When Applied To Object                                       | Action                          |
|-----|--------------------------------------------------------------|---------------------------------|
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module | Display source program mapping. |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for a CICS command report is shown here:

|                                                                                                                                                                                                                                                   |                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| File View Navigate Help                                                                                                                                                                                                                           |                                        |
| +----- The following report line was selected -----+                                                                                                                                                                                              |                                        |
| → +118E                                                                                                                                                                                                                                           | RETURN TRANSID(DNC1) 0.000 0.000 0.000 |
| +-----                                                                                                                                                                                                                                            |                                        |
| Calculation Details                                                                                                                                                                                                                               |                                        |
| CICS Transaction                                                                                                                                                                                                                                  |                                        |
| The quantities shown represent the service time for execution of the indicated CICS command while processing transaction DNC1. The quantities are mean times for the command for all executions of the transaction and are calculated as follows: |                                        |
| (1) Times command observed in txn/program                                                                                                                                                                                                         | 6                                      |
| (2) Duration of one sample interval                                                                                                                                                                                                               | 0.009999                               |
| (3) (1) × (2) = total time for transaction                                                                                                                                                                                                        | 0.059994                               |
| (4) Number of executions of transaction                                                                                                                                                                                                           | 327                                    |
| (5) (3) ÷ (4) = mean time for the command                                                                                                                                                                                                         | 0.000183                               |
| Command Attributes                                                                                                                                                                                                                                |                                        |
| CICS Command                                                                                                                                                                                                                                      | EXEC CICS RETURN TRANSID(DNC1)         |
| Issued in Load Module                                                                                                                                                                                                                             | PFSAMPA                                |
| Return offset in Module                                                                                                                                                                                                                           | +11AE                                  |
| Name of CSECT                                                                                                                                                                                                                                     | PFSAMPA                                |
| Return of Offset in CSECT                                                                                                                                                                                                                         | +118E                                  |
| The command execution measurement counts are                                                                                                                                                                                                      |                                        |
| Executing (CPU active)                                                                                                                                                                                                                            | 5                                      |
| Suspended by CICS                                                                                                                                                                                                                                 | 0                                      |
| Delayed                                                                                                                                                                                                                                           |                                        |
| CICS dispatch delay                                                                                                                                                                                                                               | 0                                      |
| MVS delay (WAIT)                                                                                                                                                                                                                                  | 0                                      |
| MVS delay (Busy)                                                                                                                                                                                                                                  | 1                                      |

A sample detail window for an SQL command is shown here:

|                                                                                                                                                                                                                                                    |                                                                        |                |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------|--------------------|
| File View Navigate Help                                                                                                                                                                                                                            |                                                                        |                |                    |
| +----- The following report line was selected -----+                                                                                                                                                                                               |                                                                        |                |                    |
|                                                                                                                                                                                                                                                    | → +85D8                                                                | SELECT         | 0.001 0.000 0.000  |
| +-----                                                                                                                                                                                                                                             |                                                                        |                |                    |
| Calculation Details                                                                                                                                                                                                                                |                                                                        |                |                    |
| The quantities shown represent the service time for execution of the indicated Db2 SQL call while processing transaction DNC1. The quantities are mean times for the SQL call for all executions of the transaction and are calculated as follows: |                                                                        |                |                    |
| (1)                                                                                                                                                                                                                                                | Times SQL call observed in txn/program                                 | 93             |                    |
| (2)                                                                                                                                                                                                                                                | Duration of one sample interval                                        | 0.006003       |                    |
| (3)                                                                                                                                                                                                                                                | (1) x (2) = total time for SQL call                                    | 0.558279       |                    |
| (4)                                                                                                                                                                                                                                                | Number of executions of transaction                                    | 342            |                    |
| (5)                                                                                                                                                                                                                                                | (3) ÷ (4) = mean time for the SQL call                                 | 0.001632       |                    |
| SQL Statement Information                                                                                                                                                                                                                          |                                                                        |                |                    |
| Subsystem name                                                                                                                                                                                                                                     | DSN1                                                                   | Attach type    | SASS               |
| Plan name                                                                                                                                                                                                                                          | PFSAMPA                                                                | Plan BIND time | Nov-28-04 14:11:17 |
| DBRM name                                                                                                                                                                                                                                          | PFSAMPC                                                                | DBRM token     | 17859595 06957A24  |
| DBRM date/time                                                                                                                                                                                                                                     | Nov-25-04 14:49:42                                                     |                |                    |
| Package ID                                                                                                                                                                                                                                         | PFSAMPC                                                                | Location       | CABNETDB24         |
| Collectn name                                                                                                                                                                                                                                      | PFSAMPX1                                                               | Pkg BIND time  | no data            |
| SQL function                                                                                                                                                                                                                                       | SELECT                                                                 | Static/dynamic | Static             |
| Precmplr stmt#                                                                                                                                                                                                                                     | 3179                                                                   | DBRM section#  | 21                 |
| CSECT/module                                                                                                                                                                                                                                       | PFSAMPC in PFSAMPC                                                     | Offset of call | 000085D8           |
| Sample count                                                                                                                                                                                                                                       | 93                                                                     | SQL req count  | 172                |
| SQL CPU time                                                                                                                                                                                                                                       | 0.28                                                                   | Service time   | 0.54               |
| SQL Statement                                                                                                                                                                                                                                      | SELECT * INTO : H , : H , : H : H , : H FROM DEPT<br>WHERE XRATE = : H |                |                    |

## E09 - CICS total service time by terminal ID

### Usage

Use this report to see an analysis of how time was spent on CICS terminals that were executing during the observation session. Expand a CICS terminal report line to see a further breakdown by transaction, program, CICS command, DLI request, and SQL request.

### Quantification

Each report line quantifies total times for transactions measured on a terminal. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E09 report shows one line for each measured CICS terminal, and one line for all nonterminal attached transactions. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL
Level 3 SQL Request

```

```

Level 3 SQL Request
...
Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request
...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request
...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement
...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services
...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...

```

## Detail line descriptions

### CICS terminal detail line

This is the first-level detail line. Each line shows information about a CICS terminal for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS terminal ID. This will be the terminal ID or N/A if a terminal ID was not available during the sample. A terminal might not be available because the transaction was running while not attached to the terminal, or the transaction was not attached to the terminal during initialization or termination. |
| NTxns         | The number of executions of transactions on this terminal.                                                                                                                                                                                                                                                          |
| Description   | This will either be terminal transaction or nonterminal transaction.                                                                                                                                                                                                                                                |
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions for this terminal as a sample size.                                                                                                                                                                            |
| Execution     | The total time, in seconds, a CPU was actively executing transactions on this terminal.                                                                                                                                                                                                                             |
| Suspend       | The total time, in seconds, that CICS had suspended execution of transactions on this terminal.                                                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, execution of the transactions on this terminal was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul>              |
| Service       | The mean service time for transactions on this terminal, including execution, suspend, and delay time.                                                                                                                                                                                                              |

## CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                 |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                               |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                                                                                                                                                                                            |
| Error         | The margin of error based on a sample population of the number of executions of the transaction.                                                                                                                                                                           |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction.                                                                                                                                                                                         |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                          |
| Delay         | The total time, in seconds, that execution of the transaction was delayed.<br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li><li>• MVS WAIT</li></ul> |
| Service       | The total service time for the transaction. This includes execution, suspend, and delay time.                                                                                                                                                                              |

## CICS program or system services detail line

This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be either CICS command lines, SQL request lines, DLI request lines, or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays “EXEC CICS.” If lines grouped under this line are SQL request lines, the description displays “EXEC SQL.” If lines grouped under this line are DLI request lines, the description displays “EXEC DLI.” Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if the CICS module name is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |



| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The total time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                              |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                         |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time.                                                                                                                                                                                          |

### CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                         |
| Execution     | The total time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                           |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                      |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                                  |
| Service       | The total service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                   |

## SQL request detail line

These lines appear under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                         |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                       |
| Execution     | The total time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                       |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The total service time for the transaction the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                             |

## DLI request detail line

These lines appear under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                         |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                              |
| Execution     | The total time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                       |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The total service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                               |

## Module/system services detail line

These lines appear under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these

lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line appears.                       |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The total time, in seconds, that the identified module was preempted by MVS.                                                           |
| Service       | The total service time for the transaction the during which the identified module was executing or delayed.                            |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                                |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                            |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                      |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                 |
| Delay         | The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                    |
|---------------|--------------------------------------|
| Name          | The heading, 'Natural' is displayed. |

|             |                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution   | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend     | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay       | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service     | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

A sample report is shown here, the transaction has been expanded to the second level.

| File View Navigate Help                               |       |                   |        |           |                         |                       |           |
|-------------------------------------------------------|-------|-------------------|--------|-----------|-------------------------|-----------------------|-----------|
| E09: CICS Total Service Time by Termid (2669/CICS23A) |       |                   |        |           | Row 00001 of 00036      |                       |           |
| Command ==> -----                                     |       |                   |        |           | Scroll ==> CSR          |                       |           |
| Name                                                  | NTxns | Description       | Error  | Execution | Total Time<br>+ Suspend | in Seconds<br>+ Delay | = Service |
| ET38                                                  | 342   | Terminal Attached | ± 5.4% | 15.207    | 2.795                   | 1.637                 | 19.640    |
| → DNC1                                                | 342   |                   | ± 5.4% | 15.207    | 2.795                   | 1.637                 | 19.640    |
| → DFHD2EX1                                            |       | CICS Program      |        | 10.912    | 2.597                   | 0.755                 | 14.265    |
| → PFSAMPA                                             |       | CICS Program      |        | 1.085     | 0.053                   | 0.215                 | 1.355     |
| → PFSAMPB                                             |       | CICS Program      |        | 0.743     | 0.071                   | 0.221                 | 1.037     |
| → CICS                                                |       | System Services   |        | 0.851     | 0.011                   | 0.077                 | 0.941     |
| → PFSAMPC                                             |       | CICS Program      |        | 0.545     | 0.059                   | 0.305                 | 0.911     |
| → PFSAMPA                                             |       | EXEC CICS         |        | 0.641     | 0.000                   | 0.041                 | 0.683     |
| → CEECCICS                                            |       | EXEC CICS         |        | 0.179     | 0.000                   | 0.017                 | 0.197     |
| → PFSAMPB                                             |       | EXEC CICS         |        | 0.179     | 0.000                   | 0.000                 | 0.179     |
| → PFSAMPC                                             |       | EXEC CICS         |        | 0.065     | 0.000                   | 0.000                 | 0.065     |
|                                                       |       |                   |        |           |                         |                       |           |
| ET40                                                  | 325   | Terminal Attached | ± 5.5% | 13.893    | 2.555                   | 1.775                 | 18.224    |
| → DNC1                                                | 325   |                   | ± 5.5% | 13.893    | 2.555                   | 1.775                 | 18.224    |
| → DFHD2EX1                                            |       | CICS Program      |        | 10.120    | 2.417                   | 0.803                 | 13.341    |
| → PFSAMPA                                             |       | CICS Program      |        | 0.791     | 0.017                   | 0.257                 | 1.067     |
| → PFSAMPB                                             |       | CICS Program      |        | 0.737     | 0.017                   | 0.215                 | 0.971     |
| → PFSAMPC                                             |       | CICS Program      |        | 0.557     | 0.041                   | 0.317                 | 0.917     |
| → CICS                                                |       | System Services   |        | 0.689     | 0.059                   | 0.089                 | 0.839     |
| → PFSAMPA                                             |       | EXEC CICS         |        | 0.653     | 0.000                   | 0.065                 | 0.719     |
| → PFSAMPB                                             |       | EXEC CICS         |        | 0.161     | 0.000                   | 0.011                 | 0.173     |
| → CEECCICS                                            |       | EXEC CICS         |        | 0.149     | 0.000                   | 0.005                 | 0.155     |
| → PFSAMPC                                             |       | EXEC CICS         |        | 0.029     | 0.000                   | 0.005                 | 0.035     |
|                                                       |       |                   |        |           |                         |                       |           |
| ET33                                                  | 122   | Terminal Attached | ± 9.0% | 5.261     | 1.109                   | 0.629                 | 7.000     |
| → DNC1                                                | 122   |                   | ± 9.0% | 5.261     | 1.109                   | 0.629                 | 7.000     |
| → DFHD2EX1                                            |       | CICS Program      |        | 3.647     | 1.043                   | 0.293                 | 4.985     |
| → PFSAMPC                                             |       | CICS Program      |        | 0.251     | 0.035                   | 0.143                 | 0.431     |
| → CICS                                                |       | System Services   |        | 0.311     | 0.011                   | 0.077                 | 0.401     |
| → PFSAMPA                                             |       | CICS Program      |        | 0.311     | 0.011                   | 0.047                 | 0.371     |
| → PFSAMPB                                             |       | CICS Program      |        | 0.281     | 0.005                   | 0.047                 | 0.335     |
| → PFSAMPA                                             |       | EXEC CICS         |        | 0.287     | 0.000                   | 0.005                 | 0.293     |
| → PFSAMPB                                             |       | EXEC CICS         |        | 0.101     | 0.000                   | 0.005                 | 0.107     |
| → CEECCICS                                            |       | EXEC CICS         |        | 0.041     | 0.000                   | 0.005                 | 0.047     |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                             | Action                            |
|-----|--------------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | Transaction, Load Module                                           | Expand to reveal next level.      |
| –   | Transaction, Load Module                                           | Collapse to hide next level.      |
| SV  | Transaction, Load Module                                           | Sort next level by value.         |
| SN  | Transaction, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                        | Display load module information.  |

| Cmd | When Applied To Object                                       | Action                          |
|-----|--------------------------------------------------------------|---------------------------------|
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module | Display source program mapping. |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for a CICS command report is shown here:

|                                                                                                                                                                                                                                                       |         |                      |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------|-------------------|
| File View Navigate Help                                                                                                                                                                                                                               |         |                      |                   |
| +----- The following report line was selected -----+                                                                                                                                                                                                  |         |                      |                   |
|                                                                                                                                                                                                                                                       | → +118E | RETURN TRANSID(DNC1) | 0.049 0.000 0.009 |
| +-----+                                                                                                                                                                                                                                               |         |                      |                   |
| Calculation Details                                                                                                                                                                                                                                   |         |                      |                   |
| CICS Transaction DNC1                                                                                                                                                                                                                                 |         |                      |                   |
| The quantities shown represent the service time for execution of the indicated CICS command while processing this transaction. The quantities are total times for all executions of the command within the transaction and are calculated as follows: |         |                      |                   |
| (1) Times command observed in txn/program 6                                                                                                                                                                                                           |         |                      |                   |
| (2) Duration of one sample interval 0.009999                                                                                                                                                                                                          |         |                      |                   |
| (3) (1) × (2) = total time for transaction 0.059994                                                                                                                                                                                                   |         |                      |                   |
| Command Attributes                                                                                                                                                                                                                                    |         |                      |                   |
| CICS Command EXEC CICS RETURN TRANSID(DNC1)                                                                                                                                                                                                           |         |                      |                   |
| Issued in Load Module PFSAMPA                                                                                                                                                                                                                         |         |                      |                   |
| Return offset in Module +11AE                                                                                                                                                                                                                         |         |                      |                   |
| Name of CSECT PFSAMPA                                                                                                                                                                                                                                 |         |                      |                   |
| Return of Offset in CSECT +118E                                                                                                                                                                                                                       |         |                      |                   |
| The command execution measurement counts are                                                                                                                                                                                                          |         |                      |                   |
| Executing (CPU active) 5                                                                                                                                                                                                                              |         |                      |                   |
| Suspended by CICS 0                                                                                                                                                                                                                                   |         |                      |                   |
| Delayed                                                                                                                                                                                                                                               |         |                      |                   |
| CICS dispatch delay 0                                                                                                                                                                                                                                 |         |                      |                   |
| MVS delay (WAIT) 0                                                                                                                                                                                                                                    |         |                      |                   |
| MVS delay (Busy) 1                                                                                                                                                                                                                                    |         |                      |                   |

A sample detail window for an SQL command is shown here:

```

File View Navigate Help
+-----+
+-----+-----+ The following report line was selected -----+
| → +6E9c SELECT 1.189 0.000 0.129 |
+-----+-----+

Calculation Details
CICS Transaction DNC1
The quantities shown represent the service time for execution of the
indicated Db2 SQL call while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times SQL call observed in txn/program 132
(2) Duration of one sample interval 0.009999
(3) (1) x (2) = total time for SQL call 1.319868

SQL Statement Information
DBRM name PFSAMPC
DBRM Token 17652081 1C3E933C
Precmplr stmt# 3179
SQL Call Module PFSAMPC
SQL Call CSECT PFSAMPC
SQL Call Offset 00006E9C
SQL Function SELECT
Subsystem name DSN1
Connection Type SASS
Package/Plan:
 Location CABNETDB21
 Collectn Name PFSAMPC6
 Package ID PFSAMPC
 Plan Name PFSAMPA

SQL Req Count: 105

SQL Statement:
 SELECT *
 INTO : H ,
 : H : H ,
 : H : H
 FROM DEP
 WHERE XRATE = : H

```

## E10 - CICS mean service time by user ID

### Usage

Use this report to see an analysis of how time was spent by CICS users that were executing during the observation session. Expand a CICS user ID report line to see a further breakdown by transaction, program, CICS command, DLI request and SQL request.

### Quantification

Each report line quantifies time as arithmetic means for all measured transactions initiated by the user. The means are calculated by dividing the total of all time spent servicing all occurrences of transactions initiated by the user, by the number of occurrences. The means are expressed in units of seconds. The mean service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded E10 report shows one line for each measured CICS user. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL
Level 3 SQL Request
Level 3 SQL Request

...
Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request

...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request

...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement

...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services

...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...

```

## Detail line descriptions

### CICS user detail line

This is the first-level detail line. Each line shows information about a CICS terminal for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS user ID.                                                                                                                                                                                                                                                                                                        |
| NTxns         | The number of executions of transactions initiated by this user.                                                                                                                                                                                                                                                         |
| Description   |                                                                                                                                                                                                                                                                                                                          |
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions by this user as a sample size.                                                                                                                                                                                      |
| Execution     | The mean time, in seconds, during which a CPU was actively executing transactions initiated by this user.                                                                                                                                                                                                                |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of transactions initiated by this user.                                                                                                                                                                                                             |
| Delay         | <p>The mean time, in seconds, during which execution of the transactions initiated by this user was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for transactions initiated by this user. This includes execution, suspend and delay time.                                                                                                                                                                                                          |



## CICS transaction detail line

This is the second-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                                   |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                 |
| Description   | If this is a recognized CICS transaction, a functional description.                                                                                                                                                                                                                          |
| Error         | The margin of error for the mean values calculated by using the number of executions of the transaction as the sample size.                                                                                                                                                                  |
| Execution     | The mean time, in seconds, during which a CPU was actively executing for the transaction.                                                                                                                                                                                                    |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction.                                                                                                                                                                                                     |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li><li>• MVS WAIT</li></ul> |
| Service       | The mean service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                                                  |

## CICS program or system services detail line

This is a third-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be either CICS command lines, SQL request lines, DLI request lines, or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays “EXEC CICS.” If lines grouped under this line are SQL request lines, the description displays “EXEC SQL.” If lines grouped under this line are DLI request lines, the description displays “EXEC DLI.” Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if the CICS module name is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The mean time, in seconds, during which CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                              |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                         |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend and delay time.                                                                                                                                                                                                   |

### CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command descriptor is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                         |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                    |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                               |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                           |
| Service       | The mean service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                    |

## SQL request detail line

These lines appear under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                                |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                              |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                        |

## DLI request detail line

These lines appear under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                                |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                                     |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, during which execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                       |

## Module/system services detail line

These lines appear under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these

lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The mean time, in seconds, for execution of the module within the grouping under which the detail line appears.                        |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The mean time, in seconds, that the identified module was preempted by MVS.                                                            |
| Service       | The mean service time for the transaction during which the identified module was executing or delayed.                                 |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                               |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                           |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                      |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                 |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                    |
|---------------|--------------------------------------|
| Name          | The heading, 'Natural' is displayed. |

|             |                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution   | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend     | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay       | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service     | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

### Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

### Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | 4 digit key for the line which is the Natural statement number for which CPU activity is reported.                                                                                                                     |
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

A sample report is shown here, the transaction has been expanded to the second level.

| File View Navigate Help                              |       |                 |        |           |                                           |        |         |
|------------------------------------------------------|-------|-----------------|--------|-----------|-------------------------------------------|--------|---------|
| E10: CICS Mean Service Time by Userid (1873/CICS32A) |       |                 |        |           | Row 00001 of 00032                        |        |         |
| Command ==> -----                                    |       |                 |        |           | Scroll ==> CSR                            |        |         |
| Name                                                 | NTxns | Description     | Error  | Execution | Mean Time in Seconds<br>+ Suspend + Delay | =      | Service |
| AHM01                                                | 0     |                 | ±99.9% | 16.731    | 4.407                                     | 28.184 | 49.323  |
| → MQS1                                               | 0     |                 | ±99.9% | 14.917    | 0.299                                     | 2.338  | 17.555  |
| → MQSAMP1                                            |       | CICS Program    |        | 12.848    | 0.089                                     | 0.944  | 13.882  |
| → CEECCICS                                           |       | EXEC CICS       |        | 1.888     | 0.119                                     | 0.479  | 2.488   |
| → CEEPLPKA                                           |       | EXEC CICS       |        | 0.000     | 0.000                                     | 0.659  | 0.659   |
| → CICS                                               |       | System Services |        | 0.104     | 0.089                                     | 0.239  | 0.434   |
| → DFHTFP                                             |       | CICS Program    |        | 0.059     | 0.000                                     | 0.000  | 0.059   |
| → MQSAMP1                                            |       | EXEC CICS       |        | 0.014     | 0.000                                     | 0.014  | 0.029   |
| → MQDR                                               | 0     |                 | ±99.9% | 0.359     | 0.404                                     | 15.966 | 16.731  |
| → CSQ4CVK1                                           |       | CICS Program    |        | 0.239     | 0.254                                     | 15.696 | 16.191  |
| → MQDRVR                                             |       | EXEC CICS       |        | 0.089     | 0.044                                     | 0.224  | 0.359   |
| → MQDRVR                                             |       | CICS Program    |        | 0.014     | 0.104                                     | 0.044  | 0.164   |
| → CICS                                               |       | System Services |        | 0.014     | 0.000                                     | 0.000  | 0.014   |
| → TDB2                                               | 0     |                 | ±99.9% | 1.379     | 3.463                                     | 8.305  | 13.147  |
| → CICS                                               |       | System Services |        | 0.329     | 2.413                                     | 6.506  | 9.250   |
| → CICSDB3                                            |       | CICS Program    |        | 0.989     | 0.899                                     | 1.769  | 3.658   |
| → CEECCICS                                           |       | EXEC CICS       |        | 0.014     | 0.149                                     | 0.014  | 0.179   |
| → CICSDB3                                            |       | EXEC CICS       |        | 0.044     | 0.000                                     | 0.014  | 0.059   |
| → DBDR                                               | 0     |                 | ±99.9% | 0.074     | 0.239                                     | 1.574  | 1.888   |
| → DB2DRVR                                            |       | EXEC CICS       |        | 0.074     | 0.239                                     | 1.574  | 1.888   |
| AGM02                                                | 0     |                 | ±99.9% | 0.000     | 29.984                                    | 0.000  | 29.984  |
| → CKAM                                               | 0     |                 | ±99.9% | 0.000     | 29.984                                    | 0.000  | 29.984  |
| → DFHMOMON                                           |       | EXEC CICS       |        | 0.000     | 29.984                                    | 0.000  | 29.984  |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                      | Action                            |
|-----|-----------------------------------------------------------------------------|-----------------------------------|
| ?   | User ID, Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | User ID, Transaction, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | User ID, Transaction, Load Module                                           | Expand to reveal next level.      |
| –   | User ID, Transaction, Load Module                                           | Collapse to hide next level.      |
| SV  | User ID, Transaction, Load Module                                           | Sort next level by value.         |
| SN  | User ID, Transaction, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                                 | Display load module information.  |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module                | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for a CICS command report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| → +06B8 PROGRAM(CSQ4CVK1) 0.014 0.044 0.104 0.164 |
+-----+
Calculation Details
CICS Transaction MQDR
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are mean times for the command for all executions of the
transaction and are calculated as follows:

(1) Times command observed in txn/program 11
(2) Duration of one sample interval 0.014992
(3) (1) × (2) = total time for command 0.164912
(4) Number of executions of transaction 0
(5) (3) / (4) = mean time for the command 252.263688

Command Attributes
CICS Command EXEC CICS LINK PROGRAM(CSQ4CVK1)
Issued in Load Module MQDRVR
Return offset in Module +06D8
Name of CSECT MQDRVR
Return Offset in CSECT +06B8

The command execution measurement counts are
Executing (CPU active) 1
Suspended by CICS 3
Delayed
 CICS dispatch delay 0
 MVS delay (WAIT) 0
 MVS delay (Busy) 7
+-----+
```

## E11 - CICS total service time by user ID

### Usage

Use this report to see an analysis of how time was spent by CICS users that were measured during the observation session. Expand a CICS user ID report line to see a further breakdown by transaction, program, CICS command, DLI request and SQL request.

# Quantification

Each report line quantifies total times for transactions measured for a CICS user. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

# Detail line hierarchy

An unexpanded E11 report shows one line for each measured CICS user ID. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
Level 2 EXEC CICS
Level 3 CICS Command
Level 3 CICS Command

Level 2 EXEC SQL
Level 3 SQL Request
Level 3 SQL Request

...
Level 2 EXEC DLI
Level 3 DLI Request
Level 3 DLI Request

...
Level 2 EXEC ADABAS
Level 3 ADABAS Request
Level 3 ADABAS Request

...
Level 3 Natural
Level 4 Natural Program
Level 4 Natural Program
Level 5 Natural Statement

...
Level 2 CICS Program
Level 3 Module
Level 3 Module
Level 3 System Services

...
Level 2 System Services
Level 3 Module
Level 3 Module
Level 3 System Services
...
```

# Detail line descriptions

## CICS terminal detail line

This is the first-level detail line. Each line shows information about a CICS user for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS user ID.                                                                                                                   |
| NTxns         | The number of executions of transactions initiated by this user.                                                                    |
| Description   | This is either Terminal Txn or Non-Terminal Txn.                                                                                    |
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions by this user as a sample size. |
| Execution     | The total time, in seconds, during which a CPU was actively executing transactions initiated by this user.                          |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of transactions initiated by this user.                       |



| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | The total time, in seconds, during which execution of the transactions initiated by this user was delayed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for transactions initiated by this user. This includes execution, suspend and delay time.                                                                                                                                                                                                   |

## CICS transaction detail line

This is the second-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                                 |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                               |
| Description   | If this is a recognized CICS transaction, a functional description.                                                                                                                                                                                                                        |
| Error         | The margin of error based on a sample population of the number of executions of the transaction.                                                                                                                                                                                           |
| Execution     | The total time, in seconds, during which a CPU was actively executing for the transaction.                                                                                                                                                                                                 |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction.                                                                                                                                                                                                  |
| Delay         | The total time, in seconds, during which execution of the transaction was delayed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction. This includes execution, suspend and delay time.                                                                                                                                                                                               |

## CICS program or system services detail line

This is a second-level detail line shown directly under the CICS transaction detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The third-level lines shown under this item can be either CICS command lines, SQL request lines, DLI request lines, or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. "CICS" is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays "EXEC CICS." If lines grouped under this line are SQL request lines, the description displays "EXEC SQL." If lines grouped under this line are DLI request lines, the description displays "EXEC DLI." Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and "CICS Program" is displayed if the CICS module name is not recognized; indicating this is likely an application program. "System Services" is displayed if no application program was in control. |
| Execution     | The total time, in seconds, during which CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul>                                                                                                                                                                                                                             |
| Service       | The total service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                               |

## CICS command detail line

These lines appear under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command descriptor. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command description is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                        |
| Execution     | The total time, in seconds, during which CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                   |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                          |

## SQL request detail line

These lines appear under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                                    |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                                  |
| Execution     | The total time, in seconds, during which CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                          |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                           |

## DLI request detail line

These lines appear under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The DLI function code followed by the PCB name.                                                                                                                      |
| Execution     | The total time, in seconds, during which CPU execution was observed while the DLI request was being processed.                                                       |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, during which execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                          |

## Module/system services detail line

These lines appear under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, "CICS" is displayed in the name field and "System Services" is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or "CICS" if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. "System Services" is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line appears.                       |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The total time, in seconds, that the identified module was preempted by MVS.                                                           |
| Service       | The total service time for the transaction during which the identified module was executing or delayed.                                |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                     |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed. |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                           |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                      |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Natural Programs processing detail line

One of these second-level lines appears under each CICS Transaction for which there is Natural processing.

| Under heading | This is displayed                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The heading, 'Natural' is displayed.                                                                                                                                                                                                                         |
| Description   | The heading, 'Natural Programs' is displayed.                                                                                                                                                                                                                |
| Execution     | The mean time, in seconds, during which CPU execution was observed while Natural was being processed.                                                                                                                                                        |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Natural was being processed.                                                                                                                               |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed, while Natural was being processed, for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which Natural was being processed. This includes execution, suspend, and delay time.                                                                                                                        |

## Natural Program detail line

One of these third-level lines appears under each Natural Program for which there is Natural processing.

| Under heading                           | This is displayed                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                    | The name of the Natural program is displayed.                                                                                                     |
| Description                             | The library from which the Natural programs was obtained is displayed.                                                                            |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program. |

## Natural Statement detail line

One of these fourth-level lines appears for each Natural Statement for which there is Natural processing.

| Under heading | This is displayed                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------|
| Name          | 4 digit key for the line which is the Natural statement number for which CPU activity is reported. |

|                                         |                                                                                                                                                                                                                        |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description                             | The description of the line: "stmt #", followed by the Natural statement number for which CPU activity is reported. If the Natural statement is in an INCLUDE, the name of the INCLUDE member is shown in parenthesis. |
| Execution/Suspend/Delay/Service columns | As before times in seconds are displayed in each column, execution/Suspend/Delay/Service but just showing the time for the named Natural program.                                                                      |

## Sample reports

A sample report is shown here. The transaction has been expanded to the second level.

| File View Navigate Help                               |       |                 |        |                    |           |         |           |
|-------------------------------------------------------|-------|-----------------|--------|--------------------|-----------|---------|-----------|
| E11: CICS Total Service Time by Userid (1873/CICS32A) |       |                 |        | Row 00001 of 00032 |           |         |           |
| Command ==>                                           |       |                 |        | Scroll ==> CSR     |           |         |           |
| Name                                                  | NTxns | Description     | Error  | Execution          | + Suspend | + Delay | = Service |
| AHM01                                                 | 0     |                 | ±99.9% | 16.731             | 4.407     | 28.184  | 49.323    |
| → MQS1                                                | 0     |                 | ±99.9% | 14.917             | 0.299     | 2.338   | 17.555    |
| → MQSAMP1                                             |       | CICS Program    |        | 12.848             | 0.089     | 0.944   | 13.882    |
| → CEECCICS                                            |       | EXEC CICS       |        | 1.888              | 0.119     | 0.479   | 2.488     |
| → CEEPLPKA                                            |       | EXEC CICS       |        | 0.000              | 0.000     | 0.659   | 0.659     |
| → CICS                                                |       | System Services |        | 0.104              | 0.089     | 0.239   | 0.434     |
| → DFHTFP                                              |       | CICS Program    |        | 0.059              | 0.000     | 0.000   | 0.059     |
| → MQSAMP1                                             |       | EXEC CICS       |        | 0.014              | 0.000     | 0.014   | 0.029     |
| → MQDR                                                | 0     |                 | ±99.9% | 0.359              | 0.404     | 15.966  | 16.731    |
| → CSQ4CVK1                                            |       | CICS Program    |        | 0.239              | 0.254     | 15.696  | 16.191    |
| → MQDRVR                                              |       | EXEC CICS       |        | 0.089              | 0.044     | 0.224   | 0.359     |
| → MQDRVR                                              |       | CICS Program    |        | 0.014              | 0.104     | 0.044   | 0.164     |
| → CICS                                                |       | System Services |        | 0.014              | 0.000     | 0.000   | 0.014     |
| → TDB2                                                | 0     |                 | ±99.9% | 1.379              | 3.463     | 8.305   | 13.147    |
| → CICS                                                |       | System Services |        | 0.329              | 2.413     | 6.506   | 9.250     |
| → CICSDB3                                             |       | CICS Program    |        | 0.989              | 0.899     | 1.769   | 3.658     |
| → CEECCICS                                            |       | EXEC CICS       |        | 0.014              | 0.149     | 0.014   | 0.179     |
| → CICSDB3                                             |       | EXEC CICS       |        | 0.044              | 0.000     | 0.014   | 0.059     |
| → DBDR                                                | 0     |                 | ±99.9% | 0.074              | 0.239     | 1.574   | 1.888     |
| → DB2DRVR                                             |       | EXEC CICS       |        | 0.074              | 0.239     | 1.574   | 1.888     |
| AGM02                                                 | 0     |                 | ±99.9% | 0.000              | 29.984    | 0.000   | 29.984    |
| → CKAM                                                | 0     |                 | ±99.9% | 0.000              | 29.984    | 0.000   | 29.984    |
| → DFHMOMON                                            |       | EXEC CICS       |        | 0.000              | 29.984    | 0.000   | 29.984    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                         | Action                            |
|-----|----------------------------------------------------------------|-----------------------------------|
| ?   | User ID, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | User ID, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | User ID, Load Module                                           | Expand to reveal next level.      |
| –   | User ID, Load Module                                           | Collapse to hide next level.      |

| Cmd | When Applied To Object                                       | Action                           |
|-----|--------------------------------------------------------------|----------------------------------|
| SV  | User ID, Load Module                                         | Sort next level by value.        |
| SN  | User ID, Load Module                                         | Sort next level by name.         |
| M   | Load Module                                                  | Display load module information. |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module | Display source program mapping.  |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for a CICS command report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| → +0750 START TRANSID(MQS1) 0.014 0.000 0.000 0.014 |
+-----+

Calculation Details
CICS Transaction MQDR
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times command observed in txn/program 1
(2) Duration of one sample interval 0.014992
(3) (1) × (2) = total time for command 0.014992

Command Attributes
CICS Command EXEC CICS START TRANSID(MQS1)
Issued in Load Module MQDRVR
Return offset in Module +0770
Name of CSECT MQDRVR
Return Offset in CSECT +0750

The command execution measurement counts are
Executing (CPU active) 1
Suspended by CICS 0
Delayed
 CICS dispatch delay 0
 MVS delay (WAIT) 0
 MVS delay (Busy) 0

```

## E12 - CICS CPU/service time by transaction

# Usage

Use this report to see an analysis of how much time was used by the CICS transactions that were measured during the observation session. A prerequisite for this report is activation of the CICS+ option during the measurement. This option records exact CPU and service times for CICS transactions. Expand a CICS transaction report line to see a further breakdown by task number.

# Quantification

Each report line shows the following for each CICS transaction:

- Number of transactions executed
- Percentage of total CPU used for this transaction
- Total CPU used for this transaction
- Mean CPU used for this transaction
- Total service time for this transaction
- Mean service time for this transaction

# Detail line hierarchy

An unexpanded E11 report shows one line for each measured CICS user ID. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
 Level 2 CICS Task Number
 Level 2 CICS Task Number
 ...
```

# Detail line descriptions

## CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The CICS transaction code.                                                                                                            |
| NTxns           | The number of executions of the transaction.                                                                                          |
| Description     | If this is a recognized CICS transaction, a functional description.                                                                   |
| % of CPU        | The percent CPU consumed by this transaction, out of the total recorded for this report.                                              |
| CPU Time: Total | The total task CPU time for all tasks counted for this CICS transaction. Large numbers will be expressed in minutes with an M suffix. |
| CPU Time: Mean  | The mean task CPU time per CICS transaction. Large numbers will be expressed in minutes with an M suffix.                             |
| Svc Time: Total | The total service time for all tasks for this CICS transaction. Large numbers will be expressed in minutes with an M suffix.          |
| Svc Time: Mean  | The mean service time per CICS transaction. Large numbers will be expressed in minutes with an M suffix.                              |



## CICS task number detail line

This is the second-level detail line shown directly under the CICS transaction detail line. It quantifies the CPU and service time for each individual CICS task run under this transaction id.

| Under Heading   | This is Displayed                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The task number of the CICS transaction.                                                                                                                  |
| Description     | The start time of the CICS transaction.                                                                                                                   |
| CPU Time: Total | The total task CPU time for this task.                                                                                                                    |
| CPU Time: Mean  | The mean task CPU time for this task. This is the same as the total time since it applies to only 1 task. This shows the CPU time to 5 decimal positions. |
| Svc Time: Total | The total service time for this task.                                                                                                                     |
| Svc Time: Mean  | The mean service time for this task. This is the same as the total time since it applies to only 1 task. This shows the CPU time to 5 decimal positions.  |

## Sample reports

A sample report is shown here. The CICS transaction has been expanded to the second level (task number).

```
File View Navigate Help

E12: CICS CPU/Service Time by Transaction (1860/CICS32A) Row 00001 of 00603
Command ==> _____ Scroll ==> CSR

Name NTxns Description % of CPU --CPU Time-- --Svc Time--
 Total Mean Total Mean
TDB2 600
→ 08879 16:05:08.21 64.5% 4.25 0.00709 83.55 0.13925
→ 09180 16:05:20.52 0.01 0.01550 0.09 0.09333
→ 08883 16:05:08.22 0.01 0.01099 0.05 0.05510
→ 08880 16:05:08.21 0.00 0.00977 0.15 0.15520
→ 08901 16:05:08.21 0.00 0.00965 0.09 0.09113
→ 08901 16:05:08.46 0.00 0.00925 0.13 0.13706
→ 09185 16:05:20.54 0.00 0.00910 0.16 0.16997
→ 09013 16:05:09.75 0.00 0.00844 0.13 0.13625
→ 09283 16:05:21.42 0.00 0.00842 0.21 0.21626
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Transaction, Task      | Display context help information. |
| ++  | Transaction, Task      | Show additional details.          |
| +   | Transaction            | Expand to reveal next level.      |
| –   | Transaction            | Collapse to hide next level.      |
| SV  | Transaction            | Sort next level by value.         |

| Cmd | When Applied To Object | Action                   |
|-----|------------------------|--------------------------|
| SN  | Transaction            | Sort next level by name. |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for a CICS command report is shown below. This example shows a CICS task ID:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| → 08879 16:05:08.21 0.01 0.01550 0.09 0.0933|
+-----+
CPU and Service Time for CICS Transaction
Transaction ID TDB2
Start Time 16:05:08.21
Stop Time 16:05:08.30
Task Number 08879
Dispatch Time 0.04277
CPU Time 0.01550
Suspend Time 0.05055
Dispatch Wait Time 0.04030
File Control Requests 370064
Db2 Requests 3
IMS Requests 0
MQ Requests 0
+-----+
```

## Chapter 5. IMS performance analysis reports

This section describes the IMS Performance Analysis Reports.

| For information about ...                 | See ...                                                                      |
|-------------------------------------------|------------------------------------------------------------------------------|
| The IMS data extractor                    | <a href="#">“Overview of IMS data extractor ” on page 276</a>                |
| The IMS+ extractor                        | <a href="#">“IMS+ extractor” on page 276</a>                                 |
| IMS Multiple Address Space Support (MASS) | <a href="#">“Overview of IMS Multiple Address Space Support” on page 276</a> |
| I01 IMS measurement profile               | <a href="#">“I01 - IMS measurement profile” on page 277</a>                  |
| I02 IMS DL/I call timeline                | <a href="#">“I02 - IMS DL/I call timeline” on page 281</a>                   |
| I03 IMS transaction timeline              | <a href="#">“I03 - IMS transaction timeline” on page 282</a>                 |
| I04 IMS transaction activity timeline     | <a href="#">“I04 - IMS transaction activity timeline” on page 284</a>        |
| I05 IMS DL/I CPU usage by PSB             | <a href="#">“I05 - IMS DL/I CPU usage by PSB” on page 290</a>                |
| I06 IMS DL/I CPU usage by transaction     | <a href="#">“I06 - IMS DL/I CPU usage by transaction” on page 293</a>        |
| I07 IMS DL/I CPU usage by DL/I call       | <a href="#">“I07 - IMS DL/I CPU usage by DL/I call” on page 296</a>          |
| I08 IMS DL/I WAIT time by PSB             | <a href="#">“I08 - IMS DL/I WAIT time by PSB” on page 299</a>                |
| I09 IMS DL/I WAIT time by transaction     | <a href="#">“I09 - IMS DL/I WAIT time by transaction” on page 302</a>        |
| I10 IMS DL/I WAIT time by DL/I call       | <a href="#">“I10 - IMS DL/I WAIT time by DL/I call” on page 305</a>          |
| I11 IMS DL/I activity by PSB              | <a href="#">“I11 - IMS DL/I activity by PSB” on page 307</a>                 |
| I12 IMS DL/I activity by transaction      | <a href="#">“I12 - IMS DL/I activity by transaction” on page 311</a>         |
| I13 IMS DL/I activity by DL/I call        | <a href="#">“I13 - IMS DL/I activity by DL/I call” on page 314</a>           |
| I14 IMS PSB/PCB attributes                | <a href="#">“I14 - IMS PSB/PCB attributes” on page 316</a>                   |
| I15 IMS DL/I call attributes              | <a href="#">“I15 - IMS DL/I call attributes” on page 318</a>                 |
| I16 IMS transaction service times         | <a href="#">“I16 - IMS transaction service times” on page 319</a>            |
| I17 IMS transaction DL/I call counts      | <a href="#">“I17 - IMS transaction DL/I call counts” on page 321</a>         |
| I18 IMS CPU/Svc time by DL/I calls        | <a href="#">“I18 - IMS CPU/Svc time by DL/I calls” on page 323</a>           |
| I19 IMS CPU/Svc time by PSB               | <a href="#">“I19 - IMS CPU/Svc time by PSB” on page 325</a>                  |
| I20 IMS CPU/Svc time by transaction       | <a href="#">“I20 - IMS CPU/Svc time by transaction” on page 327</a>          |
| I21 IMS CPU/Svc time by PCB               | <a href="#">“I21 - IMS CPU/Svc time by PCB” on page 329</a>                  |

| For information about ...          | See ...                                                            |
|------------------------------------|--------------------------------------------------------------------|
| 122 IMS Region Transaction Summary | <a href="#">“122 - IMS Region Transaction Summary” on page 331</a> |

## Overview of IMS data extractor

When the IMS data extractor is active all DL/I calls in the target address space are recorded each time a sample is taken. For each DL/I call in flight, all of the call parameters, SSAs etc, are recorded, as well as the module and offset from which the call was made. In a CICS region there can be multiple IMS threads active and so multiple DL/I calls can be recorded each time an IMS sample is taken in a CICS region.

Additionally, several IMS environment parameters are recorded each time a sample is taken. These parameters include, the region type and its status, the PSB, transaction code, IMS version and release, message sequence number and time stamp from the IO PCB. In the case of a CICS region, the scheduling and termination of PSBs is also recorded.

## IMS+ extractor

IMS+ is an IMS measurement option (data extractor) in which the precise number of DL/I calls is counted as well as the exact DL/I service time and CPU time by DL/I call. Activating the IMS+ option automatically activates the IMS option. Many of the IMS reports require that the IMS+ extractor be used.

**Note:** Running measurements with the IMS+ data extractor turned on causes each IMS call to be intercepted to collect additional data. This may have a small impact on the performance of the target address space. Care should be taken when using this feature with other products that also intercept IMS calls as unpredictable results may occur. Your installer may have chosen to limit access to this feature.

## Overview of IMS Multiple Address Space Support

IMS multiple address space (MASS) support allows you to measure an IMS transaction that is eligible to run in multiple MPP regions, either within a single IMS subsystem or within an IMSplex. You specify the IMS transaction and the IMS subsystem or IMSplex group name to measure. Application Performance Analyzer determines the MPP regions that are eligible to process the transaction and returns a list of active MPP regions in Panel 4. You select the regions you want to measure. Application Performance Analyzer creates a parent observation for each IMS subsystem and one child observation request for each selected MPP region grouped within the IMS subsystem.

To enter IMS MASS observations:

1. Start a NEW request.
2. In Panel 1 – Job Information, enter a dash (-) in the Job name/Pattern field.
3. In Panel 5 – Subsystems, enter either the IMS subsystem ID or the IMSplex group name, and the IMS transaction code.
4. In Panel 4 – Active Jobs, Application Performance Analyzer returns a list of active MPP regions that are eligible to process the transaction. Select the MPP regions you want to measure. The maximum number of regions you are permitted to select is determined during the installation of Application Performance Analyzer.
5. In Panel 2 – Options, select the IMS+ data extractor.
6. Complete any other relevant fields for your observation request.

Once the NEW request is complete and submitted, Application Performance Analyzer creates and starts separate observation requests for each MPP region selected for measurement. The observations are displayed in the R02 Observation List as child observations under an IMS parent. You can view the IMS reports for each MPP region individually. When any of the selected MPP regions has not processed the IMS transaction during the measurement interval, the measurement has a status of Ended, with 1 Sample and no IMS reports are generated.

The NEW line command can be entered on any of the child observations or the IMS parent. When the NEW command is entered on a child observation, the new request is considered a single region request with a transaction code specification, and is initialized with the same parameter values as the original request. When the NEW line command is entered on the IMS parent of a single IMS subsystem, the new request is considered an IMS MASS request and is initialized with the same parameter values as the original request for a single IMS subsystem. The Panel 4 Active Jobs list is populated with the eligible MPP regions at the time of the new request and the desired regions must be selected from the list.

## I01 - IMS measurement profile

---

### Usage

Use this report to see a general overview of the IMS measurement data. This is a good report to examine first when analyzing IMS information. It provides an at-a-glance summary of various aspects of the measurement data and helps you choose which other reports to concentrate on. Information about the IMS environment is shown at the top of this report. This is followed by a series of mini performance graphs illustrating various types of measured activity.

### IMS environment

This does not appear if the measurement was for a CICS region.

| Under Heading      | This is Displayed                                                                           |
|--------------------|---------------------------------------------------------------------------------------------|
| DFSRR00 parms      | The PARM data that was passed to DFSRR00 (the IMS region controller) in the EXEC statement. |
| IMS system ID      | The system name of the IMS subsystem under which the measured activity took place.          |
| IMS region name    | The JOB name/STC name of the IMS dependent region.                                          |
| IMS version        | The IMS version.                                                                            |
| IMS region type    | The type of dependent region: BMP, MPP, etc.                                                |
| IMS function level | The IMS function level.                                                                     |

### Performance graphs

These are histograms quantifying measurement data. To the right of some of the graphs, report codes of reports that show related and more detailed information are displayed. You can display the report by skipping the cursor to one of these fields and by pressing the ENTER key.

### Most active IMS PSBs

| Under Heading | This is Displayed                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| IMS PSB Name  | An IMS PSB name is shown and the number of samples in which processing of DL/I calls under this PSB was observed. The percentage and the graph represent the proportion of the overall measurement time DL/I calls were being serviced under this PSB.  |

## Most active IMS transactions

| Under Heading        | This is Displayed                                                                                                                                                                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples              | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.                     |
| IMS Transaction Code | An IMS transaction code is shown and the number of samples in which processing of DL/I calls under this transaction was observed. The percentage and the graph represent the proportion of the overall measurement time DL/I calls were being serviced in this transaction. |

## Most active DL/I calls

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.                                                                                                                                         |
| DL/I Call     | A DL/I call identified by three fields: a unique sequence number assigned to the DL/I call, its DL/I function code and its PCB name. The percentage and the graph represent the proportion of samples in which processing this DL/I call was observed. The percentage and the graph represent the proportion the overall measurement time all executions of this DL/I call were being serviced. |

## Most CPU consumptive DL/I

| Under Heading       | This is Displayed                                                                                                                                                                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total DL/I CPU Time | The number of seconds of CPU time consumed by all executions of DL/I calls during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| DL/I Call           | A DL/I call identified by three fields: a unique sequence number assigned to the DL/I call, its DL/I function code and its PCB name. The quantification and the graph show the number of CPU seconds of execution for this DL/I call.                                    |

## Most frequent transactions

This requires that the IMS+ measurement option is active and the execution of IMS transaction was observed. The graphic information is based on the number of transactions counted.

| Under Heading      | This is Displayed                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total txns counted | The total number of IMS transactions counted during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| IMS transaction    | The IMS transaction code and the number of executions of this transaction.                                                                                                                                                                 |

## Most frequent DL/I calls

This requires that the IMS+ measurement option was active. The graphic information is based on the number of DL/I calls counted.

| Under Heading            | This is Displayed                                                                                                                                                                                                                    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total DL/I calls counted | The total number of DL/I calls counted during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| DL/I call                | A DL/I call identified by three fields: a unique sequence number assigned to the call, its DL/I function code and its PCB name. The number of executions of this call is quantified.                                                 |

## Transaction statistics

This requires that the IMS+ measurement option was active and the execution of IMS transaction was observed.

| Under Heading    | This is Displayed                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IMS Txns counted | The number of IMS transactions counted during the measurement interval.                                                                                                       |
| Transaction rate | The average rate, in transactions per second, at which transactions were processed during the measurement interval.                                                           |
| Txn observations | The number of samples transaction execution was observed.                                                                                                                     |
| Txn throughput   | The theoretical transaction throughput, in transactions per second, based on the number of counted transactions divided by the number of seconds transactions were executing. |
| IMS Txn svc time | The total service time for all observed transactions.                                                                                                                         |
| IMS Txn CPU time | The total CPU time consumed by all observed transactions.                                                                                                                     |
| IMS Txn max svc  | The maximum service time observed for a single transaction execution.                                                                                                         |
| IMS Txn max CPU  | The maximum CPU time observed for a single transaction execution.                                                                                                             |
| IMS Txn min svc  | The minimum service time observed for a single transaction execution.                                                                                                         |
| IMS Txn min CPU  | The minimum CPU time observed for a single transaction execution.                                                                                                             |

## DLI call statistics

This requires that the IMS+ measurement option was active for the measurement and the execution of DLI calls was observed.

| Under Heading    | This is Displayed                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------------|
| DLI call count   | The number of DLI calls counted during the measurement session.                                                   |
| DLI call rate    | The DLI call rate per second during the measurement session.                                                      |
| DLI observations | The numbers of samples taken when a DLI call was in-flight.                                                       |
| DLI call thruput | The DLI call throughput rate per second based on the number of DLI calls counted divided by the DLI service time. |
| DLI svc time     | The total service time for DLI calls during the measurement session.                                              |
| DLI CPU time     | The total CPU time for DLI calls during the measurement session.                                                  |

| Under Heading | This is Displayed                                                                 |
|---------------|-----------------------------------------------------------------------------------|
| DLI max svc   | The service time of the longest running DLI call during the measurement session.  |
| DLI max CPU   | The highest CPU time for a DLI call during the measurement session.               |
| DLI min svc   | The service time of the shortest running DLI call during the measurement session. |
| DLI min CPU   | The lowest CPU time for a DLI call during the measurement session.                |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

I01: IMS Measurement Profile (00276/IMSFMPP1) Row 00001 of 00067
Command ==> ----- Scroll ==> CSR

IMS Environment -----
DFSRRRC00 parms MSG,001000000000,N00010000,,,,0,6,5,IMSF,,,,MQDC,DC,,N,
IMS system id IMSP
IMS version 15.3.0
IMS function level 00000002

Most Active IMS PSBs -----
Samples 5,000 100.0% ' ' ' ' ' ' ' '
IMSQAPGM 3,740 74.8% *****
Reports:
I05 I08
I11

Most Active IMS Transactions -----
Samples 3,000 100.0% ' ' ' ' ' ' ' '
IMSQATR 3,740 74.8% *****
Reports:
I04 I06
I09 I12

Most Active IMS DLI Calls -----
Samples 5,000 100.0% ' ' ' ' ' ' ' '
00001 GN IOPCB 3,622 72.4% *****
00002 GU IOPCB 74 1.4% *
00003 CHNG ALTPCB 39 0.7% *
00004 ISRT ALTPCB 5 0.1% *
Reports:
I07 I10
I13

Most CPU consumptive DLI -----
Total DLI CPU time 14.15 100.0% ' ' ' ' ' ' ' '
00002 GN IOPCB 13.71 96.8% *****
00001 GU IOPCB 0.20 1.4% *
00003 CHNG ALTPCB 0.20 1.4% *
00004 ISRT IOPCB 0.02 0.1% *
00005 ISRT IOPCB 0.00 0.0%
Reports:
I18 I19
I20 I21

Most Frequent Transactions -----
Total txns counted 381 100.0% ' ' ' ' ' ' ' '
IMSQATR 381 100.0% *****
Reports:
I03 I04
I16 I17

```

Remainder of report after scrolling down is shown here:



```

File View Navigate Help

I01: IMS Measurement Profile (0954/ADSMPP) Row 00031 of 00049
Command ==> _____ Scroll ==> CSR

Most Frequent DL/I Calls ----- Reports:
Total DLI calls counted 620 100.0% ' ' ' ' ' ' ' ' I02 I17
00001 GU IOPCB 206 33.2% ***** I18
00002 ISRT IOPCB 104 16.7% ***

Transactions Statistics-----
| IMS Txns counted 104 | Transaction rate 3.47 per sec |
Txn observations 612	Txn throughput 24.18 per sec
IMS Txn svc time 4.3456 sec	IMS Txn CPU time 2.2794 sec
IMS Txn max svc 0.1496 sec	IMS Txn max CPU 0.0266 sec
IMS Txn min svc 0.0276 sec	IMS Txn min CPU 0.0206 sec
-----	-----
DLI Call Statistics-----	
DLI call count 790	DLI call rate 39.69 per sec
DLI observations 1,692	DLI call thrupt 246.19per sec
-----	-----
DLI svc time 7.1757 sec	DLI CPU time 5.7611 sec
DLI max svc 0.2504 sec	DLI max CPU 0.0453 sec
DLI min svc 0.0276 sec	DLI min CPU 0.0206 sec
-----	-----

```

## I02 - IMS DL/I call timeline

### Usage

Use this report to see the chronology of DL/I calls observed during the measurement interval. Each line shows information about one executed DL/I call. The IMS+ feature must have been enabled when the measurement was performed.

The number of DLI calls displayed in this report is limited by the value of the IMSIMaxTraceSize parameter specified during Application Performance Analyzer installation, or by the value on panel 2 of the measurement request (if your installation has configured this field). The report is truncated when the number of DLI calls issued reaches the value specified for IMSIMaxTraceSize.

### Quantification

Each report line shows information pertaining to one IMS DL/I call.

### Detail line hierarchy

The I02 report shows only one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading | This is Displayed                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Call Seq      | A sequence number assigned to the DL/I call execution.                                                                                                                                                                 |
| Func          | The DL/I function code.                                                                                                                                                                                                |
| PCB Name      | The name of the PCB referenced by the DL/I call.                                                                                                                                                                       |
| ID            | An identifier assigned to each unique DL/I call. This is useful when examining printed reports. You can use this identifier to locate detailed information about the DL/I call in the I15 DL/I Call Attributes report. |
| Location      | The location, in CSECT+offset format, of the return address of the DL/I call.                                                                                                                                          |
| Stat          | The PCB status code returned by IMS upon completion of the DL/I call.                                                                                                                                                  |
| Call Time     | The time of day at which the DL/I call occurred.                                                                                                                                                                       |

| Under Heading | This is Displayed                         |
|---------------|-------------------------------------------|
| Duration      | The duration of the DL/I call in seconds. |

## Sample reports

Below is an IMS DL/I call timeline sample report:

| File View Navigate Help                   |      |          |      |               |                    |             |          |
|-------------------------------------------|------|----------|------|---------------|--------------------|-------------|----------|
| I02: IMS DL/I Call Timeline (0805/ADSMPP) |      |          |      |               | Row 00001 of 01128 |             |          |
| Command ==>                               |      |          |      |               | Scroll ==> CSR     |             |          |
| CallSeq                                   | Func | PCB Name | Id   | Location      | Stat               | Call Time   | Duration |
| 000001                                    | GU   | IOPCB    | 0001 | BBSFIN00+038C |                    | 20:36:10.29 | 0.0001   |
| 000002                                    | GHU  | DBSCA001 | 0002 | BBSAP012+0E0E |                    | 20:36:11.20 | 0.0556   |
| 000003                                    | GHU  | DBSCN001 | 0003 | BBSAP012+0EE4 |                    | 20:36:11.26 | 0.0133   |
| 000004                                    | GHU  | DBSCA002 | 0004 | BBSAP012+1086 |                    | 20:36:11.27 | 0.0003   |
| 000005                                    | ISRT | DBSCA002 | 0005 | BBSAP012+1110 |                    | 20:36:11.27 | 0.0003   |
| 000006                                    | GHU  | DBSTL001 | 0006 | BBSAP012+11B0 |                    | 20:36:11.27 | 0.0232   |
| 000007                                    | ISRT | DBSTL001 | 0007 | BBSAP012+1252 |                    | 20:36:11.30 | 0.0003   |
| 000008                                    | REPL | DBSCA001 | 0008 | BBSAP012+131E |                    | 20:36:11.30 | 0.0001   |
| 000009                                    | REPL | DBSCN001 | 0009 | BBSAP012+13A4 |                    | 20:36:11.30 | 0.0023   |
| 000010                                    | ISRT | IOPCB    | 0010 | BBSFIN00+0410 | QH                 | 20:36:11.46 | 0.0002   |
| 000011                                    | GU   | IOPCB    | 0001 | BBSFIN00+038C |                    | 20:36:11.46 | 0.0087   |
| 000012                                    | GHU  | DBSCA001 | 0002 | BBSAP012+0E0E |                    | 20:36:11.47 | 0.0396   |
| 000013                                    | GHU  | DBSCN001 | 0003 | BBSAP012+0EE4 |                    | 20:36:11.51 | 0.0257   |
| 000014                                    | GHU  | DBSCA002 | 0004 | BBSAP012+1086 |                    | 20:36:11.54 | 0.0002   |

## Line commands

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DL/I call              | Display context help information. |
| ++  | DL/I call              | Show additional details.          |
| M   | DL/I call              | Display load module information.  |
| P   | DL/I call              | Display source program mapping.   |

## I03 - IMS transaction timeline

### Usage

Use this report to see the chronology of IMS transactions observed during the measurement interval. Each line shows information about one executed IMS transaction and can be expanded to show the sequence of DL/I calls executed by the transaction. The IMS+ feature must have been enabled when the measurement was performed.

The number of transactions and DLI calls displayed in this report is limited by the value of the IMSIMaxTraceSize parameter specified during Application Performance Analyzer installation, or by the value on panel 2 of the measurement request (if your installation has configured this field). The report is truncated when the number of DLI calls issued reaches the value specified for IMSIMaxTraceSize.

### Quantification

Each report line shows information pertaining to one IMS transaction.

## Detail line hierarchy

The unexpanded I03 report shows a line for each observed IMS transaction. You can expand each line to reveal one additional hierarchical level of detail. The hierarchy is illustrated here:

```
Level 1 IMS Transaction
Level 2 DL/I Call
```

## Detail line descriptions

### IMS transaction detail line

This is the first-level detail line. Each line shows information about an observed IMS transaction. These lines appear in transaction chronological sequence.

| Under Heading | This is Displayed                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TranCode      | The IMS transaction code.                                                                                                                                          |
| PSB/PCB       | The name of the PSB under which the IMS transaction was scheduled.                                                                                                 |
| Location      | The LTERM where the transaction originated.                                                                                                                        |
| Txn Time      | The time of day at which the IMS transaction was initiated. This is the time at which the transaction program received control upon return from the GU-IOPCB call. |
| Duration      | The duration of the IMS transaction in seconds. The duration is measured from the time of return from the GU-IOPCB to the time of entry to the next GU-IOPCB.      |

### DL/I call detail line

Line This is the second-level detail line. Each line shows information about an observed IMS DL/I Call that was executed in the transaction. These lines appear in DL/I call chronological sequence.

| Under Heading | This is Displayed                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TranCode      | A sequence number assigned to the DL/I call execution.                                                                                                                                                                 |
| PSB/PCB       | The name of the PCB referred to by the DL/I call.                                                                                                                                                                      |
| ID            | An identifier assigned to each unique DL/I call. This is useful when examining printed reports. You can use this identifier to locate detailed information about the DL/I call in the I15 DL/I Call Attributes report. |
| Func          | The DLI function code.                                                                                                                                                                                                 |
| Location      | The location, in CSECT+offset format, of the return address of the DL/I call.                                                                                                                                          |
| Stat          | The PCB status code returned by IMS upon completion of the DL/I call.                                                                                                                                                  |
| Txn Time      | The time of day at which the DL/I call occurred.                                                                                                                                                                       |
| Duration      | The duration of the DL/I call in seconds.                                                                                                                                                                              |

## Sample reports

A sample report is shown below. The first TranCode has been expanded to the second level.

| File View Navigate Help                     |          |      |      |               |                    |             |          |
|---------------------------------------------|----------|------|------|---------------|--------------------|-------------|----------|
| I03: IMS Transaction Timeline (0805/ADSMPP) |          |      |      |               | Row 00001 of 00111 |             |          |
| Command ==> _____                           |          |      |      |               | Scroll ==> CSR     |             |          |
| TranCode                                    | PSB/PCB  | Id   | Func | Location      | Stat               | Txn Time    | Duration |
| BBSDR000                                    | BBSFIN00 |      |      |               |                    | 20:36:10.29 | 1.1639   |
| ± 000001                                    | IOPCB    | 0001 | GU   | BBSFIN00+038C |                    | 20:36:10.29 | 0.0001   |
| → 000002                                    | DBSCA001 | 0002 | GHU  | BBSAP012+0E0E |                    | 20:36:11.20 | 0.0556   |
| → 000003                                    | DBSCN001 | 0003 | GHU  | BBSAP012+0EE4 |                    | 20:36:11.26 | 0.0133   |
| → 000004                                    | DBSCA002 | 0004 | GHU  | BBSAP012+1086 |                    | 20:36:11.27 | 0.0003   |
| → 000005                                    | DBSCA002 | 0005 | ISRT | BBSAP012+1110 |                    | 20:36:11.27 | 0.0003   |
| → 000006                                    | DBSTL001 | 0006 | GHU  | BBSAP012+11B0 |                    | 20:36:11.27 | 0.0232   |
| → 000007                                    | DBSTL001 | 0007 | ISRT | BBSAP012+1252 |                    | 20:36:11.30 | 0.0003   |
| → 000008                                    | DBSCA001 | 0008 | REPL | BBSAP012+131E |                    | 20:36:11.30 | 0.0001   |
| → 000009                                    | DBSCN001 | 0009 | REPL | BBSAP012+13A4 |                    | 20:36:11.30 | 0.0023   |
| → 000010                                    | IOPCB    | 0010 | ISRT | BBSFIN00+0410 | QH                 | 20:36:11.46 | 0.0002   |
| BBSDR000                                    | BBSFIN00 |      |      | TERMX09       |                    | 20:36:11.47 | 0.0760   |
| BBSDR000                                    | BBSFIN00 |      |      |               |                    | 20:36:11.55 | 0.0273   |
| BBSDR000                                    | BBSFIN00 |      |      |               |                    | 20:36:11.58 | 0.0467   |

## Line commands

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Trancode, DL/I call    | Display context help information. |
| ++  | Trancode, DL/I call    | Show additional details.          |
| +   | Trancode               | Expand to reveal next level.      |
| –   | Trancode               | Collapse to hide next level.      |
| M   | Trancode, DL/I call    | Display load module information.  |
| P   | Trancode, DL/I call    | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Trancode               | Display context help information.  |
| +   | Trancode               | Expand to reveal all entries.      |
| –   | Trancode               | Collapse to show only first level. |

## I04 - IMS transaction activity timeline

### Usage

Use this report to see, for each IMS transaction, how execution of that transaction was distributed over the measurement interval.

### Quantification

A graph, in bar chart format, is displayed for each observed IMS transaction code. The horizontal axis represents the measurement interval which spans 50 columns. Each column represents an equal 1/50th subinterval of time. A scale is shown at the bottom of the graph indicating the percentage of time progression in the overall interval.

In each column, a vertical graph shows the approximate percentage of time during the subinterval that execution of the IMS transaction took place. A vertical bar of 1, 2, 3, 4 or 5 characters, extending upward from the scale, is displayed indicating the percentage of time in the subinterval execution of the indicated transaction was observed.

## Detail line descriptions

### IMS transaction activity distribution

A group of lines is shown for each reported transaction. Some information about the transaction appears to the left, and a bar chart appears to the right.

| Under Heading | This is Displayed                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Txn           | The IMS transaction code.                                                                                                                                           |
| PSB           | The name of the PSB and program.                                                                                                                                    |
| Txns          | The number of executions of the transaction that occurred during the measurement interval. This value is available only if the IMS+ measurement option was enabled. |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I04: IMS Transaction Activity Timeline (0805/ADSMPP) Row 00001 of 00018
Command ==> _____ Scroll ==> CSR
IMS Transaction <----- 2,000 Samples: Duration 59.8 Seconds ----->

Txn: BBSDR000 >80% * * * * * * *
PSB: BBSFIN00 >60% ** * * * * * * *
Txns: 50 >40% ** * * * * * * *
 >20% ***** * *** * * *
 > 0% ***** *
 1....2....3....4....5....6....7....8....9....

Txn: BBSCR000 >80% * * *
PSB: BBSFIN00 >60% * * * * * * *
Txns: 49 >40% ** * * * * * *
 >20% **** * * *** * * *
 > 0% ***** *
 1....2....3....4....5....6....7....8....9....

```

## Line commands

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Trancode               | Display context help information. |
| ++  | Trancode               | Show additional details.          |

### on headings

| Cmd | When Applied To Object  | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | IMS Transaction Display | Display context help information. |

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| SV  | IMS Transaction        | Sort next level entries by value. |
| SN  | IMS Transaction        | Sort next level entries by name.  |

## Detail lines for reports I05 through I13

This section describes the common format of detail lines shared by reports I05 through I13. These reports quantify activity based on the basis of the PSW (Program Status Word) address values observed at the time of the sample. This format is not exclusive to the IMS reports, it is also used in CPU reports such as C01, and Wait reports such as W01.

### Detail lines reported for PSW sampling

Various report detail lines quantify activity on the basis of the PSW (Program Status Word) address values observed at the time of the sample. One PSW observation is recorded for each TCB. Depending on the report, the 'activity' might be: CPU usage, WAIT time, Queued time, or overall service time.

The analysis reports classify the PSW address values and aggregate them into 'objects'. The reports show each of these objects in one detail line arranged in a hierarchy. Each successive level in the hierarchy represents a more granular breakdown of the quantifications reported in the higher level items.

These objects are reported with a Name field, a Description, a quantification expressed as a percentage, and a histogram depicting the quantity. Descriptions of these detail lines are presented here.

#### APPLCN - Application code category

A group of lines is shown for each reported transaction. Some information about the transaction appears to the left, and a bar chart appears to the right.

| Under Heading   | This is Displayed                                                                                                                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | "APPLCN"                                                                                                                                                                                    |
| Description     | "Application Code"                                                                                                                                                                          |
| Percent of Time | The percentage of activity measured in application code. The classification as application code is done on the basis of load module names and DPA (Descriptive Program Attribution) tables. |

#### SYSTEM - System/OS services category

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | "SYSTEM"                                                                                                                                                                                                                                                                                                                                                                                          |
| Description     | "System/OS Services"                                                                                                                                                                                                                                                                                                                                                                              |
| Percent of Time | The percentage of activity measured in system services. The classification as SYSTEM is done on the basis of load module names and DPA (Descriptive Program Attribution) tables. These include core operating system services as well as major system applications or subsystems: Db2, IMS, CICS, MQ, etc. SVC (Supervisor Call) routines and MVS Nucleus routines are included in this category. |

#### NOSYMB - No module name found

| Under Heading | This is Displayed |
|---------------|-------------------|
| Name          | "NOSYMB"          |

| Under Heading   | This is Displayed                                                                                                                                                                                          |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description     | "No Module Name"                                                                                                                                                                                           |
| Percent of Time | The percentage of activity measured at addresses for which associated module names could not be determined. An example of this would be execution of instructions moved into an area of GETMAINED storage. |

## DPA group

| Under Heading   | This is Displayed                                                             |
|-----------------|-------------------------------------------------------------------------------|
| Name            | DPA Group name                                                                |
| Description     | Description of the DPA group. For example: MVS, IMS, Db2, SVC, LERUNLIB, etc. |
| Percent of Time | The percentage of activity measured in modules in the indicated grouping.     |

## DPA subgroup

| Under Heading   | This is Displayed                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------|
| Name            | DPA Subgroup name.                                                                                |
| Description     | Description of the DPA subgroup. For example: MVS, IMS, SVCTYPE1, SVCTYPE2, LEBASE, LECOBOL, etc. |
| Percent of Time | The percentage of activity measured in modules in the indicated grouping.                         |

## NOSYMB address range

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | Hexadecimal address range.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description     | "Unresolved Address."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Percent of Time | The percentage of activity measured at the indicated address range. These are addresses for which no corresponding module name could be determined. These measurements are aggregated under the NOSYMB category. Each report line represents a 4K (4096 bytes) range of addresses. The address range is displayed under the Name heading in the format HHHHHxxx. HHHHH displays the first five hexadecimal digits of the address and xxx represents the three lower order digits: a range from X'000' to X'FFF' (decimal 0 to 4095). |

## SVC - Supervisor call

| Under Heading   | This is Displayed                                                     |
|-----------------|-----------------------------------------------------------------------|
| Name            | SVCnnn - where nnn is the supervisor call number in decimal.          |
| Description     | Description of the supervisor call function.                          |
| Percent of Time | The percentage of activity measured in the indicated supervisor call. |

## CSECT - Control section

| Under Heading   | This is Displayed                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------|
| Name            | A CSECT (Control Section) name.                                                                       |
| Description     | Functional description of the CSECT if one is available. Otherwise "csectname in modulename" appears. |
| Percent of Time | The percentage of activity measured in the indicated CSECT.                                           |

## Db2SQL - Db2 SQL processing category

| Under Heading   | This is Displayed                                                  |
|-----------------|--------------------------------------------------------------------|
| Name            | "Db2SQL"                                                           |
| Description     | "SQL Processing."                                                  |
| Percent of Time | The percentage of activity measured while processing SQL requests. |

## SQL statement

| Under Heading   | This is Displayed                                                                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A unique reference number assigned to the SQL statement.                                                                                                                                                                            |
| Description     | The name of the program that issued the SQL request as well as the precompiler statement number of the SQL statement in PGMNAME(stmt#) format. This is followed by the SQL function name. For example: SELECT, INSERT, COMMIT, etc. |
| Percent of Time | The percentage of activity measured while processing the indicated SQL statement.                                                                                                                                                   |

## DATAMG - Data management processing category

| Under Heading   | This is Displayed                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | "DATAMG"                                                                                                                                                                                                                                              |
| Description     | "Data Mgmt Processing."                                                                                                                                                                                                                               |
| Percent of Time | The percentage of activity measured in routines that were servicing data management (DASD) requests. This includes basic access functions (such as READ and WRITE) to files. Processing of OPEN and CLOSE functions is not included in this category. |

## DDNAME

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | DDNAME of a DASD file.                                                                                                                                                                                                                                                         |
| Description     | Access method for the indicated file: VSAM, QSAM, etc.                                                                                                                                                                                                                         |
| Percent of Time | The percentage of activity measured in routines that were servicing data management (DASD) requests for the indicated DDNAME. This includes basic access functions (such as READ and WRITE) to files. Processing of OPEN and CLOSE functions is not included in this category. |



## DASD I/O request

| Under Heading   | This is Displayed                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Name            | Type of I/O request.                                                                                                           |
| Description     | Program name and offset of the I/O request.                                                                                    |
| Percent of Time | The percentage of activity measured in routines that were servicing data management (DASD) requests for the indicated request. |

## IMS PSB

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS PSB Name. NONIMS to indicate IMS activity for which no PSB has been scheduled. |
| Description     | The type of IMS dependent region: BMP, MPP, IFP, etc.                              |
| Percent of Time | The percentage of activity measured under the indicated IMS PSB.                   |

## IMS transaction

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS transaction code.                                                              |
| Description     | The PSB to which the IMS transaction belongs.                                      |
| Percent of Time | The percentage of activity measured while executing the indicated IMS transaction. |

## IMS DL/I call

| Under Heading   | This is Displayed                                                                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A unique reference number assigned to the DL/I call.                                                                                                              |
| Description     | The DL/I function code followed by the PCB name followed by the relative PCB number in parentheses. The location of the call in csect+offset format follows this. |
| Percent of Time | The percentage of activity measured while executing the indicated DL/I call.                                                                                      |

## IMSDLI - IMS DL/I processing category

| Under Heading   | This is Displayed                                                        |
|-----------------|--------------------------------------------------------------------------|
| Name            | "IMSDLI"                                                                 |
| Description     | "IMS DL/I Calls."                                                        |
| Percent of Time | The percentage of activity measured in the processing of IMS DL/I calls. |

## I05 - IMS DL/I CPU usage by PSB

---

### Usage

Use this report to see the distribution of CPU usage in an IMS-dependent region. This report aggregates CPU usage by IMS PSB and is meaningful when measuring a region in which multiple IMS PSBs are scheduled (for example, an MPP region). Both IMS and non-IMS CPU usage is reported. IMS CPU usage measured during the execution of DL/I calls is reported under detail lines, which identify each of the DL/I calls. Non-DL/I call CPU usage is reported as application code or system routines.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

#### Note:

You should not use this report to analyze CICS measurements.

### Quantification

Each report line quantifies CPU usage as a percentage of the overall CPU usage observed for the measurement interval. Each quantity is expressed as a percentage representing the ratio of the number of CPU active observations for the object on the report detail line to the total number of CPU active observations in the measurement.

### Detail line hierarchy

An unexpanded I05 report shows a line for each IMS PSB in which CPU usage was observed. The name field reports the PSB name. I05 reports CPU usage for which there was no IMS PSB on a separate line named NONIMS. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 PSB Name or 'NONIMS'
 Level 2 IMSDLI - DL/I call execution
 Level 3 DL/I call identification
 Level 4 Category
 Level 5 Load module
 Level 6 CSECT
 Level 4 SVC total
 Level 5 SVCnnn
 Level 6 Load module
 Level 7 CSECT
 Level 2 APPLCN - application code
 Level 3 Load module
 Level 4 CSECT
 Level 2 SYSTEM - system routines
 Level 3 Category
 Level 4 Load module
 Level 5 CSECT
 Level 3 SVC total
 Level 4 SVCnnn
 Level 5 Load module
 Level 6 CSECT

Level 2 NOSYMB - no load module name
 Level 3 hexadecimal addresses
```

### Detail line descriptions

#### PSB detail line

This is the first-level detail line. It aggregates activity by IMS PSB.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS PSB Name. NONIMS to indicate IMS activity for which no PSB has been scheduled. |
| Description     | The type of IMS dependent region: BMP, MPP, IFP, etc.                              |
| Percent of Time | The percentage of activity measured under the indicated IMS PSB.                   |

## Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13”](#) on page 286.

## Sample reports

A sample report is shown below. The report is expanded to the second level.

```

File View Navigate Help

I05: IMS CPU Usage by PSB (0805/ADSMPP) Row 00001 of 00008
Command ==> Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±10.1%
 *...1...2...3...4...5...6...7...8.
BBSFIN00 PSB in MPP region 98.98 =====
→ SYSTEM System/OS Services 57.57 =====
→ IMSDLI IMS DL/I Calls 30.30 =====
→ APPLCN Application Code 10.10 =====
→ NOSYMB No Module Name 1.01 =
NONIMS Not IMS Execution 1.01 =
→ SYSTEM System/OS Services 1.01 =

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                             | Action                           |
|-----|------------------------------------------------------------------------------------|----------------------------------|
| ?   | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information |
| ++  | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details          |
| +   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level      |
| -   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level      |
| SV  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by value         |
| SN  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by name          |
| M   | Load Module, CSECT                                                                 | Display load module information  |

| Cmd | When Applied To Object                                                             | Action                         |
|-----|------------------------------------------------------------------------------------|--------------------------------|
| P   | Load Module, DL/I call, CSECT, SQL command                                         | Display source program mapping |
| C01 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset      |
| C02 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset      |
| C03 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset      |
| C08 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C08 report subset      |
| C09 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C09 report subset      |

## on headings

| Cmd | When Applied To Object         | Action                            |
|-----|--------------------------------|-----------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information. |
| +   | Name                           | Expand to reveal all entries      |
| +   | Description                    | Expand field size                 |
| +   | Percent CPU                    | Zoom in scale                     |
| -   | Name                           | Collapse to show only first level |
| -   | Description                    | Reduce field size                 |
| -   | Percent CPU                    | Zoom out scale                    |
| SV  | Name                           | Sort next level by value          |
| SN  | Name                           | Sort next level by name           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
```

---

```
More: +
+----- The following report line was selected -----+
| BBSFIN00 PSB in MPP region 98.98 00000000000000000000000000000000 |
+-----+

Calculation Details
IMS DL/I call CPU measurements 98
PSB BBSFIN00
Total CPU measurements 99
Percent of total 98.98%

IMS PSB Information
PSB Name BBSFIN00 IMS system IMSP
No.of PCBs 27 LIST=NO PCBs 12
Txn count 99 DL/I calls 1010
Sample count 611

PCBNum Name Type DBD/LTRM PROCOPT LIST
1 IOPCB TP
2 ALT1 TP YES
3 ALT2 TP YES
4 DBSCN001 DB DBSCN000 A YES
5 DBSCN002 DB DBSCN000 A YES
6 DBSCN003 DB DBSCN000 A YES
7 DBSCI001 DB DBSCI000 A YES
8 DBSCI002 DB DBSCI000 A YES
9 DBSCI003 DB DBSCI000 A YES
10 DBSCA001 DB DBSCA000 A YES
11 DBSCA002 DB DBSCA000 A YES
12 DBSCA003 DB DBSCA000 A YES
13 DBSTL001 DB DBSTL000 A YES
14 DBSTL002 DB DBSTL000 A YES
15 DBSTL003 DB DBSTL000 A YES
16 DBSCNA01 DB DBSCN000 A NO
17 DBSCNA02 DB DBSCN000 A NO
18 DBSCNA03 DB DBSCN000 A NO
19 DBSCIA01 DB DBSCI000 A NO
```

## I06 - IMS DL/I CPU usage by transaction

## Usage

Use this report to see the distribution of CPU usage in an IMS-dependent region. This report aggregates CPU usage by IMS transaction and is meaningful when measuring a region in which multiple IMS transactions are scheduled (for example, an MPP region). Both IMS and non-IMS CPU usage is reported. IMS CPU usage measured during the execution of DL/I calls is reported under detail lines, which identify each of the DL/I calls. Non-DL/I call CPU usage is reported as application code or system routines.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

**Note:**

You should not use this report to analyze CICS measurements.

## Quantification

Each report line quantifies CPU usage as a percentage of the overall CPU usage observed for the measurement interval. Each quantity is expressed as a percentage representing the ratio of the number of CPU active observations for the object on the report detail line to the total number of CPU active observations in the measurement.

## Detail line hierarchy

An unexpanded IO6 report shows a line for each IMS transaction in which CPU usage was observed. The name field reports the transaction code. IO6 reports CPU usage for which no IMS transaction was

active under a line identifying the PSB name. If no IMS PSB was active the CPU usage is reported under a line named “NONIMS.” You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 Trancode, PSB Name or 'NONIMS'
 Level 2 IMSDLI - DL/I call execution
 Level 3 DL/I call identification
 Level 4 Category
 Level 5 Load module
 Level 6 CSECT
 Level 4 SVC total
 Level 5 SVCnnn
 Level 6 Load module
 Level 7 CSECT
 Level 2 APPLCN - application code
 Level 3 Load module
 Level 4 CSECT
 Level 2 SYSTEM - system routines
 Level 3 Category
 Level 4 Load module
 Level 5 CSECT
 Level 3 SVC total
 Level 4 SVCnnn
 Level 5 Load module
 Level 6 CSECT

Level 2 NOSYMB - no load module name
 Level 3 hexadecimal addresses

```

## Detail line descriptions

### Transaction detail line

This is the first-level detail line. It aggregates activity by IMS transaction. A PSB line is reported for any activity under IMS that is not under an IMS transaction.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS transaction code.                                                              |
| Description     | The PSB to which the IMS transaction belongs.                                      |
| Percent of Time | The percentage of activity measured while executing the indicated IMS transaction. |

### Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13” on page 286.](#)

## Sample reports

A sample report is shown below. The report is expanded to the second level.

```

File View Navigate Help

IO6: IMS CPU Usage by Txn (0805/ADSMPP) Row 00001 of 00013
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±10.1%
 *....1....2....3....4....5....6....7....8.
BBSDR000 Txn in PSB BBSFIN00 55.55 =====
→ SYSTEM System/OS Services 29.29 =====
→ IMSDLI IMS DL/I Calls 19.19 =====
→ APPLCN Application Code 6.06 ===
→ NOSYMB No Module Name 1.01 =

BBSCR000 Txn in PSB BBSFIN00 43.43 =====
→ SYSTEM System/OS Services 28.28 =====
→ IMSDLI IMS DL/I Calls 11.11 =====
→ APPLCN Application Code 4.04 ==

NONIMS Not IMS Execution 1.01 =
→ SYSTEM System/OS Services 1.01 =

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                                       | Action                            |
|-----|----------------------------------------------------------------------------------------------|-----------------------------------|
| ?   | TranCode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | Trancode, PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | Trancode, PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | Trancode, PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | Trancode, PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by value.         |
| SN  | Trancode, PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by name.          |
| M   | Load Module, CSECT                                                                           | Display load module information.  |
| P   | Load Module, CSECT, DL/I call, SQL command                                                   | Display source program mapping.   |
| C01 | Trancode, PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset.        |
| C02 | Trancode, PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset.        |
| C03 | Trancode, PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset         |





**Note:**

You should not use this report to analyze CICS measurements.

## Quantification

Each report line quantifies CPU usage as a percentage of the total CPU usage observed for all DL/I call processing. CPU usage observed outside of DL/I call processing is excluded from the calculation. Each quantity is expressed as a percentage representing the ratio of the number of CPU active observations for the object described by the report detail line to the total number of CPU active observations in DL/I call processing.

## Detail line hierarchy

An unexpanded I07 report shows a line for each IMS DL/I call in which CPU usage was observed. The name field shows a sequence number assigned to each unique DL/I call. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 DL/I call identification
 Level 2 Category
 Level 3 Load module
 Level 4 CSECT
 Level 2 SVC total
 Level 3 SVCnnn
 Level 4 Load module
 Level 5 CSECT

```

## Detail line descriptions

See [“Detail lines for reports I05 through I13” on page 286.](#)

## Sample reports

A sample report is shown below. The report is expanded to the second level.

```

File View Navigate Help

I07: IMS CPU Usage by DL/I Call (0805/ADSMPP) Row 00001 of 00039
Command ==> Scroll ==> CSR

Name Description Percent of DLI CPU time * 10.00% ±18.5%
 *....1....2....3....4....5....6....7....8.
00001 GU-IOPCB(1) BBSFIN00+0 46.66 =====
→ IMS IMS Subsystem 33.33 =====
→ MVS MVS System 10.00 =====
→ NOSYMB No Module Name 3.33 ==

00006 GHU-DBSTL001(13) BBSAP 6.66 ===
→ IMS IMS Subsystem 3.33 ==
→ SVC SVC Routines 3.33 ==

00018 REPL-DBSCN001(4) BBSAP 6.66 ===
→ IMS IMS Subsystem 6.66 ===

00002 DBSCA001(10) BBSAP 6.66 ===
→ SVC SVC Routines 6.66 ===

00009 DBSCN001(4) BBSAP 6.66 ===
→ IMS IMS Subsystem 6.66 ===

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object                                                        | Action                            |
|-----|-------------------------------------------------------------------------------|-----------------------------------|
| ?   | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | DL/I call, Category, SVC, SQL command                                         | Sort next level by value.         |
| SN  | DL/I call, Category, SVC, SQL command                                         | Sort next level by name.          |
| M   | Load Module, CSECT                                                            | Display load module information.  |
| P   | CSECT, DL/I call, SQL command                                                 | Display source program mapping.   |
| C01 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset.        |
| C02 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset.        |
| C03 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset         |
| C08 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C08 report subset.        |
| C09 | Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C09 report subset.        |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| 00001 GU-IOPCB(1) BBSFIN00+0 46.66 000000000000000000000000 |
+-----+

Calculation Details
IMS DL/I call CPU measurements 14
Total CPU measurements 30
Percent of total 46.66%

DL/I Call Information
Function code GU PSB Name BBSFIN00
PCB Name IOPCB IMS Id-Region IMSP-ADSMPP
PCB Number 1 Call type CBLTDLI
CSECT/module BBSFIN00 in BBSFIN00 Offset of call 0000038C
Sample count 10 Call count 60
DLI CPU time 0.14 Service time 0.19

```

## I08 - IMS DL/I WAIT time by PSB

### Usage

Use this report to identify any delays caused by wait conditions in IMS regions. This report shows wait time by IMS PSB and is meaningful when measuring a region in which multiple IMS PSBs are scheduled (for example, a MPP region). Only wait time observed when an IMS PSB is active is reported. Wait time is identified both within the processing of DL/I calls and outside of DL/I call processing.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) and IMS batch DL/I regions.

**Note:**

You should not use this report to analyze CICS measurements.

### Quantification

Each report line quantifies wait time as a percentage of the overall time IMS PSBs were active. Each quantity is expressed as a percentage representing the ratio of the number of samples in which the active IMS program was waiting to the total number of samples IMS programs were active. Any time when no IMS programs were active is excluded. This ensures that quantifications are not distorted by inactive intervals such as those that occur between scheduled transactions.

### Detail line hierarchy

An unexpanded I08 report shows a line for each IMS PSB that was observed. The name field reports the PSB name. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 PSB Name or 'NONIMS'
 Level 2 IMSDLI - DL/I call execution
 Level 3 DL/I call identification
 Level 4 Category
 Level 5 Load module
 Level 6 CSECT
 Level 4 SVC total
 Level 5 SVCnnn
 Level 6 Load module
 Level 7 CSECT
 Level 2 APPLCN - application code
 Level 3 Load module
 Level 4 CSECT
 Level 2 SYSTEM - system routines
 Level 3 Category
 Level 4 Load module
 Level 5 CSECT

```

**Level 3** SVC total  
**Level 4** SVCnnn  
**Level 5** Load module  
**Level 6** CSECT

**Level 2** NOSYMB - no load module name  
**Level 3** hexadecimal addresses

## Detail line descriptions

### PSB detail line

This is the first-level detail line. It aggregates activity by IMS transaction.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS PSB Name. NONIMS to indicate IMS activity for which no PSB has been scheduled. |
| Description     | The type of IMS dependent region: BMP, MPP, IFP, etc.                              |
| Percent of Time | The percentage of activity measured under the indicated IMS PSB.                   |

### Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13” on page 286.](#)

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I08: IMS WAIT Time by PSB (0805/ADSMPP) Row 00001 of 00020
Command ==> Scroll ==> CSR
Name Description Percent of Time * 10.00% ±3.5
*....1....2....3....4....5....6....7....8
=====
BBSFIN00 PSB in MPP region 82.42 =====
→ IMSDLI IMS DL/I Calls 73.24 =====
→ 00012 GHU-DBSCN001(4) BB 35.15 =====
→ 00003 GHU-DBSCN001(4) BB 33.37 =====
→ 00011 GHU-DBSCA001(10) B 1.91 ==
→ 00002 GHU-DBSCA001(10) B 1.78 ==
→ 00015 GHU-DBSTL001(13) B 0.25
→ 00018 REPL-DBSCN001(4) B 0.25
→ 00001 GU-IOPCB(1) BBSFIN 0.25
→ 00006 GHU-DBSTL001(13) B 0.12
→ 00007 ISRT-DBSTL001(13) 0.12
→ SYSTEM System/OS Services 5.60 ====
→ SVC SVC Routines 5.35 ====
→ LERUNLIB Language Environme 0.25
→ APPLCN Application Code 3.56 ==
→ BKN00SUP Application Progra 1.65 =
→ BKN00102 Application Progra 1.14 =
→ BKN00101 Application Progra 0.38
→ BKN00103 Application Progra 0.25
→ BKN00111 Application Progra 1.12 =

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object                                                             | Action                            |
|-----|------------------------------------------------------------------------------------|-----------------------------------|
| ?   | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by value.         |
| SN  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by name.          |
| M   | Load Module, CSECT                                                                 | Display load module information.  |
| P   | Load Module, CSECT, DL/I call, SQL command                                         | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
```

---

```
+----- The following report line was selected -----+
| BBSFIN00 PSB in MPP region 82.42 00000000000000000000000000000000 |
+-----+
```

More: +

Calculation Details

|                                      |          |
|--------------------------------------|----------|
| IMS DL/I call wait time measurements | 647      |
| PSB                                  | BBSFIN00 |
| Total measurements                   | 785      |
| Percent of total                     | 82.42%   |

IMS PSB Information

|              |          |              |      |
|--------------|----------|--------------|------|
| PSB Name     | BBSFIN00 | IMS system   | IMSP |
| No.of PCBs   | 27       | LIST=NO PCBs | 12   |
| Txn count    | 99       | DL/I calls   | 1010 |
| Sample count | 611      |              |      |

| PCBNum | Name     | Type | DBD/LTRM | PROCOPT | LIST |
|--------|----------|------|----------|---------|------|
| 1      | IOPCB    | TP   |          |         | YES  |
| 2      | ALT1     | TP   |          |         | YES  |
| 3      | ALT2     | TP   |          |         | YES  |
| 4      | DBSCN001 | DB   | DBSCN000 | A       | YES  |
| 5      | DBSCN002 | DB   | DBSCN000 | A       | YES  |
| 6      | DBSCN003 | DB   | DBSCN000 | A       | YES  |
| 7      | DBSCI001 | DB   | DBSCI000 | A       | YES  |
| 8      | DBSCI002 | DB   | DBSCI000 | A       | YES  |
| 9      | DBSCI003 | DB   | DBSCI000 | A       | YES  |
| 10     | DBSCA001 | DB   | DBSCA000 | A       | YES  |
| 11     | DBSCA002 | DB   | DBSCA000 | A       | YES  |
| 12     | DBSCA003 | DB   | DBSCA000 | A       | YES  |
| 13     | DBSTL001 | DB   | DBSTL000 | A       | YES  |
| 14     | DBSTL002 | DB   | DBSTL000 | A       | YES  |
| 15     | DBSTL003 | DB   | DBSTL000 | A       | YES  |
| 16     | DBSCNA01 | DB   | DBSCN000 | A       | NO   |
| 17     | DBSCNA02 | DB   | DBSCN000 | A       | NO   |
| 18     | DBSCNA03 | DB   | DBSCN000 | A       | NO   |
| 19     | DBSCIA01 | DB   | DBSCI000 | A       | NO   |

## I09 - IMS DL/I WAIT time by transaction

## Usage

Use this report to identify any delays caused by wait conditions in IMS regions. This report shows wait time by IMS transaction and is meaningful when measuring a region in which multiple IMS transactions are scheduled (for example, a MPP region). Only wait time observed when an IMS PSB is active is reported. Wait time is identified both within the processing of DL/I calls and outside of DL/I call processing.

## Quantification

Each report line quantifies wait time as a percentage of the overall time IMS PSBs were active. Each quantity is expressed as a percentage, which represents the ratio of the number of samples in which the active IMS program was waiting compared to the total number of samples IMS programs were active. Any time during when no IMS programs were active are excluded. This ensures that quantifications are not distorted by inactive intervals such as those that occur between scheduled transactions.

## Detail line hierarchy

An unexpanded I09 report shows a line for each IMS transaction observed. The name field reports the transaction code. In the event that no IMS transaction was active but a PSB was active, the PSB will be identified in the report line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

**Level 1** Trancode, PSB Name or 'NONIMS'  
**Level 2** IMSDLI - DL/I call execution  
**Level 3** DL/I call identification

```

Level 4 Category
Level 5 Load module
Level 6 CSECT
Level 4 SVC total
Level 5 SVCnnn
Level 6 Load module
Level 7 CSECT
Level 2 APPLCN - application code
Level 3 Load module
Level 4 CSECT
Level 2 SYSTEM - system routines
Level 3 Category
Level 4 Load module
Level 5 CSECT
Level 3 SVC total
Level 4 SVCnnn
Level 5 Load module
Level 6 CSECT

Level 2 NOSYMB - no load module name
Level 3 hexadecimal addresses

```

## Detail line descriptions

### Transaction detail line

This is the first-level detail line. It aggregates activity by IMS transaction. For any activity under IMS which is not under an IMS transaction a PSB line is reported.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS transaction code.                                                              |
| Description     | The PSB to which the IMS transaction belongs.                                      |
| Percent of Time | The percentage of activity measured while executing the indicated IMS transaction. |

### Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13”](#) on page 286.

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I09: IMS WAIT Time by TXn (0805/ADSMPP) Row 00001 of 00026
Command ==> ----- Scroll ==> CSR

Name Description Percent of Time * 10.00% ±3.5
*....1....2....3....4....5....6....7....8
=====
BBSDR000 Txn in PSB BBSFIN00 42.80 =====
→ IMSDLI IMS DL/I Calls 35.54 =====
→ 00003 GHU-DBSCN001(4) BB 33.37 =====
→ 00002 GHU-DBSCA001(10) B 1.78 ==
→ 00006 GHU-DBSTL001(13) B 0.12
→ 00001 GU-IOPCB(1) BBSFIN 0.25
→ 00007 ISRT-DBSTL001(13) 0.12
→ SYSTEM System/OS Services 3.69 ===
→ SVC SVC Routines 3.43 ===
→ LERUNLIB Language Environme 0.25
→ APPLCN Application Code 3.56 ===
→ BKN00SUP Application Progra 1.65 =
→ BKN00102 Application Progra 1.14 =
→ BKN00101 Application Progra 0.38
→ BKN00103 Application Progra 0.25
→ BKN00111 Application Progra 1.12 =

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                                       | Action                            |
|-----|----------------------------------------------------------------------------------------------|-----------------------------------|
| ?   | Trancode, PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command                     | Expand to reveal next level.      |
| -   | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Sort next level by value.         |
| SN  | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Sort next level by name.          |
| M   | Load Module, CSECT                                                                           | Display load module information.  |
| P   | Load Module, CSECT, DL/I call, SQL command                                                   | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                            |
|-----|--------------------------------|-----------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information. |
| +   | Name                           | Expand to reveal all entries.     |



| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| +   | Description            | Expand field size.                 |
| +   | Percent CPU            | Zoom in scale.                     |
| -   | Name                   | Collapse to show only first level. |
| -   | Description            | Reduce field size.                 |
| -   | Percent CPU            | Zoom out scale.                    |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

|                                                      |          |                     |                            |
|------------------------------------------------------|----------|---------------------|----------------------------|
| File View Navigate Help                              |          |                     |                            |
| +----- The following report line was selected -----+ |          |                     |                            |
|                                                      | BBSDR000 | Txn in PSB BBSFIN00 | 42.80 00000000000000000000 |
| +-----+                                              |          |                     |                            |
| Calculation Details                                  |          |                     |                            |
| IMS DL/I call wait time measurements                 |          | 336                 |                            |
| IMS transaction                                      |          | BBSDR000            |                            |
| Total measurements                                   |          | 785                 |                            |
| Percent of total                                     |          | 42.80%              |                            |
| IMS Transaction Information                          |          |                     |                            |
| IMS Trancode                                         |          | BBSDR000            | IMS system                 |
| PSB name                                             |          | BBSFIN00            | Txn count                  |
| Total time                                           |          | 10.1332             | IMSP                       |
|                                                      |          |                     | 50                         |
|                                                      |          |                     | Total CPU time             |
|                                                      |          |                     | 0.4327                     |

## I10 - IMS DL/I WAIT time by DL/I call

### Usage

Use this report to identify delays caused by wait conditions in specific DL/I calls. This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

#### Note:

You should not use this report to analyze CICS measurements.

### Quantification

Each report line quantifies wait time as a percentage of the total time observed for all DL/I call processing. Time observed outside of DL/I call processing is excluded from the calculation. Each quantity is expressed as a percentage representing the ratio of the number of wait samples for the object described by the report detail line to the total number of samples in DL/I call processing.

### Detail line hierarchy

An unexpanded I10 report shows a line for each IMS DL/I call. The name field shows a sequence number assigned to each unique DL/I call. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 DL/I call identification
Level 2 Category
Level 3 Load module
Level 4 CSECT
Level 2 SVC total
Level 3 SVCnnn
Level 4 Load Module
Level 5 CSECT

```

## Detail line descriptions

See “Detail lines for reports I05 through I13” on page 286.

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I10: IMS WAIT Time by DL/I Call (0805/ADSMPP) Row 00001 of 00037
Command ==> _____ Scroll ==> CSR

Name Description Percent of Time * 10.00% ±4.0
*....1....2....3....4....5....6....7....8
00012 GHU-DBSCN001(4) BBSAP0 45.17 =====
→ IMS IMS Subsystem 45.17 =====
→ DFSREP00 IMS Dispatcher Int 45.17 =====

00003 GHU-DBSCN001(4) BBSAP0 42.88 =====
→ IMS IMS Subsystem 42.88 =====
→ DFSREP00 IMS Dispatcher Int 42.71 =====
→ DBFDEDB0 IMS Module 0.16

00011 GHU-DBSCA001(10) BBSAP 2.45 ==
→ IMS IMS Subsystem 2.45 ==
→ DBFDEDB0 IMS Module 2.45 ==

00002 GHU-DBSCA001(10) BBSAP 2.29 ==
→ IMS IMS Subsystem 2.29 ==
→ DBFDEDB0 IMS Module 2.29 ==

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                        | Action                            |
|-----|-------------------------------------------------------------------------------|-----------------------------------|
| ?   | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | DL/I call, Category, SVC, SQL command                                         | Sort next level by value.         |
| SN  | DL/I call, Category, SVC, SQL command                                         | Sort next level by name.          |

| Cmd | When Applied To Object        | Action                           |
|-----|-------------------------------|----------------------------------|
| M   | Load Module, CSECT            | Display load module information. |
| P   | DL/I call, CSECT, SQL command | Display source program mapping.  |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
+----- The following report line was selected -----+
| 00012 GHU-DBSCN001(4) BBSAP0 45.17 000000000000000000000000 |
+-----+

Calculation Details
IMS DL/I call wait time measurements 276
Total measurements 611
Percent of total 45.17%

DL/I Call Information
Function code GHU PSB Name BBSFIN00
PCB Name DBSCN001 IMS Id-Region IMSP-ADSMPP
PCB Number 4 Call type CBLTDLI
CSECT/module BBSAP011 in BBSAP011 Offset of call 00000E68
Sample count 277 Call count 49
DLI CPU time 0.02 Service time 8.21

SSA/FSA 01 SBSCNTL (CNTLNUM =...)
```

## I11 - IMS DL/I activity by PSB

### Usage

Use this report to see how time is consumed in IMS-dependent regions. All time is reported regardless of whether the time is CPU usage or wait. This report shows activity by IMS PSB and is meaningful when measuring a region in which multiple IMS PSBs are scheduled (for example, a MPP region). Only time observed while an IMS PSB was active is reported. Time is identified both within the processing of DL/I calls and outside of DL/I call processing but only when an IMS PSB is active.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

**Note:**

You should not use this report to analyze CICS measurements.

## Quantification

Each report line quantifies time as a percentage of the overall time IMS PSBs were active. Each quantity is expressed as a percentage representing the ratio of the number of samples in which the active IMS program was observed compared to the total number of samples IMS programs were active. Any time when no IMS programs were active is excluded. This ensures that quantifications are not distorted by inactive intervals such as those that occur between scheduled transaction.

## Detail line hierarchy

An unexpanded I11 report shows a line for each IMS PSB in which activity was observed. The name field reports the PSB name. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Trancode, PSB Name or 'NONIMS'
Level 2 IMSDLI - DL/I call execution
 Level 3 DL/I call identification
 Level 4 Category
 Level 5 Load module
 Level 6 CSECT
 Level 4 SVC total
 Level 5 SVCnnn
 Level 6 Load module
 Level 7 CSECT
 Level 2 APPLCN - application code
 Level 3 Load module
 Level 4 CSECT
 Level 2 SYSTEM - system routines
 Level 3 Category
 Level 4 Load module
 Level 5 CSECT
 Level 3 SVC total
 Level 4 SVCnnn
 Level 5 Load module
 Level 6 CSECT

Level 2 NOSYMB - no load module name
 Level 3 hexadecimal addresses
```

## Detail line descriptions

### PSB detail line

This is the first-level detail line. It aggregates activity by IMS transaction.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS PSB Name. NONIMS to indicate IMS activity for which no PSB has been scheduled. |
| Description     | The type of IMS dependent region: BMP, MPP, IFP, etc.                              |
| Percent of Time | The percentage of activity measured under the indicated IMS PSB.                   |

### Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13” on page 286.](#)

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I11: IMS DL/I Activity by PSB (0805/ADSMPP) Row 00001 of 00034
Command ==> _____ Scroll ==> CSR

Name Description Percent of Time * 10.00% ±3.5
*....1....2....3....4....5....6....7....8
BBSFIN00 PSB in MPP region 100.00 =====
→ IMSDLI IMS DL/I Calls 77.83 =====
→ 00012 GHU-DBSCN001(4) BB 35.28 =====
→ 00003 GHU-DBSCN001(4) BB 33.50 =====
→ 00001 GU-IOPCB(1) BBSFIN 2.29 ==
→ 00002 GHU-DBSCA001(10) B 2.16 ==
→ 00011 GHU-DBSCA001(10) B 1.91 ==
→ 00018 REPL-DBSCN001(4) B 0.50
→ 00006 GHU-DBSTL001(13) B 0.38
→ 00015 GHU-DBSTL001(13) B 0.38
→ 00009 REPL-DBSCN001(4) B 0.38
→ 00007 ISRT-DBSTL001(13) 0.38
→ 00004 GHU-DBSCA002(11) B 0.12
→ 00017 REPL-DBSCA001(10) 0.12
→ 00013 GHU-DBSCA002(11) B 0.12
→ 00008 REPL-DBSCA001(10) 0.12
→ 00010 ISRT-IOPCB(1) BBSF 0.12
→ SYSTEM System/OS Services 16.94 =====
→ SVC SVC Routines 15.28 =====
→ LERUNLIB Language Environme 1.14 ==
→ IMS MVS System 0.50
→ APPLCN Application Code 5.09 ==
→ BKN00SUP Application Progra 2.03 ==
→ BKNCS102 Application Progra 1.27 ==
→ BKNCS101 Application Progra 0.38

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                             | Action                            |
|-----|------------------------------------------------------------------------------------|-----------------------------------|
| ?   | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | PSB, DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by value.         |
| SN  | PSB, DL/I call, Category, SVC, SQL command                                         | Sort next level by name.          |
| M   | Load Module, CSECT                                                                 | Display load module information.  |
| P   | DL/I call, CSECT, SQL command                                                      | Display source program mapping.   |

| Cmd | When Applied To Object                                                             | Action                     |
|-----|------------------------------------------------------------------------------------|----------------------------|
| C01 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset. |
| C02 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset. |
| C03 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset. |
| C08 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C08 report subset. |
| C09 | PSB, DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C09 report subset. |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
-----+-----
+----- The following report line was selected -----+
| > 00012 GHU-DBSCN001(4) BB 35.28 000000000000000000 |
+-----+-----

Calculation Details
IMS DL/I call activity measurements 277
Total measurements 785
Percent of total 35.28%

DL/I Call Information
Function code GHU PSB Name BBSFIN00
PCB Name DBSCN001 IMS Id-Region IMSP-ADSMPP
PCB Number 4 Call type CBLTDLI
CSECT/module BBSAP011 in BBSAP011 Offset of call 00000E68
Sample count 277 Call count 49
DLI CPU time 0.02 Service time 8.21

SSA/FSA 01 SBSCNTL (CNTLNUM =...)
```

## I12 - IMS DL/I activity by transaction

### Usage

Use this report to see how time is consumed in IMS-dependent regions. All time is reported regardless of whether the time is CPU usage or wait. This report shows activity by IMS transaction and is meaningful when measuring a region in which multiple IMS transactions are scheduled (for example, a MPP region). Only time observed while an IMS PSB was active is reported. Time is identified both within the processing of DL/I calls and outside of DL/I call processing but only when an IMS PSB is active.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

#### Note:

You should not use this report to analyze CICS measurements.

### Quantification

Each report line quantifies time as a percentage of the overall time IMS PSBs were active. Each quantity is expressed as a percentage representing the ratio of the number of samples in which the active IMS program was observed compared to the total number of samples IMS programs were active. Any time when no IMS programs were active is excluded. This ensures that quantifications are not distorted by inactive intervals such as those that occur between scheduled transaction.

### Detail line hierarchy

An unexpanded I12 report shows a line for each IMS transaction observed. The name field reports the transaction code. In the event that no IMS transaction was active but a PSB was active, the PSB will be identified in the report line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Trancode, PSB Name or 'NONIMS'
 Level 2 IMSDLI - DL/I call execution
 Level 3 DL/I call identification
 Level 4 Category
 Level 5 Load module
 Level 6 CSECT
 Level 4 SVC total
 Level 5 SVCnnn
 Level 6 Load module
 Level 7 CSECT
 Level 2 APPLCN - application code
 Level 3 Load module
 Level 4 CSECT
 Level 2 SYSTEM - system routines
 Level 3 Category
 Level 4 Load module
 Level 5 CSECT
 Level 3 SVC total
 Level 4 SVCnnn
 Level 5 Load module
 Level 6 CSECT

Level 2 NOSYMB - no load module name
 Level 3 hexadecimal addresses
```

### Detail line descriptions

#### Transaction detail line

This is the first-level detail line. It aggregates activity by IMS transaction. A PSB line is reported for any activity under IMS that is not under an IMS transaction.

| Under Heading   | This is Displayed                                                                  |
|-----------------|------------------------------------------------------------------------------------|
| Name            | IMS transaction code                                                               |
| Description     | The PSB to which the IMS transaction belongs.                                      |
| Percent of Time | The percentage of activity measured while executing the indicated IMS transaction. |

## Other detail lines

Other detail lines are subcategories and show objects based on observed PSW addresses. See [“Detail lines for reports I05 through I13” on page 286.](#)

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I12: IMS DL/I Activity by Txn (0805/ADSMPP) Row 00001 of 00046
Command ==> _____ Scroll ==> CSR

Name Description Percent of Time * 10.00% ±3.5
*....1...2...3...4...5...6...7...8
BBSDR000 Txn in PSB BBSFIN00 52.48 =====
→ IMSDLI IMS DL/I Calls 38.47 =====
→ 00003 GHU-DBSCN001(4) BB 33.50 =====
→ 00002 GHU-DBSCA001(10) B 2.16 ==
→ 00001 GU-IOPCB(1) BBSFIN 1.27 ==
→ 00006 GHU-DBSTL001(13) B 0.38
→ 00009 REPL-DBSCN001(4) B 0.38
→ 00007 ISRT-DBSTL001(13) 0.38
→ 00004 GHU-DBSCA002(11) B 0.12
→ 00008 REPL-DBSCA001(10) 0.12
→ 00010 ISRT-IOPCB(1) BBSF 0.12
→ SYSTEM System/OS Services 9.29 =====
→ SVC SVC Routines 8.53 =====
→ LERUNLIB Language Environme 0.50
→ MVS MVS System 0.25
→ APPLCN Application Code 4.58 ==
→ BKN00SUP Application Progra 2.03 ==
→ BKNCS102 Application Progra 1.14 ==

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                                       | Action                            |
|-----|----------------------------------------------------------------------------------------------|-----------------------------------|
| ?   | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Expand to reveal next level.      |



| Cmd | When Applied To Object                                                                       | Action                           |
|-----|----------------------------------------------------------------------------------------------|----------------------------------|
| -   | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Collapse to hide next level.     |
| SV  | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Sort next level by value.        |
| SN  | Trancode, PSB, Category, DL/I call, Load Module, SVC, SQL command                            | Sort next level by name.         |
| M   | Load Module, CSECT                                                                           | Display load module information. |
| P   | Load Module, CSECT, DL/I call, SQL command                                                   | Display source program mapping.  |
| C01 | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset.       |
| C02 | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset.       |
| C03 | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset        |
| C08 | Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address                | Display C08 report subset.       |
| C09 | Trancode, PSB, Category, DL/I call, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C09 report subset.       |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected +-----+
| BBSDR000 Txn in PSB BBSFIN00 52.48 00000000000000000000000000000000 |
+-----+
+-----+

Calculation Details
 IMS DL/I call activity measurements 412
 IMS transaction BBSDR000
 Total measurements 785
 Percent of total 52.48%

IMS Transaction Information
 IMS Trancode BBSDR000 IMS system IMSP
 PSB name BBSFIN00 Txn count 50
 Total time 10.1332 Total CPU time 0.4327
+-----+

```

### I13 - IMS DL/I activity by DL/I call

## Usage

Use this report to see how time is consumed in IMS-dependent regions by specific DL/I calls. All time is reported regardless of whether the time is CPU usage or wait.

This report is intended for measurements of IMS-dependent regions (MPP, BMP, FPP) as well as IMS batch DL/I regions.

**Note:**

You should not use this report to analyze CICS measurements.

## Quantification

Each report line quantifies time as a percentage of the total time observed for all DL/I call processing. Time observed outside of DL/I call processing is excluded from the calculation. Each quantity is expressed as a percentage representing the ratio of the number of samples for the object described by the report detail line to the total number of samples in DL/I call processing.

## Detail line hierarchy

An unexpanded I13 report shows a line for each IMS DL/I call. The name field shows a sequence number assigned to each unique DL/I call. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 DL/I call identification
Level 2 Category
Level 3 Load module
Level 4 CSECT
Level 2 SVC total
Level 3 SCVnnn
Level 4 Load module
Level 5 CSECT

```

### Detail line descriptions

See “Detail lines for reports I05 through I13” on page 286.

## Sample reports

A sample report is shown below. The report is expanded to the third level.

```

File View Navigate Help

I13: DL/I Activity by DL/I Call (0805/ADSMPP) Row 00001 of 00089
Command ==> _____ Scroll ==> CSR

Name Description Percent of DLI Time * 10.00% ±4.0
*....1....2....3....4....5....6....7....8
00012 GHU-DBSCN001(4) BBSAP0 45.33 =====
→ IMS IMS Subsystem 45.33 =====
→ DFSREP00 IMS Dispatcher Int 45.17 =====
→ DFSLMGRO IMS Global Lock Ma 0.16

00003 GHU-DBSCN001(4) BBSAP0 43.04 =====
→ IMS IMS Subsystem 42.88 =====
→ DFSREP00 IMS Dispatcher Int 42.71 =====
→ DBFDEDB0 IMS Module 0.16
→ SVC SVC Routines 0.16
→ SVC138 PGSER 0.16

00001 GU-IOPCB(1) BBSFIN00+0 2.94 ==
→ IMS IMS Subsystem 2.29 ==
→ DFSREP00 IMS Dispatcher Int 0.65
→ DBFSYNCO IMS Module 0.49
→ DFSQGU00 IMS Module 0.32

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                        | Action                            |
|-----|-------------------------------------------------------------------------------|-----------------------------------|
| ?   | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display context help information. |
| ++  | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Show additional details.          |
| +   | DL/I call, Category, Load Module, SVC, SQL command                            | Expand to reveal next level.      |
| -   | DL/I call, Category, Load Module, SVC, SQL command                            | Collapse to hide next level.      |
| SV  | DL/I call, Category, Load Module, SVC, SQL command                            | Sort next level by value.         |
| SN  | DL/I call, Category, Load Module, SVC, SQL command                            | Sort next level by name.          |
| M   | Load Module, CSECT                                                            | Display load module information.  |
| P   | DL/I call, CSECT, SQL command                                                 | Display source program mapping.   |
| C01 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C01 report subset.        |
| C02 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C02 report subset.        |
| C03 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C03 report subset         |
| C08 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C08 report subset.        |

| Cmd | When Applied To Object                                                        | Action                     |
|-----|-------------------------------------------------------------------------------|----------------------------|
| C09 | DL/I call, Category, Load Module, SVC, CSECT, SQL command, Unresolved Address | Display C09 report subset. |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size.                 |
| +   | Percent CPU                    | Zoom in scale.                     |
| -   | Name                           | Collapse to show only first level. |
| -   | Description                    | Reduce field size.                 |
| -   | Percent CPU                    | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

|                                                      |                           |                |                              |
|------------------------------------------------------|---------------------------|----------------|------------------------------|
| File View Navigate Help                              |                           |                |                              |
| +----- The following report line was selected -----+ |                           |                |                              |
| 00012                                                | GHU-DBSCN001(4)           | BBSAP0         | 45.33 0000000000000000000000 |
| +-----+                                              |                           |                |                              |
| Calculation Details                                  |                           |                |                              |
| IMS DL/I call activity measurements                  | 277                       |                |                              |
| Total measurements                                   | 611                       |                |                              |
| Percent of total                                     | 45.33%                    |                |                              |
| DL/I Call Information                                |                           |                |                              |
| Function code                                        | GHU                       | PSB Name       | BBSFIN00                     |
| PCB Name                                             | DBSCN001                  | IMS Id-Region  | IMSP-ADSMPP                  |
| PCB Number                                           | 4                         | Call type      | CBLTDLI                      |
| CSECT/module                                         | BBSAP011 in BBSAP011      | Offset of call | 00000E68                     |
| Sample count                                         | 277                       | Call count     | 49                           |
| DLI CPU time                                         | 0.02                      | Service time   | 8.21                         |
| SSA/FSA                                              | 01 SBSCNTL (CNTLNUM =...) |                |                              |

## I14 - IMS PSB/PCB attributes

### Usage

This report is intended primarily for use when analyzing measurements using printed reports. Use I14 to look up detailed information about PSBs (and their PCBs) referred to by detail lines in other reports. When analyzing data in interactive mode, you can look up this information by pressing the ENTER key (or entering the “++” line command) on any detail line that refers to the PSB.

## Detail line descriptions

### PSB information

The following information is reported for each PSB:

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSB Name      | The name of the PSB.                                                                                                                                                                                                                                                                   |
| IMS System    | The system ID of the IMS subsystem. This information might not be available for a CICS measurement.                                                                                                                                                                                    |
| No. of PCBs   | The number of PCBs in the PSB. This information is available only if the IMS+ measurement option was enabled.                                                                                                                                                                          |
| LIST=NO PCBs  | The number of PCBs in the PSB defined with the LIST=NO option. These PCBs are not visible to the application in the PSB list passed by IMS. They are accessed by symbolic name using the AIB interface. This information is available only if the IMS+ measurement option was enabled. |
| Txn Count     | The number of IMS transactions under this PSB counted during the measurement. This information is available only if the IMS+ measurement option was enabled.                                                                                                                           |
| DL/I calls    | The number of DL/I calls executed under this PSB during the measurement. This information is available only if the IMS+ measurement option was enabled.                                                                                                                                |
| Sample count  | The number of times execution under this PSB was sampled.                                                                                                                                                                                                                              |

### PCB information

The PCBs are listed if the IMS+ measurement option was enabled.

| Under Heading | This is Displayed                                                                                    |
|---------------|------------------------------------------------------------------------------------------------------|
| PSBNum        | The relative PCB number.                                                                             |
| Name          | The symbolic name of the PCB defined in the label field of the PCB macro.                            |
| Type          | TP or DB indicates a data communications or data base PCB.                                           |
| DBD/LTRM      | The data base name for a data base PCB. The PCB LTERM parameter value for a data communications PCB. |
| PROCOPT       | The processing options for a data base PCB.                                                          |
| LIST          | Indicates whether the PCB was defined as LIST=YES or LIST=NO.                                        |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I14: IMS PSB/PCB Attributes (0805/ADSMPP) Row 00001 of 00036
Command ==> _____ Scroll ==> CSR

```

IMS PSB Information for PSBName BBSFIN00

```

PSB Name BBSFIN00 IMS system IMSP
No.of PCBs 27 LIST=NO PCBs 12
Txn count 99 DL/I calls 1010
Sample count 611

```

| PCBNum | Name     | Type | DBD/LTRM | PROCOPT | LIST |
|--------|----------|------|----------|---------|------|
| 1      | IOPCB    | TP   |          |         | YES  |
| 2      | ALT1     | TP   |          |         | YES  |
| 3      | ALT2     | TP   |          |         | YES  |
| 4      | DBSCN001 | DB   | DBSCN000 | A       | YES  |
| 5      | DBSCN002 | DB   | DBSCN000 | A       | YES  |
| 6      | DBSCN003 | DB   | DBSCN000 | A       | YES  |
| 7      | DBSCI001 | DB   | DBSCI000 | A       | YES  |
| 8      | DBSCI002 | DB   | DBSCI000 | A       | YES  |
| 9      | DBSCI003 | DB   | DBSCI000 | A       | YES  |
| 10     | DBSCA001 | DB   | DBSCA000 | A       | YES  |
| 11     | DBSCA002 | DB   | DBSCA000 | A       | YES  |
| 12     | DBSCA003 | DB   | DBSCA000 | A       | YES  |
| 13     | DBSTL001 | DB   | DBSTL000 | A       | YES  |
| 14     | DBSTL002 | DB   | DBSTL000 | A       | YES  |
| 15     | DBSTL003 | DB   | DBSTL000 | A       | YES  |
| 16     | DBSCNA01 | DB   | DBSCN000 | A       | NO   |
| 17     | DBSCNA02 | DB   | DBSCN000 | A       | NO   |
| 18     | DBSCNA03 | DB   | DBSCN000 | A       | NO   |

## I15 - IMS DL/I call attributes

### Usage

This report is intended primarily for use when analyzing measurements using printed reports. Use I15 to look up detailed information about DL/I calls referred to by detail lines in other reports. When analyzing data in interactive mode, you can look up this information by pressing the ENTER key (or entering the “++” line command) on any detail line that refers to the DL/I call.

### Detail line descriptions

#### DL/I call information

The following information is reported for each DL/I call:

| Under Heading | This is Displayed                                                              |
|---------------|--------------------------------------------------------------------------------|
| DL/I Call ID  | A unique reference number assigned to the call.                                |
| Function Code | The DL/I function code.                                                        |
| PSB Name      | The name of the PSB under which all occurrences of this DL/I call executed.    |
| PCB Name      | The name of the PCB referenced by the DL/I call.                               |
| IMS ID-Region | The ID of the IMS subsystem and the name of the IMS-dependent region.          |
| PCB Number    | The relative PCB number in its PSB.                                            |
| Call Type     | The language interface used by the call: <ASMTDLI, CBLTDLI, etc.> was sampled. |
| CSECT/Module  | The CSECT name and load module of the DL/I call.                               |

| Under Heading  | This is Displayed                                                                                                                                              |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Offset of call | The offset in the CSECT of the call.                                                                                                                           |
| Sample count   | The number of times activity in this DL/I call was sampled.                                                                                                    |
| Call count     | The number of occurrences of this DL/I call observed. This information is available only if the IMS+ measurement option was enabled.                           |
| DL/I CPU time  | The number of seconds of CPU time consumed by all occurrences of the DL/I call. This information is available only if the IMS+ measurement option was enabled. |
| Service time   | The number of seconds of service time for all occurrences of the DL/I call. This information is available only if the IMS+ measurement option was enabled.     |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I15: IMS DL/I Call Attributes (0805/ADSMPP) Row 00001 of 0192
Command ==> _____ Scroll ==> CSR

DL/I Call Id 00001

Function code GU PSB Name BBSFIN00
PCB Name IOPCB IMS Id-Region IMSP-ADSMPP
PCB Number 1 Call type CBLTDLI
CSECT/module BBSFIN00 in BBSFIN00 Offset of call 0000038C
Sample count 9 Call count 60
DL/I CPU time 0.14 Service time 0.19

DL/I Call Id 00002

Function code GHU PSB Name BBSFIN00
PCB Name DBSCA001 IMS Id-Region IMSP-ADSMPP
PCB Number 10 Call type CBLTDLI
CSECT/module BBSAP012 in BBSAP012 Offset of call 00000E0E
Sample count 16 Call count 50
DLI CPU time 0.04 Service time 0.66

SSA/FSA 01 SBSABAS (ACCTNUM =...)

```

## I16 - IMS transaction service times

### Usage

Use this report to see information about IMS transaction service times. This report is meaningful only when measuring an IMS-dependent region in which transactions are executed. The IMS+ feature must have been enabled when the measurement was performed.

### Quantification

Use this report to see information about IMS transaction service times. This report is meaningful only when measuring an IMS-dependent region in which transactions are executed. The IMS+ feature must have been enabled when the measurement was performed.

### Detail line hierarchy

The I16 report shows one detail line level. It cannot be expanded.

## Detail line descriptions

The following information is reported for each DL/I call:

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TranCode      | The IMS transaction code.                                                                                                                                                                                                                                                                                                                                           |
| PSB/PGM       | The name of the PSB and program.                                                                                                                                                                                                                                                                                                                                    |
| Counts: Txns  | The number of executions of the transaction that occurred during the measurement interval.                                                                                                                                                                                                                                                                          |
| Counts: Fetch | The number of times the program was fetched by IMS. In general, the program is fetched when the transaction is scheduled. The number of fetches of the program is also affected by the limit count value for the transaction. A high fetch count could mean that a performance improvement might be realized by raising the limit count or pre-loading the program. |
| Counts: Sched | The number of times the program was scheduled for successive executions of the transaction. This is the count of sets of consecutive transaction executions that occurred before QC status was returned to the GU-IOPCB call.                                                                                                                                       |
| Total Time    | The total execution time of the transaction during the measurement interval.                                                                                                                                                                                                                                                                                        |
| Avg/Txn       | The average execution time for the transaction based on the measurement interval.                                                                                                                                                                                                                                                                                   |
| CPU Time      | The total CPU time consumed by all executions of the transaction during the measurement interval.                                                                                                                                                                                                                                                                   |

## Sample reports

A sample report is shown below.

```
File View Navigate Help

I16: IMS Transaction Service Times (0805/ADSMPP) Row 00001 of 0002
Command ===> _____ Scroll ===> CSR

TranCode PSB/PGM ----- Counts ----- Times (secs) -----
Txns Fetch Sched Total Time Avg/Txn CPU Time
BBSDR000 BBSFIN00 50 20 20 10.133 0.202 0.432
BBSCR000 BBSFIN00 49 20 20 9.438 0.192 0.407
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Trancode               | Display context help information. |
| ++  | Trancode               | Show additional details.          |



# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| BBSDR000 BBSFIN00 50 20 20 10.133 0.202 0.432 |
+-----+

IMS Transaction Information
IMS Trancode BBSDR000 IMS system IMSP
PSB name BBSFIN00 Txn count 50
Total time 10.1332 Total CPU time 0.4327
+-----+
```

# I17 - IMS transaction DL/I call counts

## Usage

Use this report to see information about the number of DL/I calls issued by each of the measured IMS transactions. This report is meaningful only when measuring an IMS-dependent region in which transactions are executed. The IMS+ feature must have been enabled when the measurement was performed.

## Quantification

Each report line shows information pertaining to one IMS transaction.

## Detail line hierarchy

An unexpanded I17 report shows a line for each IMS transaction code for which transaction execution was observed. You can expand each line to reveal one additional hierarchical level of detail. The hierarchy is illustrated here:

```
Level 1 IMS Transaction
Level 2 DL/I Call
```

## Detail line descriptions

### IMS transaction detail line

This is the first-level detail line. Each line shows information about one IMS transaction code.

| Under Heading            | This is Displayed                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------------------------|
| Tran/PCB                 | The IMS transaction code.                                                                                           |
| PSB/DBD                  | The name of the PSB and program.                                                                                    |
| PCBNum                   | No data is reported in the transaction detail line.                                                                 |
| Func                     | No data is reported in the transaction detail line.                                                                 |
| DL/I Call Count: Total   | The total number of DL/I calls counted for all executions of the transaction during the measurement interval.       |
| DL/I Call Count: Minimum | The minimum number of DL/I calls observed in a single execution of the transaction during the measurement interval. |

| Under Heading            | This is Displayed                                                                                                       |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| DL/I Call Count: Maximum | The maximum number of DL/I calls observed in a single execution of the transaction during the measurement interval.     |
| DL/I Call Count: Average | The average number of DL/I calls per transaction for all executions of the transaction during the measurement interval. |

## DL/I call detail line

This is the second-level detail line. Each line shows information about a DL/I call for which execution was observed under the transaction.

| Under Heading            | This is Displayed                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Tran/PCB                 | The name of the PCB referenced by the indicated DL/I call.                                                                                      |
| PSB/DBD                  | The DBD name for the DL/I call for database calls.                                                                                              |
| PCBNum                   | The relative PCB number of the PCB referenced by the DL/I call.                                                                                 |
| Func                     | The DL/I function code.                                                                                                                         |
| DL/I Call Count: Total   | The total number of occurrences of the indicated DL/I call counted for all executions of the transaction during the measurement interval.       |
| DL/I Call Count: Minimum | The minimum number of occurrences of the indicated DL/I call observed in a single execution of the transaction during the measurement interval. |
| DL/I Call Count: Maximum | The maximum number of occurrences of the indicated DL/I call observed in a single execution of the transaction during the measurement interval. |
| DL/I Call Count: Average | The average number of occurrences of the indicated DL/I call per transaction during the measurement interval.                                   |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I17: IMS Transaction DL/I Call Counts (0805/ADSMPP) Row 00001 of 0002
Command ==> _____ Scroll ==> CSR

TranPCB PSB/DBD PCBNum Func ----- DL/I Call Counts -----
 Total Minimum Maximum Average
BBSR000 BBSFIN00 490 10 10 10.00
BBSR000 BBSFIN00 500 10 10 10.00

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Trancode, PCB          | Display context help information. |
| +   | Trancode               | Show additional details.          |

| Cmd | When Applied To Object | Action                       |
|-----|------------------------|------------------------------|
| -   | Trancode               | Collapse to hide next level. |
| ++  | Trancode, PCB          | Show additional details.     |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Tran/PCB               | Display context help information.  |
| +   | Tran/PCB               | Expand to reveal all entries.      |
| -   | Tran/PCB               | Collapse to show only first level. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| BBSCR000 BBSFIN00 490 10 10 10.00 |
+-----+
IMS Transaction Information
IMS Trancode BBSCR000 IMS system IMSP
PSB name BBSFIN00 Txn count 49
Total time 9.4387 Total CPU time 0.4074
+-----+

```

## I18 - IMS CPU/Svc time by DL/I calls

### Usage

Use this report to see information about exact CPU times and service times for DL/I calls. The IMS+ feature must have been enabled when the measurement was performed.

### Quantification

Each report line shows information pertaining to one DL/I call.

### Detail line hierarchy

The I18 report shows one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading | This is Displayed                                     |
|---------------|-------------------------------------------------------|
| Call          | A unique reference number assigned to the DL/I call.  |
| Func          | The DL/I function code.                               |
| PCB Name      | The name of the PCB referenced by the DL/I call.      |
| Location      | The location of the DL/I call in CSECT+offset format. |
| Count         | The number of executions of the DL/I call counted.    |

| Under Heading  | This is Displayed                                                                                                   |
|----------------|---------------------------------------------------------------------------------------------------------------------|
| Svc time/Prcnt | The total service time for all executions of this DL/I call and the percentage of the total DL/I call service time. |
| CPU time/Prcnt | The total CPU time consumed by all executions of this DL/I call and the percentage of the total DL/I call CPU time. |

## Sample reports

A sample report is shown below.

| File View Navigate Help                              |      |          |               |       |                |                   |                |       |
|------------------------------------------------------|------|----------|---------------|-------|----------------|-------------------|----------------|-------|
| I18: IMS CPU/Service Time by DL/I Call (0805/ADSMPP) |      |          |               |       |                | Row 00001 of 0018 |                |       |
| Command ==> _____                                    |      |          |               |       |                | Scroll ==> CSR    |                |       |
| ---- DL/I Processing Time ----                       |      |          |               |       |                |                   |                |       |
| Call                                                 | Func | PCB Name | Location      | Count | Svc Time/Prcnt |                   | CPU Time/Prcnt |       |
| 0012                                                 | GHU  | DBSCN001 | BBSAP011+0E68 | 49    | 8.210          | 44.4%             | 0.028          | 4.8%  |
| 0003                                                 | GHU  | DBSCN001 | BBSAP012+0EE4 | 50    | 7.823          | 42.3%             | 0.031          | 5.4%  |
| 0002                                                 | GHU  | DBSCA001 | BBSAP012+0E0E | 50    | 0.664          | 3.5%              | 0.048          | 8.3%  |
| 0011                                                 | GHU  | DBSCA001 | BBSAP011+0D92 | 49    | 0.590          | 3.1%              | 0.047          | 8.2%  |
| 0001                                                 | GU   | IOPCB    | BBSFIN00+038C | 119   | 0.557          | 3.0%              | 0.148          | 25.8% |
| 0015                                                 | GHU  | DBSTL001 | BBSAP011+111E | 49    | 0.134          | 0.7%              | 0.045          | 7.8%  |
| 0006                                                 | GHU  | DBSTL001 | BBSAP012+11B0 | 50    | 0.114          | 0.6%              | 0.043          | 7.5%  |
| 0018                                                 | REPL | DBSCN001 | BBSAP011+12EA | 49    | 0.107          | 0.5%              | 0.036          | 6.2%  |
| 0009                                                 | REPL | DBSCN001 | BBSAP012+13A4 | 50    | 0.075          | 0.4%              | 0.035          | 6.1%  |
| 0007                                                 | ISRT | DBSTL001 | BBSAP012+1252 | 50    | 0.072          | 0.3%              | 0.027          | 4.7%  |
| 0010                                                 | ISRT | IOPCB    | BBSFIN00+0410 | 99    | 0.034          | 0.1%              | 0.010          | 1.7%  |
| 0016                                                 | ISRT | DBSTL001 | BBSAP011+11C0 | 49    | 0.016          | 0.0%              | 0.015          | 2.6%  |
| 0013                                                 | GHU  | DBSCA002 | BBSAP011+0FF4 | 49    | 0.015          | 0.0%              | 0.011          | 1.9%  |
| 0004                                                 | GHU  | DBSCA002 | BBSAP012+1086 | 50    | 0.014          | 0.0%              | 0.010          | 1.7%  |
| 0005                                                 | ISRT | DBSCA002 | BBSAP012+1110 | 50    | 0.011          | 0.0%              | 0.011          | 1.9%  |
| 0014                                                 | ISRT | DBSCA002 | BBSAP011+107E | 49    | 0.011          | 0.0%              | 0.011          | 1.9%  |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DL/I Call              | Display context help information. |
| ++  | DL/I Call              | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Call                   | Display context help information. |
| SV  | Call                   | Sort next level by value.         |
| SN  | Call                   | Sort next level by name.          |

# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| 0012 GHU DBSCN001 BBSAP011+0E68 49 8.210 44.4% 0.028 4.8%|
+-----+

DL/I Call Information
Function code GHU PSB Name BBSFIN00
PCB Name DBSCN001 IMS Id-Region IMSP-ADSMPP
PCB Number 4 Call type CBLTDLI
CSECT/module BBSAP011 in BBSAP011 Offset of call 00000E68
Sample count 277 Call count 49
DLI CPU time 0.02 Service time 8.21

SSA/FSA 01 SBSCNTL (CNTLNUM =...)
```

# I19 - IMS CPU/Svc time by PSB

## Usage

Use this report to see information about exact CPU times and service times for DL/I calls by PSB. The IMS+ feature must have been enabled when the measurement was performed.

## Quantification

Each report line shows information pertaining to one PSB.

## Detail line hierarchy

The I19 report shows one detail line level. It cannot be expanded.

## Detail line descriptions

| Under Heading  | This is Displayed                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| PSB Name       | The IMS PSB name.                                                                                                                       |
| Txn Count      | The number of transaction executions counted under the indicated PSB.                                                                   |
| DL/I Count     | The number of DL/I calls counted under the indicated PSB.                                                                               |
| Svc time/Prcnt | The total service time for all executions of DL/I calls under the indicated PSB and the percentage of the total DL/I call service time. |
| CPU time/Prcnt | The total CPU time consumed by all executions of DL/I calls under the indicated PSB and the percentage of the total DL/I call CPU time. |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I19: IMS CPU/Service Time by PSB (0805/ADSMPP) Row 00001 of 0001
Command ==> ----- Scroll ==> CSR

PSB Name Txn DL/I ---- DL/I Processing Time ----
Count Count Count Svc Time/Prcnt CPU Time/Prcnt
BBSFIN00 101 1010 18.466 100.0% 0.573 100.0%

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | PSB Name               | Display context help information. |
| ++  | PSB Name               | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | PSB Name               | Display context help information. |
| SV  | PSB Name               | Sort next level by value.         |
| SN  | PSB Name               | Sort next level by name.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| BBSFIN00 99 1010 18.466 100.0% 0.573 100.0% |
+-----+

IMS PSB Information
PSB Name BBSFIN00 IMS system IMSP
No.of PCBs 27 LIST=N0 PCBs 12
Txn count 99 DL/I calls 1010
Sample count 611

PCBNum Name Type DBD/LTRM PROCOPT LIST
1 IOPCB TP DBSCN000 A YES
2 ALT1 TP DBSCN000 A YES
3 ALT2 TP DBSCN000 A YES
4 DBSCN001 DB DBSCN000 A YES
5 DBSCN002 DB DBSCN000 A YES
6 DBSCN003 DB DBSCN000 A YES
7 DBSCI001 DB DBSCI000 A YES
8 DBSCI002 DB DBSCI000 A YES
9 DBSCI003 DB DBSCI000 A YES
10 DBSCA001 DB DBSCA000 A YES
11 DBSCA002 DB DBSCA000 A YES
12 DBSCA003 DB DBSCA000 A YES
13 DBSTL001 DB DBSTL000 A YES
14 DBSTL002 DB DBSTL000 A YES
15 DBSTL003 DB DBSTL000 A YES
16 DBSCNA01 DB DBSCN000 A NO
17 DBSCNA02 DB DBSCN000 A NO
18 DBSCNA03 DB DBSCN000 A NO
19 DBSCIA01 DB DBSCI000 A NO
20 DBSCIA02 DB DBSCI000 A NO
21 DBSCIA03 DB DBSCI000 A NO
22 DBSCAA01 DB DBSCA000 A NO
23 DBSCAA02 DB DBSCA000 A NO
24 DBSCAA03 DB DBSCA000 A NO
25 DBSTLA01 DB DBSTL000 A NO
```

## I20 - IMS CPU/Svc time by transaction

### Usage

Use this report to see information about exact CPU times and service times for DL/I calls by IMS transaction. The IMS+ feature must have been enabled when the measurement was performed.

### Quantification

Each report line shows information pertaining to one IMS transaction code.

### Detail line hierarchy

The I20 report shows one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading           | This is Displayed                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| TranCode                | The IMS transaction code.                                                                                                                 |
| Txn Count               | The number of executions of the transaction that occurred during the measurement interval.                                                |
| Txn Total Time: Service | The total service time for all execution in the indicated transaction. This includes DL/I call execution and all other program execution. |

| Under Heading       | This is Displayed                                                                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Txn Total Time: CPU | The total DL/I CPU time consumed by all execution in the indicated transaction. This includes DL/I call execution and all other program execution.                                                                                                                                                       |
| Svc time/% of Txn   | The total service time for all executions of DL/I calls in the indicated transaction. The percentage indicates how much of the service time was in DL/I call processing. This total does not include GU-IOPCB wait times (not attributed to transaction service time) and may differ from other reports. |
| CPU time/% of Txn   | The total CPU time for all executions of DL/I calls in the indicated transaction. The percentage indicates how much of the CPU time was in DL/I call processing.                                                                                                                                         |

## Sample reports

A sample report is shown below.

```

File View Navigate Help

I20: IMS CPU/Service Time by Transaction (0805/ADSMPP) Row 00001 of 0002
Command ==> ----- Scroll ==> CSR

TranCode Txn -- Txn Total Time ---- ----- DL/I Processing Time -----
 Count Service CPU Time Svc time %of Txn CPU Time %of Txn
BBSDR000 50 10.133 0.432 8.995 88.7% 0.372 86.1%
BBSCR000 49 9.438 0.407 9.316 98.7% 0.356 87.4%

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | TranCode               | Display context help information. |
| ++  | TranCode               | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | TranCode               | Display context help information. |
| SV  | TranCode               | Sort next level by value.         |
| SN  | TranCode               | Sort next level by name.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:



```

+----- The following report line was selected -----+
| BBSDR000 50 10.133 0.432 8.995 88.7% 0.372 86.1% |
+-----+

```

#### IMS Transaction Information

```

IMS Trancode BBSDR000
PSB name BBSFIN00
Total time 10.1332

```

```

IMS system IMSP
Txn count 50
Total CPU time 0.4327

```

## I21 - IMS CPU/Svc time by PCB

### Usage

Use this report to see information about exact CPU times and service times for DL/I calls by individual PCB. The IMS+ feature must have been enabled when the measurement was performed.

### Quantification

Each report line shows information pertaining to one DL/I call.

### Detail line hierarchy

The I21 report shows one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading    | This is Displayed                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| PSB Name         | The PSB name.                                                                                                                   |
| PCB Name         | The name of the PCB.                                                                                                            |
| PCBNum           | The relative PCB number.                                                                                                        |
| Count            | The total number of executions of DL/I calls that referenced the indicated PCB.                                                 |
| Svc time/Percent | The total service time for all executions of DL/I calls in the indicated PCB and the percentage of the total DL/I service time. |
| CPU time/Percent | The total CPU time consumed by all executions of DL/I calls in the indicated PCB and the percentage of the total DL/I CPU time. |

### Sample reports

A sample report is shown below.

```

File View Navigate Help

I21: IMS CPU/Service Time by PCB (0805/ADSMPP) Row 00001 of 0002
Command ==> _____ Scroll ==> CSR

PSB Name PCB Name PCBNum Count ----- DL/I Call Counts -----
Svc time/Percent CPU Time/Percent
BBSFIN00 DBSCN001 4 198 16.216 87.8% 0.131 22.8%
BBSFIN00 DBSCA001 10 198 1.268 6.8% 0.106 18.4%
BBSFIN00 IOPCB 1 218 0.591 3.2% 0.158 27.5%
BBSFIN00 DBSTL001 13 198 0.337 1.8% 0.132 23.0%
BBSFIN00 DBSCA002 11 198 0.053 0.2% 0.044 7.6%

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | PCB                    | Display context help information. |
| ++  | PCB                    | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | PSB Name               | Display context help information. |
| SV  | PSB Name               | Sort next level by value.         |
| SN  | PSB Name               | Sort next level by name.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```

+----- The following report line was selected -----+
| BBSFIN00 DBSCN001 4 198 16.216 87.8% 0.131 22.8% |
+-----+

```

## IMS PSB Information

```

PSB Name BBSFIN00 IMS system IMSP
No. of PCBs 27 LIST=NO PCBs 12
Txn count 99 DL/I calls 1010
Sample count 611

```

| PCBNum | Name     | Type | DBD/LTRM | PROCOPT | LIST |
|--------|----------|------|----------|---------|------|
| 1      | IOPCB    | TP   |          |         | YES  |
| 2      | ALT1     | TP   |          |         | YES  |
| 3      | ALT2     | TP   |          |         | YES  |
| 4      | DBSCN001 | DB   | DBSCN000 | A       | YES  |
| 5      | DBSCN002 | DB   | DBSCN000 | A       | YES  |
| 6      | DBSCN003 | DB   | DBSCN000 | A       | YES  |
| 7      | DBSCI001 | DB   | DBSCI000 | A       | YES  |
| 8      | DBSCI002 | DB   | DBSCI000 | A       | YES  |
| 9      | DBSCI003 | DB   | DBSCI000 | A       | YES  |
| 10     | DBSCA001 | DB   | DBSCA000 | A       | YES  |
| 11     | DBSCA002 | DB   | DBSCA000 | A       | YES  |
| 12     | DBSCA003 | DB   | DBSCA000 | A       | YES  |
| 13     | DBSTL001 | DB   | DBSTL000 | A       | YES  |
| 14     | DBSTL002 | DB   | DBSTL000 | A       | YES  |
| 15     | DBSTL003 | DB   | DBSTL000 | A       | YES  |
| 16     | DBSCNA01 | DB   | DBSCN000 | A       | NO   |
| 17     | DBSCNA02 | DB   | DBSCN000 | A       | NO   |
| 18     | DBSCNA03 | DB   | DBSCN000 | A       | NO   |
| 19     | DBSCIA01 | DB   | DBSCI000 | A       | NO   |
| 20     | DBSCIA02 | DB   | DBSCI000 | A       | NO   |
| 21     | DBSCIA03 | DB   | DBSCI000 | A       | NO   |
| 22     | DBSCAA01 | DB   | DBSCA000 | A       | NO   |
| 23     | DBSCAA02 | DB   | DBSCA000 | A       | NO   |
| 24     | DBSCAA03 | DB   | DBSCA000 | A       | NO   |
| 25     | DBSTLA01 | DB   | DBSTL000 | A       | NO   |

## I22 - IMS Region Transaction Summary

### Usage

Use this report to view a summary of the transactions that executed in the measured IMS Dependent Region. Each detail line summarizes a transaction code with the count of that transaction and the averages for Service time (duration), CPU time, and DL/I calls. The IMS+ feature must be enabled before the measurement. If the Db2+ feature is active, the average SQL calls is reported. If the MQ+ feature is active, the average MQ calls is also reported. The total line sums the transaction counts and reports the average values across all transactions for the other columns.

By default, the detail lines are sorted in ascending transaction code (Name) sequence (SN). You can also request that the data be sorted by transaction count. Enter the SV line command on TranCode heading field to sort by transaction count. The lines are sorted in ascending transaction counts. Entering either SN or SV a second time sorts the lines in the reverse order.

### Quantification

Each report line shows the following information for each transaction code.

- The transaction code.
- The PSB name.
- The number of times that transaction code executed.
- The average service time (duration) per transaction.
- The average CPU time per transaction.

- The average DL/I calls per transaction.
- The average SQL calls per transaction.
- The average MQ calls per transaction.

The CPU time applies only to the region that is being measured. Any execution in other address spaces is not reported.

## Detail line hierarchy

The I22 report shows only one detail line level. It cannot be expanded.

## Detail line descriptions

| Under Heading | This is Displayed                                                                          |
|---------------|--------------------------------------------------------------------------------------------|
| TranCode      | The IMS transaction code.                                                                  |
| PSB Name      | The name of the PSB.                                                                       |
| Txn count     | The number of executions of the transaction that occurred during the measurement interval. |
| Svc/Trn       | The average service time of the transaction.                                               |
| CPU/Trn       | The average CPU time consumed by the transaction.                                          |
| DLI/Trn       | The average number of DLI calls for the transaction.                                       |
| SQL/Trn       | The average number of SQL calls for the transaction.                                       |
| MQ/Trn        | The average number of MQ calls for the transaction.                                        |

## Sample reports

A sample report is shown here.

```

I22: IMS Region Transaction Summary (0798/IMSDMPP1) Row 00001 of 00013
Command ==> ----- Scroll ==> CSR
IMS region name IMSDMPP1

TranCode PSB Name Txn count Svc/Trn CPU/Trn DLI/Trn SQL/Trn MQ/Trn
IMSQATR1 IMSQAPG1 7 0.5325 0.1990 11.85 1.00 3.42
IMSQATR2 IMSQAPG2 6 0.5361 0.1957 12.00 1.00 3.50
IMSQATR3 IMSQAPG3 6 0.5647 0.2028 12.00 1.00 4.00
IMSQATR4 IMSQAPG1 6 0.5369 0.1979 12.00 1.00 4.00
IMSQATR5 IMSQAPG2 6 0.4952 0.1953 12.00 1.00 4.00
IMSQATR6 IMSQAPG3 6 0.4535 0.1934 12.00 1.00 4.00
IMSQATR7 IMSQAPG1 6 0.4673 0.1917 12.00 1.00 4.00
IMSQATR8 IMSQAPG2 6 0.4855 0.1916 12.00 1.00 4.00
IMSQATR9 IMSQAPG3 6 0.5171 0.1915 12.00 1.00 4.00
IVTCV DFSIVP3 11 0.3169 0.0063 8.00 0.00 0.00
IVTN0 DFSIVP1 15 0.0067 0.0042 7.00 0.00 0.00
IVTNV DFSIVP2 16 0.0077 0.0040 7.00 0.00 0.00
Total
2.19

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here. You can always enter a “/” on any input field to open a menu of line commands available for that field.

## on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Transaction Code       | Display context help information. |
| ++  | Transaction Code       | Show additional details.          |

## on headings

| Cmd | When Applied To Heading | Action                                |
|-----|-------------------------|---------------------------------------|
| ?   | TranCode                | Display context help information.     |
| SV  | TranCode                | Sort next level by value (Txn count). |
| SN  | TranCode                | Sort next level by name.              |

## Detail window

You can enter “++” or press the Enter key on any line to display a window that contains additional information.

A sample detail window for this report is shown here:

```
+-----+
| I22 - DETAIL Window (0798/IMSDMPP1) |
| Command ==> _____ Scroll ==> CSR |
|-----+----- The following report line was selected -----+-----+
| IMSQATR2 IMSQAPG2 6 0.5361 0.1957 12.00 1.00 3.50 |
|-----+-----+
|
| IMS Transaction Information
| IMS Trancode IMSQATR2 IMS system IMSD
| PSB name IMSQAPG2 Txn count 6
| Total time 3.2171 Total CPU time 1.1745
| Total DLI call count 72
| Total SQL call count 6
| Total MQ call count 21
|
+-----+
```



## Chapter 6. Db2 performance analysis reports

This section describes the Db2 Performance Analysis Reports.

| For information about ...             | See ...                                                                      |
|---------------------------------------|------------------------------------------------------------------------------|
| The Db2 data extractor                | <a href="#">“Overview of Db2 data extractor” on page 336</a>                 |
| The Db2+ data extractor               | <a href="#">“The Db2+ data extractor” on page 336</a>                        |
| Displaying SQL Statement Text         | <a href="#">“Displaying SQL Statement Text” on page 337</a>                  |
| SQL statement sequence numbers        | <a href="#">“SQL statement sequence numbers” on page 338</a>                 |
| Db2 Multiple Address Space Support    | <a href="#">“Overview of Db2 Multiple Address Space Support” on page 338</a> |
| F01 Db2 session statistics            | <a href="#">“F01 - Db2 measurement” on page 338</a>                          |
| F02 Db2 SQL activity timeline         | <a href="#">“F02 - Db2 SQL activity timeline” on page 342</a>                |
| F03 Db2 SQL activity by DBRM          | <a href="#">“F03 - Db2 SQL activity by DBRM” on page 346</a>                 |
| F04 SQL execution summary             | <a href="#">“F04 - Db2 SQL activity by statement” on page 349</a>            |
| F05 Db2 SQL activity by plan          | <a href="#">“F05 - Db2 SQL activity by plan” on page 353</a>                 |
| F06 SQL statement attributes          | <a href="#">“F06 - Db2 SQL statement attributes” on page 356</a>             |
| F07 Db2 SQL wait time by DBRM         | <a href="#">“F07 - Db2 SQL wait time by DBRM” on page 358</a>                |
| F08 Db2 SQL wait time by statement    | <a href="#">“F08 - Db2 SQL wait time by statement” on page 361</a>           |
| F09 Db2 SQL wait time by plan         | <a href="#">“F09 - Db2 SQL wait time by plan” on page 364</a>                |
| F10 Db2 SQL CPU/Svc time by DBRM      | <a href="#">“F10 - Db2 SQL CPU/Svc time by DBRM” on page 366</a>             |
| F11 Db2 SQL CPU/Svc Time by Stmt      | <a href="#">“F11 - Db2 SQL CPU/Svc time by stmt” on page 369</a>             |
| F12 Db2 SQL CPU/Svc Time by Plan      | <a href="#">“F12 - Db2 SQL CPU/Svc time by plan” on page 373</a>             |
| F13 Db2 SQL threads analysis          | <a href="#">“F13 - Db2 SQL threads analysis” on page 376</a>                 |
| F14 Db2 CPU by plan/stored proc       | <a href="#">“F14 - Db2 CPU by plan/stored proc” on page 377</a>              |
| F15 Db2 SQL CPU/Svc Time by Rq Loc    | <a href="#">“F15 - Db2 SQL CPU/Svc Time by Rq Loc” on page 381</a>           |
| F16 - Db2 SQL CPU/Svc Time by Enclave | <a href="#">“F16 - Db2 SQL CPU/Svc Time by Enclave” on page 384</a>          |
| F17 - Db2 SQL CPU/Svc Time by Corrid  | <a href="#">“F17 - Db2 SQL CPU/Svc Time by Corrid” on page 387</a>           |
| F18 - Db2 SQL CPU/Svc Time by Wkstn   | <a href="#">“F18 - Db2 SQL CPU/Svc Time by Wkstn” on page 390</a>            |
| F19 - Db2 SQL CPU/Svc Time by EndUsr  | <a href="#">“F19 - Db2 SQL CPU/Svc Time by EndUsr” on page 394</a>           |
| F30 - Db2 Class 3 Wait Times          | <a href="#">“F30 - Db2 Class 3 Wait Times” on page 397</a>                   |

| For information about ...     | See ...                                                     |
|-------------------------------|-------------------------------------------------------------|
| Db2 EXPLAIN report            | <a href="#">“Db2 EXPLAIN report” on page 407</a>            |
| Db2SQL Category in report C01 | <a href="#">“DB2SQL category in C01 report” on page 410</a> |

## Overview of Db2 data extractor

In order to use the Db2 Performance Analysis Reports, the Db2 data extractor must be turned on when the Observation Request is entered. You must select the Db2 data extractor in the Schedule New Measurement panel.

The Db2 extractor collects measurement data directly related to SQL activity. During each sampling interval, Application Performance Analyzer interrogates Db2 to determine if the application or transaction is currently performing a Db2 request. If it is, a Db2 measurement record is created that describes the request. If the request was to process an SQL statement then details of the SQL statement are also recorded. These Db2 records later are analyzed to produce the Db2 reports.

### The Db2+ data extractor

There is a second Db2 data extractor called Db2+. You will see this if your installation has it enabled, and your TSO ID has authority to use it.

Turning on the Db2+ data extractor allows Application Performance Analyzer to collect the data required to report exact SQL request counts, SQL CPU time, SQL Service Time, and to collect Db2 accounting data from SMF. The Db2+ data extractor needs to be selected to produce report F10, F11, F12, F15, F16, F17, F18, F19, and F30. Also some fields in the F01 report require Db2+.

Turning on Db2+ will insure that the SQL text reported on SQL statements is accurate. Without Db2+ turned on, it is possible for the SQL text to be incorrect. This is true for both static and dynamic SQL.

**Note:** Running Application Performance Analyzer measurements with the Db2+ data extractor turned on causes each Db2 call to be intercepted to collect additional data. This might have a small impact on the performance of the target address space. Care should be taken when using this feature with other products that also intercept Db2 calls as unpredictable results might occur. Your installer might have chosen to limit access to this feature.

### Measuring DDF activity

If you measure a Db2 DDF address space with the Db2+ extractor turned on, Application Performance Analyzer captures the remote SQL activity detected in the address space. The data is reported in the following reports: F02, F10, F11, F12, F15, F16, F17, F18 and F19. The only other report available for a DDF measurement is S01 Measurement Profile.

For DDF measurements only, Application Performance Analyzer records the enclave CPU time, zIIP time, and zIIP on CP time for each observed SQL call.

There are some limitations when reporting on a DDF address space:

1. The SQL calls observed will not correlate one-for-one with those issued by the application at the requester site. Some calls will not be observed because they are not sent to the DDF address space.
2. Multiple SQL calls can be issued by Db2 when processing a particular SQL call. For example, an OPEN call could result in FETCH and CLOSE calls being issued by the DDF address space. These calls will have the same statement number as the OPEN call.
3. When a CALL statement results in invoking a stored procedure in the same Db2 subsystem, the stored procedure calls can also be observed in the DDF address space.
4. Some dynamic SQL statements can be shown as static. This is because the DDF address space is treating them as though they are static.
5. The SQL function of remote SQL calls display as the actual SQL function, however because they are remote:



- The SQL text might not be accurate.
  - Issuing an EXPLAIN request against a SQL statement with a type of Remote SQL can result in an error at the server rather than being caught in the TSO session of the user.
6. Some SQL calls have a statement type of Remote SQL instead of the expected SQL type. For example, INSERT and DELETE calls are observed as Remote SQL. As a consequence:
  7. A CALL statement might not always have SQL text available.
  8. A DESCRIBE statement does not have any SQL text available.

**Note:**

1. If you want to select a DDF address space from a list when setting up the measurement, enter *\*DIST* in the Job Name pattern field, unless your organization has changed the DDF address space naming standard. In that case, contact your Db2 system administrator to obtain the name of the DDF address space in your organization.
2. If you want to limit the scope of a DDF measurement, you may filter the measurement for specific Correlation Id, End User Id and/or Workstation Id in Panel 5 of the NEW dialog.
3. The Number of Samples specified for a DDF measurement is not used because each DDF call is intercepted rather than sampled. The number of samples will always be converted to approximately one per second.

## Displaying SQL Statement Text

---

When SQL statement text is displayed in a Db2 report, a limit of up to 4,000 characters, or up to 15,000 characters is displayed, depending on the circumstances. SQL statements exceeding the limit are truncated.

For non-DDF observations, the SQL text for dynamic SQL can be up to 15,000 characters long. If the Db2V option is selected, then static SQL text can also be up to 15,000 characters long. Otherwise, static SQL text is limited to 4,000 characters.

For DDF observations, the SQL text for dynamic SQL can be up to 15,000 characters long. Static SQL statements are limited to 4,000 characters.

When the execution of a SQL statement is unsuccessful, Db2 sets a negative SQLCODE. In this situation, Application Performance Analyzer displays the negative SQLCODE in the Db2 reports, rather than the SQL statement text. Report F11 SQL CPU/Service Time by Statement provides a SETUP option to limit the display of SQL statements to only those that ended successfully or to only those that ended unsuccessfully.

## SQL statement text formatting

SQL statement text is displayed unformatted in the main body of the Db2 reports. Complex SQL statements may be difficult to interpret, therefore for readability purposes the SQL statement text in the report detail windows is displayed formatted. To view the formatted SQL text in the detail window, use the '+' line command or press the Enter key as a shortcut. If statement formatting fails for any reason, it is displayed unformatted in the detail window with an accompanying warning message.

When a formatted static SQL statement is displayed, all tokens are separated by a single space, with two possible exceptions:

- Between a host variable marker and a host variable name, for example :H
- Between escaped qualified references, for example. "#SALES"."\$TARGETS"

When a formatted dynamic SQL statement is displayed:

- All tokens except escaped identifiers and string literals are displayed in upper case.
- All excess whitespace characters (including line breaks and tabs) are removed.
- All comments are removed.
- All tokens are separated by a single space.

If the unformatted SQL statement text is truncated and leaves a trailing string literal or escaped identifier with no terminating delimiter, the formatted SQL statement text will display with a matching closing delimiter appended, to prevent a parsing error.

SQL statement text with DBCS identifiers (for example, Japanese or Korean) is always displayed unformatted.

## SQL statement sequence numbers

---

A sequence number is assigned by Application Performance Analyzer to each unique SQL statement observed during the measurement. In most Db2 reports, this sequence number is preceded by either “S” or “D” indicating if the SQL statement is static or dynamic. Application Performance Analyzer will stop sampling when 99,999 unique SQL statements are observed. When this maximum is reached the observation request is cancelled with the reason ‘Maximum SQL statements exceeded’.

## Overview of Db2 Multiple Address Space Support

---

Db2 multiple address space (MASS) support allows you to create a request to measure a specific Db2 stored procedure or user-defined function, regardless of which WLM region it executes in.

You can also measure Db2 activity in stored procedures and user-defined functions that are invoked from any job you are measuring, by selecting the Collateral Db2 data extractor (CDB2). In this case, the measured job does not have to be a stored procedure or user-defined function.

To enter a Db2 MASS observation that measures a specific Db2 stored procedure or user-defined function:

1. Start a NEW request.
2. In Panel 1 – Job Information, enter a dash (-) in the Job name/Pattern field.
3. In Panel 5 – Subsystems, enter the Db2 subsystem name, the schema name, and the stored procedure name or the user-defined function name. You must also indicate whether you are measuring a stored procedure or a user-defined function.
4. In Panel 2 – Options, select the Db2 data extractor.
5. Complete any other relevant fields for your observation request.

Once the NEW request is complete and submitted, Application Performance Analyzer creates and starts an observation request for the Db2 stored procedure or user-defined function. It will execute for the duration specified on the NEW request.

To enter an observation that measures a Db2 batch job that invokes a Db2 stored procedure or user-defined function:

1. Start a NEW request.
2. In Panel 1 – Job Information, enter the batch job name in the Job name/Pattern field.
3. In Panel 2 – Options, select the Db2+ and CDB2 data extractors.
4. Complete any other relevant fields for your observation request.

Once the NEW request is complete and submitted, Application Performance Analyzer creates and starts an observation request for the Db2 batch job. Because the collateral Db2 extractor is on, when the Db2 batch job calls the stored procedure or user-defined function, Application Performance Analyzer generates a separate measurement. This measurement is displayed in the R02 Observation List as child observations under the parent.

## F01 - Db2 measurement

---

## Usage

Use this report to see a general overview of the Db2 measurement data. This is a good report to examine first when analyzing Db2 information. It provides an at-a-glance summary of various aspects of the measurement data and helps you choose which other reports to concentrate on. The first section of this report consists of a series of mini performance graphs illustrating various types of activity that was measured. This is followed by a section that reports measurement values.

## Performance graphs

These are histograms quantifying measurement data. To the right of some of the graphs, report codes of reports that show related and more detailed information are displayed. You can display the report by skipping the cursor to one of these fields and by pressing the ENTER key.

### Most Active Db2 Plans

| Under Heading | This is Displayed                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.          |
| Db2 Plan Name | A Db2 plan name is shown and the number of samples in which processing of SQL requests under this plan was observed. The percentage and the graph represent the proportion of the overall measurement time SQL requests were being serviced under this Db2 plan. |

### Most active package/DBRMs

| Under Heading        | This is Displayed                                                                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples              | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.                       |
| Package or DBRM Name | A package or DBRM name is shown and the number of samples in which processing of SQL requests in this Package/DBRM was observed. The percentage and the graph represent the proportion of the overall measurement time SQL requests were being serviced in this Package/DBRM. |

### Most active SQL statements

| Under Heading | This is Displayed                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples done during the measurement upon which this graph is based. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph.              |
| SQL Statement | The DBRM name, precompiler statement number, SQL function and the number of samples in which processing of this SQL request was observed. The percentage and the graph represent the proportion of the overall measurement time this SQL request was being serviced. |

## Most CPU consumptive SQL

This requires that the Db2+ measurement option was active.

| Under Heading      | This is Displayed                                                                                                                                                                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total SQL CPU Time | The number of seconds of CPU time consumed by all executions of SQL requests during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| SQL Statement      | The DBRM name, precompiler statement number, SQL function and the number of CPU seconds of execution for this statement.                                                                                                                                                   |

## Most frequent SQL statements

This requires that the Db2+ measurement option was active. The graphic information is based on the number of SQL requests counted.

| Under Heading           | This is Displayed                                                                                                                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total SQL Calls Counted | The total number of SQL requests counted during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| SQL Statement           | The DBRM name, precompiler statement number, SQL function and the number of SQL requests counted for this statement.                                                                                                                   |

## Single SQL call service time

This requires that the Db2+ measurement option was active.

| Under Heading                | This is Displayed                                                                                                                                                                                                                                                      |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total SQL Service Time       | The number of seconds of service time for all executions of SQL requests during the measurement. This number represents 100 percent of the data upon which the graph is based and is used as the divisor to compute the percentages shown in other lines in the graph. |
| SQL statement identification | The DBRM name, precompiler statement number, SQL function and the number of seconds of service time for this statement.                                                                                                                                                |

## Db2 measurement statistics

A grid of values is shown for the overall Db2 measurement and then a separate grid for each Db2 subsystem. If only one subsystem was observed then only one grid appears.

| Under Heading      | This is Displayed                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Db2 Subsystem Name | The name of the Db2 subsystem.                                                                                                                                                                         |
| Db2 Version        | The version of Db2 for the subsystem.                                                                                                                                                                  |
| Db2 Catalog Level  | The catalog level for the Db2 subsystem (applicable for only Db2 v12 and later versions, not applicable for v11 and earlier versions).                                                                 |
| Db2 Code Func Lvl  | The code level for the Db2 subsystem. It relates directly to the maintenance level of the Db2 subsystem (applicable for only Db2 v12 and later versions, not applicable for v11 and earlier versions). |

| Under Heading      | This is Displayed                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Db2 Curr Func Lvl  | The currently activated function level for the Db2 subsystem (applicable for only Db2 v12 and later versions, not applicable for v11 and earlier versions).                                                                                                                                                                                                                  |
| SQL Calls Sampled  | The number of unique SQL requests in which samples were taken.                                                                                                                                                                                                                                                                                                               |
| SQL observations   | The number of samples in which SQL activity was observed.                                                                                                                                                                                                                                                                                                                    |
| SQL Calls Executed | The number of SQL requests executed determined on the basis of lower and upper REQCT values for each of the Db2 threads.                                                                                                                                                                                                                                                     |
| Avg SQL call rate  | This is the average number of SQL calls per second for the measurement interval. This is based on the SQL calls counted value if it was measured (Db2+ option active). Otherwise it is based on the SQL calls executed value.                                                                                                                                                |
| SQL Calls Counted  | The number of SQL requests counted by the Db2+ measurement feature. This value is available only if the Db2+ measurement option was selected for the measurement. This is an exact SQL request count for the measurement interval.                                                                                                                                           |
| SQL throughput     | A theoretical SQL request throughput rate based on the number of SQL requests for the portion of the measurement interval SQL processing was occurring. (Time other non-SQL application activity was taking place is excluded.) This is based on the SQL calls counted value if it was measured (Db2+ option active). Otherwise it is based on the SQL calls executed value. |
| SQL service time   | The total service time for SQL processing. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                                     |
| SQL CPU time       | The total CPU time in the measured region for SQL processing. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                  |
| SQL max time       | The maximum service time for a single SQL call. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                                |
| SQL max CPU        | The maximum CPU time for a single SQL call. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                                    |
| SQL min time       | The minimum service time for a single SQL call. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                                |
| SQL min CPU        | The minimum CPU time for a single SQL call. This value is available only if the Db2+ measurement option was selected for the measurement.                                                                                                                                                                                                                                    |

## Sample reports

A sample report is shown here, it is a scrollable report, and is shown here split into two screen images.

```

File View Navigate Help

F01: Db2 Measurement Profile (1354/CICS23A) Row 00001 of 00060
Command ==> _____ Scroll ==> CSR

Most Active Db2 Plans ----- Reports:
Samples 10,000 100.0% ' ' ' ' ' ' ' ' ' ' ' ' F07
PFSAMPA 1,710 17.1% ***

Most Active Package/DBRMs ----- Reports:
Samples 10,000 100.0% ' ' ' ' ' ' ' ' ' ' ' ' F03
PFSAMPC 1,173 11.7% **
PFSAMPB 302 3.0% *
PFSAMPA 235 2.3% *

Most Active SQL Statements ----- Reports:
Samples 10,000 100.0% ' ' ' ' ' ' ' ' ' ' ' ' F04
PFSAMPC:01466 FETCH 452 4.5% *
PFSAMPA:00816 SELECT 273 2.7% *
PFSAMPC:03054 FETCH 215 2.1% *
PFSAMPB:00678 SELECT 195 1.9% *
PFSAMPB:00816 UPDATE 148 1.4% *

Most CPU consumptive SQL ----- Reports:
Total SQL CPU time 6.24 100.0% ' ' ' ' ' ' ' ' ' ' ' ' F10 F11
PFSAMPC:01466 FETCH 1.62 25.9% ***** F12
PFSAMPA:00816 SELECT 0.88 14.2% **
PFSAMPC:03054 FETCH 0.75 12.1% **
PFSAMPB:00678 SELECT 0.68 11.0% **
PFSAMPC:01316 SELECT 0.44 7.1% *

```

## F02 - Db2 SQL activity timeline

## Usage

Use this report to see information about the chronology of SQL requests that were sampled over the duration of the measurement and to identify any calls with excessive service times. Each line shows information about one SQL call. By default, the detail lines are sorted chronologically by Db2 thread. You can also request that the data be sorted in descending sequence by SQL call duration. Enter the “SD” line command on the “Threads” heading field to sort in this sequence. This will bring to the top of the report any SQL calls that might have had excessive service times.

When the Db2+ feature is active for a measurement, the number of SQL calls displayed in this report is limited by the value of the Db2IMaxTraceSize parameter specified during Application Performance Analyzer installation, or by the value on panel 2 of the measurement request (if your installation has configured this field). The report is truncated when the number of SQL calls issued reaches the value specified for Db2IMaxTraceSize.

## Quantification

When the Db2+ feature is not active, each report line shows the time at which the first sample for the identified SQL call took place. The duration of the interval execution of the SQL call was observed is also reported. This is derived from the number of samples and the sampling interval. This gives an indication of the service time for the particular SQL call.

When the Db2+ feature is active each report line shows the time at which the identified SQL call started. The service time or duration of execution of the SQL call is also reported. This is measured directly by the Db2+ feature.

## Detail line hierarchy

An unexpanded F02 report shows a line for each SQL call that was measured by the Db2+ feature or that was sampled one or more times. You can expand each line to reveal one additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 SQL Call
 Level 2 SQL Statement Text
 ...
```

## Detail line descriptions

### SQL Call execution detail line

This is the first-level detail line. Each line shows information about one SQL call.

| Under Heading | This is Displayed                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thread        | A sequence number identifying the Db2 thread. Application Performance Analyzer assigns a unique sequence number to each Db2 thread that was observed. |
| REQCT         | The REQCT value for the SQL call.                                                                                                                     |
| Program       | The name of the DBRM in which the SQL call was defined.                                                                                               |
| Stmt#         | The precompiler statement number of the SQL statement.                                                                                                |
| SQL Function  | The SQL function performed by the reported statement: SELECT, INSERT, UPDATE, etc.                                                                    |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samps         | The number of samples recorded for the interval described by this report line. This can be zero if the identified SQL call was measured by the Db2+ feature but not sampled.                                                                                                                                                                                             |
| Call Time     | When the Db2+ feature is not active this is the time at which the first sample in the sequence of samples reported by this line occurred. When the Db2+ feature is active each report line shows the time at which the identified SQL call started. The time is shown in minutes, seconds and hundredths of seconds.                                                     |
| Interval      | When the Db2+ feature is not active, this is the duration of the interval, in seconds, during which samples were recorded for the indicated SQL call. This can provide a good indication of the service time for the SQL call. When the Db2+ feature is active, this is measured directly by the Db2+ feature.                                                           |
| CPU Time      | The CPU time, in seconds, for the reported SQL call as measured by the Db2+ feature. If an SQL call was not measured by the Db2+ feature but was sampled, the CPU time will be reported as Not Available (N/A). This might occur at the beginning of a measurement before the Db2+ feature completes initialization, depending on the sampling rate and system activity. |

## SQL statement text detail line

This is second-level detail line shown directly under the SQL statement detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (Thread). A sample is shown here:

| File View Navigate Help                       |       |         |       |              |                    |             |          |          |
|-----------------------------------------------|-------|---------|-------|--------------|--------------------|-------------|----------|----------|
| F02: Db2 SQL Activity Timeline (1264/CICS23A) |       |         |       |              | Row 00001 of 01596 |             |          |          |
| Command ==>                                   |       |         |       |              | Scroll ==> CSR     |             |          |          |
| Thread                                        | REQCT | Program | Stmt# | SQL Function | Samps              | Call Time   | Interval | CPU Time |
| 52577                                         | 08557 | PFSAMPA | 816   | SELECT       | 1                  | 08:24:45.96 | 0.00     | 0.002    |
| 52577                                         | 08564 | PFSAMPA | 816   | SELECT       | 1                  | 08:24:46.25 | 0.00     | 0.001    |
| 52577                                         | 08566 | PFSAMPB | 678   | SELECT       | 1                  | 08:24:46.27 | 0.00     | 0.002    |
| 52577                                         | 08567 | PFSAMPC | 1316  | SELECT       | 2                  | 08:24:46.27 | 0.01     | 0.001    |
| 52577                                         | 08569 | PFSAMPC | 1443  | OPEN         | 1                  | 08:24:46.28 | 0.00     | 0.002    |
| 52577                                         | 08570 | PFSAMPC | 1466  | FETCH        | 2                  | 08:24:46.29 | 0.01     | 0.003    |
| 52577                                         | 08571 | PFSAMPC | 1466  | FETCH        | 2                  | 08:24:46.30 | 0.01     | 0.002    |
| 52577                                         | 08586 | PFSAMPC | 3155  | SELECT       | 3                  | 08:24:46.32 | 0.01     | 0.006    |
| 52577                                         | 08587 | PFSAMPC | 3179  | SELECT       | 1                  | 08:24:46.33 | 0.00     | 0.005    |
| 52577                                         | 08588 | PFSAMPB | 816   | UPDATE       | 1                  | 08:24:46.34 | 0.00     | 0.002    |
| 52577                                         | 08592 | PFSAMPA | 816   | SELECT       | 1                  | 08:24:46.50 | 0.00     | 0.001    |
| 52577                                         | 08598 | PFSAMPA | 816   | SELECT       | 1                  | 08:24:46.68 | 0.00     | 0.001    |
| 52577                                         | 08599 | PFSAMPB | 408   | SET HOST VAR | 1                  | 08:24:46.69 | 0.00     | 0.002    |
| 52577                                         | 08601 | PFSAMPC | 1316  | SELECT       | 5                  | 08:24:46.69 | 0.03     | 0.003    |
| 52577                                         | 08604 | PFSAMPC | 1466  | FETCH        | 1                  | 08:24:46.73 | 0.00     | 0.001    |
| 52577                                         | 08605 | PFSAMPC | 1466  | FETCH        | 3                  | 08:24:46.74 | 0.01     | 0.001    |
| 52577                                         | 08607 | PFSAMPC | 2989  | SELECT       | 1                  | 08:24:46.76 | 0.00     | 0.002    |

You can enter a “+” line command to expand to the next level, which is the SQL text. The report is shown here where a thread has been expanded:



| File View Navigate Help                              |       |         |       |              |       |             |                    |          |
|------------------------------------------------------|-------|---------|-------|--------------|-------|-------------|--------------------|----------|
| F02: Db2 SQL Activity Timeline (1264/CICS23A)        |       |         |       |              |       |             | Row 00001 of 01599 |          |
| Command ==>                                          |       |         |       |              |       |             | Scroll ==> CSR     |          |
| Thread                                               | REQCT | Program | Stmt# | SQL Function | Samps | Call Time   | Interval           | CPU Time |
| 52577                                                | 08557 | PFSAMPA | 816   | SELECT       | 1     | 08:24:45.96 | 0.00               | 0.002    |
| 52577                                                | 08564 | PFSAMPA | 816   | SELECT       | 1     | 08:24:46.25 | 0.00               | 0.001    |
| 52577                                                | 08566 | PFSAMPB | 678   | SELECT       | 1     | 08:24:46.27 | 0.00               | 0.002    |
| 52577                                                | 08567 | PFSAMPC | 1316  | SELECT       | 2     | 08:24:46.27 | 0.01               | 0.001    |
| 52577                                                | 08569 | PFSAMPC | 1443  | OPEN         | 1     | 08:24:46.28 | 0.00               | 0.002    |
| 52577                                                | 08570 | PFSAMPC | 1466  | FETCH        | 2     | 08:24:46.29 | 0.01               | 0.003    |
| 52577                                                | 08571 | PFSAMPC | 1466  | FETCH        | 2     | 08:24:46.30 | 0.01               | 0.002    |
| 52577                                                | 08586 | PFSAMPC | 3155  | SELECT       | 3     | 08:24:46.32 | 0.01               | 0.006    |
| > SELECT * INTO : H , : H , : H , : H , : H : H FROM |       |         |       |              |       |             |                    |          |
| > DEPT WHERE XRATE = : H                             |       |         |       |              |       |             |                    |          |
| 52577                                                | 08587 | PFSAMPC | 3179  | SELECT       | 1     | 08:24:46.33 | 0.00               | 0.005    |
| 52577                                                | 08588 | PFSAMPB | 816   | UPDATE       | 1     | 08:24:46.34 | 0.00               | 0.002    |
| 52577                                                | 08592 | PFSAMPA | 816   | SELECT       | 1     | 08:24:46.50 | 0.00               | 0.001    |
| 52577                                                | 08598 | PFSAMPA | 816   | SELECT       | 1     | 08:24:46.68 | 0.00               | 0.001    |
| 52577                                                | 08599 | PFSAMPB | 408   | SET HOST VAR | 1     | 08:24:46.69 | 0.00               | 0.002    |
| 52577                                                | 08601 | PFSAMPC | 1316  | SELECT       | 5     | 08:24:46.69 | 0.03               | 0.003    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Thread                 | Display context help information. |
| ++  | Thread                 | Show additional details.          |
| +   | Thread                 | Expand to reveal next level.      |
| –   | Thread                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object | Action                                |
|-----|------------------------|---------------------------------------|
| ?   | Thread                 | Display context help information.     |
| +   | Thread                 | Expand to reveal all entries.         |
| –   | Thread                 | Collapse to hide next level.          |
| ST  | Thread                 | Sort chronologically by Db2 thread.   |
| SD  | Thread                 | Sort descending by SQL call duration. |
| SC  | Thread                 | Sort descending by SQL CPU Time       |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. For example, entering “++” on an SQL line will cause this detail window to appear:

|                                                                                 |                    |                |                   |
|---------------------------------------------------------------------------------|--------------------|----------------|-------------------|
| File View Navigate Help                                                         |                    |                |                   |
| SQL Call Information                                                            |                    |                |                   |
| Sample count                                                                    | 1                  | Db2 Authid     | USER1             |
| SQL CPU time                                                                    | 0.002              | Service time   | 0.00              |
| SQL Statement Information                                                       |                    |                |                   |
| Subsystem name                                                                  | DSN1               | Attach type    | SASS              |
| Plan name                                                                       | PFSAMPC            | Plan bind time | no data           |
| DBRM name                                                                       | PFSAMPA            | DBRM token     | 17D8B8DF 05CC86F8 |
| DBRM date/time                                                                  | May-08-06 15:48:14 |                |                   |
| Package ID                                                                      | PFSAMPA            | Location       | CABNETDB24        |
| Collectn name                                                                   | PFSAMPX1           | Pkg BIND time  | no data           |
| SQL function                                                                    | SELECT             | Static/dynamic | Static            |
| Precmplr stmt#                                                                  | 678                | DBRM section#  | 4                 |
| CSECT/module                                                                    | PFSAMPA in PFSAMPA | Offset of call | 00002764          |
| Sample count                                                                    | 147                | SQL req count  | 333               |
| SQL CPU time                                                                    | 0.60               | Service time   | 0.84              |
| SQL Statement:                                                                  |                    |                |                   |
| SELECT *<br>INTO : H ,<br>: H : H ,<br>: H : H<br>FROM DEP<br>WHERE XRATE = : H |                    |                |                   |
| Db2 Thread Information                                                          |                    |                |                   |
| Thread sequence number                                                          | 00001              |                |                   |
| Attachment type                                                                 | CICS               |                |                   |
| First REQCT value observed                                                      | 05256              |                |                   |
| Time of first REQCT                                                             | 14:06:47.24        |                |                   |
| Last REQCT value observed                                                       | 10613              |                |                   |
| Time of last REQCT                                                              | 14:07:46.74        |                |                   |
| Total REQCT increments                                                          | 5,358              |                |                   |
| Duration first to last                                                          | 59.49              |                |                   |
| SQL rate for thread, per second                                                 | 90.06              |                |                   |
| Number of samples for thread                                                    | 1,417              |                |                   |
| Number of REQCT values sampled                                                  | 1,292              |                |                   |

## F03 - Db2 SQL activity by DBRM

### Usage

Use this report to see how time was consumed by SQL request processing. The percentage of time is reported by each module that issued SQL requests. Expand a module line to see a further breakdown of time consumption by individual SQL request issued by the module.

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

### Quantification

Each report line quantifies service time for all SQL requests issued by a module (DBRM). This is further broken down by SQL request. Each quantity is expressed as a percentage of the overall measurement interval.

### Detail line hierarchy

An unexpanded F03 report shows a line for each module that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 Module (DBRM)
 Level 2 SQL Request
 Level 3 SQL Statement Text
 Level 2 SQL Request
 Level 3 SQL Statement Text
 ...
```

## Detail line descriptions

### SQL DBRM (Module) detail line

This is the first-level detail line. Each line shows information about a DBRM (Module) for which SQL request measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------|
| Name            | The DBRM name. The DBRM name is often the same name as the corresponding module in which SQL requests were issued. |
| Percent of Time | The percentage of the measurement interval duration SQL Requests for the indicated DBRM Name were being processed. |

### SQL request detail line

This is the second-level detail line shown directly under the DBRM/Module detail line. It quantifies the aggregated service time for a specific SQL request.

| Under Heading   | This is Displayed                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request.                                                                                                     |
| SQL Function    | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                 |
| Percent of Time | The percentage of the measurement interval duration the indicated SQL Request was being processed.                                                                                                                 |

**Note:** It is normal for the counts for the second-level items to add up to a higher value than the first level line. The reason for this is that the program level line shows the percentage of time Db2 processing is active. For a sample, Db2 is counted as being active only once, regardless of the number of SQL statements being processed (concurrently). So its percentage can be lower than the sum of the individual SQL request statement percentages because of overlaps.

### SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (DBRM Name). A sample is shown here:

```

File View Navigate Help

F03: SQL Activity by Module (0659/CICS23A) Row 00001 of 00003
Command ==> _____ Scroll ==> CSR
Name Stmt# SQL Function Percent of Time * 10.00% ±1.1%
*....1....2....3....4....5....6....7.
PFSAMPC 17.22 =====
PFSAMPB 6.31 ===
PFSAMPA 2.00 =

```

You can enter the “+” line command on a DBRM Name to expand to the next level, which is SQL commands. Then you can expand the SQL commands to show the SQL. A sample is shown here with the first DBRM expanded, and then one of the SQL commands expanded:

```

File View Navigate Help

F03: SQL Activity by Module (0659/CICS23A) Row 00001 of 00019
Command ==> _____ Scroll ==> CSR
Name Stmt# SQL Function Percent of Time * 10.00% ±1.1%
*....1....2....3....4....5....6....7.
PFSAMPC 17.22 =====
→ S00012 01466 FETCH 9.13 =====
→ S00008 01316 SELECT 1.82 =
→ S00017 03054 FETCH 1.81 =
→ S00010 01347 SELECT 1.48 =
→ S00011 01443 OPEN 0.80
→ S00018 03155 SELECT 0.66
> SELECT * INTO : H , : H , : H , : H , : H : H FROM DEP
> T WHERE XRATE = : H
→ S00015 02989 SELECT 0.48
→ S00019 03179 SELECT 0.43
→ S00014 01562 CLOSE 0.26
→ S00016 03046 OPEN 0.25
→ S00020 03065 CLOSE 0.05
→ S00009 01316 SELECT 0.01

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Module, Seqno          | Display context help information. |
| ++  | Module, Seqno          | Show additional details.          |
| +   | Module, Seqno          | Expand to reveal next level.      |
| –   | Module, Seqno          | Collapse to hide next level.      |
| SV  | Module                 | Sort next level by value.         |
| M   | Module, Seqno          | Display load module information.  |
| SS  | Module                 | Sort next level by Seqno.         |
| P   | Seqno                  | Display source program mapping.   |
| EX  | Seqno                  | Display Db2 EXPLAIN data.         |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name, Percent Time     | Display context help information.  |
| +   | Name, Percent Time     | Expand to reveal all entries.      |
| –   | Name, Percent Time     | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level entries by name    |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. For example, entering “++” on an SQL line will cause this detail window to appear:

|                                                      |                    |                |                    |
|------------------------------------------------------|--------------------|----------------|--------------------|
| File View Navigate Help                              |                    |                |                    |
| +----- The following report line was selected -----+ |                    |                |                    |
| > S00012                                             | 3179 SELECT        | 0.84           |                    |
| +-----                                               |                    |                |                    |
| Calculation Details                                  |                    |                |                    |
| Db2 SQL activity measurements                        | 84                 |                |                    |
| SQL request                                          | SELECT             |                |                    |
| In program                                           | PFSAMPC            |                |                    |
| Precompiler statement number                         | 3179               |                |                    |
| Total measurements                                   | 10,000             |                |                    |
| Percent of total                                     | 0.84               |                |                    |
| SQL Statement Information                            |                    |                |                    |
| Subsystem name                                       | DSN1               | Attach type    | SASS               |
| Plan name                                            | PFSAMPA            | Plan bind time | May-11-05 13:57:39 |
| DBRM name                                            | PFSAMPC            | DBRM token     | 179FD30A 1B977868  |
| DBRM date/time                                       | May-11-05 13:56:56 |                |                    |
| Package ID                                           | PFSAMPC            | Location       | CABNETDB24         |
| Collectn name                                        | PFSAMPX1           | Pkg BIND time  | May-11-05 13:57:36 |
| SQL function                                         | SELECT             | Static/dynamic | Static             |
| Precmplr stmt#                                       | 3179               | DBRM section#  | 21                 |
| CSECT/module                                         | PFSAMPC in PFSAMPC | Offset of call | 00008610           |
| Sample count                                         | 84                 | SQL req count  | 172                |
| SQL CPU time                                         | 0.28               | Service time   | 0.45               |
| SQL Statement: SELECT *                              |                    |                |                    |
| INTO : H ,                                           |                    |                |                    |
| : H : H ,                                            |                    |                |                    |
| : H : H                                              |                    |                |                    |
| FROM VDEP                                            |                    |                |                    |
| WHERE DEPTNO = : H                                   |                    |                |                    |

## SETUP options

The following SETUP option can be selected with the SETUP primary command:

### Minimum percentage of time

You can set this option to eliminate reporting of SQL activity where the percentage of time is below a certain threshold.

## F04 - Db2 SQL activity by statement

# Usage

Use this report to see how time was consumed by SQL request processing. The percentage of time is reported by each SQL request.

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

# Quantification

Each report line quantifies service time for all executions of an SQL request. Each quantity is expressed as a percentage of the overall measurement interval.

# Detail line hierarchy

An unexpanded F04 report shows a line for each SQL request. You can expand each line to reveal one additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 SQL Request
Level 2 SQL Statement Text
...
```

# Detail line descriptions

## SQL request detail line

This is the first-level detail line. It quantifies the aggregated service time for a specific SQL request.

| Under Heading   | This is Displayed                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Program         | The DBRM name for the program that issued the SQL request.                                                                                                                                                         |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request.                                                                                                     |
| SQL Function    | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                 |
| Percent of Time | The percentage of the measurement interval duration the indicated SQL Request was being processed.                                                                                                                 |

## SQL statement text detail line

This is second-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

# Sample reports

A sample report is shown here:

| File View Navigate Help                       |         |       |              |                                         |       |
|-----------------------------------------------|---------|-------|--------------|-----------------------------------------|-------|
| F04: SQL Activity by Statement (0659/CICS23A) |         |       |              | Row 00001 of 00020                      |       |
| Command ==>                                   |         |       |              | Scroll ==> CSR                          |       |
| Seqno                                         | Program | Stmt# | SQL Function | Percent of Total Time * 10.00%          | ±1.1% |
|                                               |         |       |              | *....1....2....3....4....5....6....7... |       |
| S00012                                        | PFSAMPC | 01466 | FETCH        | 9.13 =====                              |       |
| S00013                                        | PFSAMPB | 00816 | UPDATE       | 3.28 ==                                 |       |
| S00001                                        | PFSAMPA | 00816 | SELECT       | 2.00 =                                  |       |
| S00008                                        | PFSAMPC | 01316 | SELECT       | 1.82 =                                  |       |
| S00017                                        | PFSAMPC | 03054 | FETCH        | 1.81 =                                  |       |
| S00004                                        | PFSAMPB | 00678 | SELECT       | 1.67 =                                  |       |
| S00010                                        | PFSAMPC | 01347 | SELECT       | 1.48 =                                  |       |
| S00002                                        | PFSAMPB | 00408 | SET HOST VA  | 1.26 =                                  |       |
| S00011                                        | PFSAMPC | 01433 | OPEN         | 0.80                                    |       |
| S00018                                        | PFSAMPC | 03155 | SELECT       | 0.66                                    |       |
| S00015                                        | PFSAMPC | 02989 | SELECT       | 0.48                                    |       |
| S00019                                        | PFSAMPC | 03179 | SELECT       | 0.43                                    |       |
| S00014                                        | PFSAMPC | 01562 | CLOSE        | 0.26                                    |       |
| S00016                                        | PFSAMPC | 03046 | OPEN         | 0.25                                    |       |
| S00020                                        | PFSAMPC | 03065 | CLOSE        | 0.05                                    |       |
| S00007                                        | PFSAMPB | 01385 | SELECT       | 0.03                                    |       |
| S00005                                        | PFSAMPB | 00947 | SELECT       | 0.02                                    |       |
| S00003                                        | PFSAMPB | 00408 | SET HOST VA  | 0.01                                    |       |
| S00006                                        | PFSAMPB | 01163 | SELECT       | 0.01                                    |       |
| S00009                                        | PFSAMPC | 01316 | SELECT       | 0.01                                    |       |

Each line can be expanded to display the SQL statement by entering the “+” line command on the Sequence Number. For example, “+” was entered on the third line in this report to display the SQL.

| File View Navigate Help                       |         |       |                                                  |                                         |       |
|-----------------------------------------------|---------|-------|--------------------------------------------------|-----------------------------------------|-------|
| F04: SQL Activity by Statement (0659/CICS23A) |         |       |                                                  | Row 00001 of 00022                      |       |
| Command ==>                                   |         |       |                                                  | Scroll ==> CSR                          |       |
| Seqno                                         | Program | Stmt# | SQL Function                                     | Percent of Total Time * 10.00%          | ±1.1% |
|                                               |         |       |                                                  | *....1....2....3....4....5....6....7... |       |
| S00012                                        | PFSAMPC | 01466 | FETCH                                            | 9.13 =====                              |       |
| S00013                                        | PFSAMPB | 00816 | UPDATE                                           | 3.28 ==                                 |       |
| S00001                                        | PFSAMPA | 00816 | SELECT                                           | 2.00 =                                  |       |
|                                               |         |       | > SELECT * INTO : H FROM DEPTA WHERE XRATE = : H |                                         |       |
| S00008                                        | PFSAMPC | 01316 | SELECT                                           | 1.82 =                                  |       |
| S00017                                        | PFSAMPC | 03054 | FETCH                                            | 1.81 =                                  |       |
| S00004                                        | PFSAMPB | 00678 | SELECT                                           | 1.67 =                                  |       |
| S00010                                        | PFSAMPC | 01347 | SELECT                                           | 1.48 =                                  |       |
| S00002                                        | PFSAMPB | 00408 | SET HOST VA                                      | 1.26 =                                  |       |
| S00011                                        | PFSAMPC | 01433 | OPEN                                             | 0.80                                    |       |
| S00018                                        | PFSAMPC | 03155 | SELECT                                           | 0.66                                    |       |
| S00015                                        | PFSAMPC | 02989 | SELECT                                           | 0.48                                    |       |
| S00019                                        | PFSAMPC | 03179 | SELECT                                           | 0.43                                    |       |
| S00014                                        | PFSAMPC | 01562 | CLOSE                                            | 0.26                                    |       |
| S00016                                        | PFSAMPC | 03046 | OPEN                                             | 0.25                                    |       |
| S00020                                        | PFSAMPC | 03065 | CLOSE                                            | 0.05                                    |       |
| S00007                                        | PFSAMPB | 01385 | SELECT                                           | 0.03                                    |       |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Seqno                  | Display context help information. |
| ++  | Seqno                  | Show additional details.          |
| +   | Seqno                  | Expand to reveal next level.      |

| Cmd | When Applied To Object | Action                           |
|-----|------------------------|----------------------------------|
| –   | Seqno                  | Collapse to hide next level.     |
| M   | Seqno                  | Display load module information. |
| P   | Seqno                  | Display source program mapping.  |
| EX  | Seqno                  | Display Db2 EXPLAIN data         |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Seqno, Percent of Time | Display context help information.  |
| +   | Seqno                  | Expand to reveal all entries.      |
| +   | Percent of Time        | Zoom in scale.                     |
| –   | Seqno                  | Collapse to show only first level. |
| –   | Percent of Time        | Zoom out scale                     |
| SV  | Seqno                  | Sort next level by value.          |
| SS  | Seqno                  | Sort next level by Seqno.          |

### Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on an SQL line will cause this detail window to pop up:



|                                                      |                    |                |                    |
|------------------------------------------------------|--------------------|----------------|--------------------|
| File View Navigate Help                              |                    |                |                    |
| +----- The following report line was selected -----+ |                    |                |                    |
| > S00012                                             | 3179 SELECT        | 0.84           |                    |
| +-----                                               |                    |                |                    |
| Calculation Details                                  |                    |                |                    |
| Db2 SQL activity measurements                        | 84                 |                |                    |
| SQL request                                          | SELECT             |                |                    |
| In program                                           | PFSAMPC            |                |                    |
| Precompiler statement number                         | 3179               |                |                    |
| Total measurements                                   | 10,000             |                |                    |
| Percent of total                                     | 0.84               |                |                    |
| SQL Statement Information                            |                    |                |                    |
| Subsystem name                                       | DSN1               | Attach type    | SASS               |
| Plan name                                            | PFSAMPA            | Plan bind time | May-11-05 13:57:39 |
| DBRM name                                            | PFSAMPC            | DBRM token     | 179FD30A 1B977868  |
| DBRM date/time                                       | May-11-05 13:56:56 |                |                    |
| Package ID                                           | PFSAMPC            | Location       | CABNETDB24         |
| Collectn name                                        | PFSAMPX1           | Pkg BIND time  | May-11-05 13:57:36 |
| SQL function                                         | SELECT             | Static/dynamic | Static             |
| Precmplr stmt#                                       | 3179               | DBRM section#  | 21                 |
| CSECT/module                                         | PFSAMPC in PFSAMPC | Offset of call | 00008610           |
| Sample count                                         | 84                 | SQL req count  | 172                |
| SQL CPU time                                         | 0.28               | Service time   | 0.45               |
| SQL Statement: SELECT *                              |                    |                |                    |
| INTO : H ,                                           |                    |                |                    |
| : H : H ,                                            |                    |                |                    |
| : H : H                                              |                    |                |                    |
| FROM VDEP                                            |                    |                |                    |
| WHERE DEPTNO = : H                                   |                    |                |                    |

## SETUP options

The following SETUP option can be selected with the SETUP primary command:

### Minimum percentage of time

You can set this option to eliminate reporting of SQL activity where the percentage of time is below a certain threshold.

## F05 - Db2 SQL activity by plan

### Usage

Use this report to see how time was consumed by SQL request processing. The percentage of time is reported by each Db2 plan under which measured SQL activity was recorded. Expand a plan line to see a further breakdown of time consumption by individual SQL request.

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

### Quantification

Each report line quantifies service time for all SQL requests issued under a Db2 Plan. This is further broken down by SQL request. Each quantity is expressed as a percentage of the overall measurement interval.

## Detail line hierarchy

An unexpanded F05 report shows a line for each module that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command ).

The hierarchy is illustrated here:

```
Level 1 Db2 Plan
 Level 2 SQL Request
 Level 3 SQL Statement Text
 Level 2 SQL Request
 Level 3 SQL Statement Text
 . . .
```

## Detail line descriptions

### Db2 plan detail line

This is the first-level detail line. Each line shows information about a Db2 Plan for which SQL request measurement data was recorded.

| Under Heading   | This is Displayed                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number assigned to the Db2 plan.                                                     |
| Plan/Pgm        | The Db2 plan name.                                                                              |
| Percent of Time | The percentage of the measurement interval duration the indicated Db2 plan was being processed. |

### SQL request detail line

This is the second-level detail line shown directly under the Db2 Plan detail line. It quantifies the aggregated service time for a specific SQL request.

| Under Heading   | This is Displayed                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Plan/Pgm        | The DBRM name for the program that issued the SQL request.                                                                                                                                                         |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request.                                                                                                     |
| SQL Function    | SQL Function The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                    |
| Percent of Time | The percentage of the measurement interval duration the indicated SQL Request was being processed.                                                                                                                 |

### SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

A sample report is shown here with a plan expanded to the second level (statement) and a statement expanded to show the SQL text.

```

File View Navigate Help

F05: SQL Activity by Plan (1336/CICS23A) Row 00001 of 00017
Command ==> ----- Scroll ==> CSR

Seqno Plan/Pgm Stmt# SQL Function Percent of Time * 10.00% ±1.1%
 *....1....2....3....4....5....6....7.
P0001 PFSAMPA 20.60 =====
→ S00003 PFSAMPC 1466 FETCH 5.79 ===
→ S00001 PFSAMPA 816 SELECT 3.10 ==
 > SELECT NEXTLIM INTO : H FROM MRATE WHERE CURATE = : H

→ S00005 PFSAMPC 3054 FETCH 2.29 =
→ S00012 PFSAMPB 678 SELECT 1.94 =
→ S00011 PFSAMPC 1316 SELECT 1.47 =
→ S00010 PFSAMPB 816 UPDATE 1.40 =
→ S00007 PFSAMPC 3179 SELECT 1.09 =
→ S00002 PFSAMPC 1347 SELECT 0.89
→ S00009 PFSAMPC 3155 SELECT 0.79
→ S00008 PFSAMPC 2989 SELECT 0.68
→ S00013 PFSAMPC 1433 OPEN 0.60
→ S00004 PFSAMPC 3046 OPEN 0.30
→ S00014 PFSAMPC 1562 CLOSE 0.14
→ S00006 PFSAMPC 3065 CLOSE 0.12

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Plan Seqno, SQL Seqno  | Display context help information. |
| ++  | Plan Seqno, SQL Seqno  | Show additional details.          |
| +   | Plan Seqno, SQL Seqno  | Expand to reveal next level.      |
| –   | Plan Seqno, SQL Seqno  | Collapse to hide next level.      |
| M   | SQL Seqno              | Display load module information.  |
| P   | SQL Seqno              | Display source program mapping.   |
| EX  | SQL Seqno              | Display Db2 EXPLAIN data          |
|     |                        |                                   |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Seqno, Percent of Time | Display context help information.  |
| +   | Seqno                  | Expand to reveal all entries.      |
| +   | Percent of Time        | Zoom in scale.                     |
| –   | Seqno                  | Collapse to show only first level. |
| –   | Percent of Time        | Zoom out scale.                    |
| SV  | Seqno                  | Sort next level by value.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. For example, entering “++” on an SQL line will cause this detail window to pop up:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > S00012 3179 SELECT 0.84 |
+-----+

Calculation Details
 Db2 SQL activity measurements 84
 SQL request SELECT
 In program PFSAMPC
 Precompiler statement number 3179
 Total measurements 10,000
 Percent of total 0.84

SQL Statement Information
 Subsystem name DSN1 Attach type SASS
 Plan name PFSAMPA Plan bind time May-11-05 13:57:39

 DBRM name PFSAMPC DBRM token 179FD30A 1B977868
 DBRM date/time May-11-05 13:56:56

 Package ID PFSAMPC Location CABNETDB24
 Collectn name PFSAMPX1 Pkg BIND time May-11-05 13:57:36

 SQL function SELECT Static/dynamic Static
 Precmplr stmt# 3179 DBRM section# 21
 CSECT/module PFSAMPC in PFSAMPC Offset of call 00008610
 Sample count 84 SQL req count 172
 SQL CPU time 0.28 Service time 0.45

 SQL Statement: SELECT *
 INTO : H ,
 : H : H ,
 : H : H
 FROM VDEP
 WHERE DEPTNO = : H
```

## SETUP options

The following SETUP option can be selected with the SETUP primary command:

### Minimum percentage of time

You can set this option to eliminate reporting of SQL activity where the percentage of time is below a certain threshold.

## F06 - Db2 SQL statement attributes

### Usage

Use this report to see detailed information about each of the measured SQL statements. This is useful as a reference report when working with printed copies of other Db2 reports that do not show full SQL statement details. (When browsing online, the pop-up detail windows show this information.) The following information is shown for each SQL statement for which activity was observed.

| Under Heading    | This is Displayed                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL Statement ID | A unique sequence number assigned by Application Performance Analyzer to the SQL statement. This is shown in other Db2 reports that display SQL statement information. |

| Under Heading     | This is Displayed                                                                                                                                                                                                                                                                                                                                        |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subsystem name    | The name of the Db2 subsystem under which the SQL statement was executed.                                                                                                                                                                                                                                                                                |
| Attachment type   | The type of Db2 attachment for the thread under which the SQL statement was executed.                                                                                                                                                                                                                                                                    |
| Plan name         | The name of the Db2 plan under which the SQL statement was executed.                                                                                                                                                                                                                                                                                     |
| Plan Bind Time    | The date and time of the BIND of the plan.                                                                                                                                                                                                                                                                                                               |
| DBRM Name         | The name of the DBRM under which the SQL statement was executed.                                                                                                                                                                                                                                                                                         |
| DBRM Token        | The DBRM consistency token. This is an 8 byte hexadecimal value that identifies the DBRM.                                                                                                                                                                                                                                                                |
| DBRM Date/Time    | The date and time of the DBRM. This is the time at which the precompiler created the DBRM.                                                                                                                                                                                                                                                               |
| Package ID        | The package ID. This is omitted if there was no package bound for the DBRM.                                                                                                                                                                                                                                                                              |
| Location          | The location name associated with the package. This is omitted if there was no package bound for the DBRM.                                                                                                                                                                                                                                               |
| Collection Name   | The collection name for the package. This is omitted if there was no package bound for the DBRM.                                                                                                                                                                                                                                                         |
| Package Bind Time | The date and time of the BIND of the package. This is omitted if there was no package bound for the DBRM.                                                                                                                                                                                                                                                |
| SQL Function      | The SQL function: SELECT, UPDATE, FETCH, etc.                                                                                                                                                                                                                                                                                                            |
| Precmplr Stmt#    | The statement number assigned by the precompiler to the SQL statement.                                                                                                                                                                                                                                                                                   |
| Static/Dynamic    | This indicates if the SQL request was Static or Dynamic.                                                                                                                                                                                                                                                                                                 |
| DBRM Section#     | The section number assigned by the precompiler to the SQL statement. Groups of related statements (such as OPEN, FETCH, CLOSE) are correlated using the section number.                                                                                                                                                                                  |
| PREPARE Stmt#     | The statement number of the corresponding PREPARE statement. This field only applies to dynamic SQL statement that operate on SQL text processed by a corresponding PREPARE statement. In order for this information to appear, it is required that execution of the corresponding PREPARE was sampled.                                                  |
| CSECT/Module      | The name of the load module and CSECT in which the SQL call was issued.                                                                                                                                                                                                                                                                                  |
| Offset of Call    | The offset of the SQL call return address in the CSECT or module.                                                                                                                                                                                                                                                                                        |
| SQL Req Count     | The number of SQL calls counted for the indicated statement. This information is available only if the Db2+ measurement option was active. It indicates the number of calls counted at the indicated SQL statement number for the duration of the measurement. Counting begins when the first SQL call is sampled.                                       |
| Sample Count      | The number of Samples in which execution of the indicate statement was measured.                                                                                                                                                                                                                                                                         |
| Total CPU Time    | The total CPU time consumed by processing of the indicated statement in the measured region. This information is available only if the Db2+ measurement option was active. It indicates the accumulated CPU time used by the indicated SQL statement number for the duration of the measurement. Accumulation begins when the first SQL call is sampled. |

| Under Heading      | This is Displayed                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total Service Time | The total service time for processing of the indicated statement. This information is available only if the Db2+ measurement option was active. It indicates the accumulated service time used by the indicated SQL statement number for the duration of the measurement. Accumulation begins when the first SQL call is sampled. |
| SQL Statement      | The SQL statement text.                                                                                                                                                                                                                                                                                                           |

## Sample reports

A sample report is shown here:

|                                                  |                                                          |                |                    |
|--------------------------------------------------|----------------------------------------------------------|----------------|--------------------|
| File View Navigate Help                          |                                                          |                |                    |
| F06: Db2 SQL Statement Attributes (1623/CICS23A) |                                                          |                | Row 00001 of 00324 |
| Command ==> _____                                |                                                          |                | Scroll ==> CSR     |
| SQL Statement Id 00001                           |                                                          |                |                    |
| Subsystem name                                   | DSN1                                                     | Attach type    | SASS               |
| Plan name                                        | PFSAMPA                                                  | Plan BIND time | Nov-28-04 14:11:17 |
| DBRM name                                        | PSSAMPA                                                  | DBRM token     | 17859595 050DCBBC  |
| DBRM date/time                                   | Nov-25-04 14:50:15                                       |                |                    |
| Package ID                                       | PFSAMPA                                                  | Location       | CABNETDB24         |
| Collectn name                                    | PFSAMPX1                                                 | Pkg BIND time  | no data            |
| SQL function                                     | SELECT                                                   | Static/dynamic | Static             |
| Precmplr stmt#                                   | 816                                                      | DBRM section#  | 1                  |
| CSECT/module                                     | PFSAMPA in PFSAMPA                                       | Offset of call | 000007FA           |
| Sample count                                     | 324                                                      | SQL req count  | 342                |
| SQL CPU time                                     | 0.91                                                     | Service time   | 1.72               |
| SQL Statement:                                   | SELECT NEXTLIM INTO : H FROM MRATE WHERE CURATE = :<br>H |                |                    |
| SQL Statement Id 00002                           |                                                          |                |                    |
| Subsystem name                                   | DSN1                                                     | Attach type    | SASS               |
| Plan name                                        | PFSAMPA                                                  | Plan BIND time | Nov-28-04 14:11:17 |
| DBRM name                                        | PFSAMPC                                                  | DBRM token     | 17859595 06957A24  |
| DBRM date/time                                   | Nov-25-04 14:49:42                                       |                |                    |
| Package ID                                       | PFSAMPC                                                  | Location       | CABNETDB24         |
| Collectn name                                    | PFSAMPX1                                                 | Pkg BIND time  | no data            |
| SQL function                                     | SELECT                                                   | Static/dynamic | Static             |
| Precmplr stmt#                                   | 1316                                                     | DBRM section#  | 6                  |

## F07 - Db2 SQL wait time by DBRM

### Usage

Use this report to see information about WAIT time that occurred during the processing of SQL requests. The percentage of time is reported for each module (DBRM) that issued SQL requests and is expressed as the percentage of the total measurement interval.

In addition, a SETUP option lets you choose to see the WAIT time expressed as a percentage of SQL service time. The two quantification options help answer these questions about SQL processing wait time:

- For how much of the overall measurement interval was the address space in a WAIT during SQL processing?

- For how much of the SQL processing time was the address space in a WAIT?

You can further expand each module line to see a further breakdown and quantification by individual SQL statements.

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

## Quantification

Each report line quantifies wait time for all SQL requests issued by a module (DBRM). This is further broken down by SQL request.

Depending on a report SETUP option, the quantities are expressed as a percentage of the overall measurement interval or as a percentage of the overall service time for the DBRM.

Keep in mind that quantification applies only to the region being measured. Db2 executes in multiple address spaces and a WAIT in the measured address space could indicate the region was suspended while part of the SQL processing was being serviced by another region.

## Detail line hierarchy

An unexpanded F07 report shows a line for each module that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```

Level 1 Module (DBRM)
 Level 2 SQL Request
 Level 3 SQL Statement Text
 Level 2 SQL Request
 Level 3 SQL Statement Text
 ...

```

## Detail line descriptions

### SQL DBRM (Module) detail line

This is the first-level detail line. Each line shows information about a DBRM (Module) for which SQL request measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The DBRM name.                                                                                                                                                                                  |
| Percent       | Either Percent of Total Time or Percent of DBRM SQL Time depending on SETUP option. This is the percentage of time that SQL processing for the indicated DBRM was observed to be in WAIT state. |

### SQL request detail line

This is the second-level detail line shown directly under the DBRM/Module detail line. It quantifies the wait time for a specific SQL request.

| Under Heading | This is Displayed                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Stmt#         | The precompiler statement number of the SQL statement.                                                                                                                                                             |

| Under Heading | This is Displayed                                                                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL Function  | The SQL function.                                                                                                                                        |
| Percent       | The percentage of the total time or of the DBRM time (depending on SETUP option) for which SQL processing for the indicated statement was in WAIT state. |

## SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This shows the report with one DBRM expanded to the second level (SQL statement):

```

File View Navigate Help

F07: SQL WAIT Time by DBRM (0611/CICS23A) Row 00001 of 00009
Command ==> _____ Scroll ==> CSR

Name Stmt# SQL Function Percent of Total Time * 10.00% ±2.5%
 *....1....2....3....4....5....6....7.
PFSAMPD 25.49 =====
→ S00001 435 FETCH 12.05 =====
→ S00003 541 UPDATE 7.50 ===
→ S00004 465 FETCH 3.95 ==
→ S00002 455 FETCH 1.91 =
→ S00005 485 FETCH 0.06
→ S00008 462 OPEN 0.00
→ S00006 481 CLOSE 0.00
→ S00007 451 CLOSE 0.00

```

You can use the + command to expand an SQL statement and show the SQL text as shown here:

```

File View Navigate Help

F07: SQL WAIT Time by DBRM (0611/CICS23A) Row 00001 of 00009
Command ==> _____ Scroll ==> CSR

Name Stmt# SQL Function Percent of Total Time * 10.00% ±2.5%
 *....1....2....3....4....5....6....7.
PFSAMPD 25.49 =====
→ S00001 435 FETCH 12.05 =====
→ S00003 541 UPDATE 7.50 ===
→ S00004 465 FETCH 3.95 ==
→ S00002 455 FETCH 1.91 =
> DECLARE RATE2 CURSOR FOR SELECT * FROM CUSTAMTS
→ S00005 485 FETCH 0.06
→ S00008 462 OPEN 0.00
→ S00006 481 CLOSE 0.00
→ S00007 451 CLOSE 0.00

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DBRM, Seqno            | Display context help information. |
| ++  | DBRM, Seqno            | Show additional details.          |



| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| +   | DBRM, Seqno            | Expand to reveal next level.                |
| –   | DBRM, Seqno            | Collapse to hide next level.                |
| M   | DBRM, Seqno            | Display load module information.            |
| P   | Seqno                  | Display source program mapping.             |
| SV  | DBRM                   | Sort next level by value.                   |
| SS  | DBRM                   | Sort lines by program and statement number. |
| EX  | Seqno                  | Display Db2 EXPLAIN data                    |

## on headings

| Cmd | When Applied To Object      | Action                             |
|-----|-----------------------------|------------------------------------|
| ?   | Name, Percent of Total Time | Display context help information.  |
| +   | Name                        | Expand to reveal all entries.      |
| +   | Percent of Total Time       | Zoom in scale.                     |
| –   | Name                        | Collapse to show only first level. |
| –   | Percent of Total Time       | Zoom out scale.                    |
| SV  | Seqno                       | Sort next level by value.          |
| SN  | Name                        | Sort next level entries by name    |

## SETUP options

Enter the SETUP primary command to select options for this report. The following option is available:

```
File View Navigate Help
+-----+
| Options for Db2 SQL wait time by DBRM |
| Enter "/" to select an option |
| - Quantify wait time as a percentage of total |
| measurement interval. Unselect to quantify |
| as a percentage of the SQL service time for |
| the DBRM. |
+-----+
```

## F08 - Db2 SQL wait time by statement

### Usage

Use this report to see information about WAIT time that occurred during the processing of SQL requests. The percentage of time is reported for each SQL statement sampled during the measurement.

In addition, a SETUP option lets you choose to see the WAIT time expressed as a percentage of SQL service time. The two quantification options help answer these questions about SQL processing wait time:

- For how much of the overall measurement interval was the address space in a WAIT during SQL processing?

- For how much of the SQL processing time was the address space in a WAIT?

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

## Quantification

Each report line quantifies wait time for an SQL request observed during the measurement.

Depending on a report SETUP option, the quantities are expressed as a percentage of the overall measurement interval or as a percentage of the overall service time for the SQL statement.

Keep in mind that quantification applies only to the region being measured. Db2 executes in multiple address spaces and a WAIT in the measured address space could indicate the region was suspended while part of the SQL processing was being serviced by another region.

## Detail line hierarchy

An unexpanded F08 report shows a line for each observed SQL statement. You can expand each line to reveal one additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 SQL Request
Level 2 SQL Statement Text
Level 1 SQL Request
Level 2 SQL Statement Text
...
```

## Detail line descriptions

### SQL request detail line

This is the first-level detail line. It quantifies the wait time for a specific SQL request.

| Under Heading         | This is Displayed                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno                 | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Program               | The DBRM name for the program that issued the SQL request.                                                                                                                                                         |
| Stmt#                 | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request.                                                                                                     |
| SQL Function          | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                 |
| Percent of Total Time | The percentage of the total time or of the SQL statement service time (depending on SETUP option) for which processing for the indicated statement was in WAIT state.                                              |

### SQL statement text detail line

This is second-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This shows the report with one of the SQL statements expanded to show the next level, which is SQL text.

```

File View Navigate Help

F08: SQL WAIT Time by Statement (0611/CICS23A) Row 00001 of 00010
Command ==> _____ Scroll ==> CSR

Seqno Program Stmt# SQL Function Percent of Total Time * 10.00% ±2.5%
 *.....1.....2.....3.....4.....5.....6.....7...
S00001 PFTESTD 435 FETCH 12.05 =====
S00003 PFTESTD 541 UPDATE 7.50 ===
S00004 PFTESTD 465 FETCH 3.95 ==
S00002 PFTESTD 455 FETCH 1.91 =
 > DECLARE RATE2 CURSOR FOR SELECT * FROM CUSTAMTS

S00005 PFTESTD 485 FETCH 0.06
S00007 PFTESTD 451 CLOSE 0.00
S00008 PFTESTD 462 OPEN 0.00
S00006 PFTESTD 481 CLOSE 0.00

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Seqno                  | Display context help information. |
| ++  | Seqno                  | Show additional details.          |
| +   | Seqno                  | Expand to reveal next level.      |
| –   | Seqno                  | Collapse to hide next level.      |
| M   | Seqno                  | Display load module information.  |
| P   | Seqno                  | Display source program mapping.   |
| EX  | Seqno                  | Display Db2 EXPLAIN data          |

### on headings

| Cmd | When Applied To Object       | Action                                           |
|-----|------------------------------|--------------------------------------------------|
| ?   | Seqno, Percent of Total Time | Display context help information.                |
| +   | Seqno                        | Expand to reveal all entries.                    |
| +   | Percent of Total Time        | Zoom in scale.                                   |
| –   | Seqno                        | Collapse to show only first level.               |
| –   | Percent of Total Time        | Zoom out scale.                                  |
| SV  | Seqno                        | Sort next level by value.                        |
| SS  | Seqno                        | Sort next level by program and statement number. |

## SETUP options

Enter the SETUP primary command to select options for this report. The following option is available:

```

File View Navigate Help
+-----+
| Options for Db2 SQL wait time by statement |
+-----+
| Enter "/" to select an option |
| - Quantify wait time as a percentage of total |
| measurement interval. Unselect to quantify |
| as a percentage of the SQL service time for |
| the SQL statement. |
+-----+

```

## F09 - Db2 SQL wait time by plan

### Usage

Use this report to see information about WAIT time that occurred during the processing of SQL requests. The percentage of time is reported for each observed Db2 Plan under which SQL requests were issued. It is expressed as the percentage of the total measurement interval.

In addition, a SETUP option lets you choose to see the WAIT time expressed as a percentage of SQL service time. The two quantification options help answer these questions about SQL processing wait time:

1. For how much of the overall measurement interval was the address space in a WAIT during SQL processing?
2. For how much of the SQL processing time was the address space in a WAIT?

You can further expand each Db2 Plan line to see a further breakdown and quantification by individual SQL statements. The SQL statements can be expanded to show the SQL text.

**Note:** This report shows all SQL calls that were sampled, but when the Db2+ feature is active it will not show SQL calls that were measured by the Db2+ feature but not sampled.

### Quantification

Each report line quantifies wait time for all SQL requests issued under a Db2 Plan. This is further broken down by SQL request.

Depending on a report SETUP option, the quantities are expressed as a percentage of the overall measurement interval or as a percentage of the overall service time under the Plan.

Keep in mind that quantification applies only to the region being measured. Db2 executes in multiple address spaces and a WAIT in the measured address space could indicate the region was suspended while part of the SQL processing was being serviced by another region.

### Detail line hierarchy

An unexpanded F09 report shows a line for each module that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```

Level 1 Db2 Plan
Level 2 SQL Request
Level 3 SQL Statement Text
Level 2 SQL Request
Level 3 SQL Statement Text
...

```

### Detail line descriptions

## Db2 plan detail line

This is the first-level detail line. Each line shows information about a Db2 Plan under whose execution SQL request measurement data was recorded.

| Under Heading         | This is Displayed                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno                 | A sequence number assigned, by Application Performance Analyzer, to the Db2 plan.                                                                                  |
| Plan/Pgm              | The name of a Db2 plan.                                                                                                                                            |
| Percent of Total Time | The percentage of the total time or of the SQL processing time for the PLAN (depending on SETUP option) for which SQL processing under the plan was in WAIT state. |

## SQL request detail line

This is the second-level detail line shown directly under the Plan detail line. It quantifies the wait time for a specific SQL request.

| Under Heading         | This is Displayed                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno                 | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic. |
| Plan/Pgm              | The name of a Db2 plan.                                                                                                                                                                                            |
| Stmt#                 | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request.                                                                                                     |
| SQL Function          | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                 |
| Percent of Total Time | The percentage of the total time or of the SQL processing time for the PLAN (depending on SETUP option) for which processing for the indicated statement was in WAIT state.                                        |

## SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

In this sample, the P0001 plan line has been expanded to the second level (SQL statement), and one of the statements has been expanded to the third level to show the SQL text.

```
File View Navigate Help

F09: SQL WAIT Time by Plan (0611/CICS23A) Row 00001 of 00010
Command ==> ----- Scroll ==> CSR

Seqno Plan/Pgm Stmt# SQL Function Percent of Total Time * 10.00% ±2.5%
 *....1....2....3....4....5....6....7...
P0001 PFPLN022 25.49 =====
→ S00001 PFTESTD 435 FETCH 12.05 =====
→ S00003 PFTESTD 541 UPDATE 7.50 =====
→ S00004 PFTESTD 465 FETCH 3.95 ==
→ S00002 PFTESTD 455 FETCH 1.91 =
 > DECLARE RATE2 CURSOR FOR SELECT * FROM CUSTAMTS
→ S00005 PFTESTD 485 FETCH 0.06
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Plan Seqno, Seqno      | Display context help information. |
| ++  | Plan Seqno, Seqno      | Show additional details.          |
| +   | Plan Seqno, Seqno      | Expand to reveal next level.      |
| –   | Plan Seqno, Seqno      | Collapse to hide next level.      |
| M   | Seqno                  | Display load module information.  |
| P   | Seqno                  | Display source program mapping.   |
| EX  | Seqno                  | Display Db2 EXPLAIN data          |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Seqno,Percent of Time  | Display context help information.  |
| +   | Seqno                  | Expand to reveal all entries.      |
| +   | Percent of Time        | Zoom in scale.                     |
| –   | Seqno                  | Collapse to show only first level. |
| –   | Percent of Time        | Zoom out scale.                    |
| SV  | Seqno                  | Sort next level by value.          |

## SETUP options

Enter the SETUP primary command to select options for this report. The following option is available:

```
File View Navigate Help
+-----+
| Options for Db2 SQL wait time by plan |
| Enter "/" to select an option |
| - Quantify wait time as a percentage of total |
| measurement interval. Unselect to quantify |
| as a percentage of the SQL service time for |
| the plan. |
+-----+
```

## F10 - Db2 SQL CPU/Svc time by DBRM

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This option records exact SQL call counts, total SQL service time and total SQL processing CPU time by embedded SQL statement. When measuring a distributed data facility (DDF) address space, SQL Enclave and SQL zIIP

CPU times are also recorded. This report shows quantification by DBRM. You can further expand each DBRM line to see a further breakdown and quantification by individual embedded SQL statement.

## Quantification

Each report line shows the following for each DBRM and, when expanded, for each SQL statement observed in the DBRM.

- Number of SQL calls.
- Total CPU time for the SQL call processing.
- Mean SQL call CPU time, or percent of total used.
- Total service time for the SQL call processing.
- Mean SQL call service time, or percent of total used.

A setup option is available to display the percent used in place of the mean fields. Keep in mind that measured CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. For DDF only, this is reflected in the enclave CPU times shown in the detail windows of this report.

## Detail line descriptions

### SQL DBRM (Module) detail line

This is the first-level detail line. Each line shows information about a DBRM (Module) for which SQL request measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                        |
|-----------------|--------------------------------------------------------------------------------------------------------------------------|
| Name            | The DBRM name.                                                                                                           |
| Nbr of Calls    | The number of SQL calls counted for this DBRM.                                                                           |
| CPU Time: Total | The total CPU time for all SQL calls counted for this DBRM. Large numbers will be expressed in minutes with an M suffix. |
| CPU Time: Mean  | The mean CPU time per SQL call. Large numbers will be expressed in minutes with an M suffix.                             |
| CPU time: Pct   | The percent of total CPU time this DBRM used.                                                                            |
| Svc Time: Total | The total service time for all SQL calls for this DBRM. Large numbers will be expressed in minutes with an M suffix.     |
| Svc Time: Mean  | The mean service time per SQL call. Large numbers will be expressed in minutes with an M suffix.                         |
| Svc time: Pct   | The percent of total service time this DBRM used.                                                                        |

### SQL request detail line

This is the second-level detail line shown directly under the DBRM/Module detail line. It quantifies an individual SQL statement.

| Under Heading | This is Displayed                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either "S" or "D" precedes the sequence number indicating if the SQL statement is static or dynamic. |

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                                                   |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total CPU time for all SQL calls counted for this statement. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                                                        |
| CPU Time: Mean  | The mean CPU time per SQL call. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                                                                                         |
| CPU Time: Pct   | The percent of total CPU time this statement used.                                                                                                                                                                                                                                                                                                                   |
| Svc Time: Total | The total service time for all SQL calls for this statement. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                                                            |
| Svc Time: Mean  | The mean service time per SQL call. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                                                                                     |
| Svc Time: Pct   | The percent of total service time this statement used.                                                                                                                                                                                                                                                                                                               |

## SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report expanded to the second level (SQL statement), and one of the statements has been expanded to the third level to show the SQL text.

| File View Navigate Help                          |       |                                                        |                     |                    |         |              |         |
|--------------------------------------------------|-------|--------------------------------------------------------|---------------------|--------------------|---------|--------------|---------|
| F10: SQL CPU/Service Time by DBRM (1286/CICS23A) |       |                                                        |                     | Row 00001 of 00014 |         |              |         |
| Command ===>                                     |       |                                                        |                     | Scroll ===> CSR    |         |              |         |
| Name                                             | Stmt# | SQL Function                                           | Nbr of<br>SQL Calls | --CPU Time--       |         | --Svc Time-- |         |
|                                                  |       |                                                        |                     | Total              | Mean    | Total        | Mean    |
| PFSAMPC                                          |       |                                                        | 1,204               | 3.08               | 0.00256 | 5.57         | 0.00462 |
| ± S00003                                         | 1466  | FETCH                                                  | 516                 | 2.27               | 0.00441 | 3.86         | 0.00749 |
| → S00006                                         | 1316  | SELECT                                                 | 172                 | 0.39               | 0.00227 | 1.01         | 0.00588 |
| → S00005                                         | 1347  | SELECT                                                 | 172                 | 0.25               | 0.00150 | 0.40         | 0.00232 |
|                                                  |       | > SELECT CUSACCT INTO : H FROM ACTINFO WHERE SPCRATE = |                     |                    |         |              |         |
|                                                  |       | > : H AND INDX01 = '01'                                |                     |                    |         |              |         |
| → S00008                                         | 1443  | OPEN                                                   | 172                 | 0.11               | 0.00064 | 0.21         | 0.00122 |
| → S00007                                         | 1562  | CLOSE                                                  | 172                 | 0.04               | 0.00026 | 0.07         | 0.00045 |
| PFSAMPB                                          |       |                                                        | 514                 | 1.04               | 0.00203 | 1.70         | 0.00331 |
| → S00002                                         | 672   | SELECT                                                 | 342                 | 0.69               | 0.00204 | 1.13         | 0.00332 |
| → S00004                                         | 810   | UPDATE                                                 | 172                 | 0.34               | 0.00201 | 0.56         | 0.00331 |
| PFSAMPA                                          |       |                                                        | 342                 | 0.84               | 0.00246 | 1.74         | 0.00511 |
| → S00002                                         | 815   | SELECT                                                 | 342                 | 0.84               | 0.00246 | 1.74         | 0.00511 |



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | DBRM, Seqno            | Display context help information.           |
| ++  | DBRM, Seqno            | Show additional details.                    |
| +   | DBRM, Seqno            | Expand to reveal next level.                |
| –   | DBRM, Seqno            | Collapse to hide next level.                |
| M   | DBRM, Seqno            | Display load module information.            |
| P   | Seqno                  | Display source program mapping.             |
| SV  | DBRM                   | Sort next level entries by value.           |
| SS  | DBRM                   | Sort lines by program and statement number. |
| EX  | Seqno                  | Display Db2 EXPLAIN data                    |
| SD  | DBRM                   | Sort next level entries by service time     |

### on headings

| Cmd | When Applied To Object | Action                                  |
|-----|------------------------|-----------------------------------------|
| ?   | Name                   | Display context help information.       |
| +   | Name                   | Expand to reveal all entries.           |
| –   | Name                   | Collapse to show only first level.      |
| SV  | Name                   | Sort next level by value.               |
| SN  | Name                   | Sort next level entries by name         |
| SD  | Name                   | Sort next level entries by service time |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by DBRM |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each DBRM (Module) and SQL statement, rather than the mean time.

## F11 - Db2 SQL CPU/Svc time by stmt

# Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This option records exact SQL call counts, total SQL service time and total SQL processing CPU time by embedded SQL statement. When measuring a distributed data facility (DDF) address space, SQL Enclave and SQL zIIP CPU times are also recorded.

# Quantification

Each report line shows the following for each SQL statement:

- Number of SQL calls.
- Total CPU time for the SQL call processing.
- Mean SQL call CPU time, or percent of total used.
- Total service time for the SQL call processing.
- Mean service time per SQL call, or percent of total used.

A setup option is available to display the percent used in place of the mean fields. Keep in mind that measured CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. For DDF only, this is reflected in the enclave CPU times shown in the detail windows of this report.

# Detail line hierarchy

An unexpanded F11 report shows a line for each measured SQL request. You can expand each line to reveal one additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 SQL Request
 Level 2 SQL Statement Text
Level 2 SQL Request
 Level 3 SQL Statement Text
...
```

# Detail line descriptions

## SQL request detail line

This is the first-level detail line. It quantifies an individual SQL statement.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno         | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Name          | The DBRM name.                                                                                                                                                                                                                                                                                                                                                       |
| Stmt#         | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function  | The SQL function. The is the name of the SQL function: SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                                                   |
| Nbr of Calls  | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |

| Under Heading   | This is Displayed                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Total | The total CPU time for all SQL calls counted for this statement. Large numbers will be expressed in minutes with an M suffix. |
| CPU Time: Mean  | The mean CPU time per SQL call. Large numbers will be expressed in minutes with an M suffix.                                  |
| CPU time: Pct   | The percent of total CPU time this statement used.                                                                            |
| Svc Time: Total | The total service time for all SQL calls for this statement. Large numbers will be expressed in minutes with an M suffix.     |
| Svc Time: Mean  | The mean service time per SQL call. Large numbers will be expressed in minutes with an M suffix.                              |
| Svc time: Pct   | The percent of total service time this statement used.                                                                        |

## SQL statement text detail line

This is second-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with one of the lines expanded to the second level to show SQL text.

| File View Navigate Help                               |         |       |                                                         |                  |                    |         |              |         |
|-------------------------------------------------------|---------|-------|---------------------------------------------------------|------------------|--------------------|---------|--------------|---------|
| F11: SQL CPU/Service Time by Statement (1300/CICS23A) |         |       |                                                         |                  | Row 00001 of 00017 |         |              |         |
| Command ==> _____                                     |         |       |                                                         |                  | Scroll ==> CSR     |         |              |         |
| Seqno                                                 | Name    | Stmt# | SQL Function                                            | Nbr of SQL Calls | --CPU Time--       |         | --Svc Time-- |         |
|                                                       |         |       |                                                         |                  | Total              | Mean    | Total        | Mean    |
| S00007                                                | PFSAMPC | 1466  | FETCH                                                   | 344              | 1.48               | 0.00432 | 2.35         | 0.00685 |
| S00001                                                | PFSAMPA | 816   | SELECT                                                  | 342              | 0.88               | 0.00258 | 1.70         | 0.00497 |
|                                                       |         |       | > SELECT NEXTLIM INTO : H FROM MRATE WHERE CURATE = : H |                  |                    |         |              |         |
| S00009                                                | PFSAMPC | 3054  | FETCH                                                   | 1,720            | 0.74               | 0.00043 | 1.15         | 0.00066 |
| S00003                                                | PFSAMPB | 678   | SELECT                                                  | 342              | 0.47               | 0.00137 | 0.75         | 0.00221 |
| S00004                                                | PFSAMPC | 1316  | SELECT                                                  | 172              | 0.42               | 0.00249 | 0.76         | 0.00446 |
| S00010                                                | PFSAMPB | 816   | UPDATE                                                  | 172              | 0.39               | 0.00231 | 0.75         | 0.00441 |
| S00002                                                | PFSAMPB | 408   | SET HOST VAR                                            | 342              | 0.38               | 0.00112 | 0.72         | 0.00211 |
| S00005                                                | PFSAMPC | 1347  | SELECT                                                  | 172              | 0.27               | 0.00161 | 0.48         | 0.00282 |
| S00014                                                | PFSAMPC | 3155  | SELECT                                                  | 172              | 0.27               | 0.00160 | 0.41         | 0.00243 |
| S00012                                                | PFSAMPC | 3179  | SELECT                                                  | 172              | 0.27               | 0.00158 | 0.47         | 0.00277 |
| S00011                                                | PFSAMPC | 2989  | SELECT                                                  | 172              | 0.22               | 0.00130 | 0.38         | 0.00221 |
| S00008                                                | PFSAMPC | 3046  | OPEN                                                    | 172              | 0.20               | 0.00121 | 0.29         | 0.00170 |
| S00006                                                | PFSAMPC | 1443  | OPEN                                                    | 172              | 0.11               | 0.00067 | 0.31         | 0.00181 |
| S00013                                                | PFSAMPC | 1562  | CLOSE                                                   | 172              | 0.04               | 0.00028 | 0.08         | 0.00048 |
| S00015                                                | PFSAMPC | 3065  | CLOSE                                                   | 172              | 0.03               | 0.00021 | 0.05         | 0.00034 |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Seqno                  | Display context help information. |
| ++  | Seqno                  | Show additional details.          |

| Cmd | When Applied To Object | Action                           |
|-----|------------------------|----------------------------------|
| +   | Seqno                  | Expand to reveal next level.     |
| –   | Seqno                  | Collapse to hide next level.     |
| M   | Seqno                  | Display load module information. |
| P   | Seqno                  | Display source program mapping.  |
| EX  | Seqno                  | Display Db2 EXPLAIN data         |

## on headings

| Cmd | When Applied To Object | Action                                  |
|-----|------------------------|-----------------------------------------|
| ?   | Seqno                  | Display context help information.       |
| +   | Seqno                  | Expand to reveal all entries.           |
| –   | Seqno                  | Collapse to show only first level.      |
| SV  | Seqno                  | Sort next level by value.               |
| SS  | Seqno                  | Sort lines by program and stmt number   |
| SD  | Seqno                  | Sort next level entries by service time |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```

+-----+
| Options for Db2 SQL CPU/Svc Time by Stmt |
| Enter "/" to select an option |
| / Show SQL statements with a positive SQLCODE |
| (these are successful calls). |
| |
| / Show SQL statements with a negative SQLCODE |
| (these are failed calls). |
| |
| / Show SQL statements by statement number and |
| ignore differences in SQL text. |
| |
| /Display Percent used in place of Mean fields |
+-----+

```

### Show SQL statements with positive SQLCODE

This shows SQL statements that end successfully with a zero or positive SQLCODE. When selected, successful SQL statements are included in the report.

### Show SQL statements with negative SQLCODE

This shows SQL statements that are unsuccessful; that is, with a negative SQLCODE. When selected, unsuccessful SQL statements are included in the report.

### Show SQL statements by statement number

This displays dynamic SQL statements consolidated by statement number and ignores differences in the SQL text. When selected, only one line is displayed per statement number regardless of the contents of the SQL text. The detail window for each statement number displays the SQL information for the first call from this statement.

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each SQL statement, rather than the mean time.

## F12 - Db2 SQL CPU/Svc time by plan

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This option records exact SQL call counts, total SQL service time and total SQL processing CPU time by embedded SQL statement. When measuring a distributed data facility (DDF) address space, SQL Enclave and SQL zIIP CPU times are also recorded. This report shows quantification by Db2 Plan. You can further expand each Db2 Plan line to see a further breakdown and quantification by individual embedded SQL statement.

### Quantification

Each report line shows the following for each Db2 Plan and, when expanded, for each SQL statement observed under the Plan.

- Number of SQL calls.
- Total CPU time for the SQL call processing.
- Mean SQL call CPU time, or percent of total used.
- Total service time for the SQL call processing.
- Mean SQL call service time, or percent of total used.

A setup option is available to display the percent used in place of the mean fields. Keep in mind that measured CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. For DDF only, this is reflected in the enclave CPU times shown in the detail windows of this report.

### Detail line hierarchy

An unexpanded F12 report shows a line for each Db2 Plan under which SQL request were issued. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 Db2 Plan
 Level 2 SQL Request
 Level 3 SQL Statement Text
 Level 2 SQL Request
 Level 3 SQL Statement Text
 ...
```

### Detail line descriptions

#### Db2 Plan detail line

This is the first-level detail line. Each line shows information about a Db2 Plan under which SQL request measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number assigned, by Application Performance Analyzer, to the Db2 plan.                                             |
| Plan/Pgm        | The Db2 Plan name.                                                                                                            |
| Nbr of Calls    | The number of SQL calls counted for this Db2 Plan.                                                                            |
| CPU Time: Total | The total CPU time for all SQL calls counted for this statement. Large numbers will be expressed in minutes with an M suffix. |

| Under Heading   | This is Displayed                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Mean  | The mean CPU time per SQL call. Large numbers will be expressed in minutes with an M suffix.                              |
| CPU time: Pct   | The percent of total CPU time this plan used.                                                                             |
| Svc Time: Total | The total service time for all SQL calls for this statement. Large numbers will be expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time per SQL call. Large numbers will be expressed in minutes with an M suffix.                          |
| SVC time: Pct   | The percent of total service time this plan used.                                                                         |

## SQL request detail line

This is the second-level detail line shown directly under the Db2 Plan detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either "S" or "D" precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                           |
| Plan/Pgm        | The DBRM name.                                                                                                                                                                                                                                                                                               |
| Stmt#           | The precompiler statement number of the SQL statement. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function.                                                                                                                                                                                                                                                                                            |
| Nbr of Calls    | The number of SQL calls counted for this statement.                                                                                                                                                                                                                                                          |
| CPU Time: Total | The total CPU time for all SQL calls counted for this statement. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                |
| CPU Time: Mean  | The mean CPU time per SQL call. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                                 |
| CPU time: Pct   | The percent of total CPU time this statement used.                                                                                                                                                                                                                                                           |
| Svc Time: Total | The total service time for all SQL calls for this statement. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                    |
| Svc Time: Mean  | The mean service time per SQL call. Large numbers will be expressed in minutes with an M suffix.                                                                                                                                                                                                             |
| SVC time: Pct   | The percent of total service time this statement used.                                                                                                                                                                                                                                                       |

## SQL statement text detail line

This is third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with the plan expanded to the second level and one of the SQL statement lines expanded to the third level to show SQL text.

| File View Navigate Help                          |          |       |                                                         |                  |              |                    |              |         |
|--------------------------------------------------|----------|-------|---------------------------------------------------------|------------------|--------------|--------------------|--------------|---------|
| F12: SQL CPU/Service Time by Plan (1300/CICS23A) |          |       |                                                         |                  |              | Row 00001 of 00018 |              |         |
| Command ==> _____                                |          |       |                                                         |                  |              | Scroll ==> CSR     |              |         |
| Seqno                                            | Plan/PGM | Stmt# | SQL Function                                            | Nbr of SQL Calls | --CPU Time-- |                    | --Svc Time-- |         |
|                                                  |          |       |                                                         |                  | Total        | Mean               | Total        | Mean    |
| P0001                                            | PFSAMPA  |       |                                                         | 4,810            | 6.25         | 0.00130            | 10.73        | 0.00223 |
| → S00007                                         | PFSAMPC  | 1466  | FETCH                                                   | 344              | 1.48         | 0.00432            | 2.35         | 0.00685 |
| → S00001                                         | PFSAMPA  | 816   | SELECT                                                  | 342              | 0.88         | 0.00258            | 1.70         | 0.00497 |
|                                                  |          |       | > SELECT NEXTLIM INTO : H FROM MRATE WHERE CURATE = : H |                  |              |                    |              |         |
| → S00009                                         | PFSAMPC  | 3054  | FETCH                                                   | 1,720            | 0.74         | 0.00043            | 1.15         | 0.00066 |
| → S00003                                         | PFSAMPB  | 678   | SELECT                                                  | 342              | 0.47         | 0.00137            | 0.75         | 0.00221 |
| → S00004                                         | PFSAMPC  | 1316  | SELECT                                                  | 172              | 0.42         | 0.00249            | 0.76         | 0.00446 |
| → S00010                                         | PFSAMPB  | 816   | UPDATE                                                  | 172              | 0.39         | 0.00231            | 0.75         | 0.00441 |
| → S00002                                         | PFSAMPB  | 408   | SET HOST V                                              | 342              | 0.38         | 0.00112            | 0.72         | 0.00211 |
| → S00005                                         | PFSAMPC  | 1347  | SELECT                                                  | 172              | 0.27         | 0.00161            | 0.48         | 0.00282 |
| → S00014                                         | PFSAMPC  | 3155  | SELECT                                                  | 172              | 0.27         | 0.00160            | 0.41         | 0.00243 |
| → S00012                                         | PFSAMPC  | 3179  | SELECT                                                  | 172              | 0.27         | 0.00158            | 0.47         | 0.00277 |
| → S00011                                         | PFSAMPC  | 2989  | SELECT                                                  | 172              | 0.22         | 0.00130            | 0.38         | 0.00221 |
| → S00008                                         | PFSAMPC  | 3046  | OPEN                                                    | 172              | 0.20         | 0.00121            | 0.29         | 0.00170 |
| → S00006                                         | PFSAMPC  | 1443  | OPEN                                                    | 172              | 0.11         | 0.00067            | 0.31         | 0.00181 |
| → S00013                                         | PFSAMPC  | 1562  | CLOSE                                                   | 172              | 0.04         | 0.00028            | 0.08         | 0.00048 |
| → S00015                                         | PFSAMPC  | 3065  | CLOSE                                                   | 172              | 0.03         | 0.00021            | 0.05         | 0.00034 |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | Plan Seqno, Seqno      | Display context help information.           |
| ++  | Plan Seqno, Seqno      | Show additional details.                    |
| +   | Plan Seqno, Seqno      | Expand to reveal next level.                |
| –   | Plan Seqno, Seqno      | Collapse to hide next level.                |
| SV  | Plan Seqno             | Sort next level entries by value.           |
| SS  | Plan Seqno             | Sort lines by program and statement number. |
| M   | Seqno                  | Display load module information.            |
| P   | Seqno                  | Display source program mapping.             |
| EX  | Seqno                  | Display Db2 EXPLAIN data                    |
| SD  | Plan Seqno             | Sort next level entries by service time     |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Seqno                  | Display context help information.  |
| +   | Seqno                  | Expand to reveal all entries.      |
| –   | Seqno                  | Collapse to show only first level. |
| SV  | Seqno                  | Sort next level by value.          |

| Cmd | When Applied To Object | Action                                  |
|-----|------------------------|-----------------------------------------|
| SD  | Seqno                  | Sort next level entries by service time |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Plan |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each Db2 plan and SQL statement, rather than the mean time.

## F13 - Db2 SQL threads analysis

### Usage

Use this report to see information about Db2 threads observed during the sampling of SQL call activity.

### Quantification

Each report line represents a range of REQCT values for one Db2 thread. A new line is reported each time a reset of the REQCT value occurs for the thread (when the value reaches 32767 and is reset to 1).

### Detail line hierarchy

Report F13 shows only one level. The detail lines cannot be expanded.

### Detail line descriptions

#### Thread detail line

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SeqNum        | A unique sequence number assigned to the Db2 thread.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Thread Addr   | An address of the Db2 'ACE' control block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Attach        | The type of attachment to Db2 for the thread. This can be: CAF, SSRF, CICS, IMS or CIB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| REQCT Range   | This is the range of REQCT values observed. The lower value is the first REQCT value observed during any measurement sample. Lower values might have occurred during the measurement which were not sampled. The higher value is the last REQCT value observed during a measurement sample. Higher values might have occurred during the measurement which were not sampled. In the case where the range is a continuation after a REQCT reset, a lower value of 1 will be reported. In the case where the range is followed by another detail line after a REQCT reset, an upper value of 32768 will be reported. |



| Under Heading      | This is Displayed                                                                                                                                                                                                                                                                                                       |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL Calls Executed | The number of SQL calls executed. This number is derived from the REQCT values.                                                                                                                                                                                                                                         |
| SQL Calls Sampled  | This is the number of unique REQCT values within the reported range for which samples occurred. This number will often be significantly lower than the Calls Executed number because the rate of SQL call processing is typically much higher than the measurement sampling rate. Hence, not all SQL calls are sampled. |

## Sample reports

A sample report is shown here:

| File View Navigate Help                  |             |        |               |                               |         |
|------------------------------------------|-------------|--------|---------------|-------------------------------|---------|
| F13: Db2 Threads Analysis (3398/CICS23A) |             |        |               | Row 00001 of 00020            |         |
| Command ==> _____                        |             |        |               | Scroll ==> CSR                |         |
| SeqNum                                   | Thread Addr | Attach | REQCT Range   | --- SQL Calls ---<br>Executed | Sampled |
| 000035                                   | 167CCAD0    | CAF    | 00003-04003   | 4,001                         | 844     |
|                                          |             |        | Thread Totals | 4,001                         | 844     |
| 000036                                   | 167CCCA8    | CAF    | 00003-04002   | 4,000                         | 866     |
|                                          |             |        | Thread Totals | 4,000                         | 866     |
| 000037                                   | 172B61F8    | CAF    | 00003-04001   | 3,999                         | 908     |
|                                          |             |        | Thread Totals | 3,999                         | 908     |

## F14 - Db2 CPU by plan/stored proc

### Usage

Use this report to see how CPU resource was consumed by each stored procedure measured during the sampling interval. The percentage of time is reported for each Db2 plan under which measured stored procedure activity was recorded. Expand a plan line to see a further breakdown of time consumption by category.

### Quantification

Each report line quantifies CPU usage as a percentage. Each percentage represents the ratio of CPU consumption observed for the reported item to the total CPU consumption measured in the address space.

### Detail line hierarchy

An unexpanded F14 report shows a line for each plan that was measured in the stored procedure address space. You can expand each line to reveal additional hierarchical levels of detail (using the “+” line command).

Only the Db2SQL Category hierarchy is shown here. Activity for the Stored Procedure which is not related to SQL processing will be shown in the SYSTEM, APPLCN, or NOSYMB categories. For information about these other categories, see [“C01 - CPU usage by category” on page 79](#). The hierarchy is illustrated here:

Level 1 Db2 Plan  
Level 2 Db2SQL Category  
Level 3 Db2 DBRM  
Level 4 Db2 Load Module

## Detail line descriptions

### Db2 Plan detail line

This is the first-level detail line. Each line shows information about a Db2 Plan for which stored procedure measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A sequence number assigned to the Db2 plan.                                                                                      |
| Description     | The plan name.                                                                                                                   |
| Percent of Time | The percentage of the measurement interval duration stored procedure requests under the indicated Db2 Plan were being processed. |

### Category detail line

This is a second-level detail line. This line shows one of five categories to which CPU time has been attributed:

**APPLCN**

Application Code

**SYSTEM**

System/OS Services

**Db2SQL**

SQL Processing

**DATAMG**

Data Management (DASD) Requests

**NOSYMB**

No Module Name Found, any execution measured at locations for which no load module name could be determined is attributed to this category.

As F14 is used for analyzing CPU consumption in Db2 Store Procedures, the category Db2SQL is the one where you should see the majority of the activity. This category and the detail lines under it are described here. For detailed information on the other categories, see [“C01 - CPU usage by category”](#) on page 79.

| Under Heading   | This is Displayed                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------|
| Seqno           | The category name “Db2SQL.”                                                                                         |
| Description     | The category description “SQL Processing.”                                                                          |
| Percent of Time | The percentage of the measurement interval duration SQL requests under the indicated Db2 Plan were being processed. |

### Db2 DBRM detail line

This is a third-level detail line shown directly under the Db2 Plan detail line. It quantifies the percentage CPU time for a specific SQL request.

| Under Heading | This is Displayed                                                                      |
|---------------|----------------------------------------------------------------------------------------|
| Seqno         | A sequence number assigned, by Application Performance Analyzer, to the SQL statement. |

| Under Heading   | This is Displayed                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------|
| Description     | The DBRM name, DBRM statement number and SQL function.                                             |
| Percent of Time | The percentage of the measurement interval duration the indicated SQL Request was being processed. |

## Db2 load module detail line

This is a fourth-level detail line showing activity for Db2 load modules used in the SQL request processing.

| Under Heading   | This is Displayed                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------|
| Seqno           | The Db2 Load Module name.                                                                                         |
| Description     | If a DPA functional description is found for the module name, it is reported under this heading.                  |
| Percent of Time | The percentage of the measurement interval duration the indicated SQL Request being processed was in this module. |

## Sample reports

A sample report is shown here, it has been expanded to the second level.

```

File View Navigate Help

F14: Db2 CPU by Plan/Stored Proc (0888/CICS23A) Row 00001 of 00019
Command ==> ----- Scroll ==> CSR

Seqno Description Percent of CPU time * 10.00% ±2.3%
 *....1....2....3....4....5....6....7....8.
P0001 Db2MAIN 39.68 =====
→ Db2SQL SQL Processing 38.41 =====
→ SYSTEM System/OS Services 1.16 =
→ APPLCN Application Code 0.05
→ NOSYMB No Module Name 0.05
→ DATAMG Data Mgmt Processin 0.00

P0002 TRSAMP 35.29 =====
→ Db2SQL SQL Processing 34.07 =====
→ SYSTEM System/OS Services 1.11 =
→ NOSYMB No Module Name 0.11
→ APPLCN Application Code 0.00
→ DATAMG Data Mgmt Processin 0.00

P0003 WLSAMP1M 24.79 =====
→ Db2SQL SQL Processing 24.45 =====
→ SYSTEM System/OS Services 0.33
→ APPLCN Application Code 0.00
→ DATAMG Data Mgmt Processin 0.00

```

## Line commands

### on objects

| Cmd | When Applied To Object                   | Action                            |
|-----|------------------------------------------|-----------------------------------|
| ?   | Plan Seqno, Category, Seqno, Load Module | Display context help information. |
| ++  | Plan Seqno, Category, Seqno, Load Module | Show additional details.          |
| +   | Plan Seqno, Category, Seqno, Load Module | Expand to reveal next level.      |
| –   | Plan Seqno, Category, Seqno, Load Module | Collapse to hide next level.      |
| SV  | Plan Seqno, Category, Seqno              | Sort next level entries by value. |

| Cmd | When Applied To Object      | Action                           |
|-----|-----------------------------|----------------------------------|
| SN  | Plan Seqno, Category, Seqno | Sort next level entries by name. |
| M   | Load Module                 | Display load module information. |
| P   | Load Module, Seqno          | Display source program mapping.  |

## on headings

| Cmd | When Applied To Object             | Action                             |
|-----|------------------------------------|------------------------------------|
| ?   | Seqno, Description, Percent of CPU | Display context help information.  |
| +   | Seqno                              | Expand to reveal all entries.      |
| +   | Description                        | Expand description field size      |
| +   | Percent of CPU                     | Zoom in scale.                     |
| –   | Seqno                              | Collapse to show only first level. |
| –   | Description                        | Reduce description field size.     |
| –   | Percent of CPU                     | Zoom out scale.                    |
| SV  | Seqno                              | Sort next level by value.          |
| SN  | Seqno                              | Sort next level by name.           |

## SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```

File View Navigate Help
- +-----+
E | Options for Db2 CPU by Plan/Stored Proc | =====
C | | 001 of 00001
 | | ==> CSR
S | Enter "/" to select an option |
P | / Report modules by "Group". Unselect to report |
 | by "SubGroup". Group is a higher level (more |
 | inclusive) categorization than SubGroup. |
 | / Show the Db2SQL category in which CPU time |
 | attributed to SQL processing is shown. |
- +-----+

```

### Reporting by Group / SubGroup

This option allows you to aggregate modules into Group or SubGroup. SubGroup offers a more granular, less inclusive categorization than Group. For example, when reporting by Group, all SVCs would be reported under the "SVC" Group. When reporting by SubGroup, SVCs would be reported under SubGroups such as SVCTYPE1 and SVCTYPE2.

### Show the Db2SQL category

This shows activity attributed to Db2 SQL statements. If it is not selected, the activity will instead be included in the appropriate system modules in the SYSTEM category. This is not available for CICS measurements.

## F15 - Db2 SQL CPU/Svc Time by Rq Loc

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. Also this report is only created when measuring a Distributed Data Facility (DDF) address space. Exact SQL call counts, total SQL service time, total SQL processing CPU time, SQL Enclave, and SQL zIIP times by SQL statement are recorded. This report shows quantification by Requester Location. You can further expand each line to see a more detailed breakdown and quantification by individual SQL statement.

**Note:** This report is for DDF measurements only.

### Quantification

Each report line shows the following for each Requester Location and, when expanded, for each SQL statement observed for the Requester Location.

- Number of SQL calls
- Total CPU time for the SQL call processing
- Mean SQL call CPU time, or percent of total used
- Total service time for the SQL call processing
- Mean SQL call service time, or percent of total used

A setup option is available to display the percent used in place of the mean fields. Remember that measured CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. This is reflected in the enclave CPU times shown in the detail windows of this report.

### Detail line hierarchy

An unexpanded F15 report shows a line for each module that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the “+” line command). The hierarchy is illustrated here:

```
Level 1 Requester Location
Level 2 SQL Request
Level 3 SQL Statement Text
Level 2 SQL Request
Level 3 SQL Statement Text
```

### Detail line descriptions

#### Requester Location detail line

This is the first-level detail line. Each line shows information about a Requester Location for which SQL request measurement data was recorded.

| Under Heading   | This is Displayed                                                         |
|-----------------|---------------------------------------------------------------------------|
| Name            | The Requester Location name.                                              |
| Nbr of Calls    | The number of SQL calls counted for this Requester Location.              |
| CPU Time: Total | The total CPU time for all SQL calls counted for this Requester Location. |
| CPU Time: Mean  | The mean CPU time per SQL call.                                           |
| CPU time: Pct   | The percent of total CPU time this requestor location used.               |
| Svc Time: Total | The total service time for all SQL calls for this Requester Location.     |

| Under Heading  | This is Displayed                                               |
|----------------|-----------------------------------------------------------------|
| Svc Time: Mean | The mean service time per SQL call.                             |
| Svc time: Pct  | The percent of total service time this requestor location used. |

## SQL request detail line

This is the second-level detail line shown directly under the Requester Location detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either "S" or "D" precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Plan/Pgm        | The DBRM name.                                                                                                                                                                                                                                                                                                                                                       |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. This is the name of the SQL function, SELECT, FETCH, UPDATE, etc. Nbr of Calls The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                             |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total CPU time for all SQL calls counted for this statement.                                                                                                                                                                                                                                                                                                     |
| CPU Time: Mean  | The mean CPU time per SQL call.                                                                                                                                                                                                                                                                                                                                      |
| CPU time: Pct   | The percent of total CPU time this statement used.                                                                                                                                                                                                                                                                                                                   |
| Svc Time: Total | The total service time for all SQL calls for this statement.                                                                                                                                                                                                                                                                                                         |
| Svc Time: Mean  | The mean service time per SQL call.                                                                                                                                                                                                                                                                                                                                  |
| Svc time: Pct   | The percent of total service time this statement used.                                                                                                                                                                                                                                                                                                               |

## SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with one location expanded to the third level (SQL text).

```

File View Navigate Help

F15: Db2 SQL CPU/Svc Time by Rq Loc (6783/CICS23A) Row 00001 of 01067
Command ==> ----- Scroll ==> CSR

Name Plan/Pgm Stmt# SQL Functn Nbr of --CPU Time-- --Svc Time--
 SQL Calls Total Mean Total Mean
CABNETDB24 295 1.66 0.00562 4.11 0.01394
- D00156 DDF2425A 279 FETCH 1 0.73 0.73480 0.79 0.79001
 > Select count(*) from SYSIBM.SYSPACKSTMT
 > (PREPARE of SQL was done at Stmt# 269 Seqno D00154)

- D00258 DDF2425A 279 FETCH 1 0.12 0.12491 0.14 0.14127
 > Select count(*) from SYSIBM.SYSVLTREE
 > (PREPARE of SQL was done at Stmt# 269 Seqno D00256)

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | Location, Seqno        | Display context help information.           |
| ++  | Location, Seqno        | Show additional details.                    |
| +   | Location, Seqno        | Expand to reveal next level.                |
| –   | Location, Seqno        | Collapse to hide next level.                |
| P   | Seqno                  | Display source program mapping.             |
| SV  | Location               | Sort next level entries by value.           |
| SS  | Location               | Sort lines by program and statement number. |
| EX  | Seqno                  | Display Db2 EXPLAIN data.                   |
| SD  | Location               | Sort next level entries by service time     |

### on headings

| Cmd | When Applied To Object | Action                                  |
|-----|------------------------|-----------------------------------------|
| ?   | Name                   | Display context help information.       |
| +   | Name                   | Expand to reveal all entries.           |
| –   | Name                   | Collapse to show only first level.      |
| SV  | Name                   | Sort next level by value.               |
| SN  | Name                   | Sort next level entries by name         |
| SD  | Name                   | Sort next level entries by service time |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```

File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Rq Loc |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+

```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each Requestor Location and SQL statement, rather than the mean time.

## F16 - Db2 SQL CPU/Svc Time by Enclave

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. Also, this report is only created when measuring a Distributed Data Facility (DDF) address space. Exact SQL call counts, total SQL service time, total SQL task CPU time, SQL Enclave, and SQL zIIP times by SQL statement are recorded. This report shows quantification by Enclave token. You can further expand each line to see a further breakdown and quantification by individual SQL statement.

**Note:** This report is for DDF measurements only.

### Quantification

Each report line shows the following for each Enclave token and, when expanded, for each SQL statement observed for the Enclave token.

- Number of SQL calls
- Total task CPU time for the SQL call processing
- Mean SQL call task CPU time, or percent of total used
- Total service time for the SQL call processing
- Mean SQL call service time, or percent of total used

A setup option is available to display the percent used in place of the mean fields. Keep in mind that the task CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. This is reflected in the enclave CPU times shown in the detail windows of this report.

### Detail line hierarchy

An unexpanded F16 report shows a line for each Enclave token that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

```

Level 1 Enclave token
 Level 2 SQL Request
 Level 3 SQL Statement Text
 Level 2 SQL Request
 Level 3 SQL Statement Text

```

### Detail line descriptions

#### Enclave token detail line

This is the first-level detail line. Each line shows information about an Enclave token for which SQL request measurement data was recorded.



| Under Heading    | This is Displayed                                                         |
|------------------|---------------------------------------------------------------------------|
| Token            | The Enclave token name.                                                   |
| Nbr of SQL Calls | The number of SQL calls counted for this Enclave token.                   |
| CPU Time: Total  | The total task CPU time for all SQL calls counted for this Enclave token. |
| CPU Time: Mean   | The mean CPU time per SQL call.                                           |
| CPU time: Pct    | The percent of total CPU time this Enclave token used.                    |
| Svc Time: Total  | The total service time for all SQL calls for this Enclave token.          |
| Svc Time: Mean   | The mean service time per SQL call.                                       |
| SVC time: Pct    | The percent of total service time this Enclave token used.                |

## SQL request detail line

This is the second-level detail line shown directly under the Enclave token detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Token           | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. This is the name of the SQL function (SELECT, FETCH, UPDATE, etc.)                                                                                                                                                                                                                                                                                 |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total task CPU time for all SQL calls counted for this statement.                                                                                                                                                                                                                                                                                                |
| CPU Time: Mean  | The mean task CPU time per SQL call.                                                                                                                                                                                                                                                                                                                                 |
| CPU Time: Pct   | The percent of total CPU time this statement used.                                                                                                                                                                                                                                                                                                                   |
| Svc Time: Total | The total service time for all SQL calls for this statement.                                                                                                                                                                                                                                                                                                         |
| Svc Time: Mean  | The mean service time per SQL call.                                                                                                                                                                                                                                                                                                                                  |
| Svc Time: Pct   | The percent of total service time this statement used.                                                                                                                                                                                                                                                                                                               |

## SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with one Enclave token expanded to the third level (SQL text).

```

File View Navigate Help

F16: Db2 SQL CPU/Svc Time by Enclave (1641/DB2ADIST) Row 00001 of 01410
Command ==> ----- Scroll ==> PAGE

Token Stmt# SQL Function Nbr of --CPU Time-- --Svc Time--
 SQL Calls Total Mean Total Mean
00000020-0000017E 1 0.04 0.04177 0.05 0.05652
± D00026 0 EXECUTE IMME 1 0.04 0.04177 0.05 0.05652
 > EXPLAIN PLAN SET QUERYNO=1 FOR SELECT
 > COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY
 > ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS COL2_KEY
 > ,DEP3_COL3_KEY,DEP3_COL4 ,DEP3_COL5 ,DEP2_COL3
 > ,DEP2_COL4 ,FIELD_TWO ,FIELD_THREE ,FIELD_FOUR
 > ,FIELD_FIVE ,FIELD_SIX ,FIELD_SEVEN
 > ,CHAR(FIELD_EIGHT,ISO) ,CHAR(FIELD_NINE,ISO)
 > ,FIELD_TEN ,TIMEZONE () FROM MAIN FULL OUTER JOIN DEP2
 > ON DEP2_COL1_KEY = FIELD_ONE_KEY LEFT JOIN DEP3 ON
 > DEP3_COL1_KEY = DEP2_COL1_KEY AND DEP3_COL2_KEY =
 > DEP2_COL2_KEY ORDER BY COL1_KEY ,COL2_KEY
 > ,DEP3_COL3_KEY

00000024-00000198 1 0.04 0.04154 0.04 0.04668
→ D00026 0 EXECUTE IMME 1 0.04 0.04154 0.04 0.04668
 > EXPLAIN PLAN SET QUERYNO=1 FOR SELECT
 > COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY
 > ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS COL2_KEY
 > ,DEP3_COL3_KEY,DEP3_COL4 ,DEP3_COL5 ,DEP2_COL3
 > ,DEP2_COL4 ,FIELD_TWO ,FIELD_THREE ,FIELD_FOUR
 > ,FIELD_FIVE ,FIELD_SIX ,FIELD_SEVEN
 > ,CHAR(FIELD_EIGHT,ISO) ,CHAR(FIELD_NINE,ISO)
 > ,FIELD_TEN ,TIMEZONE () FROM MAIN FULL OUTER JOIN DEP2
 > ON DEP2_COL1_KEY = FIELD_ONE_KEY LEFT JOIN DEP3 ON
 > DEP3_COL1_KEY = DEP2_COL1_KEY AND DEP3_COL2_KEY =
 > DEP2_COL2_KEY ORDER BY COL1_KEY ,COL2_KEY
 > ,DEP3_COL3_KEY

00000020-000001A8 1 0.04 0.04167 0.04 0.04925
→ D00026 0 EXECUTE IMME 1 0.04 0.04167 0.04 0.04925
 > EXPLAIN PLAN SET QUERYNO=1 FOR SELECT
 > COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY
 > ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS
COL2_KEY

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | Token, Seqno           | Display context help information.           |
| ++  | Token, Seqno           | Show additional details.                    |
| +   | Token, Seqno           | Expand to reveal next level.                |
| -   | Token, Seqno           | Collapse to hide next level.                |
| SV  | Token                  | Sort next level entries by value.           |
| SS  | Token                  | Sort lines by program and statement number. |
| SD  | Token                  | Sort next level entries by service time     |
| P   | Seqno                  | Display source program mapping.             |
| EX  | Seqno                  | Display Db2 EXPLAIN data.                   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Token                  | Display context help information.  |
| +   | Token                  | Expand to reveal all entries.      |
| –   | Token                  | Collapse to show only first level. |
| SV  | Token                  | Sort next level by value.          |
| SN  | Token                  | Sort next level by name.           |
| SD  | Token                  | Sort next level by service time.   |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Enclave |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each Enclave token and SQL statement, rather than the mean time.

## F17 - Db2 SQL CPU/Svc Time by Corrid

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. Also this report is only created when measuring a Distributed Data Facility (DDF) address space. Exact SQL call counts, total SQL service time, total SQL task CPU time, SQL Enclave, and SQL zIIP times by SQL statement are recorded. This report shows quantification by Correlation ID. You can further expand each line to see a further breakdown and quantification by individual SQL statement.

**Note:** This report is for DDF measurements only.

### Quantification

Each report line shows the following for each Correlation ID and, when expanded, for each SQL statement observed for the Correlation ID.

- Number of SQL calls
- Total task CPU time for the SQL call processing
- Mean SQL call task CPU time, or percent of total used
- Total service time for the SQL call processing
- Mean SQL call service time, or percent of total used

A setup option is available to display the percent used in place of the mean fields. Keep in mind that the task CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. This is reflected in the enclave CPU times shown in the detail windows of this report.

## Detail line hierarchy

An unexpanded F17 report shows a line for each Correlation ID that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

```
Level 1 Correlation ID
Level 2 SQL Request
Level 3 SQL Statement Text
Level 2 SQL Request
Level 3 SQL Statement Text
```

## Detail line descriptions

### Correlation ID detail line

This is the first-level detail line. Each line shows information about a Correlation ID for which SQL request measurement data was recorded.

| Under Heading    | This is Displayed                                                          |
|------------------|----------------------------------------------------------------------------|
| Corrid           | The Correlation ID name.                                                   |
| Nbr of SQL Calls | The number of SQL calls counted for this Correlation ID.                   |
| CPU Time: Total  | The total task CPU time for all SQL calls counted for this Correlation ID. |
| CPU Time: Mean   | The mean CPU time per SQL call.                                            |
| CPU Time: Pct    | The percent of total CPU time this Correlation ID used.                    |
| Svc Time: Total  | The total service time for all SQL calls for this Correlation ID.          |
| Svc Time: Mean   | The mean service time per SQL call.                                        |
| Svc Time: Pct    | The percent of total service time this Correlation ID used.                |

### SQL request detail line

This is the second-level detail line shown directly under the Correlation ID detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Corrid          | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either "S" or "D" precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. This is the name of the SQL function (SELECT, FETCH, UPDATE, etc.)                                                                                                                                                                                                                                                                                 |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total task CPU time for all SQL calls counted for this statement.                                                                                                                                                                                                                                                                                                |
| CPU Time: Mean  | The mean task CPU time per SQL call.                                                                                                                                                                                                                                                                                                                                 |

| Under Heading   | This is Displayed                                            |
|-----------------|--------------------------------------------------------------|
| CPU Time: Pct   | The percent of total CPU time this statement used.           |
| Svc Time: Total | The total service time for all SQL calls for this statement. |
| Svc Time: Mean  | The mean service time per SQL call.                          |
| Svc Time: Pct   | The percent of total service time this statement used.       |

## SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with one Correlation ID expanded to the third level (SQL text).

| File View Navigate Help                             |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |                            |                            |       |         |
|-----------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------|----------------------------|-------|---------|
| F17: Db2 SQL CPU/Svc Time by Corrid (1641/DB2ADIST) |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  | Row 00001 of 00314         |                            |       |         |
| Command ==>                                         |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  | Scroll ==> PAGE            |                            |       |         |
| Corrid                                              | Stmt# | SQL Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Nbr of SQL Calls | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |       |         |
| db2bp.exe                                           |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 160              | 0.63                       | 0.00394                    | 25.92 | 0.16200 |
| ± D00026                                            | 0     | EXECUTE IMME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                | 0.16                       | 0.04137                    | 0.20  | 0.05004 |
|                                                     |       | > EXPLAIN PLAN SET QUERYNO=1 FOR SELECT<br>> COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY<br>> ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS COL2_KEY<br>> ,DEP3_COL3_KEY,DEP3_COL4 ,DEP3_COL5 ,DEP2_COL3<br>> ,DEP2_COL4 ,FIELD_TWO ,FIELD_THREE ,FIELD_FOUR<br>> ,FIELD_FIVE ,FIELD_SIX ,FIELD_SEVEN<br>> ,CHAR(FIELD_EIGHT,ISO) ,CHAR(FIELD_NINE,ISO)<br>> ,FIELD_TEN ,TIMEZONE ( ) FROM MAIN FULL OUTER JOIN DEP2<br>> ON DEP2_COL1_KEY = FIELD_ONE_KEY LEFT JOIN DEP3 ON<br>> DEP3_COL1_KEY = DEP2_COL1_KEY AND DEP3_COL2_KEY =<br>> DEP2_COL2_KEY ORDER BY COL1_KEY ,COL2_KEY<br>> ,DEP3_COL3_KEY                                                                                                                                                                                                                                                                                                                                       |                  |                            |                            |       |         |
| ± D00007                                            | 0     | FETCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                | 0.07                       | 0.01895                    | 0.07  | 0.01983 |
|                                                     |       | > ( SELECT T1.FIELD_ONE_KEY AS<br>> UNION_COLUMN_01 ,T1.FIELD_TWO AS<br>> UNION_COLUMN_02 FROM AIF04.MAIN T1 WHERE NOT EXISTS<br>> (SELECT * FROM AIF04.DEP1 T2 WHERE T1.FIELD_ONE_KEY =<br>> T2.DEP1_COL1_KEY1 ) UNION SELECT T3.FIELD_ONE_KEY<br>> AS UNION_COLUMN_01 ,T3.FIELD_TWO<br>> AS UNION_COLUMN_02 FROM AIF04.MAIN T3 WHERE NOT EXISTS<br>> (SELECT * FROM AIF04.DEP2 T4 WHERE T3.FIELD_ONE_KEY =<br>> T4.DEP2_COL1_KEY ) ) UNION ALL ( SELECT<br>> T2.FIELD_ONE_KEY AS UNION_COLUMN_01<br>> ,T2.FIELD_TWO AS UNION_COLUMN_02 FROM<br>> AIF04.MAIN T2 WHERE NOT EXISTS (SELECT * FROM<br>> AIF04.DEP1 T1 WHERE T2.FIELD_ONE_KEY =<br>> T1.DEP1_COL1_KEY1 ) UNION SELECT T4.FIELD_ONE_KEY<br>> AS UNION_COLUMN_01 ,T4.FIELD_TWO<br>> AS UNION_COLUMN_02 FROM AIF04.MAIN T4 WHERE NOT EXISTS<br>> (SELECT * FROM AIF04.DEP2 T3 WHERE T4.FIELD_ONE_KEY =<br>> T3.DEP2_COL1_KEY ) )<br>> (PREPARE of SQL was done at Stmt# 0 Seqno D0005) |                  |                            |                            |       |         |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | Corrid, Seqno          | Display context help information.           |
| ++  | Corrid, Seqno          | Show additional details.                    |
| +   | Corrid, Seqno          | Expand to reveal next level.                |
| –   | Corrid, Seqno          | Collapse to hide next level.                |
| SV  | Corrid                 | Sort next level entries by value.           |
| SS  | Corrid                 | Sort lines by program and statement number. |
| SD  | Corrid                 | Sort next level entries by service time     |
| P   | Seqno                  | Display source program mapping.             |
| EX  | Seqno                  | Display Db2 EXPLAIN data.                   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Corrid                 | Display context help information.  |
| +   | Corrid                 | Expand to reveal all entries.      |
| –   | Corrid                 | Collapse to show only first level. |
| SV  | Corrid                 | Sort next level by value.          |
| SN  | Corrid                 | Sort next level by name.           |
| SD  | Corrid                 | Sort next level by service time.   |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Corrid |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each Correlation ID and SQL statement, rather than the mean time.

## F18 - Db2 SQL CPU/Svc Time by Wkstn

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. Also this report is only created when measuring a Distributed Data Facility (DDF) address space. Exact SQL call counts, total SQL service time, total SQL task CPU time, SQL Enclave, and SQL zIIP times by SQL statement are recorded. This report shows quantification by Workstation ID. You can further expand each line to see a further breakdown and quantification by individual SQL statement.

**Note:** This report is for DDF measurements only.

## Quantification

Each report line shows the following for each Workstation ID and, when expanded, for each SQL statement observed for the Workstation ID.

- Number of SQL calls
- Total task CPU time for the SQL call processing
- Mean SQL call task CPU time, or percent of total used
- Total service time for the SQL call processing
- Mean SQL call service time, or percent of total used

A setup option is available to display the percent used in place of the mean fields. Keep in mind that the task CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. This is reflected in the enclave CPU times shown in the detail windows of this report.

## Detail line hierarchy

An unexpanded F18 report shows a line for each Workstation ID that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

```
Level 1 Workstation ID
Level 2 SQL Request
Level 3 SQL Statement Text
Level 2 SQL Request
Level 3 SQL Statement Text
```

## Detail line descriptions

### Workstation ID detail line

This is the first-level detail line. Each line shows information about a Workstation ID for which SQL request measurement data was recorded.

| Under Heading    | This is Displayed                                                          |
|------------------|----------------------------------------------------------------------------|
| Wkstn            | The Workstation ID name.                                                   |
| Nbr of SQL Calls | The number of SQL calls counted for this Workstation ID.                   |
| CPU Time: Total  | The total task CPU time for all SQL calls counted for this Workstation ID. |
| CPU Time: Mean   | The mean CPU time per SQL call.                                            |
| CPU Time: Pct    | The percent of total CPU time this Workstation ID used.                    |
| Svc Time: Total  | The total service time for all SQL calls for this Workstation ID.          |
| Svc Time: Mean   | The mean service time per SQL call.                                        |
| Svc Time: Pct    | The percent of total service time this Workstation ID used.                |

### SQL request detail line

This is the second-level detail line shown directly under the Workstation ID detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wkstn           | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either "S" or "D" precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. This is the name of the SQL function (SELECT, FETCH, UPDATE, etc.)                                                                                                                                                                                                                                                                                 |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total task CPU time for all SQL calls counted for this statement.                                                                                                                                                                                                                                                                                                |
| CPU Time: Mean  | The mean task CPU time per SQL call.                                                                                                                                                                                                                                                                                                                                 |
| CPU Time: Pct   | The percent of total CPU time this statement used.                                                                                                                                                                                                                                                                                                                   |
| Svc Time: Total | The total service time for all SQL calls for this statement.                                                                                                                                                                                                                                                                                                         |
| Svc Time: Mean  | The mean service time per SQL call.                                                                                                                                                                                                                                                                                                                                  |
| Svc Time: Pct   | The percent of total service time this statement used.                                                                                                                                                                                                                                                                                                               |

### SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

### Sample reports

This sample shows the report with one Workstation id expanded to the third level (SQL text)



| File View Navigate Help                            |       |                                                        |                  |                    |         |              |         |
|----------------------------------------------------|-------|--------------------------------------------------------|------------------|--------------------|---------|--------------|---------|
| F18: Db2 SQL CPU/Svc Time by Wkstn (1641/DB2ADIST) |       |                                                        |                  | Row 00001 of 00337 |         |              |         |
| Command ==>                                        |       |                                                        |                  | Scroll ==> CSR     |         |              |         |
| Wkstn                                              | Stmt# | SQL Function                                           | Nbr of SQL Calls | --CPU Time--       |         | --Svc Time-- |         |
|                                                    |       |                                                        |                  | Total              | Mean    | Total        | Mean    |
| D12A3H26                                           |       |                                                        | 105              | 0.57               | 0.00548 | 0.61         | 0.00586 |
| ± D00016                                           | 0     | EXECUTE IMME                                           | 3                | 0.11               | 0.03885 | 0.13         | 0.04345 |
|                                                    | >     | EXPLAIN PLAN SET QUERYNO=1 FOR SELECT                  |                  |                    |         |              |         |
|                                                    | >     | COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY     |                  |                    |         |              |         |
|                                                    | >     | ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS COL2_KEY    |                  |                    |         |              |         |
|                                                    | >     | ,DEP3_COL3_KEY,DEP3_COL4,DEP3_COL5,DEP2_COL3           |                  |                    |         |              |         |
|                                                    | >     | ,DEP2_COL4,FIELD_TWO,FIELD_THREE,FIELD_FOUR            |                  |                    |         |              |         |
|                                                    | >     | ,FIELD_FIVE,FIELD_SIX,FIELD_SEVEN                      |                  |                    |         |              |         |
|                                                    | >     | ,CHAR(FIELD_EIGHT,ISO),CHAR(FIELD_NINE,ISO)            |                  |                    |         |              |         |
|                                                    | >     | ,FIELD_TEN,TIMEZONE () FROM MAIN FULL OUTER JOIN DEP2  |                  |                    |         |              |         |
|                                                    | >     | ON DEP2_COL1_KEY = FIELD_ONE_KEY LEFT JOIN DEP3 ON     |                  |                    |         |              |         |
|                                                    | >     | DEP3_COL1_KEY = DEP2_COL1_KEY AND DEP3_COL2_KEY =      |                  |                    |         |              |         |
|                                                    | >     | DEP2_COL2_KEY ORDER BY COL1_KEY, COL2_KEY              |                  |                    |         |              |         |
|                                                    | >     | ,DEP3_COL3_KEY                                         |                  |                    |         |              |         |
| → D00020                                           | 0     | FETCH                                                  | 12               | 0.08               | 0.00744 | 0.09         | 0.00763 |
|                                                    | >     | SELECT * FROM PLAN_TABLE ORDER BY QUERYNO, QBLOCKNO,   |                  |                    |         |              |         |
|                                                    | >     | PLANNO                                                 |                  |                    |         |              |         |
|                                                    | >     | (PREPARE of SQL was done at Stmt# 0 Seqno D00017)      |                  |                    |         |              |         |
| → D00019                                           | 0     | OPEN                                                   | 3                | 0.08               | 0.02768 | 0.08         | 0.02891 |
|                                                    | >     | SELECT * FROM PLAN_TABLE ORDER BY QUERYNO, QBLOCKNO,   |                  |                    |         |              |         |
|                                                    | >     | PLANNO                                                 |                  |                    |         |              |         |
|                                                    | >     | (PREPARE of SQL was done at Stmt# 0 Seqno D00017)      |                  |                    |         |              |         |
| → D00034                                           | 0     | FETCH                                                  | 3                | 0.05               | 0.01741 | 0.05         | 0.01809 |
|                                                    | >     | ( SELECT T1.FIELD_ONE_KEY AS                           |                  |                    |         |              |         |
|                                                    | >     | UNION_COLUMN_01, T1.FIELD_TWO AS                       |                  |                    |         |              |         |
|                                                    | >     | UNION_COLUMN_02 FROM AIF04.MAIN T1 WHERE NOT EXISTS    |                  |                    |         |              |         |
|                                                    | >     | (SELECT * FROM AIF04.DEP1 T2 WHERE T1.FIELD_ONE_KEY =  |                  |                    |         |              |         |
|                                                    | >     | T2.DEP1_COL1_KEY1 ) UNION SELECT T3.FIELD_ONE_KEY      |                  |                    |         |              |         |
|                                                    | >     | AS UNION_COLUMN_01, T3.FIELD_TWO                       |                  |                    |         |              |         |
|                                                    | >     | AS UNION_COLUMN_02 FROM AIF04.MAIN T3 WHERE NOT EXISTS |                  |                    |         |              |         |
|                                                    | >     | (SELECT * FROM AIF04.DEP2 T4 WHERE T3.FIELD_ONE_KEY =  |                  |                    |         |              |         |
|                                                    | >     | T4.DEP2_COL1_KEY ) ) UNION ALL ( SELECT                |                  |                    |         |              |         |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | Wkstn, Seqno           | Display context help information.           |
| ++  | Wkstn, Seqno           | Show additional details.                    |
| +   | Wkstn, Seqno           | Expand to reveal next level.                |
| –   | Wkstn, Seqno           | Collapse to hide next level.                |
| SV  | Wkstn                  | Sort next level entries by value.           |
| SS  | Wkstn                  | Sort lines by program and statement number. |
| SD  | Wkstn                  | Sort next level entries by service time     |
| P   | Seqno                  | Display source program mapping.             |
| EX  | Seqno                  | Display Db2 EXPLAIN data.                   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Wkstn                  | Display context help information.  |
| +   | Wkstn                  | Expand to reveal all entries.      |
| –   | Wkstn                  | Collapse to show only first level. |
| SV  | Wkstn                  | Sort next level by value.          |
| SN  | Wkstn                  | Sort next level by name.           |
| SD  | Wkstn                  | Sort next level by service time.   |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Wkstn |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each Workstation ID and SQL statement, rather than the mean time.

## F19 - Db2 SQL CPU/Svc Time by EndUsr

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. Also this report is only created when measuring a Distributed Data Facility (DDF) address space. Exact SQL call counts, total SQL service time, total SQL task CPU time, SQL Enclave, and SQL zIIP times by SQL statement are recorded. This report shows quantification by End User ID. You can further expand each line to see a further breakdown and quantification by individual SQL statement.

**Note:** This report is for DDF measurements only.

### Quantification

Each report line shows the following for each End User ID and, when expanded, for each SQL statement observed for the End User ID.

- Number of SQL calls
- Total task CPU time for the SQL call processing
- Mean SQL call task CPU time, or percent of total used
- Total service time for the SQL call processing
- Mean SQL call service time, or percent of total used

A setup option is available to display the percent used in place of the mean fields. Keep in mind that the task CPU time applies only to the region being measured. Db2 executes in multiple address spaces and CPU could also be consumed in other Db2 regions not reflected in this report. This is reflected in the enclave CPU times shown in the detail windows of this report.

## Detail line hierarchy

An unexpanded F19 report shows a line for each End User ID that issued SQL requests. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

```
Level 1 End User ID
Level 2 SQL Request
Level 3 SQL Statement Text
Level 2 SQL Request
Level 3 SQL Statement Text
```

## Detail line descriptions

### End User ID detail line

This is the first-level detail line. Each line shows information about an End User ID for which SQL request measurement data was recorded.

| Under Heading    | This is Displayed                                                       |
|------------------|-------------------------------------------------------------------------|
| EndUsr           | The End User ID name.                                                   |
| Nbr of SQL Calls | The number of SQL calls counted for this End User ID.                   |
| CPU Time: Total  | The total task CPU time for all SQL calls counted for this End User ID. |
| CPU Time: Mean   | The mean CPU time per SQL call.                                         |
| CPU Time: Pct    | The percent of total CPU time this End User ID used.                    |
| Svc Time: Total  | The total service time for all SQL calls for this End User ID.          |
| Svc Time: Mean   | The mean service time per SQL call.                                     |
| Svc Time: Pct    | The percent of total service time this End User ID used.                |

### SQL request detail line

This is the second-level detail line shown directly under the End User ID detail line. It quantifies an individual SQL statement.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EndUsr          | A sequence number. This is assigned by Application Performance Analyzer to uniquely identify the SQL request. Either “S” or “D” precedes the sequence number indicating if the SQL statement is static or dynamic.                                                                                                                                                   |
| Stmt#           | The precompiler statement number. This is the statement number assigned by the precompiler to the SQL request. When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| SQL Function    | The SQL function. This is the name of the SQL function (SELECT, FETCH, UPDATE, etc.)                                                                                                                                                                                                                                                                                 |
| Nbr of Calls    | The number of SQL calls counted for this SQL statement.                                                                                                                                                                                                                                                                                                              |
| CPU Time: Total | The total task CPU time for all SQL calls counted for this statement.                                                                                                                                                                                                                                                                                                |
| CPU Time: Mean  | The mean task CPU time per SQL call.                                                                                                                                                                                                                                                                                                                                 |

| Under Heading   | This is Displayed                                            |
|-----------------|--------------------------------------------------------------|
| CPU Time: Pct   | The percent of total CPU time this statement used.           |
| Svc Time: Total | The total service time for all SQL calls for this statement. |
| Svc Time: Mean  | The mean service time per SQL call.                          |
| Svc Time: Pct   | The percent of total service time this statement used.       |

## SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

This sample shows the report with one End User ID expanded to the third level (SQL text).

| File View Navigate Help                             |       |                                                        |                  |                            |                            |       |         |
|-----------------------------------------------------|-------|--------------------------------------------------------|------------------|----------------------------|----------------------------|-------|---------|
| F19: Db2 SQL CPU/Svc Time by EndUsr (1641/DB2ADIST) |       |                                                        |                  | Row 00001 of 00336         |                            |       |         |
| Command ==>                                         |       |                                                        |                  | Scroll ==> CSR             |                            |       |         |
| EndUsr                                              | Stmt# | SQL Function                                           | Nbr of SQL Calls | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |       |         |
| USR01                                               |       |                                                        | 121              | 0.67                       | 0.00555                    | 16.74 | 0.13837 |
| ± D00016                                            | 0     | EXECUTE IMME                                           | 3                | 0.11                       | 0.03885                    | 0.13  | 0.04345 |
|                                                     | >     | EXPLAIN PLAN SET QUERYNO=1 FOR SELECT                  |                  |                            |                            |       |         |
|                                                     | >     | COALESCE(FIELD_ONE_KEY, DEP2_COL1_KEY) AS COL1_KEY     |                  |                            |                            |       |         |
|                                                     | >     | ,COALESCE(DEP2_COL2_KEY, DEP3_COL2_KEY) AS COL2_KEY    |                  |                            |                            |       |         |
|                                                     | >     | ,DEP3_COL3_KEY,DEP3_COL4 ,DEP3_COL5 ,DEP2_COL3         |                  |                            |                            |       |         |
|                                                     | >     | ,DEP2_COL4 ,FIELD_TWO ,FIELD_THREE ,FIELD_FOUR         |                  |                            |                            |       |         |
|                                                     | >     | ,FIELD_FIVE ,FIELD_SIX ,FIELD_SEVEN                    |                  |                            |                            |       |         |
|                                                     | >     | ,CHAR(FIELD_EIGHT,ISO) ,CHAR(FIELD_NINE,ISO)           |                  |                            |                            |       |         |
|                                                     | >     | ,FIELD_TEN ,TIMEZONE () FROM MAIN FULL OUTER JOIN DEP2 |                  |                            |                            |       |         |
|                                                     | >     | ON DEP2_COL1_KEY = FIELD_ONE_KEY LEFT JOIN DEP3 ON     |                  |                            |                            |       |         |
|                                                     | >     | DEP3_COL1_KEY = DEP2_COL1_KEY AND DEP3_COL2_KEY =      |                  |                            |                            |       |         |
|                                                     | >     | DEP2_COL2_KEY ORDER BY COL1_KEY ,COL2_KEY              |                  |                            |                            |       |         |
|                                                     | >     | ,DEP3_COL3_KEY                                         |                  |                            |                            |       |         |
| → D00020                                            | 0     | FETCH                                                  | 12               | 0.08                       | 0.00744                    | 0.09  | 0.00763 |
|                                                     | >     | SELECT * FROM PLAN_TABLE ORDER BY QUERYNO, QBLOCKNO,   |                  |                            |                            |       |         |
|                                                     | >     | PLANNO                                                 |                  |                            |                            |       |         |
|                                                     | >     | (PREPARE of SQL was done at Stmt# 0 Seqno D00017)      |                  |                            |                            |       |         |
| → D00019                                            | 0     | OPEN                                                   | 3                | 0.08                       | 0.02768                    | 0.08  | 0.02891 |
|                                                     | >     | SELECT * FROM PLAN_TABLE ORDER BY QUERYNO, QBLOCKNO,   |                  |                            |                            |       |         |
|                                                     | >     | PLANNO                                                 |                  |                            |                            |       |         |
|                                                     | >     | (PREPARE of SQL was done at Stmt# 0 Seqno D00017)      |                  |                            |                            |       |         |
| → D00034                                            | 0     | FETCH                                                  | 3                | 0.05                       | 0.01741                    | 0.05  | 0.01809 |
|                                                     | >     | ( SELECT T1.FIELD_ONE_KEY AS                           |                  |                            |                            |       |         |
|                                                     | >     | UNION_COLUMN_01 ,T1.FIELD_TWO AS                       |                  |                            |                            |       |         |
|                                                     | >     | UNION_COLUMN_02 FROM AIF04.MAIN T1 WHERE NOT EXISTS    |                  |                            |                            |       |         |
|                                                     | >     | (SELECT * FROM AIF04.DEP1 T2 WHERE T1.FIELD_ONE_KEY =  |                  |                            |                            |       |         |
|                                                     | >     | T2.DEP1_COL1_KEY1 ) UNION SELECT T3.FIELD_ONE_KEY      |                  |                            |                            |       |         |
|                                                     | >     | AS UNION_COLUMN_01 ,T3.FIELD_TWO                       |                  |                            |                            |       |         |
|                                                     | >     | AS UNION_COLUMN_02 FROM AIF04.MAIN T3 WHERE NOT EXISTS |                  |                            |                            |       |         |
|                                                     | >     | (SELECT * FROM AIF04.DEP2 T4 WHERE T3.FIELD_ONE_KEY =  |                  |                            |                            |       |         |
|                                                     | >     | T4.DEP2_COL1_KEY ) ) UNION ALL ( SELECT                |                  |                            |                            |       |         |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

## on objects

| Cmd | When Applied To Object | Action                                      |
|-----|------------------------|---------------------------------------------|
| ?   | EndUsr, Seqno          | Display context help information.           |
| ++  | EndUsr, Seqno          | Show additional details.                    |
| +   | EndUsr, Seqno          | Expand to reveal next level.                |
| –   | EndUsr, Seqno          | Collapse to hide next level.                |
| SV  | EndUsr                 | Sort next level entries by value.           |
| SS  | EndUsr                 | Sort lines by program and statement number. |
| SD  | EndUsr                 | Sort next level entries by service time     |
| P   | Seqno                  | Display source program mapping.             |
| EX  | Seqno                  | Display Db2 EXPLAIN data.                   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | EndUsr                 | Display context help information.  |
| +   | EndUsr                 | Expand to reveal all entries.      |
| –   | EndUsr                 | Collapse to show only first level. |
| SV  | EndUsr                 | Sort next level by value.          |
| SN  | EndUsr                 | Sort next level by name.           |
| SD  | EndUsr                 | Sort next level by service time.   |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
File View Navigate Help
+-----+
| Options for Db2 SQL CPU/Svc Time by Endusr |
| Enter "/" to select an option |
| _ Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by each End User ID and SQL statement, rather than the mean time.

## F30 - Db2 Class 3 Wait Times

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This report shows quantification of Db2 Class 3 wait times in micro seconds. The wait times are extracted from Db2 SMF records created during the measurement and are accumulated by plan name. This report is only produced

when the Db2 SMF configuration option is enabled during installation, and Application Performance Analyzer is able to collect the Db2 accounting trace data from SMF.

## Detail Line descriptions

### **Plan Name**

This is the name of the Db2 plan for which the following Class 3 wait times are accumulated.

### **Database I/O**

This is the accumulated I/O elapsed wait time for database I/O.

### **Read I/O other**

This is the accumulated wait time for read I/O that was done under a thread other than the one being measured.

### **Write I/O other**

This is the accumulated wait time for write I/O that was done under a thread other than the one being measured.

### **IRLM Lock/Latch**

This is the accumulated wait time due to local contention for locks.

### **Db2 Latch**

This is the accumulated wait time due to latch contention.

### **Page Latch**

This is the accumulated wait time due to page latch contention.

### **Log Write I/O**

This is the accumulated wait time for a log write I/O.

### **Log Read**

This is the accumulated wait time for archive reads, active reads, and active log prefetch reads.

### **ARC LOG QUIESCE**

This is the accumulated wait time due to processing of ARCHIVE LOG MODE(QUIESCE) commands.

### **Phase 1 Write**

This is the accumulated wait time for commit phase 1 database write I/O completion.

### **TCP/IP LOB/XML**

This is the accumulated wait time for TCP/IP LOB and XML materialization.

### **Glbl Contention**

This is the accumulated wait time due to global contention for parent L-locks.

### **Group Messages**

This is the accumulated wait time due to sending of messages to other Db2 members in the data sharing group.

### **CF Requests**

This is the accumulated wait time for IXLCACHE and IXLFCOMP asynch requests.

### **Drain Lock**

This is the accumulated wait time for a drain lock.

### **Claim Release**

This is the accumulated wait time for a drain when waiting for claims to be released.

### **Task Switch: COMMIT**

This is the accumulated wait time due to synchronous execution unit switching for Db2 commit, abort, or deallocation processing.

### **Task Switch: OPEN/CLOSE**

This is the accumulated wait time due to synchronous execution unit switching to the Db2 Open/Close data set service or the HSM recall service.

### **Task Switch: SYSLGRNG**

This is the accumulated wait time due to synchronous execution unit switching to the Db2 SYSLGRNG recording service. This service is also sometimes used for level-id checking for down level detection.

### Task Switch: Data Manager

This is the Accumulated wait time due to synchronous execution unit switching to the Db2 Dataspace Manager Services, which include; Define data set, Extend data set, Delete data set, Reset data set, and VSAM catalog access.

### Task Switch: Other

This is the accumulated wait time due to synchronous execution unit switching to other Db2 service tasks.

## Sample reports

A sample report is shown here.

|                                            |          |                 |          |                    |
|--------------------------------------------|----------|-----------------|----------|--------------------|
| F30: Db2 Class 3 Wait Times (7507/CICS32A) |          |                 |          | Row 00001 of 00015 |
| Command ==>                                |          |                 |          | Scroll ==> CSR     |
|                                            |          |                 |          |                    |
| Plan Name    PFSAMPC                       |          |                 |          |                    |
|                                            |          |                 |          |                    |
| Database I/O                               | 0.105690 | Glbl Contention | 0.000000 |                    |
| Read I/O other                             | 0.122218 | Group Messages  | 0.000000 |                    |
| Write I/O other                            | 0.000000 | CF Requests     | 0.000000 |                    |
| IRLM Lock/Latch                            | 1.147968 | Drain Lock      | 0.000000 |                    |
| Db2 Latch                                  | 0.021755 | Claim Release   | 0.000000 |                    |
| Page Latch                                 | 0.000000 | Task Switch:    |          |                    |
| Log Write I/O                              | 0.000000 | COMMIT          | 0.111894 |                    |
| Log Read                                   | 0.000000 | OPEN/CLOSE      | 0.260264 |                    |
| ARC LOG QUIESCE                            | 0.000000 | SYSLGRNG        | 0.005714 |                    |
| Phase 1 Write                              | 0.000000 | Data Manager    | 0.099253 |                    |
| TCP/IP LOB/XML                             | 0.000000 | Other           | 0.000000 |                    |

## F31 - Db2+ (SMF) CPU/Elapsed Times

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This report shows quantification of Db2 SMF CPU, Elapsed and Specialty Engine (SE) times. These times are either extracted or calculated from fields obtained from Db2 SMF records. These SMF records are created during the measurement and are accumulated by Thread Address (ACE).

Use this report to see Db2 Accounting Information collected and recorded by SMF during the sampling of Db2+ measurements. F31 shows the Db2 CPU, Elapsed and Specialty Engine (SE) Times extracted and/or calculated based on the Db2 Accounting Information.

### Quantification

Each report line shows the following for each Thread Address.

- Plan name
- Attach Type
- CPU Time
- Elapsed Time
- Specialty Engine Time

### Detail Line Hierarchy

There is only one detail line level in this report.

## Detail Line descriptions

### CPU, Elapsed and SE Times detail line

| Under heading   | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accounting Data | Description of which Class (1 or 2) the data represents.<br><br><b>Class 1</b> - This is the time spent in Db2 and outside of Db2. The time spent outside of Db2 is usually referred to as "in application".<br><br><b>Class 2</b> - This is the time spent in Db2 and includes:<br><br><b>Non-Nested</b><br>This value represents the time the allied agent spent in Db2 for non-nested activity. This time does not include the time for processing SQL statements issued by Stored Procedures, User-Defined functions (UDF) or Triggers.<br><br><b>Stored Procedures</b><br>This value represents time consumed for Stored Procedures.<br><br><b>UDF Requests</b><br>This value represents time consumed executing user-defined functions.<br><br><b>Trigger</b><br>This value represents time consumed executing under the control of Triggers. |
| CPU Time        | Class 1 and Class 2 CPU Times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Elapsed Time    | Class 1 and Class 2 Elapsed Times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| SE Time         | Class 1 and Class 2 Specialty Engine (SE) Times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Sample reports

A sample report is shown as follows:

```
File View Navigate Help

F31: Db2+ (SMF) CPU/Elapsed Times (00793/QADBCX15) Row 00001 of 00001
Command ==> ----- Scroll ==> CSR_

Thread Address Plan Attach CPU Time Elapsed Time Specialty Engine
Type CPU Time

168C0EC0 PLANCX15 CAF 00:08.368765 00:09.605468 00:00.000000
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. You can enter a "/" on any input field to open a menu of line commands available for that field.

### on objects

|    |                |                                          |
|----|----------------|------------------------------------------|
| ?  | Thread Address | Display context help information.        |
| ++ | Thread Address | Show additional details about this line. |





## Detail Line descriptions

### SQL Functions and Call Counts

| Under heading                 | This is displayed                                              |
|-------------------------------|----------------------------------------------------------------|
| SQL Functions and Call Counts | SQL Functions are displayed together with the number of calls. |

## Sample reports

A sample report is shown as follows:

```
File View Navigate Help

F32: Db2+ (SMF) SQL Activity (00793/QADBCX15) Row 00001 of 00001
Command ==> _____ Scroll ==> CSR_

Thread Plan Attach SQL SQL
Address Plan Type Call Total Call Timeouts

168C0EC0 PLANCX15 CAF 124 0
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. You can enter a “/” on any input field to open a menu of line commands available for that field.

### on objects

|    |                |                                          |
|----|----------------|------------------------------------------|
| ?  | Thread Address | Display context help information.        |
| ++ | Thread Address | Show additional details about this line. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown as follows:

```

File View Navigate Help
+-----+
F32 - DETAIL Window (00793/QADBCX15)
Command ==> ----- Scroll ==> CSR_
More: +
+-----+ The following report line was selected -----+
| 168C0EC0 PLANCX15 CAF 124 0 |
+-----+

SQL Functions and Call Counts

SELECT 0 CREATE TABLE 0
INSERT 0 CREATE INDEX 0
UPDATE 0 CREATE TABLESPACE 0
DELETE 0 CREATE DATABASE 0
FETCH 54 CREATE SYNONYM 0
OPEN 24 CREATE STORAGE GROUP 0
CLOSE 24 CREATE VIEW 0
PREPARE 22 CREATE ALIAS 0

DROP TABLE 0 ALTER TABLE 0
DROP INDEX 0 ALTER INDEX 0
DROP TABLESPACE 0 ALTER TABLESPACE 0
DROP DATABASE 0 ALTER DATABASE 0

```

## SETUP Options

There are no setup options for this report.

## F33 - Db2+ (SMF) Buffer Pool Stats

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This report shows quantification of Db2 SMF Buffer Pool Statistics. This data is either extracted or calculated from fields obtained from Db2 SMF records. These SMF records are created during the measurement and are accumulated by Thread Address (ACE).

Use this report to see Db2 Accounting Information collected and recorded by SMF during the sampling of Db2+ measurements. F33 offers a view of the Buffer Pool Statistics extracted and/or calculated based on the Db2 Accounting Information.

### Quantification

Each report line shows the following for each Thread Address.

- Plan name
- Attach Type
- Buffer Pool Id
- I/O Request Total

### Detail Line Hierarchy

There is only one detail line level in this report.

### Detail Line descriptions

#### Buffer Pool Statistics

| Under heading | This is displayed |
|---------------|-------------------|
|---------------|-------------------|

|                                   |                                                                                                                                                                                                                         |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Get Page Requests Issued          | This is the number of successful requests for pages for queries that are processed in parallel. This count includes both successful and unsuccessful requests for pages for queries that are not processed in parallel. |
| Read w/disk Cache Hits            | This is the number of read I/O operations that resulted in disk cache hits.                                                                                                                                             |
| Unsuccessful Get Page Operations  | This is the number of times a page requested for a query processed in parallel was unavailable because an I/O was in progress or the page was not found in the buffer pool.                                             |
| SETW Issued for System Pages      | This is the number of times a buffer update occurs for the agent. This counter is incremented every time a page is updated and is ready to be written to DASD.                                                          |
| Synchronous Read I/O              | This is the number of synchronous read I/Os. This counter is incremented for each media manager synchronous physical read request.                                                                                      |
| Immediate (Synchronous) Write I/O | This is the number of immediate (synchronous) write I/Os. This occurs when any synchronous write is triggered or an immediate write threshold is reached.                                                               |
| Sequential Prefetch Requested     | This is the number of sequential prefetch requests.                                                                                                                                                                     |
| List Prefetch Requested           | This is the number of list prefetch requests.                                                                                                                                                                           |
| Dynamic Prefetch Requested        | This is the number of dynamic prefetch requests.                                                                                                                                                                        |

## Sample reports

A sample report is shown as follows:

```

File View Navigate Help

F33: Db2+ (SMF) Buffer Pool Stats (00008/QADBCS27) Row 00001 of 00001
Command ==> _____ Scroll ==> CSR_

Thread Plan Attach Buffer I/O
Address Type Type Pool Id Request Total

15441020 DBACS27 CAF 0 61

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. You can enter a “/” on any input field to open a menu of line commands available for that field.

### on objects

|    |                |                                          |
|----|----------------|------------------------------------------|
| ?  | Thread Address | Display context help information.        |
| ++ | Thread Address | Show additional details about this line. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown as follows:

```

File View Navigate Help
+-----+
F33 - DETAIL Window (00008/QADBCS27)
Command ==> ----- Scroll ==> CSR
More: +
+-----+ The following report line was selected -----+
| 15441020 DBACS27 CAF 0 61 |
+-----+

Buffer Pool Statistics

Get Page Requests Issued 270082
Read w/disk Cache Hits 0
Unsuccessful Get Page Operations 0

SETW Issued for System Pages 99
Synchronous Read I/O 61
Immediate (Synchronous) Write I/O 0

Sequential Prefetch Requested 0
List Prefetch Requested 1
Dynamic Prefetch Requested 0

```

## SETUP Options

There are no setup options for this report.

## F34 - Db2+ (SMF) Locking Activity

### Usage

A prerequisite for this report is activation of the Db2+ option during the measurement. This report shows quantification of Db2 SMF Locking Activity. This data is either extracted or calculated from fields obtained from Db2 SMF records. These SMF records are created during the measurement and are accumulated by Thread Address (ACE).

Use this report to see Db2 Accounting Information collected and recorded by SMF during the sampling of Db2+ measurements. F34 offers a view of the Locking Activity extracted and/or calculated based on the Db2 Accounting Information.

### Quantification

Each report line shows the following for each Thread Address.

- Plan name
- Attach Type
- Lock Requests
- Lock Escalations
- Deadlocks

### Detail Line Hierarchy

There is only one detail line level in this report.

### Detail Line descriptions

#### Locking Activity Details

| Under heading | This is displayed |
|---------------|-------------------|
|---------------|-------------------|

|                        |                                                                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suspends (Lock Cnflct) | This is the number of suspends because of lock conflict. This is the number of times a lock could not be obtained and the unit of work was suspended.                 |
| Suspends (Ltch Cnflct) | This is the number of suspends because of IRLM latch conflict.                                                                                                        |
| Suspends (Other)       | This is the number of suspends because of other reasons. This includes IRLM sync requests and IRLM synchronous notifies.                                              |
| Timeouts               | This is the lock timeout count and is the number of times a unit of work was suspended for a time that exceeded the time out value.                                   |
| Deadlocks              | This is the deadlock count and is the number of times deadlocks were detected.                                                                                        |
| Lock Escal (Shared)    | This is the count of lock escalations to shared mode.                                                                                                                 |
| Lock Escal (Excl)      | This is the count of lock escalations to exclusive mode.                                                                                                              |
| Max Pg/Row Locks Held  | This is the maximum number of page or row locks held. This is the maximum number of page or row locks concurrently held by a single application during its execution. |
| Lock Requests          | This is the lock request count.                                                                                                                                       |
| Unlock Requests        | This is the unlock request count.                                                                                                                                     |
| Claim Requests         | This is the claim request count.                                                                                                                                      |
| Claim Request Failures | This is the number of unsuccessful claim requests.                                                                                                                    |
| Drain Requests         | This is the number of drain requests.                                                                                                                                 |
| Drain Request Failures | This is the number of unsuccessful drain requests.                                                                                                                    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. You can enter a “/” on any input field to open a menu of line commands available for that field.

### on objects

|    |                |                                          |
|----|----------------|------------------------------------------|
| ?  | Thread Address | Display context help information.        |
| ++ | Thread Address | Show additional details about this line. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown as follows:

```

File View Navigate Help

F34 - DETAIL Window (00008/QADBCS27)
Command ==> _____ Scroll ==> CSR
 More: +
+----- The following report line was selected -----+
| 15441020 DBACS27 CAF 1652 0 0|
+-----+
Locking Activity Details

Suspends (Lock Cnflct) 0 Lock Requests 1652
Suspends (Ltch Cnflct) 0 Unlock Requests 690
Suspends (Other) 0

Timeouts 0 Claim Requests 0
Deadlocks 0 Claim Request Failures 0

Lock Escal (Shared) 0 Drain Requests 0
Lock Escal (Excl) 0 Drain Request Failures 0

Max Pg/Row Locks Held 6

```

## SETUP Options

There are no setup options for this report.

## Db2 EXPLAIN report

The Db2 EXPLAIN report is available through the Application Performance Analyzer ISPF interface only, and is displayed by typing the command “EX” on a SQL statement. It is available in most Db2 reports. There are two sources of information for this report: static EXPLAIN data and dynamic EXPLAIN data.

## Usage

Use this report to see the Db2 EXPLAIN information for a particular SQL statement. Each report line represents a row in the result PLAN\_TABLE. You can obtain this report by issuing an “EX” line command against the SQL statement you want explained.

## Static EXPLAIN

Static EXPLAIN data is requested when an “EX” command is issued on a SQL statement, if the DB2X data extractor was selected for the observation request and the SQL statement was bound with the EXPLAIN(YES) option.

Static EXPLAIN data is obtained at the time of the measurement. Any changes made to the Db2 objects since the measurement was requested will not be reflected in the EXPLAIN request.

This will be indicated in the Db2 EXPLAIN report by the following at the bottom of the report:

Source: Static Explain

## Dynamic EXPLAIN

A dynamic EXPLAIN is requested when an “EX” command is issued on a SQL statement that does not have static EXPLAIN data available. Application Performance Analyzer will issue a dynamic EXPLAIN request on the SQL text of the statement you have selected.

**Note:** Not all SQL statements can be the subject of a dynamic EXPLAIN request. Included among these are UPDATE or DELETE statements with a WHERE CURRENT OF clause.

A prerequisite for this report is activation of the Db2+ option during the measurement.

The dynamic EXPLAIN request is executed at the time you request it. It is not issued at the time of the measurement. Thus, any changes made to the Db2 objects since the measurement was requested will affect the dynamic EXPLAIN request. It is valid to select a DECLARE CURSOR or a SELECT INTO statement. Application Performance Analyzer will remove the DECLARE CURSOR clause or the INTO clause before issuing the dynamic EXPLAIN request. It will also substitute any :H host variable placeholders in static SQL statements with a question mark. A dynamic EXPLAIN request can be requested on SQL statements up to 15000 bytes long.

This will be indicated in the Db2 EXPLAIN report by the following at the bottom of the report:

Source: Dynamic Explain

## Field descriptions

The values of certain columns from each row of PLAN\_TABLE are displayed in each report line. To see more detailed information, including values of additional PLAN\_TABLE columns, issue the “++” line command or press the ENTER key. For full descriptions of these columns, refer to *Db2 Universal Database for z/OS: Application Programming and SQL Guide*.

| Under Heading | This is Displayed                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blk Num       | The value of the QBLOCKNO column. This is also an input field. Use the “++” line command or press the ENTER key to display more information about the PLAN_TABLE row. |
| Plan Num      | The value of the PLANNO column.                                                                                                                                       |
| Mix Op        | The value of the MIXOPSEQ column.                                                                                                                                     |
| Join Mthd     | The value of the METHOD column.                                                                                                                                       |
| Acc Type      | The value of the ACCESTYPE column.                                                                                                                                    |
| Match Cols    | The value of the MATCHCOLS column.                                                                                                                                    |
| Index Only    | The value of the INDEXONLY column.                                                                                                                                    |
| Sort New      | U J O G The values of the SORTN_UNIQ, SORTN_JOIN, SORTN_ORDERBY and SORTN_GROUPBY columns.                                                                            |
| Sort Comp     | U J O G The values of the SORTC_UNIQ, SORTC_JOIN, SORTC_ORDERBY and SORTC_GROUPBY columns.                                                                            |
| Table Name    | The value of the TNAME column.                                                                                                                                        |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

Db2 EXPLAIN (0274/QADBCX07) Row 00001 of 00006
Command ==> Scroll ==> CSR

Blk Plan Mix Join Acc Match Index Sort New Sort Comp Table
Num. Num. Op Mthd Type Cols Only U J O G U J O G Name

0001 1 0 0 R 0 N
0001 2 0 1 R 0 N N Y N
0001 3 0 1 R 0 N N Y N
0001 4 0 3 0

Source: Static Explain

```



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Blk Num                | Display context help information. |
| ++  | Blk Num                | Show additional details.          |

**Note:** There are no line commands on headings for this report.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown below (shown in three scrollable screen segments).

```
File View Navigate Help
+-----+
Db2 EXPLAIN Data for Selected Row More: +
Block number 0003
Plan number 0001
Join method None
Table creator USER4
Table name MAIN
Access type Table space scan
Matching columns 0
Index creator n/a
Index name n/a
Index only No
Merge join columns 0
Correlation name T3
Page range screening n/a
Join type n/a
Query block type SELECT
Direct row access n/a

Sort New Composite
Unique No No
Join No No
Order by No No
Group by No No

Lock mode Intent Share
Prefetch Pure sequential
Function evaluation After data retrieval and sorting
Multiple index operation sequence no. 0

Parallelism Information:
Number of tasks 0
Group identifier 0
Join degree 0
Join group id 0
Sort composite group id 0
+-----+
```

File View Navigate Help

|                                                     |                              |     |           |
|-----------------------------------------------------|------------------------------|-----|-----------|
| Sort new table group id                             |                              | 0   | More: - + |
| Parallelism mode                                    |                              | n/a |           |
| Descriptive Names Mapped to PLAN_TABLE Column Names |                              |     |           |
| <u>Descriptive Name</u>                             | <u>Column Name</u>           |     |           |
| Block number                                        | QBLOCKNO                     |     |           |
| Plan number                                         | PLANNO                       |     |           |
| Join method                                         | METHOD                       |     |           |
| Table creator                                       | CREATOR                      |     |           |
| Table name                                          | TNAME                        |     |           |
| Access type                                         | ACCESSTYPE                   |     |           |
| Matching columns                                    | MATCHCOLS                    |     |           |
| Index creator                                       | ACCESSCREATOR                |     |           |
| Index name                                          | ACCESSNAME                   |     |           |
| Index only                                          | INDEXONLY                    |     |           |
| Unique                                              | SORTN_UNIQ, SORTC_UNIQ       |     |           |
| Join                                                | SORTN_JOIN, SORTC_JOIN       |     |           |
| Order by                                            | SORTN_ORDERBY, SORTC_ORDERBY |     |           |
| Group by                                            | SORTN_GROUPBY, SORTC_GROUPBY |     |           |
| Lock mode                                           | TSLOCKMODE                   |     |           |
| Prefetch                                            | PREFETCH                     |     |           |
| Function evaluation                                 | COLUMN_FN_EVAL               |     |           |
| Multiple index operation sequence no.               | MIXOPSEQ                     |     |           |
| Number of tasks                                     | ACCESS_DEGREE                |     |           |
| Group identifier                                    | ACCESS_PGROUP_ID             |     |           |
| Join degree                                         | JOIN_DEGREE                  |     |           |
| Join group id                                       | JOIN_PGROUP_ID               |     |           |
| Sort composite group id                             | SORTC_PGROUP_ID              |     |           |
| Sort new table group id                             | SORTN_PGROUP_ID              |     |           |
| Parallelism mode                                    | PARALLELISM_MODE             |     |           |
| Merge join columns                                  | MERGE_JOIN_COLS              |     |           |
| Correlation name                                    | CORRELATION_NAME             |     |           |
| Page range screening                                | PAGE_RANGE                   |     |           |
| Join type                                           | JOIN_TYPE                    |     |           |

File View Navigate Help

|                   |  |                    |         |
|-------------------|--|--------------------|---------|
| Query block type  |  | QBLOCK_TYPE        | More: - |
| Direct row access |  | PRIMARY_ACCESSTYPE |         |

## DB2SQL category in C01 report

More Db2 measurement data is presented in the C01 CPU Usage by Category report, under the category DB2SQL. If you expand the DB2SQL with the “+” line command, SQL Statement items will be displayed.

A sample is shown here:

File View Navigate Help

C01: CPU Usage by Category (0645/CICS23A) Row 00001 of 00014  
Command ==> \_\_\_\_\_ Scroll ==> CSR

| Name                               | Description          | Percent of CPU time * 10.00% | ±2.6% |
|------------------------------------|----------------------|------------------------------|-------|
| *...1...2...3...4...5...6...7...8. |                      |                              |       |
| SYSTEM                             | System/OS Services   | 76.39                        | ===== |
| DB2SQL                             | SQL Processing       | 17.02                        | ===== |
| → 00008                            | PFSAMPC(1466) FETCH  | 8.00                         | ===== |
| → 00003                            | PFSAMPB(408) SET HOS | 2.10                         | ===== |
| → 00010                            | PFSAMPB(816) UPDATE  | 2.03                         | ===== |
| → 00004                            | PFSAMPC(1316) SELECT | 1.56                         | ===== |
| → 00006                            | PFSAMPC(1347) SELECT | 0.94                         | ===== |
| → 00002                            | PFSAMPB(678) SELECT  | 0.67                         | ===== |
| → 00001                            | PFSAMPA(816) SELECT  | 0.67                         | ===== |
| → 00007                            | PFSAMPC(1443) OPEN   | 0.61                         | ===== |
| → 00009                            | PFSAMPC(1562) CLOSE  | 0.40                         | ===== |
| APPLCN                             | Application Code     | 6.58                         | ===== |

You can enter the “+” command to further expand each SQL statement one more level to display a breakdown by load module.

**SQL Statement**

This item attributes measured activity to a Db2 SQL statement.

**Name Column**

A sequence number is assigned by Application Performance Analyzer to each unique SQL statement observed during the measurement. This sequence number is shown in the name field. It is possible for some sequence numbers to be missing (sequence gaps) from the report. This will occur if a sequence number was assigned to SQL statements but no CPU activity was measured for these statements.

**Description Column**

The name of the program that issued the SQL request followed by the precompiler statement number (enclosed in parentheses) is shown here. This is followed by the SQL function (e.g. SELECT, INSERT, COMMIT).



## Chapter 7. MQ performance analysis reports

This section describes the MQ performance analysis reports.

| For information about ...          | See ...                                                         |
|------------------------------------|-----------------------------------------------------------------|
| The MQ data extractor              | <a href="#">“Overview of MQ data extractor ” on page 413</a>    |
| Q01 MQ activity summary            | <a href="#">“Q01 - MQ activity summary” on page 414</a>         |
| Q02 MQ CPU usage by queue          | <a href="#">“Q02 - MQ CPU usage by queue” on page 416</a>       |
| Q03 MQ CPU usage by request        | <a href="#">“Q03 - MQ CPU usage by request” on page 419</a>     |
| Q04 MQ CPU usage by transaction    | <a href="#">“Q04 - MQ CPU usage by Txn” on page 421</a>         |
| Q05 MQ service time by queue       | <a href="#">“Q05 - MQ service time by queue” on page 424</a>    |
| Q06 MQ Serv Time by Request        | <a href="#">“Q06 - MQ service time by request” on page 427</a>  |
| Q07 MQ service time by transaction | <a href="#">“Q07 - MQ service time by Txn” on page 429</a>      |
| Q08 MQ wait time by queue          | <a href="#">“Q08 - MQ wait time by queue” on page 432</a>       |
| Q09 MQ wait time by request        | <a href="#">“Q09 - MQ wait time by request” on page 435</a>     |
| Q10 MQ wait time by transaction    | <a href="#">“Q10 - MQ wait time by Txn” on page 437</a>         |
| Q11 MQ+ Activity Timeline          | <a href="#">“Q11 - MQ+ Activity Timeline” on page 440</a>       |
| Q12 MQ+ CPU/SVC Time by Queue      | <a href="#">“Q12 - MQ+ CPU/SVC Time by Queue” on page 443</a>   |
| Q13 MQ+ CPU/SVC Time by Request    | <a href="#">“Q13 - MQ+ CPU/SVC Time by Request” on page 446</a> |
| Q14 MQ+ CPU/SVC Time by Txn        | <a href="#">“Q14 - MQ+ CPU/SVC Time by Txn” on page 449</a>     |

### Overview of MQ data extractor

In order to use the MQ Performance Analysis Reports, the MQ data extractor must be turned on when the Observation Request is entered. You must select the MQS data extractor in the Enter an Observation Request panel.

This data extractor provides the ability to observe/sample and report on MQ interface calls (both dynamic and static) in Batch, IMS and CICS programs. More specifically, to show the CPU and wait time spent in MQ interface calls and to attribute the time spent to a particular MQ interface call.

When the MQ data extractor is selected, Application Performance Analyzer will record the following information in the sample file for each MQ call that it observes:

- Environment (Batch, IMS or CICS)
- Load module that issued the call
- Offset within the load module of the return address from the MQ call
- Type of MQI call (MQOPEN, MQGET, etc.)
- Queue Manager name
- Object name (for example, the queue name)
- Message size (actual length for MQPUT/MQPUT1, buffer length for MQGET)
- MQ Options (for MQOPEN, MQGET, MQPUT MQCLOSE)
- Message type, priority and persistence

- Transaction ID (CICS and IMS)

**Note:** In an IMS environment, Application Performance Analyzer might not be able to determine the default Queue Manager name for some samples if the Application Performance Analyzer task has not previously sampled any. This might result in the MQ object name being unknown for the first few calls. Subsequent sampling runs will obtain the MQ object name for each sample.

## The MQ+ extractor

MQ+ is a measurement option where the precise number of MQ calls, the exact MQ service time, and CPU time by MQ call are counted. When you select the MQ+ option, Application Performance Analyzer captures the data that is required to produce the MQ+ timeline and service time reports Q11 through Q14.

Selecting the MQ+ option has a small impact on the performance of the target address space. Be careful when you use the MQ+ feature with other products that also intercept MQ calls because unpredictable results might occur. Your installer can choose to limit access to this feature.

## Q01 - MQ activity summary

---

### Usage

Use this report to see a summary of the MQ requests (Calls) issued during the observation session and a list of the MQ objects referenced by these requests.

### Detail line descriptions

#### Access to the following MQ objects observed

Each referenced object is described under this heading. For each object, the following information is reported:

| Under Heading       | This is Displayed                                                                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object Seq. Nbr     | A unique sequence number assigned by Application Performance Analyzer to each unique object.                                                                             |
| Object Manager Name | The name of the MQ Queue Manager – usually four characters. This name is combined with the object name to fully qualify the name.                                        |
| Object Name         | A one to 48 character MQ object name. Some functions do not reference an object. In this case, Application Performance Analyzer shows an entry with 'n/a' in this field. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Object Type   | <p>The type of object. One of the following is shown:</p> <ul style="list-style-type: none"> <li>• Queue</li> <li>• Namelist</li> <li>• Process</li> <li>• Storage Class</li> <li>• Queue Manager</li> <li>• Channel</li> <li>• Auth Info</li> <li>• CF Structure</li> <li>• Alias Queue</li> <li>• Model Queue</li> <li>• Local Queue</li> <li>• Remote Queue</li> <li>• Sender Channel</li> <li>• Server Channel</li> <li>• Reqstr Channel</li> <li>• Recvr Channel</li> <li>• Current® Channel</li> <li>• Saved Channel</li> <li>• SVRCON Channel</li> <li>• CLNTCON Channel</li> </ul> |

## MQ calls observed

Each observed MQ request is listed under this heading. For each request, the following information is reported:

| Under Heading | This is Displayed                                                      |
|---------------|------------------------------------------------------------------------|
| Module        | The name of the load module that issued the MQ request.                |
| CSECT         | The name of the CSECT in the module containing the MQ CALL.            |
| Offset        | The hexadecimal offset in the CSECT of the return address to the CALL. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | The MQ function: <ul style="list-style-type: none"> <li>• CONNECT</li> <li>• DISCONN</li> <li>• OPEN</li> <li>• CLOSE</li> <li>• GET</li> <li>• PUT</li> <li>• PUT1</li> <li>• COMMIT</li> <li>• BACKOUT</li> <li>• INQUIRE</li> <li>• SET</li> </ul> |
| Queue Mgr     | The Queue Manager name.                                                                                                                                                                                                                               |
| Object Name   | The object name.                                                                                                                                                                                                                                      |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

Q01: MQ Activity Summary (00434/QAMQBGTW) Row 00001 of 00018
Command ==> Scroll ==> CSR_

Access to the Following MQ Objects Observed

Object Sequence Number 0001
Queue Manager Name CSQ9 (V09.2.4)
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue

Object Sequence Number 0002
Queue Manager Name CSQ9 (V09.2.4)
Object Name n/a

MQ Calls Observed

Module CSECT Offset Function Queue Mgr Object Name
MQBCS01 MQBCS01 0030A4 CONNECT CSQ1
MQBCS01 MQBCS01 00313E OPEN CSQ1 SYSTEM.DEFAULT.LOCAL.QUEUE
MQBCS01 MQBCS01 00334C PUT CSQ1 SYSTEM.DEFAULT.LOCAL.QUEUE
MQBCS01 MQBCS01 0033DC CLOSE CSQ1 SYSTEM.DEFAULT.LOCAL.QUEUE
MQBCS01 MQBCS01 0033DC CLOSE CSQ1
MQBCS01 MQBCS01 003452 COMMIT CSQ1
MQBCS01 MQBCS01 0034C8 DISCONN CSQ1

```

## Q02 - MQ CPU usage by queue

### Usage

Use this report to see how CPU resources were consumed by MQ Requests. The percentage of CPU usage is reported by MQ Queue Name. Expand the Queue Name detail lines to see a further breakdown by individual MQ Request.



## Quantification

Each report line quantifies CPU usage for an MQ Queue Name. This is further broken down by MQ Request.

## Detail line hierarchy

An unexpanded Q02 report shows a line for each MQ Queue. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```
Level 1 MQ Queue
Level 2 MQ Request
Level 2 MQ Request
...
```

## Detail line descriptions

### MQ queue detail line

This is the first-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading       | This is Displayed                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue. |
| Description         | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue. |
| Percent of CPU Time | The percentage of CPU time consumed while executing MQ Requests for the indicated MQ Queue Name.            |

### MQ request detail line

This is a second-level detail line shown directly under the MQ Queue detail line. It quantifies CPU usage for a specific MQ Request.

| Under Heading       | This is Displayed                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                   |
| Description         | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address. |
| Percent of CPU Time | The percentage of CPU time consumed while executing the indicated MQ Request.                                                                   |

## Sample reports

A sample report is shown here. It has been fully expanded by entering “+” on the Name field.

```

File View Navigate Help

Q02: MQ CPU Usage by Queue (0643/MQTST01) Row 00001 of 00010
Command ==> ----- Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±2.8%
 *....1....2....3....4....5....6....7.
CSQ1 SYSTEM.DEFAULT.ALIAS.QUEUE 75.90 =====
→ PUT MQBCS01+334C 75.50 =====
→ OPEN MQBCS01+313E 0.32
→ CLOSE MQBCS01+33DC 0.08

CSQ1 No Object Name 8.83 ===
→ CONNECT MQBCS01+30A4 7.06 ===
→ DISCONN MQBCS01+34C8 1.60 =
→ CLOSE MQBCS01+33DC 0.08
→ COMMIT MQBCS01+3452 0.08

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Queue, Request         | Display context help information. |
| ++  | Queue, Request         | Show additional details.          |
| +   | Queue                  | Expand to reveal next level.      |
| –   | Queue                  | Collapse to hide next level.      |
| SV  | Queue                  | Sort next level by value.         |
| SN  | Queue                  | Sort next level by name.          |
| P   | Request                | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of CPU                 | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of CPU                 | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > PUT MQBCS01+334C 78.70 000000000000000000000000 |
+-----+

Calculation Details
MQ Series CPU measurements 1,201
Total CPU measurements 1,526
Percent of total 78.70%

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue
```

## Usage

## Quantification

## Detail line descriptions

### MQ request detail line

| Under Heading       | This is Displayed                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                   |
| Description         | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address. |
| Percent of CPU Time | The percentage of CPU time consumed while executing the indicated MQ Request.                                                                   |

### MQ queue detail line

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| Under Heading       | This is Displayed                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue. |
| Description         | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue. |
| Percent of CPU Time | The percentage of CPU time consumed while executing MQ Requests for the indicated MQ Queue Name.            |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

Q03: MQ CPU Usage by Request (0643/MQTST01) Row 00001 of 00007
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±2.8%
 *....1....2....3....4....5....6....7.
PUT MQBCS01+334C 75.50 =====
CONNECT MQBCS01+30A4 7.06 ===
DISCONN MQBCS01+34C8 1.60 =
OPEN MQBCS01+313E 0.32
CLOSE MQBCS01+33DC 0.08
CLOSE MQBCS01+33DC 0.08
COMMIT MQBCS01+3452 0.08

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Request, Queue         | Display context help information. |
| ++  | Request, Queue         | Show additional details.          |
| +   | Request                | Expand to reveal next level.      |
| –   | Request                | Collapse to hide next level.      |
| P   | Request                | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of CPU                 | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |

| Cmd | When Applied To Object | Action                    |
|-----|------------------------|---------------------------|
| –   | Percent of CPU         | Zoom out scale.           |
| SV  | Name                   | Sort next level by value. |
| SN  | Name                   | Sort next level by name.  |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > PUT MQBCS01+334C 78.70 000000000000000000000000 |
+-----+

Calculation Details
MQ Series CPU measurements 1,201
Total CPU measurements 1,526
Percent of total 78.70%

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue

```

## Q04 - MQ CPU usage by Txn

### Usage

Use this report to see how CPU resources were consumed by MQ Requests. The percentage of CPU usage is reported by CICS or IMS transaction. Expand the transaction detail lines to see a further breakdown by MQ Queue and by individual MQ Request.

### Quantification

Each report line quantifies CPU usage for a CICS or IMS transaction under which MQ Requests were serviced. This is further broken down by MQ Queue and by MQ Request.

### Detail line hierarchy

An unexpanded Q04 report shows a line for each CICS or IMS transaction. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```

Level 1 CICS/IMS Transaction Level
Level 2 MQ Queue
Level 3 MQ Request
Level 3 MQ Request
...

```

## Detail line descriptions

### CICS/IMS transaction detail line

This is the first-level detail line. Each line shows information about a CICS or IMS transaction under which MQ requests were issued.

| Under Heading       | This is Displayed                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | A CICS or IMS transaction code. This is the transaction under which measured MQ Requests were issued. "Batch" is shown here for request not issued under control of a CICS or IMS transaction. |
| Description         | "CICS Transaction" or "IMS Transaction". "Not in IMS/CICS Txn" is shown here if the request was not issued under control of a CICS or IMS transaction.                                         |
| Percent of CPU Time | The percentage of CPU time consumed while executing MQ Requests under control of the indicated transaction.                                                                                    |

### MQ queue detail line

This is the second-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading       | This is Displayed                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue. |
| Description         | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue. |
| Percent of CPU Time | The percentage of CPU time consumed while executing MQ Requests for the indicated MQ Queue Name.            |

### MQ request detail line

This is a third-level detail line shown directly under the MQ Queue detail line. It quantifies CPU usage for a specific MQ Request.

| Under Heading       | This is Displayed                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                   |
| Description         | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address. |
| Percent of CPU Time | The percentage of CPU time consumed while executing the indicated MQ Request.                                                                   |

## Sample reports

A sample report is show here. It has been fully expanding by entering "+" on the Name heading.

```

File View Navigate Help

Q04: MQ CPU Usage by Txn/Queue (0025/MQTST01) Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

Name Description Percent of CPU time * 10.00% ±2.8%
 *....1....2....3....4....5....6....7.
MQS1 CICS Transaction 13.71 =====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 13.20 =====
→ GET MQSAMP1+2DF2 10.92 =====
→ OPEN MQSAMP1+2C2C 1.94 =
→ CLOSE MQSAMP1+31A0 0.34
→ CSQ1 No Object Name 0.50
→ CLOSE MQSAMP1+31A0 0.50

MQDR CICS Transaction 8.03 ====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 7.80 ====
→ PUT CSQ4CVK1+284E 5.65 ==
→ OPEN CSQ4CVK1+277E 1.86 =
→ CLOSE CSQ4CVK1+29E2 0.28
→ CSQ1 No Object Name 0.23
→ CLOSE CSQ4CVK1+29E2 0.12

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object       | Action                            |
|-----|------------------------------|-----------------------------------|
| ?   | Transactions, Queue, Request | Display context help information. |
| ++  | Transactions, Queue, Request | Show additional details.          |
| +   | Transactions, Queue          | Expand to reveal next level.      |
| –   | Transactions, Queue          | Collapse to hide next level.      |
| SV  | Transactions, Queue          | Sort next level by value.         |
| SN  | Transactions, Queue          | Sort next level by name.          |
| P   | Request                      | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of CPU                 | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of CPU                 | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

```
File View Navigate Help
-----+-----+
+----- The following report line was selected -----+
| > PUT MQBCS01+334C 78.70 000000000000000000000000 |
+-----+-----+

Calculation Details
MQ Series CPU measurements 1,201
Total CPU measurements 1,526
Percent of total 78.70%

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue
```

## Q05 - MQ service time by queue

## Usage

Use this report to see how time was consumed by MQ Requests. The percentage of time is reported by MQ Queue Name. Expand the Queue Name detail lines to see a further breakdown by individual MQ Request.

## Quantification

Each report line quantifies service time for an MQ Queue Name. The service time is the actual time measured MQ requests were being processed. This is further broken down by MQ Request.

## Detail line hierarchy

An unexpanded Q05 report shows a line for each MQ Queue. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```

Level 1 MQ Queue
Level 2 MQ Request
Level 2 MQ Request
...
```

## Detail line descriptions

### MQ queue detail line

This is the first-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.



| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## MQ request detail line

This is a second-level detail line shown directly under the MQ Queue detail line. It quantifies time consumed during executions of a specific MQ Request.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                                                                                                                                                                                                        |
| Description     | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address.                                                                                                                                                                                      |
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A sample report is show here. It has been fully expanded by pressing “+” on the Name heading.

|                                              |                     |                                       |
|----------------------------------------------|---------------------|---------------------------------------|
| File View Navigate Help                      |                     |                                       |
| -----                                        |                     |                                       |
| Q05: MQ Service Time by Queue (0025/MQTST01) |                     | Row 00001 of 00010                    |
| Command ==> _____                            |                     | Scroll ==> CSR                        |
| <u>Name</u>                                  | <u>Description</u>  | <u>Percent of time * 10.00%</u> ±0.9% |
|                                              |                     | *....1....2....3....4....5....6....7. |
| CSQ1                                         | CSQ1.DEFXTMIT.QUEUE | 29.71 =====                           |
| → GET                                        | MQSAMP1+2DF2        | 14.79 =====                           |
| → PUT                                        | CSQ4CVK1+284E       | 8.56 ===                              |
| → OPEN                                       | CSQ4CVK1+277E       | 2.64 =                                |
| → OPEN                                       | MQSAMP1+2C2C        | 2.54 =                                |
| → CLOSE                                      | CSQ4CVK1+29E2       | 0.61                                  |
| → CLOSE                                      | MQSAMP1+31A0        | 0.55                                  |
| CSQ1                                         | No Object Name      | 0.90                                  |
| → CLOSE                                      | MQSAMP1+31A0        | 0.50                                  |
| → CLOSE                                      | CSQ4CVK1+29E2       | 0.39                                  |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

## on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Queue, Request         | Display context help information. |
| ++  | Queue, Request         | Show additional details.          |
| +   | Queue                  | Expand to reveal next level       |
| –   | Queue                  | Collapse to hide next level       |
| SV  | Queue                  | Sort next level by value.         |
| SN  | Queue                  | Sort next level by name.          |
| P   | Request                | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > PUT MQBCS01+334C 72.46 000000000000000000000000 |
+-----+

Calculation Details
MQ Series activity measurements 1,645
Total measurements 2,270
Percent of total 72.46%

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue

```

```

File View Navigate Help
+-----+
+*****- The following report line was selected *****+
| → PUT MQBCS01+334C 60.38 =====+
+*****+
Calculation Details
The 60.38% quantification represents 1,102 samples during
which the indicated MQ request was being serviced
The percentage is the portion of the total session elapsed
time of 1,825 samples.

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.ALIAS.QUEUE
Object Type Queue
+-----+

```

## Q06 - MQ service time by request

### Usage

Use this report to see how time was consumed by MQ Requests. The percentage of time is reported by MQ Request. Expand the MQ Request lines to see a further breakdown by MQ Queue.

### Quantification

Each report line quantifies service time for an MQ Request. This is further broken down by MQ Queue Name.

### Detail line hierarchy

An unexpanded Q06 report shows a line for each MQ Request. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```

Level 1 MQ Request
 Level 2 MQ Queue
 Level 2 MQ Queue
 ...

```

### Detail line descriptions

#### MQ request detail line

This is a first-level detail line shown directly under the MQ Queue detail line. It quantifies consumption of time for a specific MQ Request.

| Under Heading | This is Displayed                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                   |
| Description   | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address. |

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## MQ queue detail line

This is the second-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

Q06: MQ Service Time by Request (0643/MQTST01) Row 00001 of 00007
Command ==> _____ Scroll ==> CSR

Name Description Percent of time * 10.00% ±2.3%
 *....1....2....3....4....5....6....7.
PUT MQBCS01+334C 60.38 =====
CONNECT MQBCS01+30A4 10.84 ====
DISCONN MQBCS01+34C8 1.42 =
COMMIT MQBCS01+3452 1.09 =
OPEN MQBCS01+313E 0.21
CLOSE MQBCS01+33DC 0.05
CLOSE MQBCS01+33DC 0.05

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Request, Queue         | Display context help information. |
| ++  | Request, Queue         | Show additional details.          |
| +   | Request                | Expand to reveal next level       |
| –   | Request                | Collapse to hide next level       |



## Quantification

Each report line quantifies time consumed by MQ requests in a CICS or IMS transaction. This is further broken down by MQ Queue and by MQ Request.

## Detail line hierarchy

An unexpanded Q07 report shows a line for each CICS or IMS transaction. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```
Level 1 CICS/IMS Transaction
Level 2 MQ Queue
Level 3 MQ Request
Level 3 MQ Request
...
```

## Detail line descriptions

### CICS/IMS transaction detail line

This is the first-level detail line. Each line shows information about a CICS or IMS transaction under which MQ requests were issued.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A CICS or IMS transaction code. This is the transaction under which measured MQ Requests were issued. "Batch" is shown here for request not issued under control of a CICS or IMS transaction.                                                                                                                                                                      |
| Description     | "CICS Transaction" or "IMS Transaction." "Not in IMS/CICS Txn" is shown here if the request was not issued under control of a CICS or IMS transaction.                                                                                                                                                                                                              |
| Percent of Time | The percentage of the measurement interval duration MQ Requests under control of the indicated transaction were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

### MQ queue detail line

This is the second-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## MQ request detail line

This is a third-level detail line shown directly under the MQ Queue detail line. It quantifies time consumption for a specific MQ Request.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                                                                                                                                                                                                        |
| Description     | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address.                                                                                                                                                                                      |
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A fully expanded report is shown here:

```
File View Navigate Help

Q07: MQ Service Time by Txn/Queue (0025/MQTST01) Row 00001 of 00015
Command ==> _____ Scroll ==> CSR

Name Description Percent of time * 10.00% ±0.9%
 *....1....2....3....4....5....6....7.
MQS1 CICS Transaction 18.40 =====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 17.89 =====
→ GET MQSAMP1+2DF2 14.79 =====
→ OPEN MQSAMP1+2C2C 2.54 =
→ CLOSE MQSAMP1+31A0 0.55
→ CSQ1 No Object Name 0.50
→ CLOSE MQSAMP1+31A0 0.50

MQDR CICS Transaction 12.21 ====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 11.82 ====
→ PUT CSQ4CVK1+284E 8.56 ===
→ OPEN CSQ4CVK1+277E 2.64 =
→ CLOSE CSQ4CVK1+29E2 0.61
→ CSQ1 No Object Name 0.39
→ CLOSE CSQ4CVK1+29E2 0.39
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object      | Action                            |
|-----|-----------------------------|-----------------------------------|
| ?   | Transaction, Queue, Request | Display context help information. |
| ++  | Transaction, Queue, Request | Show additional details.          |
| +   | Transaction, Queue          | Expand to reveal next level.      |
| –   | Transaction, Queue          | Collapse to hide next level.      |
| SV  | Transaction, Queue          | Sort next level by value.         |
| SN  | Transaction, Queue          | Sort next level by name.          |





## Quantification

Each report line quantifies wait time attributed to requests for an MQ Queue Name. This is further broken down by MQ Request.

## Detail line hierarchy

An unexpanded Q08 report shows a line for each MQ Queue. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```
Level 1 MQ Queue
Level 2 MQ Request
Level 2 MQ Request
...
```

## Detail line descriptions

### MQ queue detail line

This is the first-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue..                                                                                                                                                                                                                                          |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

### MQ request detail line

This is a second-level detail line shown directly under the MQ Queue detail line. It quantifies wait time during executions of a specific MQ Request.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                                                                                                                                                                                                        |
| Description     | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address.                                                                                                                                                                                      |
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A fully expanded report is shown here:

```

File View Navigate Help

Q08: MQ Wait Time by Queue (0025/MQTST01) Row 00001 of 00011
Command ==> _____ Scroll ==> CSR
Name Description Percent of time * 10.00% ±0.9%
 *....1....2....3....4....5....6....7.
CSQ1 CSQ1.DEFXMIT.QUEUE 5.80 ==
→ GET MQSAMP1+2DF2 3.01 ==
→ PUT CSQ4CVK1+284E 1.60 =
→ OPEN CSQ4CVK1+277E 0.59
→ OPEN MQSAMP1+2C2C 0.38
→ CLOSE CSQ4CVK1+29E2 0.18
→ CLOSE MQSAMP1+31A0 0.01

CSQ1 No Object Name 0.10
→ CLOSE MQSAMP1+31A0 0.08
→ CLOSE CSQ4CVK1+29E2 0.01

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Queue, Request         | Display context help information. |
| ++  | Queue, Request         | Show additional details.          |
| +   | Queue                  | Expand to reveal next level.      |
| –   | Queue                  | Collapse to hide next level.      |
| SV  | Queue                  | Sort next level by value.         |
| SN  | Queue                  | Sort next level by name.          |
| P   | Request                | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| > PUT MQBCS01+334C 19.55 0000000000 |
+-----+

Calculation Details
MQ Series wait measurements 444
Total measurements 2,270
Percent of total 19.55%

MQ Request Details
Calling Module MQBCS01
CSECT MQBCS01
Offset 00334C
Request Type PUT
Queue Manager CSQ1
Object Name SYSTEM.DEFAULT.LOCAL.QUEUE
Object Type Queue
+-----+
```

## Q09 - MQ wait time by request

### Usage

Use this report to see how much wait time occurred during processing of MQ Requests. The percentage of wait time is reported by MQ Request. Expand the MQ Request lines to see a further breakdown by MQ Queue.

### Quantification

Each report line quantifies wait time for an MQ Request. This is further broken down by MQ Queue Name.

### Detail line hierarchy

An unexpanded Q09 report shows a line for each MQ Request. You can expand each line to reveal one additional hierarchical level of detail.

The hierarchy is illustrated here:

```
Level 1 MQ Request
Level 2 MQ Queue
Level 2 MQ Queue
...

```

### Detail line descriptions

#### MQ request detail line

This is a first-level detail line shown directly under the MQ Queue detail line. It quantifies wait time for a specific MQ Request.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                                                                                                                                                                                                        |
| Description     | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address.                                                                                                                                                                                      |
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## MQ queue detail line

This is the second-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A sample report is shown here:

```

File View Navigate Help

Q09: MQ Wait Time by Request (0643/MQTST01) Row 00001 of 00003
Command ==> _____ Scroll ==> CSR

Name Description Percent of time * 10.00% ±2.3%
 *....1....2....3....4....5....6....7.
COMMIT MQBCS01+3452 1.04 =
CONNECT MQBCS01+30A4 0.38
DISCONN MQBCS01+34C8 0.21

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Request, Queue         | Display context help information. |
| ++  | Request, Queue         | Show additional details.          |
| +   | Request                | Expand to reveal next level.      |

| Cmd | When Applied To Object | Action                          |
|-----|------------------------|---------------------------------|
| –   | Request                | Collapse to hide next level.    |
| P   | Request                | Display source program mapping. |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information. A sample detail window for this report is shown here:

|                                                      |                               |
|------------------------------------------------------|-------------------------------|
| File View Navigate Help                              |                               |
| +----- The following report line was selected -----+ |                               |
| > PUT                                                | MQBCS01+334C 19.55 0000000000 |
| +-----                                               |                               |
| Calculation Details                                  |                               |
| MQ Series wait measurements                          | 444                           |
| Total measurements                                   | 2,270                         |
| Percent of total                                     | 19.55%                        |
| MQ Request Details                                   |                               |
| Calling Module                                       | MQBCS01                       |
| CSECT                                                | MQBCS01                       |
| Offset                                               | 00334C                        |
| Request Type                                         | PUT                           |
| Queue Manager                                        | CSQ1                          |
| Object Name                                          | SYSTEM.DEFAULT.LOCAL.QUEUE    |
| Object Type                                          | Queue                         |

## Q10 - MQ wait time by Txn

### Usage

Use this report to see how much wait time occurred during processing of MQ Requests. The percentage of wait time is reported by CICS or IMS transaction. Expand the transaction detail lines to see a further breakdown by MQ Queue and by individual MQ Request.

## Quantification

Each report line quantifies wait time in MQ requests in a CICS or IMS transaction. This is further broken down by MQ Queue and by MQ Request.

## Detail line hierarchy

An unexpanded Q10 report shows a line for each CICS or IMS transaction. You can expand each line to reveal one additional hierarchical level of detail (using the “+” line command).

The hierarchy is illustrated here:

```
Level 1 CICS/IMS Transaction
Level 2 MQ Queue
Level 3 MQ Request
Level 3 MQ Request
...
```

## Detail line descriptions

### CICS/IMS transaction detail line

This is the first-level detail line. Each line shows information about a CICS or IMS transaction under which MQ requests were issued.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | A CICS or IMS transaction code. This is the transaction under which measured MQ requests were issued. “Batch” is shown here for requests not issued under control of a CICS or IMS transaction.                                                                                                                                                                                  |
| Description     | Either “CICS Transaction” or “IMS Transaction.” If the request was not issued under control of a CICS or IMS transaction, “Not in IMS/CICS Txn” will be displayed.                                                                                                                                                                                                               |
| Percent of Time | The percentage of the measurement interval duration during which MQ requests under control of the indicated transaction were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

### MQ queue detail line

This is the second-level detail line. Each line shows information about an MQ Queue for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Queue Manager name. This name, in combination with the Queue Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Description     | The MQ Queue Name. This name, in combination with the Queue Manager Name, uniquely identifies the MQ Queue.                                                                                                                                                                                                                                           |
| Percent of Time | The percentage of the measurement interval duration MQ Requests for the indicated Queue Name were being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## MQ request detail line

This is a third-level detail line shown directly under the MQ Queue detail line. It quantifies wait time for a specific MQ Request.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The MQ Request function. This is the MQ function specified by the MQ Request.                                                                                                                                                                                                                                                        |
| Description     | Program name and offset. This is the name of the program in which the MQ CALL was issued and the hexadecimal offset of the CALL return address.                                                                                                                                                                                      |
| Percent of Time | The percentage of the measurement interval duration the indicated MQ request was being processed. This represents the percentage of samples for MQ requests out of the total number of samples, except for CICS measurements, where it represents the percentage of samples for MQ requests out of the total number of CICS samples. |

## Sample reports

A fully expanded report is shown here:

```
File View Navigate Help

Q10: MQ Wait Time by Transaction (0025/MQTST01) Row 00001 of 00015
Command ===> _____ Scroll ===> CSR

Name Description Percent of time * 2.5% ±0.9%
 *....1....2....3....4....5....6....7.
MQS1 CICS Transaction 3.64 =====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 3.62 =====
→ GET MQSAMP1+2DF2 3.01 =====
→ OPEN MQSAMP1+2C2C 0.59 =
→ CLOSE MQSAMP1+31A0 0.01
→ CSQ1 No Object Name 0.01
→ CLOSE MQSAMP1+31A0 0.01

MQDR CICS Transaction 2.25 ====
→ CSQ1 CSQ1.DEFXMIT.QUEUE 2.17 ====
→ PUT CSQ4CVK1+284E 1.60 ===
→ OPEN CSQ4CVK1+277E 0.38 =
→ CLOSE CSQ4CVK1+29E2 0.18
→ CSQ1 No Object Name 0.08
→ CLOSE CSQ4CVK1+29E2 0.08
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object      | Action                            |
|-----|-----------------------------|-----------------------------------|
| ?   | Transaction, Queue, Request | Display context help information. |
| ++  | Transaction, Queue, Request | Show additional details.          |
| +   | Transaction, Queue          | Expand to reveal next level.      |
| –   | Transaction, Queue          | Collapse to hide next level.      |
| SV  | Transaction, Queue          | Sort next level by value.         |
| SN  | Transaction, Queue          | Sort next level by name.          |

| Cmd | When Applied To Object | Action                          |
|-----|------------------------|---------------------------------|
| P   | Request                | Display source program mapping. |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | Name, Description, Percent CPU | Display context help information.  |
| +   | Name                           | Expand to reveal all entries.      |
| +   | Description                    | Expand field size                  |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | Name                           | Collapse to show only first level. |
| –   | Description                    | Reduce field size.                 |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | Name                           | Sort next level by value.          |
| SN  | Name                           | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

|                                                      |                            |                  |
|------------------------------------------------------|----------------------------|------------------|
| File View Navigate Help                              |                            |                  |
| +----- The following report line was selected -----+ |                            |                  |
| > PUT                                                | MQBCS01+334C               | 19.55 0000000000 |
| +-----                                               |                            |                  |
| Calculation Details                                  |                            |                  |
| MQ Series wait measurements                          |                            | 444              |
| Total measurements                                   |                            | 2,270            |
| Percent of total                                     |                            | 19.55%           |
| MQ Request Details                                   |                            |                  |
| Calling Module                                       | MQBCS01                    |                  |
| CSECT                                                | MQBCS01                    |                  |
| Offset                                               | 00334C                     |                  |
| Request Type                                         | PUT                        |                  |
| Queue Manager                                        | CSQ1                       |                  |
| Object Name                                          | SYSTEM.DEFAULT.LOCAL.QUEUE |                  |
| Object Type                                          | Queue                      |                  |

## Q11 - MQ+ Activity Timeline

### Usage

Use the Q11 report to see information about the chronology of MQ calls that are intercepted during the measurement. You can also use the Q11 report to identify calls with excessive service times and CPU times. Each line shows information about one intercepted MQ call. You must enable the MQ+ feature before the measurement performs.



By default, the detail lines are sorted in ascending chronological sequence. You can also request that the data is sorted by service time. Enter the **SD line** command on the “Seqno” heading field to sort in this sequence. This will bring MQ calls that might have excessive service times to the top of the report.

The number of MQ calls that is displayed in the Q11 report is limited by the value of the MQIMaxTraceSize parameter that is specified during Application Performance Analyzer installation, or by the value on panel 2 of the measurement request if your installation has configured this field. The report is truncated when the number of MQ calls issued reaches the value that is specified for MQIMaxTraceSize.

## Quantification

Each report line shows the following information for each MQ call:

- The type of call and where it originated.
- The length of the message.
- The time of the call.
- The service time (duration) for the MQ call processing.
- The CPU time for the MQ call processing.

The CPU time applies only to the region being measured. MQ runs in multiple address spaces and CPU might also be consumed in other MQ regions.

## Detail Line Hierarchy

An unexpanded report shows a line for each MQ call that is intercepted by the MQ+ feature. You can expand each line to reveal one additional hierarchical level of detail by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 MQ Call Details
 Level 2 MQ Queue Manager and Queue
 ...
```

## Detail Line Descriptions

### MQ Call detail line

MQ Call detail line is the first-level detail line. Each line shows information about one MQ call.

| Under Heading | This is Displayed                                                             |
|---------------|-------------------------------------------------------------------------------|
| Seqno         | A unique sequence number that is assigned by Application Performance Analyzer |
| Call          | The MQ call type                                                              |
| Location      | The CSECT and offset where the call originated                                |
| Msg Len       | The length of the MQ message                                                  |
| Call Time     | The time of day at which the MQ call was issued                               |
| Svc Time      | The service time (duration) of the MQ call in seconds                         |
| CPU Time      | The CPU time that the MQ call consumed in seconds                             |

## MQ Queue Manager and Queue Name detail line

MQ Queue Manager and Queue Name detail line is second-level detail line. The MQ Queue Manager and Queue Name detail line displays the MQ queue manager name and the queue name that is used in the request.

## Sample Report

An expanded sample report is shown as follows:

| -----                                     |       |                    |         |            |                    |          |
|-------------------------------------------|-------|--------------------|---------|------------|--------------------|----------|
| Q11: MQ+ Activity Timeline (0098/CICS42A) |       |                    |         |            | Row 00001 of 03172 |          |
| Seqno                                     | Call  | Location           | Msg Len | Call Time  | Svc Time           | CPU Time |
| 00001                                     | Put   | CSQ4CVK1+4FC2      | 200     | 9:06:38.82 | 0.00076            | 0.00076  |
| →CSQ7                                     |       | CSQ7.DEFXMIT.QUEUE |         |            |                    |          |
| 00002                                     | Close | CSQ4CVK1+5176      | 0       | 9:06:38.82 | 0.00027            | 0.00027  |
| →CSQ7                                     |       |                    |         |            |                    |          |
| 00003                                     | Open  | CSQ4CVK1+4EDA      | 0       | 9:06:38.85 | 0.00045            | 0.00045  |
| →CSQ7                                     |       | CSQ7.DEFXMIT.QUEUE |         |            |                    |          |
| 00004                                     | Put   | CSQ4CVK1+4FC2      | 200     | 9:06:38.85 | 0.00072            | 0.00072  |
| →CSQ7                                     |       | CSQ7.DEFXMIT.QUEUE |         |            |                    |          |
| 00005                                     | Put   | CSQ4CVK1+4FC2      | 200     | 9:06:38.85 | 0.00060            | 0.00060  |
| →CSQ7                                     |       | CSQ7.DEFXMIT.QUEUE |         |            |                    |          |
| 00006                                     | Close | CSQ4CVK1+5176      | 0       | 9:06:38.86 | 0.00020            | 0.00021  |
| →CSQ7                                     |       |                    |         |            |                    |          |
| 00007                                     | Open  | MQSAMP1+3AB8       | 0       | 9:06:38.86 | 0.00050            | 0.00050  |
| →CSQ7                                     |       | CSQ7.DEFXMIT.QUEUE |         |            |                    |          |

## Line commands

The following table summarizes the line commands available in this report, and the objects and headings to which they apply. You can enter a forward slash (/) on any input field to pop up a menu of line commands that are available for that field.

### on objects

| Cmd | When Applied To: | Action                             |
|-----|------------------|------------------------------------|
| ?   | Call, Queue      | Displays context help information. |
| ++  | Call             | Shows additional details.          |
| +   | Call             | Expands to reveal next level.      |
| –   | Call             | Collapses to hide next level.      |
| M   | Call             | Displays load module information.  |
| P   | Call             | Displays source program mapping.   |

### on headings

| Cmd | When Applied To Heading | Action                             |
|-----|-------------------------|------------------------------------|
| ?   | Seqno                   | Displays context help information. |
| +   | Seqno                   | Expands to reveal all entries.     |
| –   | Seqno                   | Collapses to hide next level.      |
| SV  | Seqno                   | Sorts by Call Time.                |

| Cmd | When Applied To Heading | Action                        |
|-----|-------------------------|-------------------------------|
| SD  | Seqno                   | Sorts by Svc Time (Duration). |

## Detail window

To display a popup window that contains additional information, press the plus sign (+) twice or **Enter** on any MQ Call detail line. For example, if you press the plus sign (+) twice, the following detail window appears:

```
+-----+
| Q11 - DETAIL Window (0097/IMSDMPP5) |
+-----+-----+-----+-----+
| 00012 Get MQICS02+525A 112 6:51:00.94 0.00168 0.00072 |
+-----+-----+-----+-----+
| MQ Call Information |
| Call Time 16:51:00.94 Service time 0.00168 |
| Call type Get CPU time 0.00072 |
| Location DFSSAM02 in MQICS02 Offset of 0000525A |
| Completion Code 0 Reason Code 0 |
| Message Type Datagram Message Size 112 |
| Priority 0 Persistent No |
| Object Type Queue |
| Call Options Browse |
| Object Name SYSTEM.DEFAULT.LOCAL.QUEUE |
| MQ Server Information |
| Queue Manager CSQ7 Version 07.1.0 |
+-----+-----+-----+-----+
```

## Q12 - MQ+ CPU/SVC Time by Queue

### Usage

Use this report to see an analysis of how much time MQ calls that are intercepted during the observation session use. The analysis is arranged by queue manager. To use the Q12 report, you must activate MQ+ option during the measurement. The MQ+ option records exact CPU and service times for MQ calls. To see a further breakdown by MQ call, expand a Queue Manager report line.

### Quantification

Each report line shows the following information for each MQ call.

- Number of MQ calls
- Total CPU time
- Mean CPU time
- Total service time
- Mean service time

The CPU time applies to the region being measured only. MQ executes in multiple address spaces and CPU might also be consumed in other MQ regions.

To display the percent that is used in place of the mean fields, use the setup option.

## Detail Line Hierarchy

An unexpanded report shows a line for each unique MQ Queue Manager and Queue. To reveal an additional hierarchical level of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 MQ Queue Manager and Queue
Level 2 MQ Call
...
```

## Detail Line Descriptions

### MQ queue manager detail line

MQ queue manager detail line is the first-level detail line. The MQ queue manager detail line shows the MQ queue manager summary.

| Under Heading   | This is Displayed                                                                                                           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Name            | The name of the queue manager                                                                                               |
| Description     | The queue name                                                                                                              |
| Nbr of Calls    | The number of MQ calls that are counted for this queue. Large numbers are expressed in thousands with a K suffix.           |
| CPU Time: Total | The total CPU time in seconds for all MQ calls for this queue. Large numbers are expressed in thousands with an M suffix.   |
| CPU Time: Mean  | The mean CPU time in seconds per MQ call for this queue. Large numbers are expressed in thousands with an M suffix.         |
| CPU Time: Pct   | The percent of total CPU time for MQ calls for this queue. Large numbers are expressed in thousands with an M suffix.       |
| Svc Time: Total | The total service time in seconds for all MQ calls for this queue. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds per MQ call for this queue. Large numbers are expressed in minutes with an M suffix.       |
| Svc Time: Pct   | The percent of total service time for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.     |

### MQ Call detail line

MQ Call detail line is the second-level detail line. The MQ Call detail line is displayed directly under the MQ queue manager detail line. The MQ Call detail line quantifies the CPU and service time for each MQ call.

| Under Heading   | This is Displayed                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------|
| Name            | The MQ call type                                                                                         |
| Description     | The CSECT name and offset where the call originated                                                      |
| Nbr of Calls    | The number of MQ calls counted. Large numbers are expressed in thousands with a K suffix.                |
| CPU Time: Total | The total CPU time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix. |
| CPU Time: Mean  | The mean CPU time in seconds per MQ call. Large numbers are expressed in minutes with an M suffix.       |

| Under Heading   | This is Displayed                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------|
| CPU Time: Pct   | The percent of total CPU time for this MQ call. Large numbers are expressed in minutes with an M suffix.     |
| Svc Time: Total | The total service time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds per MQ call. Large numbers are expressed in minutes with an M suffix.       |
| Svc Time: Pct   | The percent of total service time for this MQ call. Large numbers are expressed in minutes with an M suffix. |

## Sample reports

A sample report is shown as follows. The queue manager is expanded to the second level MQ call.

```

Q12: MQ+ CPU/SVC Time by Queue (0098/CICS42A) Row 00001 of 00008

Name Description Nbr of --CPU Time-- --Svc Time--
 Calls Total Mean Total Mean
CSQ7 CSQ7.DEFXMIT.QUEUE 1,189 0.96 0.00081 1.91 0.00161
→Put CSQ4CVK1+4FC2 393 0.36 0.00092 0.64 0.00163
→Get MQSAMP1+3C4C 400 0.37 0.00092 0.64 0.00160
→Open MQSAMP1+3AB8 200 0.13 0.00065 0.48 0.00241
→Open CSQ4CVK1+4EDA 196 0.10 0.00053 0.14 0.00075
CSQ7 CSQ7.DEFXMIT.QUEUE 397 0.09 0.00025 0.14 0.00035
→Close CSQ4CVK1+5176 197 0.04 0.00023 0.06 0.00035
→Close MQSAMP1+401A 200 0.05 0.00026 0.07 0.00036
```

## Line Commands

The following table summarizes the line commands available in this report, and the objects and headings to which they apply. To open a menu of line commands available for any input fields, enter a forward slash (/) on the field.

### on objects

| Cmd | When Applied To: | Action                             |
|-----|------------------|------------------------------------|
| ?   | Queue, Call      | Displays context help information. |
| ++  | Queue, Call      | Shows additional details.          |
| +   | Queue            | Expands to reveal next level.      |
| –   | Queue            | Collapses to hide next level.      |
| M   | Call             | Displays load module information.  |
| P   | Call             | Displays source program mapping.   |

### on headings

| Cmd | When Applied To Heading | Action                             |
|-----|-------------------------|------------------------------------|
| ?   | Name                    | Displays context help information. |
| +   | Name                    | Expands to reveal all entries.     |

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| –   | Name                    | Collapses to hide next level.       |
| SV  | Name                    | Sorts by Call Time.                 |
| SD  | Name                    | Sorts by Total Svc Time (Duration). |

## Detail window

To open a window that contains additional information, press the plus sign (+) twice or **Enter**. A sample detail window for a queue is shown as follows:

```

+-----+
| Q12 - DETAIL Window (0098/CICS42A) |
+-----+
| +----- The following report line was selected -----+ |
| | CSQ7 CSQ7.DEFXMIT.QUEUE 1,189 0.96 0.00081 1.91 0.00161 | |
| +-----+ |
| Queue Identification |
Queue Manager	CSQ7
Object Name	CSQ7.DEFXMIT.QUEUE
Number of MQ Calls	1,189
Total CPU Time	(seconds) 0.96875
Mean CPU per Call	(seconds) 0.00081
Total Service Time	(seconds) 1.91547
Mean Time per Call	(seconds) 0.00161
0.00161	
+-----+

```

## SETUP options

Enter the **SETUP** primary command to select options for this report. The following option is available:

### Display Percent used in place of Mean fields.

When selected, this option displays the percent of total CPU and total service time used by the MQ calls, rather than the mean time.

## Q13 - MQ+ CPU/SVC Time by Request

### Usage

Use Q13 report to see an analysis of how much time the MQs that are intercepted use during the observation session. The analysis is arranged by MQ call. To use Q13 report, you must activate the MQ+ option during the measurement. The MQ+ option records exact CPU and service times for MQ calls. To see a further breakdown by queue, expand an MQ call report line.

### Quantification

Each report line shows the following information for each MQ call:

- Number of MQ calls
- Total CPU time
- Mean CPU time
- Total service time
- Mean service time

The CPU time applies to the region being measured only. MQ executes in multiple address spaces and CPU might also be consumed in other MQ regions.

To display the percent used in place of the mean fields, use a setup option.

## Detail Line Hierarchy

An unexpanded report shows a line for each unique MQ call. To reveal an additional hierarchical level of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 MQ Call
Level 2 MQ Queue Manager and Queue
...
```

## Detail Line Descriptions

### MQ Call detail line

MQ Call detail line is the first-level detail line. The MQ Call detail line quantifies the CPU and service time for each MQ call.

| Under Heading   | This is Displayed                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------|
| Name            | The MQ call type                                                                                             |
| Description     | The CSECT name and offset where the call originated                                                          |
| Nbr of Calls    | The number of MQ calls counted. Large numbers are expressed in thousands with a K suffix.                    |
| CPU Time: Total | The total CPU time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix.     |
| CPU Time: Mean  | The mean CPU time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix.      |
| CPU Time: Pct   | The percent of total CPU time for this MQ call. Large numbers are expressed in minutes with an M suffix.     |
| Svc Time: Total | The total service time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix.  |
| Svc Time: Pct   | The percent of total service time for this MQ call. Large numbers are expressed in minutes with an M suffix. |

### MQ queue manager detail line

MQ queue manager detail line is the second-level detail line. The MQ queue manager detail line shows the MQ queue manager and queue that is used by the call.

| Under Heading | This is Displayed                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------|
| Name          | The queue manager name                                                                                   |
| Description   | The queue name                                                                                           |
| Nbr of Calls  | The number of MQ calls counted for this queue. Large numbers are expressed in thousands with a K suffix. |

| Under Heading   | This is Displayed                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Total | The total CPU time in seconds for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.     |
| CPU Time: Mean  | The mean CPU time in seconds for MQ call for this queue. Large numbers are expressed in minutes with an M suffix.       |
| CPU Time: Pct   | The percent of total CPU time for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.     |
| Svc Time: Total | The total service time in seconds for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds for MQ call for this queue. Large numbers are expressed in minutes with an M suffix.   |
| Svc Time: Pct   | The percent of total service time for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix. |

## Sample reports

A sample report is shown as follows. The MQ call is expanded to the second level (queue manager and queue).

```

Q13: MQ+ CPU/SVC Time by Request (0098/CICS42A) Row 00001 of 00012

Name Description Nbr of --CPU Time-- --Svc Time--
 Calls Total Pct Total Pct
Put CSQ4CVK1+4FA2 393 0.36 34.11 0.64 31.33
→CSQ7 CSQ7.DEFXXMIT.QUEUE 393 0.36 34.11 0.64 31.33
Get MQSAMP1+3C2C 400 0.37 34.91 0.64 31.35
→CSQ7 CSQ7.DEFXXMIT.QUEUE 400 0.37 34.91 0.64 31.35
Open MQSAMP1+3A98 200 0.13 12.38 0.48 23.54
→CSQ7 CSQ7.DEFXXMIT.QUEUE 200 0.13 12.38 0.48 23.54
Open CSQ4CVK1+4EBA 196 0.10 9.98 0.14 7.20
→CSQ7 CSQ7.DEFXXMIT.QUEUE 196 0.10 9.98 0.14 7.20
Close CSQ4CVK1+5156 197 0.04 4.42 0.06 3.37
→CSQ7 No Object Name 197 0.04 4.42 0.06 3.37
Close MQSAMP1+3FFA 200 0.05 4.99 0.07 3.58
→CSQ7 No Object Name 200 0.05 4.99 0.07 3.58
```

## Line Commands

The following table summarizes the line commands available in this report, and the objects and headings to which they apply. To open a menu of line commands available for any input fields, enter a forward slash (/) on the field.

### on objects

| Cmd | When Applied To: | Action                             |
|-----|------------------|------------------------------------|
| ?   | Call, Queue      | Displays context help information. |
| ++  | Call, Queue      | Shows additional details.          |
| +   | Call             | Expands to reveal next level.      |
| -   | Call             | Collapses to hide next level.      |
| M   | Call             | Displays load module information.  |



| Cmd | When Applied To: | Action                           |
|-----|------------------|----------------------------------|
| P   | Call             | Displays source program mapping. |

## on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Name                    | Displays context help information.  |
| +   | Name                    | Expands to reveal all entries.      |
| -   | Name                    | Collapses to hide next level.       |
| SV  | Name                    | Sorts by Total CPU Time.            |
| SD  | Name                    | Sorts by Total Svc Time (Duration). |

## Detail window

To open a window that contains additional information, press the plus sign (+) twice or **Enter**. A sample detail window for a queue is shown as follows:

```
+-----+
Q13 - DETAIL Window (0098/CICS42A)
+-----+
+-----+-----+-----+-----+-----+-----+-----+
| Put CSQ4CVK1+4FA2 393 0.36 34.11 0.64 31.33|
+-----+-----+-----+-----+-----+-----+-----+

Request Identification
Location CSQ4CVK1+4FA2
Number of MQ Calls 393
Total CPU Time (seconds) 0.36164
Percent CPU Time 34.11
Total Service Time (seconds) 0.64235
Percent Service Time 31.33
+-----+-----+-----+-----+-----+-----+-----+
```

## SETUP options

Enter the **SETUP** primary command to select options for this report. The following option is available:

### Display Percent used in place of Mean fields.

When selected, this option displays the percent of total CPU and total service time used by the MQ calls, rather than the mean time.

## Q14 - MQ+ CPU/SVC Time by Txn

### Usage

Use the Q14 report to see an analysis of how much time MQ calls that are intercepted during the observation session use. The analysis is arranged by CICS or IMS transaction. The Q14 report applies to CICS and IMS observations only. Before you use the Q14 report, you must activate the MQ+ option during the measurement. The MQ+ option records exact CPU and service times for MQ calls. To see a further breakdown by queue, expand an MQ call report line.

## Quantification

Each report line shows the following information for each MQ call.

- Number of MQ calls
- Total CPU time
- Mean CPU time
- Total service time
- Total service time

The CPU time applies to the region being measured only. MQ executes in multiple address spaces and CPU might also be consumed in other MQ regions.

To display the percent that is used in place of the mean fields, use a setup option.

## Detail Line Hierarchy

An unexpanded report shows a line for each unique MQ call. To reveal an additional hierarchical level of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 Transaction Name and Description
Level 2 MQ Queue Manager and Queue
Level 3 MQ Call
...
```

## Detail Line Descriptions

### Transaction detail line

Transaction detail line is the first-level detail line. The transaction detail line shows the transaction that issues the MQ call.

| Under Heading   | This is Displayed                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Name            | The CICS or IMS transaction ID.                                                                                                   |
| Description     | The transaction description if available.                                                                                         |
| Nbr of Calls    | The number of MQ calls counted for this transaction. Large numbers are expressed in thousands with a K suffix.                    |
| CPU Time: Total | The total CPU time in seconds for all MQ calls for this transaction. Large numbers are expressed in minutes with an M suffix.     |
| CPU Time: Mean  | The mean CPU time in seconds per MQ call for this transaction. Large numbers are expressed in minutes with an M suffix.           |
| CPU Time: Pct   | The percent of total CPU time for MQ calls for this transaction. Large numbers are expressed in minutes with an M suffix.         |
| Svc Time: Total | The total service time in seconds for all MQ calls for this transaction. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds per MQ call for this transaction. Large numbers are expressed in minutes with an M suffix.       |
| Svc Time: Pct   | The percent of total service time for MQ calls for this transaction. Large numbers are expressed in minutes with an M suffix.     |

## MQ queue manager detail line

MQ queue manager detail line is the second-level detail line. The MQ queue manager detail line shows the MQ queue manager and queue that is used by the call.

| Under Heading   | This is Displayed                                                                                                           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Name            | The queue manager name                                                                                                      |
| Description     | The queue name                                                                                                              |
| Nbr of Calls    | The number of MQ calls counted for this queue. Large numbers are expressed in thousands with a K suffix.                    |
| CPU Time: Total | The total CPU time in seconds for all MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.     |
| CPU Time: Mean  | The mean CPU time in seconds per MQ call for this queue. Large numbers are expressed in minutes with an M suffix.           |
| CPU Time: Pct   | The percent of total CPU time for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.         |
| Svc Time: Total | The total service time in seconds for all MQ calls for this queue. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds per MQ call for this queue. Large numbers are expressed in minutes with an M suffix.       |
| Svc Time: Pct   | The percent of total service time for MQ calls for this queue. Large numbers are expressed in minutes with an M suffix.     |

## MQ Call detail line

MQ Call detail line is the third-level detail line. The MQ Call detail line quantifies the CPU and service time for each MQ call.

| Under Heading   | This is Displayed                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------|
| Name            | The MQ call type                                                                                             |
| Description     | The CSECT name and offset where the call originated                                                          |
| Nbr of Calls    | The number of MQ calls counted. Large numbers are expressed in thousands with a K suffix.                    |
| CPU Time: Total | The total CPU time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix.     |
| CPU Time: Mean  | The mean CPU time in seconds per MQ call. Large numbers are expressed in minutes with an M suffix.           |
| CPU Time: Pct   | The percent of total CPU time for this MQ call. Large numbers are expressed in minutes with an M suffix.     |
| Svc Time: Total | The total service time in seconds for this MQ call. Large numbers are expressed in minutes with an M suffix. |
| Svc Time: Mean  | The mean service time in seconds per MQ call. Large numbers are expressed in minutes with an M suffix.       |
| Svc Time: Pct   | The percent of total service time for this MQ call. Large numbers are expressed in minutes with an M suffix. |

# Sample reports

A sample report that is expanded two levels is shown as follows:

| Q14: MQ+ CPU/SVC Time by Txn (0098/CICS42A) |                    |              |              | Row 00001 of 00006 |              |         |
|---------------------------------------------|--------------------|--------------|--------------|--------------------|--------------|---------|
| Name                                        | Description        | Nbr of Calls | --CPU Time-- |                    | --Svc Time-- |         |
|                                             |                    |              | Total        | Mean               | Total        | Mean    |
| MQS1                                        |                    | 800          | 0.55         | 0.00069            | 1.19         | 0.00149 |
| →CSQ7                                       | CSQ7.DEFXMIT.QUEUE | 600          | 0.50         | 0.00083            | 1.12         | 0.00187 |
| →CSQ7                                       | No Object Name     | 200          | 0.05         | 0.00026            | 0.07         | 0.00036 |
| MQDR                                        |                    | 786          | 0.51         | 0.00065            | 0.85         | 0.00109 |
| →CSQ7                                       | CSQ7.DEFXMIT.QUEUE | 589          | 0.46         | 0.00079            | 0.79         | 0.00134 |
| →CSQ7                                       | No Object Name     | 197          | 0.04         | 0.00023            | 0.06         | 0.00035 |

# Line Commands

The following table summarizes the line commands available in this report, and the objects and headings to which they apply. To open a menu of line commands available for any input fields, enter a forward slash (/) on the field.

## on objects

| Cmd | When Applied To:         | Action                            |
|-----|--------------------------|-----------------------------------|
| ?   | Transaction, Queue, Call | Displays context help information |
| ++  | Transaction, Queue, Call | Shows additional details.         |
| +   | Transaction, Queue       | Expands to reveal next level.     |
| –   | Transaction, Queue       | Collapses to hide next level.     |
| M   | Call                     | Displays load module information. |
| P   | Call                     | Displays source program mapping.  |

## on headings

| Cmd | When Applied To Heading | Action                             |
|-----|-------------------------|------------------------------------|
| ?   | Name                    | Displays context help information. |
| +   | Name                    | Expands to reveal all entries.     |
| –   | Name                    | Collapses to hide next level.      |
| SV  | Name                    | Sorts by Total CPU Time.           |
| SV  | Name                    | Sorts by Total CPU Time.           |

# Detail window

To open a window that contains additional information, press the plus sign (+) twice or **Enter**. A sample detail window for a transaction is shown as follows:

```

Q14 - DETAIL Window (0098/CICS42A)

+----- The following report line was selected -----+
| MQS1 800 0.55 52.28 1.19 58.48|
+-----+

Transaction Identification
Transaction Name MQS1
Number of MQ Calls 800
Total CPU Time (seconds) 0.55419
Percent CPU Time 52.28
Total Service Time (seconds) 1.19887
Percent Service Time 58.48

```

## SETUP options

Enter the **SETUP** primary command to select options for this report. The following option is available:

**Display Percent used in place of Mean fields.**

When selected, this option displays the percent of total CPU and total service time used by the MQ calls, rather than the mean time.



## Chapter 8. Java/USS/HFS performance analysis reports

This section describes the Java performance analysis reports.

| For information about ...          | See ...                                                            |
|------------------------------------|--------------------------------------------------------------------|
| The Java data extractor            | <a href="#">“Overview of Java data extractor ” on page 456</a>     |
| J01 Java summary and attributes    | <a href="#">“J01 - Java summary and attributes” on page 458</a>    |
| J02 Java heap usage timeline       | <a href="#">“J02 - Java heap usage timeline” on page 459</a>       |
| J03 Java CPU usage by thread       | <a href="#">“J03 - Java CPU usage by thread” on page 461</a>       |
| J04 Java CPU usage by package      | <a href="#">“J04 - Java CPU usage by package” on page 463</a>      |
| J05 Java CPU usage by class        | <a href="#">“J05 - Java CPU usage by class” on page 466</a>        |
| J06 Java CPU usage by method       | <a href="#">“J06 - Java CPU usage by method” on page 468</a>       |
| J07 Java CPU usage by call path    | <a href="#">“J07 - Java CPU usage by call path” on page 471</a>    |
| J09 Java service time by package   | <a href="#">“J09 - Java service time by package” on page 474</a>   |
| J10 Java service time by class     | <a href="#">“J10 - Java service time by class” on page 477</a>     |
| J11 Java service time by method    | <a href="#">“J11 - Java service time by method” on page 480</a>    |
| J12 java service time by call path | <a href="#">“J12 - Java service time by call path” on page 483</a> |
| J14 Java wait time by package      | <a href="#">“J14 - Java wait time by package” on page 485</a>      |
| J15 Java wait time by class        | <a href="#">“J15 - Java wait time by class” on page 488</a>        |
| J16 Java wait time by method       | <a href="#">“J16 - Java wait time by method” on page 491</a>       |
| J17 Java wait time by call path    | <a href="#">“J17 - Java wait time by call path” on page 494</a>    |
| H01 HFS Service Time by Path Name  | <a href="#">“H01 - HFS Service Time by Path Name” on page 501</a>  |
| H02 HFS Service Time by Device     | <a href="#">“H02 - HFS Service Time by Device” on page 503</a>     |
| H03 HFS File Activity              | <a href="#">“H03 - HFS File Activity” on page 506</a>              |
| H04 HFS File Attributes            | <a href="#">“H04 - HFS File Attributes” on page 508</a>            |
| H05 HFS Device Activity            | <a href="#">“H05 - HFS Device Activity” on page 509</a>            |
| H06 HFS Device Attributes          | <a href="#">“H06 - HFS Device Attributes” on page 511</a>          |
| H07 HFS Activity Timeline          | <a href="#">“H07 - HFS Activity Timeline” on page 512</a>          |
| H08 HFS Wait Time by Path Name     | <a href="#">“H08 - HFS Wait Time by Path Name” on page 514</a>     |
| H09 HFS Wait Time by Device        | <a href="#">“H09- HFS Wait Time by Device” on page 516</a>         |
| H10 HFS Service Time by Request    | <a href="#">“H10- HFS Service Time by Request” on page 519</a>     |
| H11 HFS Wait Time by Request       | <a href="#">“H11- HFS Wait Time by Request” on page 521</a>        |

## Overview of Java data extractor

---

In order to use the Java Performance Analysis Reports, the Java data extractor must be turned on when the Observation Request is entered. You must select the Java data extractor in the Schedule New Measurement panel.

The Java data extractor collects Java call stack information for each Java application thread. The call stack information identifies the methods in the call chain. Information about each method includes the package (if any), class, method and signature (parameter types and return type), and the source line number being executed (if available).

## Considerations for Java

---

Before Java programs can be sampled, the J9VM support in Application Performance Analyzer must be enabled. Contact your systems programmer to verify whether this support is enabled.

Measuring a Java application requires loading a JVMTI agent to obtain Java samples. The JVMTI agent is loaded when the target Java job is started. The agent remains alive until the Java job terminates. The agent sits in a wait state until a sampling session is requested. After the sampling session completes, the agent returns to a wait state.

Only one observation at a time is supported for a specific Java address space.

IMS Java programs are supported in Java Message Processing (JMP) and Java Batch Processing (JBP) regions.

CICS Java programs are supported.

Application Performance Analyzer will stop sampling Java programs when the main thread ends, even if the specified number of samples has not been reached.

Java measurement reports are unrelated to CPU Usage Analysis and CPU Wait Analysis reports, since Java samples are extracted by running a JVMTI agent asynchronously with CPU samples.

Java calls that are observed with a native method at the top of the call stack are only included in the Service Time reports. This is because the J9VM does not know whether the native method is executing, waiting, or queued for execution.

Java native methods are identified in the method detail pop-up window of Java Service Time reports.

## Using the JVMTI agent

---

You must specify the JVMTI agent in a runtime parameter of the target Java job. The agent is loaded using the Java `-agentpath:` runtime parameter. Specify the full path name of either the 31-bit JVMTI agent (`libCAZJTA11.so`) or the 64-bit JVMTI agent (`libCAZJTA14.so`) depending on whether your target Java job is 31-bit or 64-bit.

The format of the `-agentpath` runtime parameter is:

`-agentpath:/dir/agent=stcid,n`

where:

***dir***

The path to the Application Performance Analyzer JVMTI agent.

***agent***

The name of the Application Performance Analyzer JVMTI agent you are loading. Use `libCAZJTA11.so` for 31-bit. Use `libCAZJTA14.so` for 64-bit.

***stcid***

The Application Performance Analyzer started task id. This is needed only when you have more than one Application Performance Analyzer started task operating on your system.



**n**

The number of minutes to wait for the Application Performance Analyzer started task to become active.

An example of how to specify a 64-bit JVMTI agent in JCL that uses BPXBATCH to run the Java program *prog* follows. The example assumes that the USS components of Application Performance Analyzer have been installed in a directory named **/usr/lpp/apa/v14r2**, and that there is only one Application Performance Analyzer started task in the system.

```
//STEP EXEC PGM=BPXBATCH,
//PARM='sh java -agentpath:/usr/lpp/apa/v14r2/libCAZJTA14.so prog'
```

If there is more than one Application Performance Analyzer started task in the system, the **-agentpath:** runtime parameter can specify the system id of the started task. The following example shows how to specify that the JVMTI agent is to be loaded for the started task with a system id of CAZ1.

```
//STEP EXEC PGM=BPXBATCH,
//PARM='sh java -agentpath:/usr/lpp/apa/v14r2/libCAZJTA14.so=CAZ1 prog'
```

The JVMTI agent must locate the Application Performance Analyzer started task. By default, it will timeout after 1 minute if the started task is not found. This time limit can be overridden. The example that follows shows how to specify a time limit of 9 minutes.

```
//STEP EXEC PGM=BPXBATCH,
//PARM='sh java -agentpath:/usr/lpp/apa/v14r2/libCAZJTA14.so=CAZ1,9 prog'
```

## USS multiple address space measurements

Spawned address spaces and substeps might be generated when measuring USS. Application Performance Analyzer will measure these additional address spaces if you specify a value in the USS observations field in the Schedule New Measurement panel.

When you use this feature, a USS master record will be displayed above all the associated measurements. The master record has a status of **USS**.

An example is shown here:

File View Navigate Help

R02: IBM APA for z/OS Observation List (ZRAY)

Row 00001 of 00221

Command ==>

Scroll ==> CSR

| ReqNum  | Owned By | Description      | Job Name | Date/Time    | Samples | Status |
|---------|----------|------------------|----------|--------------|---------|--------|
| 02385 + | USER1    | USS TEST#1       | ARAUTEE  | Apr-18 19:56 | 2,500   | USS    |
| → 02386 |          | BPXBATCH RUN     |          | Apr-18 19:56 | 10      | Ended  |
| → 02387 |          | BPXPRECP *OMVSEX |          | Apr-18 19:56 | 7       | Ended  |
| → 02388 |          | BPXPRECP *OMVSEX | *Java*   | Apr-18 19:57 | 2,500   | Ended  |
| → 02389 |          | BPXPRFC STEP1    |          | Apr-18 19:56 | 29      | Ended  |
| → 02390 |          | BPXPRFC STEP1    |          | Apr-18 19:57 | 2,500   | Ended  |
| → 02391 |          | BPXPRFC STEP1    |          | Apr-18 19:57 | 2,500   | Ended  |
| → 02392 |          | BPXPRFC STEP1    | *Java*   | Apr-18 19:57 | 2,500   | Ended  |
| → 02393 |          | BPXPRFC STEP1    | *Java*   | Apr-18 19:57 | 2,500   | Ended  |

You can expand the USS master record by entering a “+” on the sequence number. The additional measurements in the expanded record include the original measurement (the initiating step) and any spawned address spaces or substeps.

The description field in the subordinate measurements under the USS master record is populated with the program name and step name. For spawned address spaces, this would normally be BPXPRFC STEP1. For substeps, this would normally be BPXPRECP \*OMVSEX.

If Java is detected in a step, then \*Java\* is placed in the description to the right of the program and step name.

If the step is run from the USS shell, and a Java command string is available, then the Java command string will be placed in the description instead of the information described above.

## J01 - Java summary and attributes

---

### Usage

This report displays general information about the observed Java environment. There are four sections:

- Java Virtual Machines
- Java Packages
- Java Classes
- Java Methods

### Java Virtual Machines

This section identifies Java Virtual Machines (JVMs) observed during the measurement session.

### Java packages

This section lists each of the Java packages in which activity was observed during the measurement session. Each package is assigned a unique sequence number, which is cross referenced in other reports.

### Java classes

This section lists each of the Java classes in which activity was observed during the measurement session. Each class is assigned a unique sequence number, which is cross referenced in other reports.

### Java methods

This section lists each of the Java methods in which activity was observed during the measurement session. Each method is assigned a unique sequence number, which is cross referenced in other reports.

### Warnings and errors

In some circumstances Application Performance Analyzer will be unable to produce complete Java reports when the Java data extractor is turned on during measurement. In this case, a 'Warnings and Errors' section will be displayed in J01 with a message indicating the problem. Please refer to the Application Performance Analyzer *Messages Guide* for specific details of the problem.

### Sample reports

A sample report is shown here.

```

File View Navigate Help

J01: Java Summary/Attributes (8551/JVMTST01) Row 00001 of 00082
Command ==> _____ Scroll ==> CSR

Observed Java Virtual Machines (JVMs)

JVmId Identifier Heap Max Description
00001 18754508 1M 67 J2RE 1.4.2 IBM z/OS Persistent Reusable VM
build cm142-20060824 (SR6)

Observed Java Packages

PkgId Package Name
00001 java/util/zip
00002 java/lang
00003 java/util/jar
00004 sun/misc
00005 java/security
00006 java/net
00007 java/io
00008 com/ibm/jvm/io

Observed Java Classes

ClsId PkgId Class Name
00001 00002 Object
00002 00001 ZipFile
00003 00003 JarFile
00004 00004 URLClassPath$Loader
00005 00004 URLClassPath$JarLoader
00006 00004 URLClassPath$3

Observed Java Methods

MthId ClsId Method Name
00001 00002 open
00002 00002 <init>
00003 00003 <init>
00004 00003 <init>
00005 00005 getJarFile
00006 00005 <init>
00007 00006 run
00008 00007 doPrivileged1

```

## J02 - Java heap usage timeline

### Overview

This timeline analysis report breaks the observation session duration into a number of (approximately) fixed-length, chronological time intervals. Each line represents one of these intervals. By default, 15 intervals are reported, each representing approximately the same number of samples. This illustrates any progressive resource usage trends. The values under the heading Storage quantify the amount of heap storage allocated by the JVM during the interval.

A SETUP option is available from which you can specify the number of intervals and whether to include total heap storage in the report. Heap storage used is presented in green, and the additional storage to make up the total is presented in white.

### Detail line descriptions

Each line represents reports values under the following headings:

- SEQN
- Storage
- Total

## SEQN

This is the sequence number of the interval. Intervals are numbered 0001, 0002, etc.

## Storage

This is the amount of heap storage in use by the Java application. This is an effective measurement of the Java application's demand on central storage. The value is expressed in units of kilobytes (1024 bytes) or megabytes (1048576 bytes). Each line shows the maximum value observed during the particular interval.

## Total

This is the amount of heap storage allocated to the Java application. This is an effective measurement of the Java application's demand on central storage. The value is expressed in units of kilobytes (1024 bytes) or megabytes (1048576 bytes). Each line shows the maximum value observed during the particular interval.

## Sample reports

A sample report is shown here. It reports on heap usage (green) and heap total (white).

```
File View Navigate Help

J02: Java Heap Usage Timeline (0116/JVMTST01) Row 00001 of 00047
Command ==> Scroll ==> CSR

SEQN Storage Total <---1140K-----2140K-->
 ...+...+...+...+...+...+...+...+...+...
0001 1615K 2048K =====
0002 1243K 2048K =====
0003 1243K 2048K =====
0004 1243K 2048K =====
0005 1243K 2048K =====
0006 1243K 2048K =====
0007 1243K 2048K =====
0008 1243K 2048K =====
0009 1243K 2048K =====
0010 1341K 2048K =====
0011 1351K 2048K =====
0012 1352K 2048K =====
0013 1352K 2048K =====
0014 1352K 2048K =====
0015 1352K 2048K =====
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | SEQN                   | Display context help information. |
| ++  | SEQN                   | Show additional details.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a popup window containing additional information.

For example, entering “++” on a sequence number will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
+ 0001 1615K 2048K -----+
+-----+

Information about sampled interval

Interval Number 1
Nbr of Samples 20
Heap Used 1615K
Heap Total 2048K

```

## SETUP options

Enter the SETUP primary command to select options for this report. The following popup will be displayed:

```

File View Navigate Help
+-----+
Options for Memory Usage Timeline
+-----+
Number of Intervals 15
This is the number of equal time intervals within
the duration of the measurement that are to be
reported. Each report line will show measurement
information for one interval.

/ Report on Heap usage and Heap total, unselect
to report on Heap usage only.
+-----+
001 of 00015
====> CSR

```

### Number of Intervals

Use this option to change the number of equal time intervals that are reported.

### Report on Heap usage and total

Select this option to include total heap storage in the report. Heap usage is displayed in green and total heap storage is displayed in white.

## J03 - Java CPU usage by thread

### Usage

Use this report to see how CPU time was consumed by execution of Java programs for each Java thread. The report shows one line for each Java thread. When the JVM reuses a z/OS Task Control Block (TCB), the individual CPU times for the threads cannot be obtained. In this case, the thread name is preceded by a number in parentheses. All threads that have reused a particular TCB will have the same number and the percentage used will indicate the total of all threads using the same TCB.

### Quantification

Each report line quantifies time measured as a percentage of total time. The percentage represents the ratio of the CPU time in the indicated Java thread to the total CPU time consumed during the sampling period.

### Detail line descriptions

## Java Thread detail line

This report shows one detail line for each unique Java thread.

| Under Heading   | This is Displayed                                                                            |
|-----------------|----------------------------------------------------------------------------------------------|
| JavaID          | The unique sequence number assigned to this Java thread.                                     |
| Thread Name     | The name of the thread.                                                                      |
| Percent of Time | The percentage of CPU used by this thread out of the total used during the sampling period.. |

## Sample reports

A sample report is shown here. The (1) before the Thread Name indicates that these threads reused the same TCB.

```
File View Navigate Help

J03: Java CPU Usage by Thread (0116/JVMTST01) Row 00001 of 00012
Command ==> _____ Scroll ==> CSR

JavaID Thread Name Percent of CPU Time * 10.00%
 *...1...2...3...4...5...6...7...
0003 (1)Attachment 2305 18.72 =====
0002 (1)Alpha 18.72 =====
0001 main 18.56 =====

Note: Items in parentheses indicate a thread that reused a TCB
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | JavaId                 | Display context help information. |
| ++  | JavaId                 | Show additional details.          |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | JavaId                 | Display context help information. |
| SV  | JavaId                 | Sort next level by value.         |
| SN  | JavaId                 | Sort next level by name.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a popup window containing additional information.

For example, entering “++” on a sequence number will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
+ 0003 (1)Attachment 2305 18.72 =====+
+-----+
Calculation Details
Total CPU time 24.99
Thread Name (1)Attachment 2305
Thread CPU time 4.68
Percent of total 18.72%

```

# J04 - Java CPU usage by package

## Usage

Use this report to see how CPU time was consumed by execution of Java programs in each unique package. The unexpanded report shows one or more lines for each Java package in which execution was observed.

You can further expand each line item to show classes within the package, then methods within the class, then source lines within the method.

## Quantification

Each report line quantifies time measured as a percentage of total time, the percentage represents the ratio of the number of CPU active measurements in the indicated Java object to the total number of CPU active observations.

## Detail line hierarchy

An unexpanded report shows a line for each Java Package. The name field shows a sequence number assigned to each unique Package. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 Java Package
Level 2 Java Class
Level 3 Java Method
Level 4 Java Line Number
...

```

## Detail line descriptions

### Java package detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number is assigned to each observed Java Package and is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java Package.                                                                         |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Java class detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                          |
|-----------------|--------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java class is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java class.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                          |

## Java method detail line

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java Method is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the fourth-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Pkg/Cls/Mthd    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been fully expanded to show all four levels.

```
File View Navigate Help

J04: Java CPU Usage by Package (0116/JVMTST01) Row 00001 of 00276
Command ==> _____ Scroll ==> CSR

JavaId Pkg/Cls/Mthd Percent of CPU Time * 10.00% ±3.1%
 *....1....2....3....4....5....6....7...
00002 java/lang 39.52 =====
→ 00104 StrictMath 20.05 =====
 → 00228 log 10.52 =====
 → 00000 line # unknown 10.52 =====
 → 00226 sqrt 9.53 =====
 → 00000 line # unknown 9.53 =====
→ 00029 Math 15.83 =====
 → 00219 log 10.71 =====
 → 02290 line # 2290 9.04 =====
 → 00000 line # unknown 1.67 =
 → 00227 sqrt 5.01 ==
 → 02312 line # 2312 4.12 ==
 → 00000 line # unknown 0.88
 → 00048 max 0.09
 → 02760 line # 2760 0.09
```



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object              | Action                            |
|-----|-------------------------------------|-----------------------------------|
| ?   | Package, Class, Method, line number | Display context help information. |
| ++  | Package, Class, Method, line number | Show additional details.          |
| +   | Package, Class, Method              | Expand to reveal next level.      |
| –   | Package, Class, Method              | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | JavaId, Pkg/Cls/Mthd, Percent of Time | Display context help information.  |
| +   | JavaId                                | Expand to reveal all entries.      |
| +   | Pkg/Cls/Mthd                          | Expand description field size.     |
| +   | Percent of Time                       | Zoom in scale.                     |
| –   | JavaId                                | Collapse to show only first level. |
| –   | Pkg/Cls/Mthd                          | Reduce description field size.     |
| –   | Percent of Time                       | Zoom out scale.                    |
| SV  | JavaId                                | Sort next level by value.          |
| SN  | JavaId                                | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java class will cause this detail window to appear.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| -> 00104 StrictMath 20.05 ===== |
+-----+
Calculation Details
 Application code CPU measurements 204
 Total CPU measurements 1,017
 Percent of total 20.05%

Class name:
 StrictMath

Package Name :
 Java/lang
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J05 - Java CPU usage by class

### Usage

Use this report to see how CPU time was consumed by execution of Java programs in each unique class. The unexpanded report shows one or more lines for each Java class in which execution was observed.

**Note:** The class name is implicitly qualified by the package name, which can be seen in the detail window for the class.

You can further expand each line item to show methods within the class, then source lines within the method.

### Quantification

Each report line quantifies time measured as a percentage of total time, the percentage represents the ratio of the number of CPU active measurements in the indicated Java object to the total number of CPU active observations.

### Detail line hierarchy

An unexpanded report shows a line for each Java class. The name field shows a sequence number assigned to each unique class. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

**Level 1** Java Class  
**Level 2** Java Method  
**Level 3** Java Line Number

### Detail line descriptions

#### Java class detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number is assigned to each observed Java class and is displayed in this column. |
| Class/Method    | The name of a Java class.                                                                         |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                 |

#### Java method detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Class/Method    | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Class/Method    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J05: Java CPU Usage by Class (0116/JVMTST01) Row 00001 of 00186
Command ==> _____ Scroll ==> CSR

JavaID Class/Method Percent of CPU Time* 10.00% ±3.1%
*....1....2....3....4....5....6....7...
00102 Burner 32.15 =====
→ 00220 calc 27.72 =====
→ 00221 baby 4.42 ==

00104 StrictMath 20.05 =====
→ 00228 log 10.52 =====
→ 00226 sqrt 9.53 =====

00029 Math 15.83 =====
→ 00219 log 10.71 =====
→ 00227 sqrt 5.01 ==
→ 00048 max 0.09

00019 JarFile 1.37 =
→ 00037 hasClassPathAttribute 0.98
→ 00085 getManifest 0.19
→ 00114 initializeVerifier 0.09
→ 00025 getJarEntry 0.09
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object     | Action                            |
|-----|----------------------------|-----------------------------------|
| ?   | Class, Method, line number | Display context help information. |
| ++  | Class, Method, line number | Show additional details.          |
| +   | Class, Method              | Expand to reveal next level.      |
| –   | Class, Method              | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object                | Action                            |
|-----|---------------------------------------|-----------------------------------|
| ?   | JavaID, Class/Method, Percent of Time | Display context help information. |
| +   | JavaID                                | Expand to reveal all entries.     |

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| +   | Class/Method           | Expand description field size.     |
| +   | Percent of Time        | Zoom in scale.                     |
| –   | JavaId                 | Collapse to show only first level. |
| –   | Class/Method           | Reduce description field size.     |
| –   | Percent of Time        | Zoom out scale.                    |
| SV  | JavaId                 | Sort next level by value.          |
| SN  | JavaId                 | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00104 calc 27.72 ===== |
+-----+
+-----+
Calculation Details
Application code CPU measurements 282
Total CPU measurements 1,017
Percent of total 27.72%

Method Name:
 calc

Method Descriptor:
 (I)D

Method Signature:
 calc(int) double

Class Name:
 Burner

Package Name:
 com/basamps/sample
+-----+

```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J06 - Java CPU usage by method

### Usage

Use this report to see how CPU time was consumed by execution of Java programs in each unique method. The unexpanded report shows one or more lines for each Java method in which execution was observed.

**Note:** The method name is implicitly qualified by its package and class names, which can be seen in the detail window for the method.

You can further expand each line item to show methods within the class, then source lines within the method.

## Quantification

Each report line quantifies time measured as a percentage of total time, the percentage represents the ratio of the number of CPU active measurements in the indicated Java object to the total number of CPU active observations.

## Detail line hierarchy

An unexpanded report shows a line for each Java method. The name field shows a sequence number assigned to each unique method. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Java Method
 Level 2 Java Line Number
```

## Detail line descriptions

### Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

### Java line number

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| MthId           | The line number of a Java source statement.                                                         |
| Method          | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

J06: Java CPU Usage by Method (0116/JVMST01) Row 00001 of 00186
Command ==> _____ Scroll ==> CSR

MthId Method Percent of CPU Time * 10.00% ±3.1%
 *....1....2....3....4....5....6....7...
00220 calc 27.72 =====
→ 00029 line # 29 25.46 =====
→ 00024 line # 24 1.37
→ 00036 line # 36 0.29
→ 00027 line # 27 0.19
→ 00026 line # 26 0.19
→ 00000 line # unknown 0.19

00219 log 10.71 =====
→ 02290 line # 2290 9.04 =====
→ 00000 line # unknown 1.67 =

00228 log 10.52 =====
→ 00000 line # unknown 10.52 =====

00226 sqrt 9.53 =====
→ 00000 line # unknown 9.53 =====

00227 sqrt 5.01 =====
→ 02312 line # 2312 4.12 ===
→ 00000 line # unknown 0.88

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```
File View Navigate Help
+-----+
+-----+ The following report line was selected +-----+
| -> 00220 calc 27.72 ===== |
+-----+
Calculation Details
 Application code CPU measurements 282
 Total CPU measurements 1,017
 Percent of total 27.72%

Method Name:
 calc

Method Descriptor:
 (I)D

Method Signature:
 calc(int) double

Class Name:
 Burner

Package Name:
 com/basamps/sample
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J07 - Java CPU usage by call path

### Usage

Use this report to see how CPU time was consumed by execution of Java programs in each unique call path. The unexpanded report shows one or more lines for each Java method in which execution was observed. Execution in a method is quantified and reported separately for each different call path. (A call path represents a path of control in the form: A calls B calls C calls D ... etc.)

By expanding the first-level method line you can see a line for each of the calling methods in the path of control. These are shown in reverse order of control. In the case of A calls B calls C calls D, method D (in which execution was observed) is reported in the first-level line and the second-level lines show C then B then A.

### Quantification

The first-level report line quantifies CPU time measured as a percentage of total time, the percentage represents the ratio of the number of CPU active measurements in the indicated Java object to the total number of CPU active observations.

# Detail line hierarchy

An unexpanded report shows a line for each Java method line. The name field shows a sequence number assigned to each unique method line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

**Level 1** 1 Java Method  
**Level 2** Calling Java Method Line

# Detail line descriptions

## Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the second-level detail line.

| Under Heading | This is Displayed                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------|
| MthId         | A unique sequence number assigned to each observed Java method.                                            |
| Method        | The line number of the statement that invoked the next method in the call path and the name of the method. |

# Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J07: Java CPU Usage by Call Path (0116/JVMTST01) Row 00001 of 01831
Command ==> _____ Scroll ==> CSR

MthId Method Percent of CPU Time * 10.00% ±3.1%
 *....1....2....3....4....5....6....7...
00220 calc 25.36 =====
→ 00221 line 16 baby
→ 00218 line 25 main

00228 log 10.42 =====
→ 00219 line 2290 log
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main

00226 sqrt 9.43 =====
→ 00227 line 2312 sqrt
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main

00219 log 8.94 =====
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main
```



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00220 calc 27.72 ===== |
+-----+
+-----+
Calculation Details
Application code CPU measurements 282
Total CPU measurements 1,017
Percent of total 27.72%

Method Name:
calc

Method Descriptor:
(I)D

Method Signature:
calc(int) double

Class Name:
Burner

Package Name:
com/basamps/sample
+-----+

```

## J09 - Java service time by package

### Usage

Use this report to see how service time was consumed by execution of Java programs in each unique package. The unexpanded report shows one or more lines for each Java package in which execution was observed.

You can further expand each line item to show classes within the package, then methods within the class, then source lines within the method.

### Quantification

Each report line quantifies service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (package, class, method or line) was in flight to the total number of samples. An observation is counted as execution regardless of the CPU state (active, WAIT, or queued).

### Detail line hierarchy

An unexpanded report shows a line for each Java method line. The name field shows a sequence number assigned to each unique method line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 Java Package
 Level 2 Java Class
 Level 3 Java Method
 Level 4 Java Line Number

```

### Detail line descriptions

#### Java package detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java package and is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java package.                                                                      |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                |

## Java class detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                          |
|-----------------|--------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java class is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java class.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                          |

## Java method detail line

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the fourth-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Pkg/Cls/Mthd    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

J09: Java Service Time by Package (0116/JVMTST01) Row 00001 of 01831
Command ==> _____ Scroll ==> CSR

JavaId Pkg/Cls/Mthd Percent of Time * 10.00% ±2.4%
 *....1....2....3....4....5....6....7...
00002 java/lang 33.01 =====
→ 00104 StrictMath 16.50 =====
→ 00029 Math 12.87 =====
→ 00005 ClassLoader 1.01 =
→ 00010 String 0.65
→ 00017 ClassLoader$NativeLibrar 0.47
→ 00040 StringBuffer 0.29
→ 00096 Thread 0.29
→ 00021 Runtime 0.11
→ 00022 System 0.11
→ 00077 Character 0.11
→ 00057 Class 0.11
→ 00097 Shutdown 0.11
→ 00001 Object 0.05
→ 00047 StringCoding 0.05
→ 00049 StringCoding$DecoderCach 0.05
→ 00079 Throwable 0.05
→ 00103 FloatingDecimal 0.05

00020 com/baseamps/sample 28.84 =====
→ 00102 Burner 28.84 =====

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object              | Action                            |
|-----|-------------------------------------|-----------------------------------|
| ?   | Package, Class, Method, line number | Display context help information. |
| ++  | Package, Class, Method, line number | Show additional details.          |
| +   | Package, Class, Method              | Expand to reveal next level.      |
| –   | Package, Class, Method              | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | JavaId, Pkg/Cls/Mthd, Percent of Time | Display context help information.  |
| +   | JavaId                                | Expand to reveal all entries.      |
| +   | Pkg/Cls/Mthd                          | Expand description field size.     |
| +   | Percent of Time                       | Zoom in scale.                     |
| –   | JavaId                                | Collapse to show only first level. |
| –   | Pkg/Cls/Mthd                          | Reduce description field size.     |
| –   | Percent of Time                       | Zoom out scale.                    |
| SV  | JavaId                                | Sort next level by value.          |
| SN  | JavaId                                | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java class will cause this detail window to appear.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| -> 00104 StrictMath 16.50 ===== |
+-----+
Calculation Details
Application code CPU measurements 277
Total measurements 1,678
Percent of total 16.50%

Class Name:
StrictMath

Package Name:
java/lang
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J10 - Java service time by class

### Usage

Use this report to see how service time was consumed by execution of Java programs in each unique class. The unexpanded report shows one or more lines for each Java class in which execution was observed.

**Note:** The class name is implicitly qualified by the package name, which can be seen in the detail window for the class.

You can further expand each line item to show methods within the class, then source lines within the method.

### Quantification

Each report line quantifies service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (package, class, method or line) was in flight to the total number of samples. An observation is counted as execution regardless of the CPU state (active, WAIT, or queued).

### Detail line hierarchy

An unexpanded report shows a line for each Java class. The name field shows a sequence number assigned to each unique class. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Java Class
Level 2 Java Method
Level 3 Java Line Number
```

### Detail line descriptions

## Java class detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                              |
|-----------------|------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java class and is displayed in this column. |
| Class/Method    | The name of a Java class.                                                                      |
| Percent of Time | The percentage of activity measured in the indicated Java object.                              |

## Java method detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Class/Method    | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Class/Method    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J10: Java Service Time by Class (0116/JVMTST01) Row 00001 of 00208
Command ==> _____ Scroll ==> CSR

JavaId Class/Method Percent of Time * 10.00% ±2.4%
 *....1....2....3....4....5....6....7...
00102 Burner 28.84 =====
→ 00220 calc 23.95 =====
→ 00221 baby 4.88 ==

00104 StrictMath 16.50 =====
→ 00226 sqrt 8.28 ===
→ 00228 log 8.22 ===

00029 Math 12.87 =====
→ 00219 log 8.52 ===
→ 00227 sqrt 4.23 ==
→ 00048 max 0.11

00018 ZipFile 1.54 =
→ 00049 getEntry 0.77
→ 00062 open 0.59
→ 00039 getInflater 0.05
→ 00054 read 0.05
→ 00035 getEntry 0.05
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object     | Action                            |
|-----|----------------------------|-----------------------------------|
| ?   | Class, Method, line number | Display context help information. |
| ++  | Class, Method, line number | Show additional details.          |
| +   | Class, Method              | Expand to reveal next level.      |
| –   | Class, Method              | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | JavaId, Class/Method, Percent of Time | Display context help information.  |
| +   | JavaId                                | Expand to reveal all entries.      |
| +   | Class/Method                          | Expand description field size.     |
| +   | Percent of Time                       | Zoom in scale.                     |
| –   | JavaId                                | Collapse to show only first level. |
| –   | Class/Method                          | Reduce description field size.     |
| –   | Percent of Time                       | Zoom out scale.                    |
| SV  | JavaId                                | Sort next level by value.          |
| SN  | JavaId                                | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00220 calc 23.95 ===== |
+-----+
+-----+
Calculation Details
Application code activity measurements 402
Total measurements 1,678
Percent of total 23.95%

Method Name:
calc

Method Descriptor:
(I)D

Method Signature:
calc(int) double

Class Name:
Burner

Package Name:
com/basamps/sample
+-----+

```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J11 - Java service time by method

### Usage

Use this report to see how service time was consumed by execution of Java programs in each unique method. The unexpanded report shows one or more lines for each Java method in which execution was observed.

**Note:** The method name is implicitly qualified by its package and class names, which can be seen in the detail window for the method.

You can further expand each line item to show methods within the class, then source lines within the method.

### Quantification

Each report line quantifies service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (package, class, method or line) was in flight to the total number of samples. An observation is counted as execution regardless of the CPU state (active, WAIT, or queued).

### Detail line hierarchy

An unexpanded report shows a line for each Java method. The name field shows a sequence number assigned to each unique method. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 Java Method
Level 2 Java Line Number

```

### Detail line descriptions



## Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| MthId           | The line number of a Java source statement.                                                         |
| Method          | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Java line number

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Class/Method    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J11: Java Service Time by Method (0116/JVMTST01) Row 00001 of 00313
Command ==> _____ Scroll ==> CSR

JavaID Class/Method Percent of CPU Time * 10.00% ±2.4%
 *...1...2...3...4...5...6...7...
00220 calc 23.95 =====
→ 00029 line # 29 21.51 =====
→ 00024 line # 24 1.31 =
→ 00036 line # 36 0.41
→ 00027 line # 27 0.35
→ 00000 line # unknown 0.23
→ 00026 line # 26 0.11

00219 log 8.52 =====
→ 02290 line # 2290 6.19 ====
→ 00000 line # unknown 2.32 =

00226 sqrt 8.28 =====
→ 00000 line # unknown 8.28 =====

00228 log 8.22 =====
→ 00000 line # unknown 8.22 =====
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00220 calc 23.95 ===== |
+-----+
+-----+
Calculation Details
Application code activity measurements 402
Total measurements 1,678
Percent of total 23.95%

Method Name:
calc

Method Descriptor:
(I)D

Method Signature:
calc(int) double

Class Name:
Burner

Package Name:
com/basamps/sample
+-----+

```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J12 - Java service time by call path

### Usage

Use this report to see how service time was consumed by execution of Java programs in each unique call path. The unexpanded report shows one or more lines for each Java method in which execution was observed. Execution in a method is quantified and reported separately for each call path. (A call path represents a path of control in the form: A calls B calls C calls D, etc.)

By expanding the first-level method line you can see a line for each of the calling methods in the path of control. These are shown in reverse order of control. In the case of A calls B calls C calls D, method D (in which execution was observed) is reported in the first-level line and the second-level lines show C then B then A.

### Quantification

The first-level report line quantifies service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (method or line) was in flight to the total number of samples. An observation is counted as execution regardless of the CPU state (active, WAIT, or queued).

### Detail line hierarchy

An unexpanded report shows a line for each Java method line. The name field shows a sequence number assigned to each unique method line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```

Level 1 Java Method
Level 2 Calling Java Method Line

```

### Detail line descriptions

## Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                                          |
|-----------------|------------------------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method.                                            |
| Method          | The line number of the statement that invoked the next method in the call path and the name of the method. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                          |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J12: Java Service Time by Call Path (0116/JVMTST01) Row 00001 of 02766
Command ==> ----- Scroll ==> CSR

MthId Method Percent of Time * 10.00% ±2.4%
 *....1....2....3....4....5....6....7...
00220 calc 21.45 =====
→ 00221 line 16 baby
→ 00218 line 25 main

00226 sqrt 8.22 ====
→ 00227 line 2312 sqrt
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main

00228 log 8.16 ====
→ 00219 line 2290 log
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main

00219 log 6.13 ===
→ 00220 line 29 calc
→ 00221 line 16 baby
→ 00218 line 25 main
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

## on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

## on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a line number will cause this detail window to appear.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| -> 00218 line 25 main |
+-----+
Calculation Details
 Application code activity measurements 1
 Total measurements 1,678
 Percent of total 0.05%

Method Name:
 main[Ljava/lang/String;)V

Method Descriptor:
 (I)D

Method Signature:
 main(java.lang.String[]) void

Class Name:
 Burner3Test
+-----+
```

## J14 - Java wait time by package

## Usage

Use this report to see how much WAIT time was measured during execution of Java programs in each unique package. The unexpanded report shows one or more lines for each Java package in which execution was observed.

You can further expand each line item to show classes within the package, then methods within the class, then source lines within the method.

## Quantification

Each report line quantifies WAIT time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (package, class, method or line) was in a wait state, to the total number of samples.

## Detail line hierarchy

An unexpanded report shows a line for each Java package. The name field shows a sequence number assigned to each unique package. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Java Package
 Level 2 Java Class
 Level 3 Java Method
 Level 4 Java Line Number
```

## Detail line descriptions

### Java package detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number is assigned to each observed Java package and is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java package.                                                                         |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

### Java class detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                          |
|-----------------|--------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java class is displayed in this column. |
| Pkg/Cls/Mthd    | The name of a Java Class.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                          |

### Java method detail line

This is the third-level detail line.

| Under Heading | This is Displayed                           |
|---------------|---------------------------------------------|
| JavaID        | The line number of a Java source statement. |

| Under Heading   | This is Displayed                                                 |
|-----------------|-------------------------------------------------------------------|
| Pkg/Cls/Mthd    | The name of a Java method.                                        |
| Percent of Time | The percentage of activity measured in the indicated Java object. |

## Java line number

This is the fourth-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Pkg/Cls/Mthd    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

J14: Java Wait Time by Package (0116/JVMTST01) Row 00001 of 00022
Command ==> _____ Scroll ==> CSR

JavaID Pkg/Cls/Mthd Percent of Time * 2.50% ±2.4%
 *....1....2....3....4....5....6....7...
00006 java/util/zip 0.89 ==
→ 00018 ZipFile 0.89 ==

00002 java/lang 0.77 ==
→ 00005 ClassLoader 0.35 =
→ 00096 Thread 0.23
→ 00017 ClassLoader$NativeLibrar 0.05
→ 00057 Class 0.05
→ 00021 Runtime 0.05

00018 com/dovetail/jzos 0.23
→ 00078 ZFile 0.23

00005 java/io 0.17
→ 00098 FileInputStream 0.11
→ 00012 UnixFileSystem 0.05

00007 java/util/jar 0.05
→ 00019 JarFile 0.05

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object              | Action                            |
|-----|-------------------------------------|-----------------------------------|
| ?   | Package, Class, Method, line number | Display context help information. |
| ++  | Package, Class, Method, line number | Show additional details.          |
| +   | Package, Class, Method              | Expand to reveal next level.      |
| –   | Package, Class, Method              | Collapse to hide next level.      |

## on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | JavaId, Pkg/Cls/Mthd, Percent of Time | Display context help information.  |
| +   | JavaId                                | Expand to reveal all entries.      |
| +   | Pkg/Cls/Mthd                          | Expand description field size.     |
| +   | Percent of Time                       | Zoom in scale.                     |
| –   | JavaId                                | Collapse to show only first level. |
| –   | Pkg/Cls/Mthd                          | Reduce description field size.     |
| –   | Percent of Time                       | Zoom out scale.                    |
| SV  | JavaId                                | Sort next level by value.          |
| SN  | JavaId                                | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java class will cause this detail window to appear.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| -> 00018 ZipFile 0.89 == |
+-----+
Calculation Details
 Application code wait time measurements 15
 Total measurements 1,678
 Percent of total 0.89%
Class Name:
 ZipFile
Package Name:
 java/util/zip
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J15 - Java wait time by class

### Usage

Use this report to see how much WAIT time was measured during execution of Java programs in each unique class. The unexpanded report shows one or more lines for each Java class in which execution was observed.

**Note:** The class name is implicitly qualified by the package name, which can be seen in the detail window for the class.

You can further expand each line item to show methods within the class, then source lines within the method.



## Quantification

Each report line quantifies WAIT time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (class, method or line) was in a wait state, to the total number of samples.

## Detail line hierarchy

An unexpanded report shows a line for each Java class. The name field shows a sequence number assigned to each unique class. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

```
Level 1 Java Class
Level 2 Java Method
Level 3 Java Line Number
```

## Detail line descriptions

### Java class detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number is assigned to each observed Java class and is displayed in this column. |
| Class/Method    | The name of a Java class.                                                                         |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                 |

### Java method detail line

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| JavaID          | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Class/Method    | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

### Java line number

This is the third-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| JavaID          | The line number of a Java source statement.                                                         |
| Class/Method    | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

J15: Java Wait Time by Class (0116/JVMTST01) Row 00001 of 00033
Command ==> _____ Scroll ==> CSR

JavaId Class/Method Percent of Time * 2.50% ±2.4%
 *....1....2....3....4....5....6....7...
00018 ZipFile 0.89 ==
→ 00049 getEntry 0.65 =
→ 00062 open 0.23

00005 ClassLoader 0.35 =
→ 00139 findBootstrapClass 0.35 =

00029 ZFile 0.23
→ 00173 fopen 0.23

00096 Thread 0.23
→ 00203 start 0.23

00098 FileInputStream 0.11
→ 00207 readBytes 0.11

00019 JarFile 0.05
→ 00037 hasClassPathAttribute 0.05

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object     | Action                            |
|-----|----------------------------|-----------------------------------|
| ?   | Class, Method, line number | Display context help information. |
| ++  | Class, Method, line number | Show additional details.          |
| +   | Class, Method              | Expand to reveal next level.      |
| –   | Class, Method              | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object                | Action                             |
|-----|---------------------------------------|------------------------------------|
| ?   | JavaId, Class/Method, Percent of Time | Display context help information.  |
| +   | JavaId                                | Expand to reveal all entries.      |
| +   | Class/Method                          | Expand description field size.     |
| +   | Percent of Time                       | Zoom in scale.                     |
| –   | JavaId                                | Collapse to show only first level. |
| –   | Class/Method                          | Reduce description field size.     |
| –   | Percent of Time                       | Zoom out scale.                    |
| SV  | JavaId                                | Sort next level by value.          |
| SN  | JavaId                                | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```
File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00049 getEntry 0.65 |
+-----+
+-----+
Calculation Details
Application code wait time measurements 11
Total measurements 1,678
Percent of total 0.65%

Method Name:
getEntry

Method Descriptor:
(JLjava/lang/String;)J

Method Signature:
getEntry(long, java.lang.String) long

Class Name:
ZipFile

Package Name:
java/util/zip
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J16 - Java wait time by method

### Usage

Use this report to see how much WAIT time was measured during execution of Java programs in each unique method. The unexpanded report shows one or more lines for each Java method in which execution was observed.

**Note:** The method name is implicitly qualified by its package and class names, which can be seen in the detail window for the method.

You can further expand each line item to show methods within the class, then source lines within the method.

### Quantification

Each report line quantifies WAIT time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which execution of the indicated Java object (method or line) was in a wait state, to the total number of samples.

# Detail line hierarchy

An unexpanded report shows a line for each Java Method. The name field shows a sequence number assigned to each unique Method. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

|         |                  |
|---------|------------------|
| Level 1 | Java Method      |
| Level 2 | Java Line Number |

# Detail line descriptions

## Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

## Java line number

This is the second-level detail line.

| Under Heading   | This is Displayed                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------|
| MthId           | The line number of a Java source statement.                                                         |
| Method          | The line number of a Java source statement or “unknown” if the line number could not be determined. |
| Percent of Time | The percentage of activity measured in the indicated Java object.                                   |

# Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

J16: Java Wait Time by Method (0116/JVMST01) Row 00001 of 00035
Command ==> ----- Scroll ==> CSR

JavaId Class/Method Percent of CPU Time * 2.50% ±2.4%
*....1....2....3....4....5....6....7...
00049 getEntry 0.65 =
→ 00000 line # unknown 0.65 =

00139 findBootstrapClass 0.35 =
→ 00000 line # unknown 0.35 =

00062 open 0.23
→ 00000 line # unknown 0.23

00173 fopen 0.23
→ 00000 line # unknown 0.23

00203 start 0.23
→ 00000 line # unknown 0.23

00207 readBytes 0.11
→ 00000 line # unknown 0.11

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.

```
File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00049 getEntry 0.65 |
+-----+
Calculation Details
Application code wait time measurements 11
Total measurements 1,678
Percent of total 0.65%

Method Name:
getEntry

Method Descriptor:
(JLjava/lang/String;)J

Method Signature:
getEntry(long, java.lang.String) long

Class Name:
ZipFile

Package Name:
java/util/zip
+-----+
```

**Note:** If you have Java source program mapping information specified, this detail window will display the Java source when invoked from a Java line number object.

## J17 - Java wait time by call path

### Usage

Use this report to see how much WAIT time was measured during execution of Java programs in each unique call path. The unexpanded report shows one or more lines for each Java method in which execution was observed. Execution in a method is quantified and reported separately for each call path. (A call path represents a path of control in the form of: A calls B calls C calls D, etc.)

By expanding the first-level method line you can see a line for each of the calling methods in the path of control. These are shown in reverse order of control. In the case of A calls B calls C calls D, method D (in which execution was observed) is reported in the first-level line and the second-level lines show C then B then A.

### Quantification

The first-level report line quantifies WAIT time measured as a percentage of total time, the percentage represents the ratio of the number of samples in which execution of the indicated Java object (method or line) was in a wait state, to the total number of samples.

## Detail line hierarchy

An unexpanded report shows a line for each Java method line. The name field shows a sequence number assigned to each unique method line. You can expand each line to reveal additional hierarchical levels of detail. The hierarchy is illustrated here:

**Level 1** Java Method  
**Level 2** Calling Java Method Line

## Detail line descriptions

### Java method detail line

This is the first-level detail line.

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| MthId           | A unique sequence number assigned to each observed Java method is displayed in this column. |
| Method          | The name of a Java method.                                                                  |
| Percent of Time | The percentage of activity measured in the indicated Java object.                           |

### Java line number

This is the second-level detail line.

| Under Heading | This is Displayed                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------|
| MthId         | A unique sequence number assigned to each observed Java method.                                            |
| Method        | The line number of the statement that invoked the next method in the call path and the name of the method. |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

J17: Java Wait Time by Call Path (0116/JVMTST01) Row 00001 of 00158
Command ===> ----- Scroll ===> CSR

MthId Method Percent of Time * 2.50% ±2.4%
 *....1....2....3....4....5....6....7...
00049 getEntry 0.59 =
→ 00035 line 173 getEntry
→ 00036 line 257 getEntry
→ 00025 line 244 getJarEntry
→ 00037 line 483 hasClassPathAtt
→ 00038 line 29 jarFileHasClassP
→ 00028 line 889 getClassPath
→ 00002 line 351 getLoader
→ 00003 line 205 getResource
→ 00004 line 846 run
→ 00005 doPrivileged1
→ 00006 line 389 doPrivileged
→ 00007 line 371 findClass
→ 00008 line 572 loadClass
→ 00009 line 442 loadClass
→ 00010 line 504 loadClass

00139 findBootstrapClass 0.29 =
→ 00140 line 1062 findBootstrapC
→ 00008 line 565 loadClass
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Method, line number    | Display context help information. |
| ++  | Method, line number    | Show additional details.          |
| +   | Method                 | Expand to reveal next level.      |
| –   | Method                 | Collapse to hide next level.      |

### on headings

| Cmd | When Applied To Object         | Action                             |
|-----|--------------------------------|------------------------------------|
| ?   | MthId, Method, Percent of Time | Display context help information.  |
| +   | MthId                          | Expand to reveal all entries.      |
| +   | Method                         | Expand description field size.     |
| +   | Percent of Time                | Zoom in scale.                     |
| –   | MthId                          | Collapse to show only first level. |
| –   | Method                         | Reduce description field size.     |
| –   | Percent of Time                | Zoom out scale.                    |
| SV  | MthId                          | Sort next level by value.          |
| SN  | MthId                          | Sort next level by name.           |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a Java method will cause this detail window to appear.



```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| -> 00049 getEntry 0.65 |
+-----+

Calculation Details
Application code wait time measurements 11
Total measurements 1,678
Percent of total 0.65%

Method Name:
getEntry

Method Descriptor:
(JLjava/lang/String;)J

Method Signature:
getEntry(long, java.lang.String) long

Class Name:
ZipFile

Package Name:
java/util/zip

```

## J18 - Java Garbage Collection Report

### Usage

This report displays information about Java garbage collection (GC) events and the evolution of the size of the JVM heap during the course of a measurement.

It can be used to determine the frequency of GC events, the amount of time spent in garbage collection, and how effective each garbage collection event is at freeing storage on the JVM heap.

Users must have READ access on RACF FACILITY profile USE.JAVAGCHEAP in order to enable garbage collection measurements. See *APA Customization Guide* for more details about security profiles.

### Summary Section

A static (non scrolling) box containing a summary of the observed garbage collection activity is displayed at the top of the report. It contains the following fields:

#### Number of GC Events

The number of separate garbage collection events observed during the measurement.

#### Total GC Elapsed Time

The cumulative time, in seconds, elapsed during all observed garbage collection events.

#### Average GC Event Time

The average GC Event time – Total GC Elapsed Time / Number of GC Events.

#### Total JVM Sample Time

The total time spent measuring the JVM.

#### Percent Time Elapsed in GC

Total GC Elapsed Time divided by Total JVM Sample Time.

### Detail Line Descriptions

There are two types of detail lines in this report: **Garbage Collection Event Detail Line** and **Heap Size Detail Line**.

## Garbage Collection Event Detail Line

### Sequence Number

This is the JVMTI sample number during which the information displayed on the detail line was recorded.

### GC Event Duration

The duration of the observed garbage collection event measured in seconds.

## Heap Size Detail Line

### Sequence Number

This is the JVMTI sample number during which the information displayed on the detail line was recorded. The frequency of heap size detail lines is influenced by the value of the heapwalk frequency. This variable is set using the `-Dcom.ibm.apa.gcheapwalk.frequency` Java option. If this option is set to an integer F, then APA will attempt to take a heap sample every F samples. For example, if `com.ibm.apa.gcheapwalk.frequency=10`, then a heap sample will be taken every 10 JVMTI samples. The default heapwalk frequency is 100.

During JVM startup, there might be other processes occurring that constrain how often the heap sampling can occur. Because of this the heap sample interval might not initially match the requested frequency F. As the measurement progresses, however, it should converge on the requested heap sampling frequency.

### GC Event Duration

The duration of the observed garbage collection event measured in seconds.

### Heap Bytes

The total number of bytes that are used on the JVM heap, for all objects, at the time of the measurement.

### Heap Object Count

The total number of objects on the JVM heap at the time of the measurement.

## Sample Report

```
File View Navigate Help

J18: Java Garbage Collection Stats (00362/GCTEST)
Command ==>

+--- Garbage Collection(GC) Summary ----+
|Number of GC Events 53 |
|Total GC Time (secs) 4.04 |
|Average GC Time (secs) 0.07 |
|Total JVM Sample Time (secs) 170.98 |
|Percent Time Elapsed in GC 2.36 |
+-----+

Sequence Number

000100 Heap Bytes: 533,424 Heap Object Count: 9539
000100 *** GC Event *** Duration (secs): 0.10

000320 Heap Bytes: 632,768 Heap Object Count: 9886
000330 Heap Bytes: 668,744 Heap Object Count: 10316
000340 Heap Bytes: 685,128 Heap Object Count: 10677
000370 Heap Bytes: 703,384 Heap Object Count: 11091
000380 Heap Bytes: 713,448 Heap Object Count: 11324

000380 *** GC Event *** Duration (secs): 0.03
000420 Heap Bytes: 719,600 Heap Object Count: 11706
000428 *** GC Event *** Duration (secs): 0.04
000440 Heap Bytes: 632,032 Heap Object Count: 11389
```

## J19 - Java Heap Object Report

### Usage

This report provides detailed information about every object present on the JVM heap at a single point in time. It does this by triggering a JVM heap dump and analyzing the contents of the dump.

It will group all the heap objects by class name and display the percentage use of the heap by all such groups. The detail pop up window will also display the number of instances of each class and the average class size. Average size is used since some classes, such as strings, are variable in size.

This report can be used to identify classes that are having an unexpected impact on the JVM heap use, either because of a large class size or many instances.

Users must have READ access on RACF FACILITY profile USE.JAVAGCHEAP in order to collect heap detail measurements. See *APA Customization Guide* for more details about security profiles.

The heap object report is generated at one instant in time during the APA measurement. The timing of the heap measurement is determined by one or both of these Java options.

- `-Dcom.ibm.apa.heapdump.trigger.threshold=heap size (# of bytes)`
- `-Dcom.ibm.apa.heapdump.trigger.gc.eventNum=GC event number`

Examples:

Java option `-Dcom.ibm.apa.heapdump.trigger.threshold=75M` will trigger a heap dump when the heap size surpasses 75 MB. Valid byte multiplier prefixes are K/k(kilobytes), M/m(Megabytes), and G/g(Gigabytes).

Java option `-Dcom.ibm.apa.heapdump.trigger.gc.eventNum=2` will trigger a heap dump when the second garbage collection is started (as observed since the start of the measurement).

If both options are set, a dump is triggered as soon as either condition becomes true.

If neither option is set, then no heap dump is triggered and no report is generated.

After one heap is triggered and processed, APA will not request any additional dumps.

There must be enough space in user's USS(OMVS) home directory to contain the heap dump. The JVMTI will analyze this dump, then delete it, but there still needs to be space for temporary storage. The user in this case is the owner of the job being sampled or the STCID assigned to the started task.

### Warning

This report requires a JVM heap dump to be taken in the measured job or started task. A Java heap dump is a “stop-the-world” event – all other activity in the JVM is suspended while the dump is taken. This can take a significant amount of time depending on the size of the heap. Do not enable this report on a production JVM or any JVM where performance is critical unless such activity can be tolerated. It is mainly intended for use in development while debugging unusual garbage collection activity or out-of-memory conditions.

### Detail Line Descriptions

There is one type of detail line. It contains the following two fields:

#### Heap Object Classes and Arrays

This field displays the class name of each object, object array, or primitive type array that has been observed. The class name is truncated if it doesn't fit in the thirty byte wide display. The class name begins with a “{” character if it is an object array containing instances of the named class. Java has eight primitive types – byte, short, int, long, float, double, boolean, and char. Therefore, it is possible to see a detail line representing a primitive type array of each one of these types.

## Percentage of Heap Used

The percentage of the entire JVM heap that is occupied by all instances of this class or class array. This is calculated by dividing the total bytes used by all instances by the total number of bytes in the heap. The total number of bytes in the heap is the sum of the free heap size and the occupied heap size.

## Line Commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| CMD | When Applied to Object | Action                                    |
|-----|------------------------|-------------------------------------------|
| ?   | SEQN                   | Display context help information.         |
| ++  | SEQN                   | Show additional details in pop-up window. |

## Sample Report

```
File View Navigate Help

J19: Java Heap Object Report (00362/GCTEST)
Command ==>

Heap Object Classes & Arrays Percentage of Heap Used * 10%
 1....2....3....4....5....6....7....8....9....
Primitive_Array:type_char 9.56 00000
Primitive_Array:type_byte 5.07 000
java/util/TreeMap$Entry 1.82 0
java/lang/String 1.77 0
java/lang/Object 0.65
java/lang/String 0.40
java/util/Hashtable$Entry 0.23
java/lang/Integer 0.16
Primitive_Array:type_long 0.15
java/lang/J9VMInternals$ClassI 0.14
java/lang/ref/SoftReference 0.10
java/net/URL 0.10
java/util/Hashtable$Entry 0.10
java/io/File 0.08
jC 0.08
java/lang/Thread 0.06
java/lang/StringBuilder 0.06
Primitive_Array:type_int 0.05
java/util/LinkedHashMap$Entry 0.04
sun/util/locale/LocaleObjectCa 0.04
java/lang/ClassLoader$ClassNam 0.04
java/util/concurrent/Concurren 0.04
java/lang/Integer 0.04
java/net/Parts 0.03
java/io/ExpiringCache$Entry 0.03
java/util/HashMap$Node 0.03
java/security/AccessControlCon 0.03
```

## Detail Window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a class name will cause this detail window to appear.

```

+-----+
| J19 - DETAIL Window (00362/GCTEST) |
| Command ==> | Scroll ==> CSR |
+-----+-----+ The following report line was selected -----+
| Primitive_Array:type_char 9.56 00000 |
+-----+-----+
Heap Object Details
Class Name
Primitive_Array:type_char
Class Type Primitive Array
Object Instance Count 3399
Average Object Size 70
Object Total Bytes 238128
Object Total Bytes Ranking 1

```

## Detail Window Field Descriptions

### Class Name

The Java class to which the observed object or array belongs.

### Class Type

The Java object type. This can be a standard OBJECT instance, a CLASS object (only one instance possible), an array of Java OBJECTs, or an array of Java primitive types.

### Object Instance Count

The number of instances of this class observed on the heap at the time of the dump.

### Average Object Size

The calculated average object size for objects of this class.

### Object Total Bytes

The total number of bytes occupied by all instances of this class on the heap.

### Object Total Bytes Ranking

The ordinal ranking of the object total bytes for this class as compared to all other class type byte totals.

## H01 - HFS Service Time by Path Name

### Usage

Use this report to see how Service time was consumed by HFS file activity during the observation session. Each report line shows an HFS file, listed by path name, for which activity was observed. If HFS file activity was observed during a sample, but could not be attributed to a specific file, the activity is aggregated to a single report line with a path name of “unknown”.

### Quantification

Each report line quantifies Service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS call against the indicated HFS file was inflight to the total number of samples. An observation is counted as inflight regardless of the CPU state: Active, WAIT, or Queued.

### Detail line descriptions

## HFS File detail line

| Under Heading   | This is Displayed                                              |
|-----------------|----------------------------------------------------------------|
| FileId          | A unique sequence number assigned to each HFS file.            |
| Path Name       | The HFS file path name.                                        |
| Percent of Time | The percentage of activity measured in the indicated HFS file. |

## Sample reports

A sample report is shown here.

```

File View Navigate Help

H01: HFS Service Time by Path Name (8242/JVMTST01) Row 00001 of 00070
Command ==> _____ Scroll ==> CSR

FileId Path Name Percent of Time * 10.00% ±1.0%
 *....1....2....3....4....5....6..
00002 /dev/ttyp0001 70.36
00000 unknown 66.59
00001 /dev/ttyp0000 50.49
00063 /tmp/ofile.txt 13.28
00021 /Z18/usr/lpp/java/J1.4/lib/core. 1.59
00080 /Z18/usr/lpp/java/J1.4/lib/core. 1.18
00062 /u/zfs/iface.txt 0.53
00041 /Z18/usr/lpp/java/J1.4/lib/ext/d 0.32
00032 /Z18/usr/lpp/java/J1.4/lib/ibmor 0.18
00075 /u/zfs/platz 0.18
00044 /Z18/usr/lpp/java/J1.4/lib/ext/i 0.16
00005 /dev/pty0001 0.15
00043 /Z18/usr/lpp/java/J1.4/lib/ext/i 0.15
00072 /u/zfs/platz 0.15
00070 /u/zfs/platz 0.14
00036 /u/zfs/platz 0.12

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | FileId                 | Display context help information. |
| ++  | FileId                 | Show additional details.          |

### on headings

| Cmd | When Applied To Heading            | Action                            |
|-----|------------------------------------|-----------------------------------|
| ?   | FileId, Path Name, Percent of Time | Display context help information. |
| +   | Path Name                          | Expand description field size.    |
| +   | Percent of Time                    | Zoom in scale.                    |
| –   | Path Name                          | Reduce description field size.    |
| –   | Percent of Time                    | Zoom out scale.                   |
| SV  | FileId                             | Sort next level by value.         |

| Cmd | When Applied To Heading | Action                        |
|-----|-------------------------|-------------------------------|
| SN  | FileId                  | Sort next level by FileId.    |
| SP  | FileId                  | Sort next level by Path Name. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a FileId will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| 00002 /dev/ttyp001 70.36 |
+-----+
Calculation Details
HFS file measurements 7.036
Total measurements 10.000
Percent of total 70.36%
HFS File Information
Path name /dev/ttyp001
File type Character Special File Major 2 Minor 1
Opened 7:05:22.45 Friday Mar 16 2007
Device# 4
Serial# 17
Open Flags Read/Write Read_Only Write_Only
Not_a_controlling_terminal
+-----+

```

## SETUP options

The SETUP command displays the following options:

```

Minimum Percentage of Time 0.00

This is the minimum percentage of HFS activity
measured for which an item is to be included in
the report.

```

By default, all HFS files with inflight activity during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to files with activity above the specified threshold.

## H02 - HFS Service Time by Device

### Usage

Use this report to see how Service time was consumed by HFS device activity during the observation session. The unexpanded report shows an HFS device, listed by device number, for which activity was observed. If HFS file activity was observed during a sample, but could not be attributed to a specific file and device, the activity is aggregated to a single report line with a device number of “unknown”. You can further expand each line item to show the HFS files associated with the device.

### Quantification

Each report line quantifies Service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS call against the indicated HFS device

was inflight to the total number of samples. An observation is counted as inflight regardless of the CPU state: Active, WAIT, or Queued.

## Detail line hierarchy

An unexpanded report shows a line for each HFS device. The name field shows a sequence number assigned to each unique device. You can expand each line to reveal an additional hierarchical level of detail. The hierarchy is illustrated here: Level 1 HFS Device Level 2 HFS File

Level 1 HFS Device  
Level 2 HFS File

## Detail line descriptions

### HFS Device detail line

This is the first-level detail line.

| Under Heading     | This is Displayed                                                |
|-------------------|------------------------------------------------------------------|
| DevId             | A unique sequence number assigned to each HFS device.            |
| Device#>Path Name | The HFS device number.                                           |
| Percent of Time   | The percentage of activity measured in the indicated HFS device. |

### HFS File detail line

This is the first-level detail line.

| Under Heading     | This is Displayed                                              |
|-------------------|----------------------------------------------------------------|
| DevId             | A unique sequence number assigned to each HFS file.            |
| Device#>Path Name | The HFS file path name..                                       |
| Percent of Time   | The percentage of activity measured in the indicated HFS file. |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

H02: HFS Service Time by Device (8242/JVMTST01) Row 00001 of 00085
Command ==> _____ Scroll ==> CSR

DevId Device#>PathName Percent of Time * 10.00% ±1.0%
*...1...2...3...4...5...6..
00001 4 85.07
→ 00002 /dev/ttyp0001 70.36
→ 00001 /dev/ttyp0000 50.49
→ 00005 /dev/ptyp0001 0.15
→ 00066 /dev/null 0.06
→ 00004 /dev/ptyp0000 0.06
→ 00066 /dev/null 0.04
→ 00066 /dev/null 0.03
→ 00066 /dev/null 0.02
→ 00066 /dev/null 0.02
→ 00066 /dev/null 0.01
→ 00066 /dev/null 0.01

00000 unknown 66.59
00009 8 13.28
→ 00063 /tmp/ofile.txt 13.28
```



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DevId, FileId          | Display context help information. |
| ++  | DevId, FileId          | Show additional details.          |
| +   | DevId                  | Expand to reveal next level.      |
| -   | DevId                  | Collapse to hide next level.      |
| SV  | DevId                  | Sort next level by value.         |
| SN  | DevId                  | Sort next level by FileId.        |
| SP  | DevId                  | Sort next level by Path Name.     |

### on headings

| Cmd | When Applied To Heading                  | Action                             |
|-----|------------------------------------------|------------------------------------|
| ?   | DevId, Device#>PathName, Percent of Time | Display context help information.  |
| +   | DevId                                    | Expand to reveal all entries.      |
| +   | Device#>PathName                         | Expand field size.                 |
| +   | Percent of Time                          | Zoom in scale.                     |
| –   | DevId                                    | Collapse to show only first level. |
| –   | Device#>PathName                         | Reduce field size.                 |
| –   | Percent of Time                          | Zoom out scale.                    |
| SV  | DevId                                    | Sort next level by value.          |
| SN  | DevId                                    | Sort next level by DevId.          |
| SD  | DevId                                    | Sort next level by Device#.        |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a DevId will cause this detail window to appear.

```

File View Navigate Help
+-----+
+-----+ The following report line was selected -----+
| 00001 4 85.07 |
+-----+

Calculation Details
HFS device measurements 8.507
Total measurements 10.000
Percent of total 85.07%

HFS Device Information
Device 4
Dataset name HFS.ADCD.DEV
DD name SYS00006
Physical file system HFS
Mount point /X235/dev
Mounted 8:40:24.22 Friday Mar 9 2007

```

## SETUP options

The SETUP command displays the following options:

```

Minimum Percentage of Time 0.00

This is the minimum percentage of HFS activity
measured for which an item is to be included in
the report.

```

By default, all HFS devices with inflight activity during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to devices with activity above the specified threshold.

## H03 - HFS File Activity

### Usage

Use this report to display the Read/Write counts for each HFS file captured during the observation session. Each report line shows an HFS file, listed by path name, and its associated Read/Write count.

### Quantification

Each report line quantifies the Read/Write count by subtracting the Read count at the start of the observation session from the Read count at the end of the observation session; subtracting the Write count at the start of the observation session from the Write count at the end of the observation session; and adding the two differences together.

### Detail line descriptions

#### HFS File detail line

| Under Heading | This is Displayed                                   |
|---------------|-----------------------------------------------------|
| FileId        | A unique sequence number assigned to each HFS file. |
| Path Name     | The HFS file path name.                             |
| File Type     | The HFS file type.                                  |
| Reads/Writes  | The Read/Write count for the indicated HFS file.    |

## Sample reports

A sample report is shown here.

| File                                   | View                                | Navigate               | Help               |
|----------------------------------------|-------------------------------------|------------------------|--------------------|
| H03: HFS File Activity (8242/JVMTST01) |                                     |                        | Row 00001 of 00198 |
| Command ==>                            |                                     |                        | Scroll ==> CSR     |
| FileId                                 | Path Name                           | File Type              | Reads/Writes       |
| 00063                                  | /tmp/ofile.txt                      | Regular File           | 55,985             |
| 00021                                  | /Z18/usr/lpp/java/J1.4/lib/core.jar | Regular File           | 715                |
| 00080                                  | /Z18/usr/lpp/java/J1.4/lib/core.jar | Regular File           | 644                |
| 00062                                  | /u/zfs/iface.txt                    | Regular File           | 261                |
| 00005                                  | /dev/ptyp0001                       | Character Special File | 171                |
| 00070                                  | /u/zfs/platz                        | Regular File           | 100                |
| 00066                                  | /dev/null                           | Character Special File | 98                 |
| 00036                                  | /u/zfs/platz                        | Regular File           | 98                 |
| 00068                                  | /u/zfs/platz                        | Regular File           | 97                 |
| 00074                                  | /dev/null                           | Character Special File | 96                 |
| 00035                                  | /dev/null                           | Character Special File | 89                 |
| 00064                                  | /u/zfs/platz                        | Regular File           | 88                 |
| 00072                                  | /u/zfs/platz                        | Regular File           | 88                 |
| 00069                                  | /dev/null                           | Character Special File | 86                 |
| 00075                                  | /u/zfs/platz                        | Regular File           | 84                 |
| 00065                                  | /dev/null                           | Character Special File | 74                 |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | FileId                 | Display context help information. |
| ++  | FileId                 | Show additional details.          |

### on headings

| Cmd | When Applied To Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | FileId                  | Display context help information. |
| SV  | FileId                  | Sort next level by value.         |
| SN  | FileId                  | Sort next level by FileId.        |
| SD  | FileId                  | Sort next level by Path Name.     |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a FileId will cause this detail window to appear.

File View Navigate Help

## SETUP options

The **SETUP** command displays the following options:

Enter "/" to select an option

\_ Omit files for which no activity was observed during the measurement interval. Unselect to include all files.

By default, all HFS files are displayed. Select this option to omit HFS files that had no read/write activity during the observation session.

## H04 - HFS File Attributes

## Usage

Use this report to see detailed information about each HFS file that was open during the observation session. This is useful as a reference report when working with printed copies of other HFS reports that do not show full HFS file details. (When browsing online, the popup detail windows show this information.)

### Detail line descriptions

The following information is shown for each HFS device.

| Under Heading | This is Displayed                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------|
| FileId        | A unique sequence number assigned to the HFS file. This is shown in other HFS reports that display HFS file information. |
| Path Name     | The HFS file path name.                                                                                                  |
| File Type     | The HFS file type.                                                                                                       |
| Major         | If the file type is Character Special, the associated Major number is displayed.                                         |
| Minor         | If the file type is Character Special, the associated Minor number is displayed.                                         |
| Opened        | The date and time that the file was opened (local time).                                                                 |
| Device#       | The HFS device number associated with the file.                                                                          |
| Serial#       | The HFS file serial number.                                                                                              |

| Under Heading             | This is Displayed                                                                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open Flags                | All the file Open Flags that are set are listed here.                                                                                                                                                |
| Mode Flags - File Type    | The HFS file type listed in the HFS Mode Flags.                                                                                                                                                      |
| Mode Flags - Permissions  | The file permissions (Read/Write/Execute) categorized by Owner, Group, and Other.                                                                                                                    |
| Mode Flags - Set Id Flags | The Set Id is indicated by either Userid or Group. The Sticky bit setting is also displayed here (if on).                                                                                            |
| File Activity             | The file activity is listed by category. The initial counts recorded at the start of the observation session, the final counts recorded at the end of the observation, and the delta are all listed. |

## Sample reports

A sample report is shown here.

```

File View Navigate Help

H04: HFS File Attributes (8242/JVMTST01) Row 00001 of 02162
Command ==> _____ Scroll ==> CSR_

HFS file information reported for 115 files.

FileId 00001
Path name /dev/tty0000
File type Character Special File Major 2 Minor 0
Opened 6:47:58.93 Friday Mar 16 2007
Device# 4
Serial# 12
Open Flags Read/Write Read_Only Write_Only
 Not_a_controlling_terminal

File Activity Initial Last Delta
Read Requests 11 12 1
Write Requests 33 40 7
Dir I/O Blocks 19 19 0
Blocks Read 5 5 0
Blocks Written 0 0 0
Bytes Read 14,883 14,901 18
Bytes Written 1,244 1,350 106

```

## H05 - HFS Device Activity

### Usage

Use this report to display the Read/Write counts for each HFS device captured during the observation session. Each report line shows an HFS device, listed by device number, and its associated Read/Write count.

### Quantification

Each report line quantifies the Read/Write count by subtracting the Read count at the start of the observation session from the Read count at the end of the observation session; subtracting the Write count at the start of the observation session from the Write count at the end of the observation session; and adding the two differences together.

### Detail line descriptions

The following information is shown for each HFS device.

| Under Heading | This is Displayed                                     |
|---------------|-------------------------------------------------------|
| DevId         | A unique sequence number assigned to each HFS device. |
| Device#       | The HFS device number.                                |
| Mount Point   | The directory at which the file system was mounted.   |
| Reads/Writes  | The Read/Write count for the indicated HFS device.    |

## Sample reports

A sample report is shown here.

```

File View Navigate Help

H05: HFS Device Activity (8242/JVMTST01) Row 00001 of 00009
Command ==> _____ Scroll ==> CSR
DevId Device# Mount Point Reads/Writes
00009 8 /X235/tmp 55,985
00004 24 /Z18/usr/lpp/java 6,463
00001 4 /X235/dev 996
00005 11 /u/zfs 984
00003 10 /u 81
00007 12 /Z18/usr/lpp/Db2/db2810 12
00008 16 /Z18/usr/lpp/cicsts/cicsts31 12
00002 3 /Z18 0
00006 7 /X235/etc 0

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DevId                  | Display context help information. |
| ++  | DevId                  | Show additional details.          |

### on headings

| Cmd | When Applied To Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | DevId                   | Display context help information. |
| SV  | DevId                   | Sort next level by value.         |
| SN  | DevId                   | Sort next level by DevId.         |
| SD  | DevId                   | Sort next level by Device#.       |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a DevId will cause this detail window to appear.

```

File View Navigate Help

Device 00004
 Device# 24
 Dataset name JVA140.HFS
 DD name SYS00025
 Physical file system HFS
 Mount point /Z18/usr/lpp/java
 Mounted 8:40:36.62 Friday Mar 9 2007

Device Activity Initial Last Delta
 Read Requests 186,308 192,771 6,463
 Write Requests 0 0 0
 Dir I/O Blocks 67,554 73,030 5,476
 Blocks Read 247,016 258,524 11,508
 Blocks Written 0 0 0
 Bytes Read 462,232,053 501,613,789 39,381,736
 Bytes Written 0 0 0

```

## SETUP options

The SETUP command displays the following options:

Enter "/" to select an option

\_ Omit devices for which no activity was observed during the measurement interval. Unselect to include all devices.

By default, all HFS devices are displayed. Select this option to omit HFS devices that had no read/write activity during the observation session.

## H06 - HFS Device Attributes

## Usage

Use this report to see detailed information about each HFS device captured during the observation session. This is useful as a reference report when working with printed copies of other HFS reports that do not show full HFS device details. (When browsing online, the popup detail windows show this information.)

## Detail line descriptions

The following information is shown for each HFS device.

| Under Heading        | This is Displayed                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------|
| DevId                | A unique sequence number assigned to the HFS device. This is shown in other HFS reports that display HFS device information. |
| Device#              | The HFS device number.                                                                                                       |
| Dataset Name         | The dataset containing the HFS file system.                                                                                  |
| DD Name              | The DD name assigned to the HFS dataset.                                                                                     |
| Physical File System | The file system type - HFS, zFS, NFS.                                                                                        |
| Mount Point          | The directory at which the file system was mounted.                                                                          |
| Mounted              | The date and time that the file system was mounted (local time).                                                             |

| Under Heading   | This is Displayed                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device Activity | The device activity is listed by category. The initial counts recorded at the start of the observation session, the final counts recorded at the end of the observation, and the delta are all listed. |

## Sample reports

A sample report is shown here.

```

File View Navigate Help

H06: HFS Device Attributes (8242/JVMTST01) Row 00001 of 0165
Command ==> _____ Scroll ==> CSR

HFS device information reported for 9 devices.

DevId 00001
Device# 4
Dataset name HFS.ADCD.DEV
DD name SYS00006
Physical file system HFS
Mount point /X235/dev
Mounted 8:40:24.22 Friday Mar 9 2007

Device Activity Initial Last Delta
Read Requests 5,922 6,138 216
Write Requests 1,070 1,850 780
Dir I/O Blocks 565 579 14
Blocks Read 56 56 0
Blocks Written 0 0 0
Bytes Read 220,179 221,394 1,215
Bytes Written 70,730 71,540 810

```

## H07 - HFS Activity Timeline

### Usage

Use this report to see, for each HFS file, how activity on the file was distributed over the measurement interval.

### Quantification

A graph, in bar chart format, is displayed for each observed HFS file. The horizontal axis represents the measurement interval which spans 50 columns. Each column represents an equal 1/50th sub-interval of time. A scale is shown at the bottom of the graph indicating the percentage of time progression in the overall interval.

In each column, a vertical graph shows (roughly) the percentage of time during the sub-interval that activity on the HFS file took place. A vertical bar of 1, 2, 3, 4 or 5 characters, extending upward from the scale, is displayed indicating the percentage of time in the sub-interval during which file activity was observed.

### Detail line descriptions

#### HFS Activity Distribution

A group of lines is shown for each reported HFS file. Some information about the HFS files is displayed to the left, and a bar chart is displayed on the right.





| File View Navigate Help |                               |           |            |
|-------------------------|-------------------------------|-----------|------------|
| FileId 00002            |                               |           |            |
| Path name               | /dev/tty0001                  |           |            |
| File type               | Character Special File        | Major 2   | Minor 1    |
| Opened                  | 7:05:22.45 Friday Mar 16 2007 |           |            |
| Device#                 | 4                             |           |            |
| Serial#                 | 17                            |           |            |
| Open Flags              | Read/Write                    | Read_Only | Write_Only |
|                         | Not_a_controlling_terminal    |           |            |
| File Activity           | Initial                       | Last      | Delta      |
| Read Requests           | 7                             | 20        | 13         |
| Write Requests          | 29                            | 60        | 31         |
| Dir I/O Blocks          | 19                            | 19        | 0          |
| Blocks Read             | 5                             | 5         | 0          |
| Blocks Written          | 0                             | 0         | 0          |
| Bytes Read              | 14,810                        | 15,073    | 263        |
| Bytes Written           | 1,829                         | 2,252     | 423        |

## SETUP options

The SETUP command displays the following options:

```
Enter "/" to select an option

_ Omit files for which no activity was observed
during the measurement interval. Unselect to
include all files.
```

By default, all HFS files are displayed. Select this option to omit HFS files that had no read/write activity during the observation session.

## H08 - HFS Wait Time by Path Name

### Usage

Use this report to identify delays resulting from waits during HFS requests. Each report line shows an HFS file, listed by path name, for which wait time was observed. If a wait was observed during a sample where there was an inflight HFS request, but could not be attributed to a specific file, the wait is aggregated to a single report line with a path name of "unknown".

### Quantification

Each report line quantifies wait time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS call against the indicated HFS file was in a wait to the total number of samples.

### Detail line descriptions

#### HFS File detail line

| Under Heading   | This is Displayed                                         |
|-----------------|-----------------------------------------------------------|
| FileId          | A unique sequence number assigned to each HFS file.       |
| Path Name       | The HFS file path name                                    |
| Percent of Time | The percentage wait time measured for the indicated file. |

## Sample reports

A sample report is shown here.

| File                                            | View                             | Navigate                          | Help               |
|-------------------------------------------------|----------------------------------|-----------------------------------|--------------------|
| H08: HFS Wait Time by Path Name (8242/JVMTST01) |                                  |                                   | Row 00001 of 00046 |
| Command ==>                                     |                                  |                                   | Scroll ==> CSR     |
| FileId                                          | Path Name                        | Percent of Time * 10.00%          | ±1.0%              |
|                                                 |                                  | *....1....2....3....4....5....6.. |                    |
| 00002                                           | /dev/ttyp0001                    | 70.29                             |                    |
| 00000                                           | unknown                          | 66.53                             |                    |
| 00001                                           | /dev/ttyp0000                    | 50.46                             |                    |
| 00021                                           | /Z18/usr/lpp/java/J1.4/lib/core. | 0.94                              |                    |
| 00080                                           | /Z18/usr/lpp/java/J1.4/lib/core. | 0.62                              |                    |
| 00063                                           | /tmp/ofile.txt                   | 0.32                              |                    |
| 00041                                           | /Z18/usr/lpp/java/J1.4/lib/ext/d | 0.31                              |                    |
| 00062                                           | /u/zfs/ofile.txt                 | 0.24                              |                    |
| 00032                                           | /Z18/usr/lpp/java/J1.4/lib/ibmor | 0.18                              |                    |
| 00044                                           | /Z18/usr/lpp/java/J1.4/lib/ext/i | 0.14                              |                    |
| 00026                                           | /Z18/usr/lpp/java/J1.4/lib/chars | 0.09                              |                    |
| 00042                                           | /Z18/usr/lpp/java/J1.4/lib/ext/g | 0.09                              |                    |
| 00034                                           | /Z18/usr/lpp/java/J1.4/lib/ibmpk | 0.08                              |                    |
| 00072                                           | /u/zfs/platz                     | 0.08                              |                    |
| 00075                                           | /u/zfs/platz                     | 0.08                              |                    |
| 00029                                           | /Z18/usr/lpp/java/J1.4/lib/ibmjg | 0.07                              |                    |
| 00036                                           | /u/zfs/platz                     | 0.07                              |                    |
| 00054                                           | /Z18/usr/lpp/java/J1.4/lib/ext/r | 0.07                              |                    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | FileId                 | Display context help information. |
| ++  | FileId                 | Show additional details.          |

### on headings

| Cmd | When Applied To Heading            | Action                            |
|-----|------------------------------------|-----------------------------------|
| ?   | FileId, Path Name, Percent of Time | Display context help information. |
| +   | Path Name                          | Expand description field size.    |
| +   | Percent of Time                    | Zoom in scale.                    |
| –   | Path Name                          | Reduce description field size.    |
| –   | Percent of Time                    | Zoom out scale.                   |
| SV  | FileId                             | Sort next level by value.         |
| SN  | FileId                             | Sort next level by FileId.        |
| SP  | FileId                             | Sort next level by Path Name.     |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a FileId will cause this detail window to appear.

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| 00002 /dev/ttyp0001 70.29 |
+-----+

Calculation Details
HFS file wait time measurements 7,029
Total measurements 10,000
Percent of total 70.29%

HFS File Information
Path name /dev/ttyp0001
File type Character Special File Major 2 Minor 1
Opened 7:05:22.45 Friday Mar 16 2007
Device# 4
Serial# 17
Open Flags Read/Write Read_Only Write_Only
 Not_a_controlling_terminal
```

## SETUP options

The SETUP command displays the following options:

```
Minimum Percentage of Time 0.00
```

This is the minimum percentage of HFS wait time measured for which an item is to be included in the report.

By default, all HFS files with wait time during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to files with wait time above the specified threshold.

## H09- HFS Wait Time by Device

### Usage

Use this report to identify delays resulting from waits during HFS requests. Each report line shows an HFS device, listed by device number, for which wait time was observed. If a wait was observed during a sample, where there was an inflight HFS request, but could not be attributed to a specific file and device, the wait is aggregated to a single report line with a device number of "unknown". You can further expand each line item to show the HFS files associated with the device.

### Quantification

Each report line quantifies wait time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS call against the indicated HFS device was in a wait to the total number of samples.

### Detail line hierarchy

An unexpanded report shows a line for each HFS device. The name field shows a sequence number assigned to each unique device. You can expand each line to reveal an additional hierarchical level of detail. The hierarchy is illustrated here:

```
Level 1 HFS Device
Level 2 HFS File
```

### Detail line descriptions

## HFS Device detail line

This is the first-level detail line.

| Under Heading     | This is Displayed                                               |
|-------------------|-----------------------------------------------------------------|
| DevId             | A unique sequence number assigned to each HFS device.           |
| Device#>Path Name | The HFS device number.                                          |
| Percent of Time   | The percentage wait time measured for the indicated HFS device. |

## HFS File detail line

This is the second-level detail line.

| Under Heading     | This is Displayed                                            |
|-------------------|--------------------------------------------------------------|
| DevId             | A unique sequence number assigned to each HFS file.          |
| Device#>Path Name | The HFS file path name.                                      |
| Percent of Time   | The percentage activity measured for the indicated HFS file. |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```
File View Navigate Help

H09: HFS Wait Time by Device (8242/JVMTST01) Row 00001 of 00057
Command ==> Scroll ==> CSR

DevId Device#>PathName Percent of Time * 10.00% ±1.0%
 *....1....2....3....4....5....6..
00001 4 84.84
→ 00002 /dev/ttyp0001 70.29
→ 00001 /dev/ttyp0000 50.46

00000 unknown 66.53
00004 24 3.27
→ 00021 /Z18/usr/lpp/java/J1.4/lib/core 0.94
→ 00080 /Z18/usr/lpp/java/J1.4/lib/core 0.62
→ 00041 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.31
→ 00032 /Z18/usr/lpp/java/J1.4/lib/ibmo 0.18
→ 00044 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.14
→ 00026 /Z18/usr/lpp/java/J1.4/lib/char 0.09
→ 00042 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.09
→ 00034 /Z18/usr/lpp/java/J1.4/lib/ibmp 0.08
→ 00029 /Z18/usr/lpp/java/J1.4/lib/ibmj 0.07
→ 00054 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.07
→ 00081 /Z18/usr/lpp/java/J1.4/lib/grap 0.07
→ 00043 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.06
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | DevId, FileId          | Display context help information. |
| ++  | DevId, FileId          | Show additional details.          |

| Cmd | When Applied To Object | Action                        |
|-----|------------------------|-------------------------------|
| +   | DevId                  | Expand to reveal next level.  |
| –   | DevId                  | Collapse to hide next level.  |
| SV  | DevId                  | Sort next level by value.     |
| SN  | DevId                  | Sort next level by FileId.    |
| SP  | DevId                  | Sort next level by Path Name. |

## on headings

| Cmd | When Applied To Heading                   | Action                             |
|-----|-------------------------------------------|------------------------------------|
| ?   | DevId, Device#>Path Name, Percent of Time | Display context help information.  |
| +   | DevId                                     | Expand to reveal all entries.      |
| +   | Device#>Path Name                         | Expand field size.                 |
| +   | Percent of Time                           | Zoom in scale.                     |
| –   | DevId                                     | Collapse to show only first level. |
| –   | Device#>Path Name                         | Reduce field size.                 |
| –   | Percent of Time                           | Zoom out scale.                    |
| SV  | DevId                                     | Sort next level by value.          |
| SN  | DevId                                     | Sort next level by DevId.          |
| SD  | DevId                                     | Sort next level by Device#.        |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a DevId will cause this detail window to appear.

```

File View Navigate Help
+-----+
+----- The following report line was selected -----+
| 00001 4 84.84 |
+-----+
Calculation Details
 HFS device wait time measurements 8.484
 Total measurements 10,000
 Percent of total 84.84%
HFS Device Information
 Device# 4
 Dataset name HFS.ADCD.DEV
 DD name SYS00006
 Physical file system HFS
 Mount point /X235/dev
 Mounted 8:40:24.22 Friday Mar 9 2007
+-----+

```

## SETUP options

The SETUP command displays the following options:

Minimum Percentage of Time . . . . . 0.00

This is the minimum percentage of HFS wait time measured for which an item is to be included in the report.

By default, all HFS devices with wait time during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to devices with activity above the specified threshold.

## H10- HFS Service Time by Request

### Usage

Use this report to see how Service time was consumed by HFS file requests during the observation session. The unexpanded report shows an HFS request, listed by Request name, for which activity was observed. If an HFS file request was observed during a sample, but could not be attributed to a specific file, the request is aggregated to a single report line with a request name of "unknown". You can further expand each line item to show the HFS files associated with the request.

### Quantification

Each report line quantifies Service time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS request was inflight to the total number of samples. An observation is counted as inflight regardless of the CPU state: Active, WAIT, or Queued.

### Detail line hierarchy

An unexpanded report shows a line for each HFS request. The name field shows a sequence number assigned to each unique request type. You can expand each line to reveal an additional hierarchical level of detail. The hierarchy is illustrated here:

**Level 1** HFS Request  
**Level 2** HFS File

### Detail line descriptions

#### HFS Request detail line

This is the first-level detail line.

| Under Heading     | This is Displayed                                               |
|-------------------|-----------------------------------------------------------------|
| ReqId             | A unique sequence number assigned to each request type.         |
| Request>Path Name | The HFS request name.                                           |
| Percent of Time   | The percentage activity measured for the indicated HFS request. |

#### HFS File detail line

This is the second-level detail line.

| Under Heading     | This is Displayed                                            |
|-------------------|--------------------------------------------------------------|
| ReqId             | A unique sequence number assigned to each HFS file.          |
| Request>Path Name | The HFS file path name.                                      |
| Percent of Time   | The percentage activity measured for the indicated HFS file. |

## Sample reports

A sample report is shown here. It has been expanded to the second level.

```

File View Navigate Help

H10: HFS Service Time by Request (8242/JVMTST01) Row 00001 of 00090
Command ==> _____ Scroll ==> CSR

ReqId Request>PathName Percent of Time * 10.00% ±1.0%
 *....1....2....3....4....5....6..
00001 read 86.02
→ 00002 /dev/ttyp0000 70.35
→ 00001 /dev/ttyp0000 50.48
→ 00021 /Z18/usr/lpp/java/J1.4/lib/core 1.52
→ 00080 /Z18/usr/lpp/java/J1.4/lib/core 1.10
→ 00062 /u/zfs/iface.txt 0.53
→ 00041 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.32
→ 00032 /Z18/usr/lpp/java/J1.4/lib/ibmo 0.18
→ 00075 /u/zfs/platz 0.18
→ 00043 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.15
→ 00044 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.15
→ 00072 /u/zfs/platz 0.15
→ 00070 /u/zfs/platz 0.14
→ 00036 /u/zfs/platz 0.12
→ 00064 /u/zfs/platz 0.12
→ 00022 /Z18/usr/lpp/java/J1.4/lib/grap 0.11
→ 00005 /dev/ptyp0001 0.11
→ 00026 /Z18/usr/lpp/java/J1.4/lib/char 0.10

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | ReqId, FileId          | Display context help information. |
| ++  | ReqId, FileId          | Show additional details.          |
| +   | ReqId                  | Expand to reveal next level.      |
| –   | ReqId                  | Collapse to hide next level.      |
| SV  | ReqId                  | Sort next level by value.         |
| SN  | ReqId                  | Sort next level by FileId.        |
| SP  | ReqId                  | Sort next level by Path Name.     |

### on headings

| Cmd | When Applied To Heading                  | Action                             |
|-----|------------------------------------------|------------------------------------|
| ?   | ReqId, Request>PathName, Percent of Time | Display context help information.  |
| +   | ReqId                                    | Expand to reveal all entries.      |
| +   | Request>Path Name                        | Expand field size.                 |
| +   | Percent of Time                          | Zoom in scale.                     |
| –   | ReqId                                    | Collapse to show only first level. |



| Cmd | When Applied To Heading | Action                      |
|-----|-------------------------|-----------------------------|
| –   | Request>Path Name       | Reduce field size.          |
| –   | Percent of Time         | Zoom out scale.             |
| SV  | ReqId                   | Sort next level by value.   |
| SN  | ReqId                   | Sort next level by ReqId.   |
| SR  | ReqId                   | Sort next level by Request. |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a ReqId will cause this detail window to appear.

```

File View Navigate Help
+-----+
| +-----+ The following report line was selected +-----+
| | 00001 read 86.02 |
| +-----+
|
| Calculation Details
| HFS request measurements 8.602
| Total measurements 10,000
| Percent of total 86.02%
|
+-----+

```

## SETUP options

The SETUP command displays the following options:

```

Minimum Percentage of Time 0.00

This is the minimum percentage of HFS activity
measured for which an item is to be included in
the report.

```

By default, all HFS requests captured during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to requests with activity above the specified threshold.

## H11- HFS Wait Time by Request

### Usage

Use this report to identify delays resulting from waits during HFS requests. Each report line shows an HFS request, listed by Request name, for which wait time was observed. If a wait was observed during a sample, where there was an inflight HFS request, but could not be attributed to a specific file, the wait is aggregated to a single report line with a request name of "unknown". You can further expand each line item to show the HFS files associated with the request.

### Quantification

Each report line quantifies wait time measured as a percentage of total time. The percentage represents the ratio of the number of samples in which an HFS request was in a wait, to the total number of samples.

## Detail line hierarchy

An unexpanded report shows a line for each HFS request. The name field shows a sequence number assigned to each unique request type. You can expand each line to reveal an additional hierarchical level of detail. The hierarchy is illustrated here:

Level 1 HFS Request  
Level 2 HFS File

## Detail line descriptions

### HFS Request detail line

This is the first-level detail line.

| Under Heading     | This is Displayed                                                |
|-------------------|------------------------------------------------------------------|
| ReqId             | A unique sequence number assigned to each request type.          |
| Request>Path Name | The HFS request name.                                            |
| Percent of Time   | The percentage wait time measured for the indicated HFS request. |

### HFS File detail line

This is the second-level detail line.

| Under Heading     | This is Displayed                                             |
|-------------------|---------------------------------------------------------------|
| ReqId             | A unique sequence number assigned to each HFS file.           |
| Request>Path Name | The HFS file path name.                                       |
| Percent of Time   | The percentage wait time measured for the indicated HFS file. |

## Sample reports

A sample report is shown here.

```
File View Navigate Help

H11: HFS Wait Time by Request (8242/JVMTST01) Row 00001 of 00052
Command ==> Scroll ==> CSR

ReqId Request>PathName Percent of Time * 10.00% ±1.0%
*....1....2....3....4....5....6..
00001 read 35.38
→ 00002 /dev/ttyp0001 70.29
→ 00001 /dev/ttyp0000 50.46
→ 00021 /Z18/usr/lpp/java/J1.4/lib/core 0.94
→ 00080 /Z18/usr/lpp/java/J1.4/lib/core 0.62
→ 00041 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.31
→ 00062 /u/zfs/iface.txt 0.24
→ 00032 /Z18/usr/lpp/java/J1.4/lib/ibmo 0.18
→ 00044 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.14
→ 00026 /Z18/usr/lpp/java/J1.4/lib/char 0.09
→ 00042 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.09
→ 00034 /Z18/usr/lpp/java/J1.4/lib/ibmp 0.08
→ 00072 /u/zfs/platz 0.08
→ 00075 /u/zfs/platz 0.08
→ 00029 /Z18/usr/lpp/java/J1.4/lib/ibmj 0.07
→ 00036 /u/zfs/platz 0.07
→ 00054 /Z18/usr/lpp/java/J1.4/lib/ext/ 0.07
→ 00081 /Z18/usr/lpp/java/J1.4/lib/grap 0.07
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | ReqId, FileId          | Display context help information. |
| ++  | ReqId, FileId          | Show additional details.          |
| +   | ReqId                  | Expand to reveal next level.      |
| –   | ReqId                  | Collapse to hide next level.      |
| SV  | ReqId                  | Sort next level by value.         |
| SN  | ReqId                  | Sort next level by FileId.        |
| SP  | ReqId                  | Sort next level by Path Name.     |

### on headings

| Cmd | When Applied To Heading                  | Action                             |
|-----|------------------------------------------|------------------------------------|
| ?   | ReqId, Request>PathName, Percent of Time | Display context help information.  |
| +   | ReqId                                    | Expand to reveal all entries.      |
| +   | Request>Path Name                        | Expand field size.                 |
| +   | Percent of Time                          | Zoom in scale.                     |
| –   | ReqId                                    | Collapse to show only first level. |
| –   | Request>Path Name                        | Reduce field size.                 |
| –   | Percent of Time                          | Zoom out scale.                    |
| SV  | ReqId                                    | Sort next level by value.          |
| SN  | ReqId                                    | Sort next level by ReqId.          |
| SR  | ReqId                                    | Sort next level by Request.        |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

For example, entering “++” on a ReqId will cause this detail window to appear.

```

File View Navigate Help
+-----+
| +-----+ The following report line was selected -----+
| | 00001 read 85.38 |
| +-----+
|
| Calculation Details
| HFS request wait time measurements 8.538
| Total measurements 10,000
| Percent of total 85.38%
| +-----+

```

## SETUP options

The SETUP command displays the following options:

```

Minimum Percentage of Time 0.00

This is the minimum percentage of HFS wait time
measured for which an item is to be included in
the report.

```

By default, all HFS requests captured during an observation session are displayed. Use the Minimum Percent of Time option to limit the report to requests with wait time above the specified threshold.

## Chapter 9. WebSphere performance analysis reports

This section describes the WebSphere (WAS) performance analysis reports.

| For information about...                     | See...                                                                     |
|----------------------------------------------|----------------------------------------------------------------------------|
| The WAS data extractor                       | <a href="#">“Overview of WAS data extractor” on page 525</a>               |
| Measuring WAS servant address space activity | <a href="#">“Measuring WAS servant address space activity” on page 526</a> |
| B01 WAS Summary                              | <a href="#">“B01 - WAS Summary” on page 526</a>                            |
| B02 WAS Activity                             | <a href="#">“B02 - WAS Activity” on page 529</a>                           |
| B03 WAS Activity by Origin                   | <a href="#">“B03 - WAS Activity by Origin” on page 533</a>                 |
| B04 WAS Activity by Servant                  | <a href="#">“B04 - WAS Activity by Servant” on page 537</a>                |
| B05 WAS EJB Activity                         | <a href="#">“B05 - WAS EJB Activity” on page 542</a>                       |
| B06 WAS EJB Activity by Origin               | <a href="#">“B06 - WAS EJB Activity by Origin” on page 545</a>             |
| B07 WAS EJB Activity by Servant              | <a href="#">“B07 - WAS EJB Activity by Servant” on page 548</a>            |
| B08 WAS Servlet/JSP Activity                 | <a href="#">“B08 – WAS Servlet/JSP Activity” on page 551</a>               |
| B09 WAS Servlet/JSP by Origin                | <a href="#">“B09 - WAS Servlet/JSP by Origin” on page 554</a>              |
| B10 WAS Servlet/JSP by Servant               | <a href="#">“B10 WAS Servlet/JSP by Servant” on page 557</a>               |
| B11 WAS/CICS Calls                           | <a href="#">“B11 - WAS/CICS Calls” on page 560</a>                         |
| B12 WAS/Db2 Calls                            | <a href="#">“B12 - WAS/Db2 Calls” on page 563</a>                          |
| B13 Async Work Requests                      | <a href="#">“B13 - Async Work Requests” on page 566</a>                    |
| B14 Async Work by Work Mgr                   | <a href="#">“B14 - Async Work by Work Mgr” on page 569</a>                 |
| B15 Async Work by Servant                    | <a href="#">“B15 - Async Work by Servant” on page 571</a>                  |
| B16 WOLA Inbound Requests                    | <a href="#">“B16 - WOLA Inbound Requests” on page 574</a>                  |
| B17 WOLA Inbound by Origin                   | <a href="#">“B17 - WOLA Inbound by Origin” on page 577</a>                 |
| B18 WOLA Inbound by Servant                  | <a href="#">“B18 - WOLA Inbound by Servant” on page 581</a>                |
| B19 WOLA Outbound Requests                   | <a href="#">“B19 - WOLA Outbound Requests” on page 585</a>                 |
| B20 WOLA Outbound by Register                | <a href="#">“B20 - WOLA Outbound by Register” on page 587</a>              |
| B21 WOLA Outbound by Servant                 | <a href="#">“B21 - WOLA Outbound by Servant” on page 589</a>               |

### Overview of WAS data extractor

To use the WebSphere Performance Analysis Reports, WAS must be enabled in Application Performance Analyzer by your installation, and the WAS data extractor must be turned on when the Observation Request is entered. You select the WAS data extractor in the Options panel when creating a new measurement. The WAS data extractor is valid only if the target job is an active WAS controller address space. The WAS controller is not actually sampled, since no application code runs in a WAS controller. Instead, all WAS requests processed by the target WAS controller are recorded in the sample file. The sampling frequency will be changed to 1 per second and the number of samples will be changed to the sampling duration in seconds when the WAS measurement request begins.

When the WAS data extractor is selected, SMF records are activated for the target WAS controller address space. The SMF records contain information about each WAS request processed by the server. This SMF data is extracted and written to the sample file.

#### **Sequence Numbers**

The sequence numbers assigned to unique occurrences of object names (EJBs, servlets, and so on) do not necessarily indicate the order in which the objects were invoked.

#### **CPU and Service Times**

CPU time (including zIIP and zAAP time) is measured in microseconds. zIIP and zAAP CPU times are normalized to CP time. Service time (elapsed time) is measured in milliseconds. Total service time can exceed the sampling duration, because WAS processes multiple requests in parallel.

#### **CPU Usage Breakdown**

The SMF records contain information at the request level, giving total CPU and service times for each request. If the request invokes the Web container or EJB container, the SMF records contain information for each servlet/JSP or method invoked, to a maximum of 30 unique occurrences. Included in this information is CPU time, service time, and the number of times the object was invoked.

The sum of CPU times and service times for the breakdown will not add up to the CPU time and service time for the request, since not all activity is recorded in the breakdown when processing a request.

Similarly, the invocation count for a servlet/JSP or method will not add up to the request count at the request level.

#### **Request Types**

The type of a request is determined by its SMF record. Only a single type is recorded for each request. For example, if a request arrives via HTTP for a managed bean, the request type is HTTP. It will be counted once as an HTTP request. It will not be counted as an Mbean request.

## **Measuring WAS servant address space activity**

---

If during measurement of the controller, one or more WebSphere Application Services servant address spaces become active, they will also be automatically measured in separate child observation sessions. The servant observation sessions use a sampling frequency based on the number of samples and duration entered for the WAS request, and end when the controller measurement ends. You may select any of the following extractors when WAS is selected: CICS, Db2, Db2+, CDb2, Db2V, and JAVA. However, these extractors are only enabled for the servant observation sessions. Upon completion of the measurement, all servant observations will include a copy of the controller's B01 to B10 reports for your convenience.

**Note:** Measurement of servant region activity requires the Application Performance Analyzer WLM intercept be enabled during installation. Contact your system programmer to verify that the WLM intercept is enabled in Application Performance Analyzer.

## **B01 - WAS Summary**

---

### **Usage**

Use this report to see a summary of the WAS requests that were observed for the duration of the measurement.

### **Detail Line descriptions**

#### **System Identification**

This section identifies the z/OS system on which the measurement was done.

**System name**

The system name taken from the CVTSNAME field of the MVS CVT control block.

**Sysplex**

The sysplex name taken from the ECVTSPLX field of the MVS ECVT control block.

**Job name**

The job name of the WAS controller address space.

**Job id**

The job identifier of the WAS controller address space.

**ASID**

The address space identifier of the WAS controller address space, displayed in hex.

**WAS Identification**

This section identifies the WAS server on which the measurement was done.

**Cell**

The cell short name of the WAS server.

**Node**

The node name of the WAS server.

**Cluster**

The cluster name of the WAS server.

**Server**

The server name of the WAS server.

**WAS version**

The version number of the WAS server.

**Service level**

The build level of the WAS server.

**Request Counts**

This section provides counts of the number of requests observed for each request type. Requests are counted once only for a single type.

**Total requests**

The total number of requests observed. This is the sum of all request counts below except for timed out requests.

**IIOP requests**

The number of Internet Inter-ORB Protocol requests observed.

**HTTP requests**

The number of Hypertext Transfer Protocol requests observed.

**HTTPS requests**

The number of Hypertext Transfer Protocol Secure requests observed.

**MDB Plan A requests**

The number of Message Driven Bean Plan A requests observed. A plan "A" request is an MDB request from a listener port that is listening in the controller.

**MDB Plan B requests**

The number of Message Driven Bean Plan B requests observed. A plan "B" request is an MDB request from a listener port that is listening in the servant.

**MDB Plan C requests**

The number of Message Driven Bean Plan C requests observed. A plan "C" request is an MDB request from an activation specification that is listening in the adjunct.

**SIP requests**

The number of Session Initiation Protocol requests observed.

**SIPS requests**

The number of Session Initiation Protocol Secure requests observed.

**MBean requests**

The number of Managed Bean requests observed.

**OTS requests**

The number of Object Transaction Service requests observed.

**Internal requests**

The number of internal requests observed.

**Inbound WOLA requests**

The number of inbound WOLA requests observed.

**Unknown requests**

The number of unknown requests observed.

**Asynchronous requests**

The number of asynchronous requests observed.

**Timed out requests**

The number of requests that timed out and were not processed by a servant region. This count is not included in the total at the top, since the requests are already included in one of the other request counts.

**Outbound WOLA**

The number of outbound WOLA requests sent. The count is not included in the total at the top because these are requests to another system.

**Outbound unknown**

The number of outbound requests sent of an unknown type. This count is not included in the total at the top because these are requests to another system.

**Service Time**

This section shows the service time (elapsed time) for all of the requests observed. Note that the total service time can exceed the sampling duration, because WAS processes multiple requests in parallel.

**Total service time**

The total service time, measured from the time that the request was received to the time that the controller finished processing the request response.

**WLM queued time**

The total time that the requests spent on the Workload Manager queue.

**Dispatched time**

The total time that the requests spent being processed by the servant region.

**Controller time**

The total time that the requests spent being processed by the controller region.

**Asynchronous time**

The total time that is spent processing asynchronous requests. The time is not included in the total service time because these requests are independently dispatched and can run in parallel.

**CPU Usage**

This section shows the CPU time recorded for all of the requests observed.

**Enclave CPU time**

The total CPU time consumed by each observed request, as reported by the enclave when it was deleted. This includes normalized zIIP and zAAP time.

**Encl zIIP CPU time**

The total zIIP CPU time consumed by each observed request, as reported by the enclave when it was deleted. This time is normalized.

**Encl zAAP CPU time**

The total zAAP CPU time consumed by each observed request, as reported by the enclave when it was deleted. This time is normalized.

**Encl CPU s/units**

The total CPU service units for each observed request, as reported by the enclave when it was deleted.



### Encl zIIP s/units

The total zIIP service units for each observed request, as reported by the enclave when it was deleted.

### Encl zAAP s/units

The total zAAP service units for each observed request, as reported by the enclave when it was deleted.

### Async Encl CPU time

The total CPU time that is consumed by each observed asynchronous request, as reported by the enclave when it was deleted. This includes normalized zIIP and zAAP time.

### Async Encl zIIP CPU

The total zIIP CPU time that is consumed by each observed asynchronous request, as reported by the enclave when it was deleted. This time is normalized.

### Async Encl zAAP CPU

The total zAAP CPU time that is consumed by each observed asynchronous request, as reported by the enclave when it was deleted. This time is normalized.

## Sample reports

A sample report is shown here.

| File View Navigate Help         |          |                      |              |
|---------------------------------|----------|----------------------|--------------|
| B01: WAS Summary (0144/AZSR00A) |          | Row 00001 of 00024   |              |
| Command ==>                     |          | Scroll ==> CSR       |              |
| System Identification           |          | WAS Identification   |              |
| System name:                    | X235     | Cell:                | AZBASEA      |
| Sysplex:                        | ADCDPL   | Node:                | AZNODEA      |
| Job name:                       | AZSR00A  | Cluster:             | AZSR00       |
| Job id:                         | STC08056 | Server:              | AZSR00A      |
| ASID:                           | 007A     | WAS version:         | 7.0.0.12     |
|                                 |          | Service level:       | cf121027     |
| Request Counts                  |          | Service Time         |              |
| Total requests:                 | 218      | Total service time:  | 00:03:27.005 |
| IIOP requests:                  | 0        | WLM queued time:     | 00:00:00.176 |
| HTTP requests:                  | 218      | Dispatched time:     | 00:00:02.732 |
| HTTPS requests:                 | 0        | Controller time:     | 00:03:24.095 |
| MDB Plan A requests:            | 0        | Asynchronous time:   |              |
| 00:00:00.000                    |          |                      |              |
| MDB Plan B requests:            | 0        |                      |              |
| MDB Plan C requests:            | 0        | CPU Usage            |              |
| SIP requests:                   | 0        | Enclave CPU time:    | 00:00:10.327 |
| SIPS requests:                  | 0        | Encl zIIP CPU time:  | 00:00:09.341 |
| MBean requests:                 | 0        | Encl zAAP CPU time:  | 00:00:00.000 |
| OTS requests:                   | 0        | Encl CPU s/units:    | 24940        |
| Internal requests:              | 0        | Encl zIIP s/units:   | 22552        |
| Inbound WOLA requests:          | 0        | Encl zAAP s/units:   |              |
| 0                               |          |                      |              |
| Unknown requests:               | 0        | Async Encl CPU time: | 00:00:00.000 |
| Asynchronous requests:          | 0        | Async Encl zIIP CPU: | 00:00:00.000 |
| Timed out requests:             | 0        | Async Encl zAAP CPU: | 00:00:00.000 |
| Outbound WOLA:                  | 0        |                      |              |
| Outbound unknown:               | 0        |                      |              |

## B02 - WAS Activity

### Usage

This report shows quantification by the classification name of the request. You can expand each request line to see a breakdown and quantification by object (EJB or Web application) and method or servlet/JSP within the object.

## Quantification

Each report line shows the following for each WAS request and, when expanded, the object invocation lines for the request.

- Count of the number of requests or invocations of an object.
- Total CPU time for the request or invocation.
- Mean CPU time for the request or invocation.
- Total service time for the request or invocation.
- Mean service time for the request or invocation.

## Detail Line hierarchy

An unexpanded report shows a line for each unique WAS request. You can expand each line to reveal two additional hierarchical levels of detail.

The hierarchy is illustrated here:

**Level 1** WAS request  
    **Level 2** EJB or Web application  
        **Level 3** Method or servlet/JSP  
    **Level 2** EJB or Web application  
        **Level 3** Method or servlet/JSP

## Detail Line descriptions

### WAS Request detail line

This is the first level detail line. Each line shows information about a WAS request for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                    |
| Name            | The request name.                                                                                                                    |
| Count           | The number of requests counted for this request name. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests counted for this request name. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time per request. The CPU time includes normalized zIIP and zAAP CPU time.                                              |
| Svc Time: Total | The total service time (elapsed time) for all requests counted for this request name.                                                |
| Svc Time: Mean  | The mean service time per request.                                                                                                   |

### Object detail line

This is the second level detail line shown directly under the Request detail line. It quantifies invocation of an EJB or a Web application at the object level.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                                                                                                                                                     |
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                       |
| Count           | The number of invocations counted for this object. Large numbers will be expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore the level 2 counts do not necessarily add up to the level 1 count.         |
| CPU Time: Total | The total CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 2 CPU times do not necessarily add up to the level 1 CPU times. |
| CPU Time: Mean  | The mean CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 2 CPU times do not necessarily add up to the level 1 CPU times.  |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 2 service times do not necessarily add up to the level 1 service times.                           |
| Svc Time: Mean  | The mean service time for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 2 service times do not necessarily add up to the level 1 service times.                                           |

## Invocation detail line

This is the third level detail line shown directly under the Object detail line. It quantifies invocation of a method or servlet/JSP within the object.

| Under Heading   | This is Displayed                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 4 sequence number within the level 3 line.                                                                                                |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                      |
| Count           | The number of invocations counted for this method or servlet/JSP. Large numbers will be expressed in thousands or millions with a K or M suffix.  |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time. |

| Under Heading   | This is Displayed                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time. |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP within its context.                                      |
| Svc Time: Mean  | The mean service time for all invocations of this method or servlet/JSP within its context.                                                      |

## Sample reports

A sample report is shown here with the first level 1 line fully expanded.

| B02: WAS Activity (0144/AZSR00A) |                                                                         |               |                    | Row 00001 of 00038 |                    |         |
|----------------------------------|-------------------------------------------------------------------------|---------------|--------------------|--------------------|--------------------|---------|
| Command ==>                      |                                                                         |               |                    | Scroll ==> CSR     |                    |         |
| Seqno                            | Request, EJB/Webapp Method/Servlet Name                                 | Request Count | --CPU Time-- Total | Mean               | --Svc Time-- Total | Mean    |
| 00001                            | /PlantsByWebSphere/servlet/ShoppingServlet                              | 40            | 6.30               | 0.15765            | 1.30               | 0.03269 |
| > 00002                          | PlantsByWebSphere#PlantsByWebSphere.war                                 | 80            | 4.53               | 0.05665            | 0.81               | 0.01023 |
| > 00003                          | ShoppingServlet                                                         | 40            | 4.26               | 0.10668            | 0.78               | 0.01955 |
| > 00002                          | /shopping.jsp                                                           | 17            | 0.04               | 0.00270            | 0.01               | 0.00070 |
| > 00006                          | /product.jsp                                                            | 11            | 0.03               | 0.00300            | 0.00               | 0.00036 |
| > 00010                          | /cart.jsp                                                               | 11            | 0.17               | 0.01618            | 0.02               | 0.00181 |
| > 00014                          | /login.jsp                                                              | 1             | 0.00               | 0.00812            | 0.00               | 0.00100 |
| > 00003                          | PlantsByWebSphere::PlantsByWebSphereEJB.jar::ShoppingCart               | 64            | 0.11               | 0.00181            | 0.01               | 0.00015 |
| > 00008                          | getItem:                                                                | 29            | 0.01               | 0.00047            | 0.00               | 0.00006 |
| > 00009                          | getTotalCost:                                                           | 11            | 0.00               | 0.00050            | 0.00               | 0.00000 |
| > 00011                          | addItem:com.ibm.websphere.samples.plantsbywebsphereejb.ShoppingCartItem | 11            | 0.00               | 0.00055            | 0.00               | 0.00018 |
| > 00013                          | getCartContents:                                                        | 11            | 0.00               | 0.00051            | 0.00               | 0.00000 |
| > 00012                          | create:                                                                 | 2             | 0.08               | 0.04259            | 0.00               | 0.00300 |
| > 00001                          | PlantsByWebSphere::PlantsByWebSphereEJB.jar::Catalog                    | 39            | 1.36               | 0.03498            | 0.11               | 0.00284 |
| > 00007                          | getItemInventory:java.lang.String                                       | 22            | 0.30               | 0.01388            | 0.02               | 0.00104 |
| > 00001                          | getItemByCategory:integer                                               | 17            | 1.05               | 0.06228            | 0.08               | 0.00517 |
| 00002                            | /PlantsByWebSphere/servlet/ImageServlet                                 | 174           | 3.96               | 0.02276            | 205.62             | 1.18173 |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Seqno                  | Display context help information. |

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B03 - WAS Activity by Origin

### Usage

This report shows quantification by the origin of the request. You can expand each origin line to see a breakdown and quantification by request, object (EJB or Web application) and method or servlet/JSP within the object.

### Quantification

Each report line shows the following for each request origin and, when expanded, the request lines and object invocation lines for the request.

- Count of the number of requests or invocations of an object.
- Total CPU time for the request or invocation.
- Mean CPU time for the request or invocation.
- Total service time for the request or invocation.
- Mean service time for the request or invocation.

### Detail Line hierarchy

An unexpanded report shows a line for each unique request origin. You can expand each line to reveal three additional hierarchical levels of detail.

The hierarchy is illustrated here:

- Level 1** WAS request origin
  - Level 2** WAS request
    - Level 3** EJB or Web application
      - Level 4** Method or servlet/JSP
  - Level 2** WAS request
    - Level 3** EJB or Web application
      - Level 4** Method or servlet/JSP

## Detail Line descriptions

### WAS Request origin detail line

This is the first level detail line. Each line shows information about a WAS request origin for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                              |
| Name            | The origin name, identifying from whence the WAS request came.                                                                 |
| Count           | The number of requests counted for this origin. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests counted for this origin. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this origin. The CPU time includes normalized zIIP and zAAP CPU time.                                    |
| Svc Time: Total | The total service time (elapsed time) for all requests counted for this origin.                                                |
| Svc Time: Mean  | The mean service time for this origin.                                                                                         |

### WAS Request detail line

This is the second level detail line shown directly under the Origin detail line. It quantifies the WAS requests that came from the origin above.

| Under Heading   | This is Displayed                                                                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 2 sequence number within the level 1 line.                                                                                                            |
| Name            | The request name.                                                                                                                                                    |
| Count           | The number of requests counted for this request name that came from the origin above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests counted for this request name that came from the origin above. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this request. The CPU time includes normalized zIIP and zAAP CPU time.                                                                         |

| Under Heading   | This is Displayed                                                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|
| Svc Time: Total | The total service time (elapsed time) for all requests counted for this request name that came from the origin above. |
| Svc Time: Mean  | The mean service time for this request.                                                                               |

## Object detail line

This is the third level detail line shown directly under the Request detail line. It quantifies invocation of an EJB or a Web application at the object level.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                                                                                                                                                                        |
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                                          |
| Count           | The number of invocations counted for this object. Large numbers will be expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore the level 3 counts do not necessarily add up to the level 2 count.                            |
| CPU Time: Total | The total CPU time for all invocations of this object within its context. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 3 CPU times do not necessarily add up to the level 2 CPU times. |
| CPU Time: Mean  | The mean CPU time for all invocations of this object within its context. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 3 CPU times do not necessarily add up to the level 2 CPU times.  |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this object within its context. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 3 service times do not necessarily add up to the level 2 service times.                           |
| Svc Time: Mean  | The mean service time for all invocations of this object within its context. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 3 service times do not necessarily add up to the level 2 service times.                                           |

## Invocation detail line

This is the fourth level detail line shown directly under the Object detail line. It quantifies invocation of a method or servlet/JSP.

| Under Heading   | This is Displayed                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                               |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                     |
| Count           | The number of invocations counted for this method or servlet/JSP. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this method or servlet/JSP.                                                                         |

## Sample reports

A sample report is shown here with the first level 1 line partially expanded.

```

B03: WAS Activity by Origin (0144/AZSR00A) Row 00012 of 00038
Command ==> Scroll ==> CSR

 Origin,Req,EJB/Web Request --CPU Time-- --Svc Time--
Seqno Method/Servlet Name Count Total Mean Total Mean
00001 ip addr=99.247.184.65 100 6.39 0.06395 104.24 1.04240
> 00002 /PlantsByWebSphere/serv 78 1.83 0.02346 103.34 1.32494
 let/ImageServlet
> 00001 /PlantsByWebSphere/serv 22 4.56 0.20750 0.89 0.04070
 let/ShoppingServlet
> 00002 PlantsByWebSphere#Pla 44 3.57 0.08130 0.62 0.01418
 ntsByWebSphere.war
> 00003 ShoppingServlet 22 3.40 0.15490 0.59 0.02722
> 00002 /shopping.jsp 8 0.02 0.00279 0.00 0.00087
> 00006 /product.jsp 7 0.02 0.00296 0.00 0.00028
> 00010 /cart.jsp 7 0.12 0.01802 0.01 0.00228
> 00003 PlantsByWebSphere::Pl 41 0.10 0.00251 0.00 0.00021
 antsByWebSphereEJB.java
 r::ShoppingCart
> 00008 getItems: 19 0.00 0.00049 0.00 0.00005
> 00009 getTotalCost: 7 0.00 0.00058 0.00 0.00000
> 00011 addItem:com.ibm.web 7 0.00 0.00063 0.00 0.00028
 sphere.samples.plan
 tsbywebsphereeejb.Sh
 oppingCartItem
> 00013 getCartContents: 7 0.00 0.00059 0.00 0.00000
> 00012 create: 1 0.08 0.08112 0.00 0.00600
> 00001 PlantsByWebSphere::Pl 22 0.71 0.03251 0.05 0.00268
 antsByWebSphereEJB.java
 r::Catalog
> 00007 getItemInventory:java 14 0.20 0.01477 0.01 0.00107
 va.lang.String
> 00001 getItemByCategory: 8 0.50 0.06354 0.04 0.00550
 int
00002 ip addr=70.30.134.79 118 3.93 0.03332 102.76 0.87088

```



## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B04 - WAS Activity by Servant

---

### Usage

This report shows quantification by servant in which the request ran. You can expand each servant line to see a breakdown and quantification by request, object (EJB or Web application) and method or servlet/JSP within the object.

### Quantification

Each report line shows the following for each servant region and, when expanded, the request lines and object invocation lines for the request.

- Count of the number of requests or invocations of an object.
- Total CPU time for the request or invocation.
- Mean CPU time for the request or invocation.

- Total service time for the request or invocation.
- Mean service time for the request or invocation.

## Detail Line hierarchy

An unexpanded report shows a line for each unique servant region. You can expand each line to reveal three additional hierarchical levels of detail.

The hierarchy is illustrated here:

**Level 1** WAS servant region

**Level 2** WAS request

**Level 3** EJB or Web application

**Level 4** Method or servlet/JSP

**Level 2** WAS request

**Level 3** EJB or Web application

**Level 4** Method or servlet/JSP

## Detail Line descriptions

### WAS Request servant detail line

This is the first level detail line. Each line shows information about a WAS servant region for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                                                                                                                                                                                                                                                         |
| Name            | The job name and job id of the servant region in which the request was processed.                                                                                                                                                                                                                                                                                                         |
| Count           | The number of requests counted for this servant. Large numbers will be expressed in thousands or millions with a K or M suffix. Note: An Affinity Count is displayed in the detail window for this line. This is a count of the number of requests queued to this specific servant region because the requests had an affinity to the servant, possibly because of HTTP session affinity. |
| CPU Time: Total | The total CPU time for all requests counted for this servant. The CPU time includes normalized zIIP and zAAP CPU time.                                                                                                                                                                                                                                                                    |
| CPU Time: Mean  | The mean CPU time for this servant. The CPU time includes normalized zIIP and zAAP CPU time.                                                                                                                                                                                                                                                                                              |
| Svc Time: Total | The total service time (elapsed time) for all requests counted for this servant.                                                                                                                                                                                                                                                                                                          |
| Svc Time: Mean  | The mean service time for this servant.                                                                                                                                                                                                                                                                                                                                                   |

### WAS Request detail line

This is the second level detail line shown directly under the servant detail line. It quantifies the WAS requests that came from the servant above.

| Under Heading   | This is Displayed                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 2 sequence number within the level 1 line.                                                                                                          |
| Name            | The request name.                                                                                                                                                  |
| Count           | The number of requests counted for this request name that ran in the servant above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests counted for this request name that ran in the servant above. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this request. The CPU time includes normalized zIIP and zAAP CPU time.                                                                       |
| Svc Time: Total | The total service time (elapsed time) for all requests counted for this request name that ran in the servant above.                                                |
| Svc Time: Mean  | The mean service time for this request.                                                                                                                            |

## Object detail line

This is the third level detail line shown directly under the Request detail line. It quantifies invocation of an EJB or a Web application at the object level.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                                                                                                                                                                        |
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                                          |
| Count           | The number of invocations counted for this object. Large numbers will be expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore the level 3 counts do not necessarily add up to the level 2 count.                            |
| CPU Time: Total | The total CPU time for all invocations of this object within its context. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 3 CPU times do not necessarily add up to the level 2 CPU times. |
| CPU Time: Mean  | The mean CPU time for all invocations of this object within its context. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore the level 3 CPU times do not necessarily add up to the level 2 CPU times.  |

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Svc Time: Total | The total service time (elapsed time) for all invocations of this object within its context. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 3 service times do not necessarily add up to the level 2 service times. |
| Svc Time: Mean  | The mean service time for all invocations of this object within its context. There is processing in addition to the service time incurred by these invoked objects. Therefore the level 3 service times do not necessarily add up to the level 2 service times.                 |

## Invocation detail line

This is the fourth level detail line shown directly under the Object detail line. It quantifies invocation of a method or servlet/JSP.

| Under Heading   | This is Displayed                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                               |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                     |
| Count           | The number of invocations counted for this method or servlet/JSP. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this method or servlet/JSP.                                                                         |

## Sample reports

A sample report is shown here with the first level 1 line partially expanded.

Command ==&gt;

Scroll ==&gt; CSR

| Seqno   | Servant, Req, EJB/Web<br>Method/Servlet Name                                | Request<br>Count | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |
|---------|-----------------------------------------------------------------------------|------------------|----------------------------|----------------------------|
| 00001   | AZSR00AS STC08061                                                           | 100              | 6.39 0.06395               | 104.24 1.04240             |
| > 00002 | /PlantsByWebSphere/servlet/ImageServlet                                     | 78               | 1.83 0.02346               | 103.34 1.32494             |
| > 00001 | /PlantsByWebSphere/servlet/ShoppingServlet                                  | 22               | 4.56 0.20750               | 0.89 0.04070               |
| > 00002 | PlantsByWebSphere#PlantsByWebSphere.war                                     | 44               | 3.57 0.08130               | 0.62 0.01418               |
| > 00003 | ShoppingServlet                                                             | 22               | 3.40 0.15490               | 0.59 0.02722               |
| > 00002 | /shopping.jsp                                                               | 8                | 0.02 0.00279               | 0.00 0.00087               |
| > 00006 | /product.jsp                                                                | 7                | 0.02 0.00296               | 0.00 0.00028               |
| > 00010 | /cart.jsp                                                                   | 7                | 0.12 0.01802               | 0.01 0.00228               |
| > 00003 | PlantsByWebSphere::PlantsByWebSphereEJB.java::ShoppingCart                  | 41               | 0.10 0.00251               | 0.00 0.00021               |
| > 00008 | getItems:                                                                   | 19               | 0.00 0.00049               | 0.00 0.00005               |
| > 00009 | getTotalCost:                                                               | 7                | 0.00 0.00058               | 0.00 0.00000               |
| > 00011 | addItem:com.ibm.web<br>sphere.samples.plantsbywebsphereejb.ShoppingCartItem | 7                | 0.00 0.00063               | 0.00 0.00028               |
| > 00013 | getCartContents:                                                            | 7                | 0.00 0.00059               | 0.00 0.00000               |
| > 00012 | create:                                                                     | 1                | 0.08 0.08112               | 0.00 0.00600               |
| > 00001 | PlantsByWebSphere::PlantsByWebSphereEJB.java::Catalog                       | 22               | 0.71 0.03251               | 0.05 0.00268               |
| > 00007 | getItemInventory:java.lang.String                                           | 14               | 0.20 0.01477               | 0.01 0.00107               |
| > 00001 | getItemsByCategory:int                                                      | 8                | 0.50 0.06354               | 0.04 0.00550               |
| 00002   | AZSR00AS STC08062                                                           | 118              | 3.93 0.03332               | 102.76 0.87088             |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

## On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B05 - WAS EJB Activity

---

### Usage

This report shows quantification by EJB name, for those requests that invoked an EJB. You can expand each EJB line to see a breakdown and quantification by method within the EJB.

### Quantification

Each report line shows the following for each EJB object and, when expanded, the methods invoked for the object.

- Count of the number of requests or invocations of the EJB or method.
- Total CPU time for the EJB or method.
- Mean CPU time for the EJB or method.
- Total service time for the EJB or method.
- Mean service time for the EJB or method.

### Detail Line hierarchy

An unexpanded report shows a line for each unique EJB. You can expand each line to reveal three additional hierarchical levels of detail.

The hierarchy is illustrated here:

**Level 1** EJB

**Level 2** Method

### Detail Line descriptions

#### EJB detail line

This is the first level detail line. Each line shows information about an EJB for which measurement data was recorded.

| Under Heading | This is Displayed                 |
|---------------|-----------------------------------|
| Seqno         | A unique level 1 sequence number. |
| Name          | The EJB name.                     |

| Under Heading   | This is Displayed                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of invocations counted for this EJB. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this EJB. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time per EJB. The CPU time includes normalized zIIP and zAAP CPU time.                                            |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this EJB.                                                         |
| Svc Time: Mean  | The mean service time per EJB.                                                                                                 |

## Method detail line

This is the second level detail line shown directly under the EJB detail line. It quantifies invocation of a method within the EJB.

| Under Heading   | This is Displayed                                                                                                                 |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                |
| Name            | The EJB method name.                                                                                                              |
| Count           | The number of invocations counted for this method. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this method. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this method.                                                                         |

## Sample reports

A sample report is shown here with the level 1 lines fully expanded.

B05: WAS EJB Activity (0144/AZSR00A)

Row 00001 of 00019

Command ==>

Scroll ==> CSR

| Seqno   | Request, EJB/Webapp<br>Method/Servlet Name                                          | Request<br>Count | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |
|---------|-------------------------------------------------------------------------------------|------------------|----------------------------|----------------------------|
| 00001   | PlantsByWebSphere::Plants<br>ByWebSphereEJB.jar::Catalog                            | 213              | 3.16 0.01487               | 0.27 0.00128               |
| > 00005 | getItemImageBytes:java.<br>lang.String                                              | 174              | 1.80 0.01036               | 0.16 0.00093               |
| > 00001 | getItemByCategory:int                                                               | 17               | 1.05 0.06228               | 0.08 0.00517               |
| > 00007 | getItemInventory:java.l<br>ang.String                                               | 22               | 0.30 0.01388               | 0.02 0.00104               |
| 00003   | PlantsByWebSphere::Plants<br>ByWebSphereEJB.jar::Shopp<br>ingCart                   | 64               | 0.11 0.00181               | 0.01 0.00015               |
| > 00012 | create:                                                                             | 2                | 0.08 0.04259               | 0.00 0.00300               |
| > 00008 | getItem:                                                                            | 29               | 0.01 0.00047               | 0.00 0.00006               |
| > 00011 | addItem:com.ibm.websphe<br>re.samples.plantsbywebs<br>phereejb.ShoppingCartIt<br>em | 11               | 0.00 0.00055               | 0.00 0.00018               |
| > 00013 | getCartContents:                                                                    | 11               | 0.00 0.00051               | 0.00 0.00000               |
| > 00009 | getTotalCost:                                                                       | 11               | 0.00 0.00050               | 0.00 0.00000               |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |



| Cmd | When applied to object | Action                |
|-----|------------------------|-----------------------|
| SC  | Seqno                  | Sort by CPU time.     |
| SS  | Seqno                  | Sort by Service time. |

## B06 - WAS EJB Activity by Origin

### Usage

This report shows quantification of EJB invocations by the origin of requests that invoked the EJB. You can expand each origin line to see a breakdown and quantification by EJB and method within the EJB.

### Quantification

Each report line shows the following for each request origin and, when expanded, the EJB and method lines for the origin.

- Count of the number of requests or invocations of an EJB or method.
- Total CPU time for the EJB or method.
- Mean CPU time for the EJB or method.
- Total service time for the EJB or method.
- Mean service time for the EJB or method.

### Detail Line hierarchy

An unexpanded report shows a line for each unique request origin. You can expand each line to reveal two additional hierarchical levels of detail.

The hierarchy is illustrated here:

**Level 1** WAS request origin  
**Level 2** EJB  
**Level 3** Method  
**Level 2** EJB  
**Level 3** Method

### Detail Line descriptions

#### WAS Request origin detail line

This is the first level detail line. Each line shows information about a WAS request origin for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                     |
| Name            | The origin name, identifying from whence the WAS request came.                                                                        |
| Count           | The number of EJB invocations counted for this origin. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all EJB invocations counted for this origin. The CPU time includes normalized zIIP and zAAP CPU time.          |

| Under Heading   | This is Displayed                                                                           |
|-----------------|---------------------------------------------------------------------------------------------|
| CPU Time: Mean  | The mean CPU time for this origin. The CPU time includes normalized zIIP and zAAP CPU time. |
| Svc Time: Total | The total service time (elapsed time) for all EJB invocations counted for this origin.      |
| Svc Time: Mean  | The mean service time for this origin.                                                      |

## EJB detail line

This is the second level detail line shown directly under the Origin detail line. It quantifies invocation of an EJB.

| Under Heading   | This is Displayed                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                     |
| Name            | The EJB name.                                                                                                                                          |
| Count           | The number of invocations counted for this EJB within the origin above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this EJB within the origin above. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this EJB within the origin above. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this EJB within the origin above.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this EJB within the origin above.                                                                         |

## Method detail line

This is the third level detail line shown directly under the EJB detail line. It quantifies invocation of a method within the EJB.

| Under Heading   | This is Displayed                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                   |
| Name            | The EJB method name.                                                                                                                                 |
| Count           | The number of invocations counted for this method within its context. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method within its context. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this method within its context. The CPU time includes normalized zIIP and zAAP CPU time.                    |

| Under Heading   | This is Displayed                                                                            |
|-----------------|----------------------------------------------------------------------------------------------|
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method within its context. |
| Svc Time: Mean  | The mean service time for all invocations of this method within its context.                 |

## Sample reports

A sample report is shown here with the first level 1 line fully expanded.

```

B06: WAS EJB Activity by Origin (0144/AZSR00A) Row 00001 of 00022
Command ==> Scroll ==> CSR
 Origin,EJB, Request --CPU Time-- --Svc Time--
Seqno Method Name Count Total Mean Total Mean
00001 ip addr=99.247.184.65 141 1.65 0.01175 0.14 0.00102
> 00001 PlantsByWebSphere::Plan 100 1.55 0.01554 0.13 0.00136
 tsByWebSphereEJB.jar::C
 atalog
 > 00005 getItemImageBytes:jav 78 0.83 0.01075 0.07 0.00098
 a.lang.String
 > 00007 getItemInventory:java 14 0.20 0.01477 0.01 0.00107
 .lang.String
 > 00001 getItemByCategory:in 8 0.50 0.06354 0.04 0.00550
 t
> 00003 PlantsByWebSphere::Plan 41 0.10 0.00251 0.00 0.00021
 tsByWebSphereEJB.jar::S
 hoppingCart
 > 00008 getItem: 19 0.00 0.00049 0.00 0.00005
 > 00009 getTotalCost: 7 0.00 0.00058 0.00 0.00000
 > 00011 addItem:com.ibm.websp 7 0.00 0.00063 0.00 0.00028
 here.samples.plantsby
 websphereejb.Shopping
 CartItem
 > 00013 getCartContents: 7 0.00 0.00059 0.00 0.00000
 > 00012 create: 1 0.08 0.08112 0.00 0.00600
00002 ip addr=70.30.134.79 136 1.62 0.01196 0.13 0.00102

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |

| Cmd | When applied to object | Action                |
|-----|------------------------|-----------------------|
| SS  | Seqno                  | Sort by Service time. |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B07 - WAS EJB Activity by Servant

---

### Usage

This report shows quantification of EJB invocations by the servant region in which the EJB was invoked. You can expand each servant line to see a breakdown and quantification by EJB and method within the EJB.

### Quantification

Each report line shows the following for each servant region and, when expanded, the EJB and method lines for the servant.

- Count of the number of requests or invocations of an EJB or method.
- Total CPU time for the EJB or method.
- Mean CPU time for the EJB or method.
- Total service time for the EJB or method.
- Mean service time for the EJB or method.

### Detail Line hierarchy

An unexpanded report shows a line for each unique servant region. You can expand each line to reveal two additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 WAS servant region
 Level 2 EJB
 Level 3 Method
 Level 2 EJB
 Level 3 Method

```

### Detail Line descriptions

## WAS Request servant detail line

This is the first level detail line. Each line shows information about a WAS servant for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                      |
| Name            | The job name and job id of the servant region in which the request was processed.                                                      |
| Count           | The number of EJB invocations counted for this servant. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all EJB invocations counted for this servant. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this servant. The CPU time includes normalized zIIP and zAAP CPU time.                                           |
| Svc Time: Total | The total service time (elapsed time) for all EJB invocations counted for this servant.                                                |
| Svc Time: Mean  | The mean service time for this servant.                                                                                                |

## EJB detail line

This is the second level detail line shown directly under the servant detail line. It quantifies invocation of an EJB.

| Under Heading   | This is Displayed                                                                                                                                       |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                      |
| Name            | The EJB name.                                                                                                                                           |
| Count           | The number of invocations counted for this EJB within the servant above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this EJB within the servant above. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this EJB within the servant above. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this EJB within the servant above.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this EJB within the servant above.                                                                         |

## Method detail line

This is the third level detail line shown directly under the EJB detail line. It quantifies invocation of a method within the EJB.

| Under Heading   | This is Displayed                                                                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                   |
| Name            | The EJB method name.                                                                                                                                 |
| Count           | The number of invocations counted for this method within its context. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method within its context. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this method within its context. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this method within its context.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this method within its context.                                                                         |

## Sample reports

A sample report is shown here with the first level 1 line fully expanded.

| B07: WAS EJB Activity by Origin (0144/AZSR00A)                                              |                  |                            |                            | Row 00001 of 00022 |         |  |
|---------------------------------------------------------------------------------------------|------------------|----------------------------|----------------------------|--------------------|---------|--|
| Command ==>                                                                                 |                  |                            |                            | Scroll ==> CSR     |         |  |
| Servant,EJB<br>Seqno Method Name                                                            | Request<br>Count | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |                    |         |  |
| 00001 AZSR00AS STC08061                                                                     | 141              | 1.65                       | 0.01175                    | 0.14               | 0.00102 |  |
| > 00001 PlantsByWebSphere::Plan<br>tsByWebSphereEJB.jar::C<br>atalog                        | 100              | 1.55                       | 0.01554                    | 0.13               | 0.00136 |  |
| > 00005 getItemImageBytes:jav<br>a.lang.String                                              | 78               | 0.83                       | 0.01075                    | 0.07               | 0.00098 |  |
| > 00007 getItemInventory:java<br>.lang.String                                               | 14               | 0.20                       | 0.01477                    | 0.01               | 0.00107 |  |
| > 00001 getItemByCategory:in<br>t                                                           | 8                | 0.50                       | 0.06354                    | 0.04               | 0.00550 |  |
| > 00003 PlantsByWebSphere::Plan<br>tsByWebSphereEJB.jar::S<br>hoppingCart                   | 41               | 0.10                       | 0.00251                    | 0.00               | 0.00021 |  |
| > 00008 getItem:                                                                            | 19               | 0.00                       | 0.00049                    | 0.00               | 0.00005 |  |
| > 00009 getTotalCost:                                                                       | 7                | 0.00                       | 0.00058                    | 0.00               | 0.00000 |  |
| > 00011 addItem:com.ibm.websp<br>here.samples.plantsby<br>websphereejb.Shopping<br>CartItem | 7                | 0.00                       | 0.00063                    | 0.00               | 0.00028 |  |
| > 00013 getCartContents:                                                                    | 7                | 0.00                       | 0.00059                    | 0.00               | 0.00000 |  |
| > 00012 create:                                                                             | 1                | 0.08                       | 0.08112                    | 0.00               | 0.00600 |  |
| 00002 AZSR00AS STC08062                                                                     | 136              | 1.62                       | 0.01196                    | 0.13               | 0.00102 |  |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

## On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

## On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B08 – WAS Servlet/JSP Activity

---

### Usage

This report shows quantification by Web application name for those requests that invoked a servlet or JSP. You can expand each Web application line to see a breakdown and quantification by servlet or JSP name within the Web application.

### Quantification

Each report line shows the following for each Web application and, when expanded, the servlet/JSP invoked within the application.

- Count of the number of requests or invocations of the Web application or servlet/JSP.
- Total CPU time for the Web application or servlet/JSP.
- Mean CPU time for the Web application or servlet/JSP.
- Total service time for the Web application or servlet/JSP.
- Mean service time for the Web application or servlet/JSP.

## Detail Line hierarchy

An unexpanded report shows a line for each unique Web application. You can expand each line to reveal an additional level of detail.

**Level 1** Web application  
**Level 2** Servlet/JSP

## Detail Line descriptions

### Web application detail line

This is the first level detail line. Each line shows information about a Web application for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                          |
| Name            | The Web application name.                                                                                                                  |
| Count           | The number of invocations counted for this Web application. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this Web application. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time per Web application. The CPU time includes normalized zIIP and zAAP CPU time.                                            |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this Web application.                                                         |
| Svc Time: Mean  | The mean service time per Web application.                                                                                                 |

### Servlet/JSP detail line

This is the second level detail line shown directly under the Web application detail line. It quantifies invocation of a servlet/JSP within the Web application.

| Under Heading   | This is Displayed                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                     |
| Name            | The servlet/JSP name.                                                                                                                  |
| Count           | The number of invocations counted for this servlet/JSP. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this servlet/JSP. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this servlet/JSP.                                                         |



| Under Heading  | This is Displayed                                              |
|----------------|----------------------------------------------------------------|
| Svc Time: Mean | The mean service time for all invocations of this servlet/JSP. |

## Sample reports

A sample report is shown here with the level 1 lines fully expanded.

```

B08: WAS Servlet/JSP Activity (0144/AZSR00A) Row 00001 of 00008
Command ==> Scroll ==> CSR
 Web App, Request --CPU Time-- --Svc Time--
Seqno Servlet/JSP Name Count Total Mean Total Mean
00002 PlantsByWebSphere#PlantsB 254 5.92 0.02333 1.93 0.00761
 yWebSphere.war
> 00004 ImageServlet 174 1.39 0.00801 1.11 0.00641
> 00003 ShoppingServlet 40 4.26 0.10668 0.78 0.01955
> 00002 /shopping.jsp 17 0.04 0.00270 0.01 0.00070
> 00006 /product.jsp 11 0.03 0.00300 0.00 0.00036
> 00010 /cart.jsp 11 0.17 0.01618 0.02 0.00181
> 00014 /login.jsp 1 0.00 0.00812 0.00 0.00100

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| –   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| –   | Seqno                  | Collapse to hide next level entries. |

| Cmd | When applied to object | Action                            |
|-----|------------------------|-----------------------------------|
| SV  | Seqno                  | Sort next level entries by value. |
| SC  | Seqno                  | Sort by CPU time.                 |
| SS  | Seqno                  | Sort by Service time.             |

## B09 - WAS Servlet/JSP by Origin

### Usage

This report shows quantification of Web application invocations by the origin of requests that invoked the Web application. You can expand each origin line to see a breakdown and quantification by Web application and servlet/JSP within the Web application.

### Quantification

Each report line shows the following for each request origin and, when expanded, the Web application and servlet/JSP lines for the request.

- Count of the number of invocations of a Web application or servlet/JSP.
- Total CPU time for the Web application or servlet/JSP.
- Mean CPU time for the Web application or servlet/JSP.
- Total service time for the Web application or servlet/JSP.
- Mean service time for the Web application or servlet/JSP.

### Detail Line hierarchy

An unexpanded report shows a line for each unique request origin. You can expand each line to reveal two additional hierarchical levels of detail.

The hierarchy is illustrated here:

**Level 1** WAS request origin  
**Level 2** Web application  
**Level 3** Servlet/JSP  
**Level 2** Web application  
**Level 3** Servlet/JSP

### Detail Line descriptions

#### WAS Request origin detail line

This is the first level detail line. Each line shows information about a WAS request origin for which measurement data was recorded.

| Under Heading | This is Displayed                                              |
|---------------|----------------------------------------------------------------|
| Seqno         | A unique level 1 sequence number.                              |
| Name          | The origin name, identifying from whence the WAS request came. |

| Under Heading   | This is Displayed                                                                                                                                 |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of Web application invocations counted for this origin. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all Web application invocations counted for this origin. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this origin. The CPU time includes normalized zIIP and zAAP CPU time.                                                       |
| Svc Time: Total | The total service time (elapsed time) for all Web application invocations counted for this origin.                                                |
| Svc Time: Mean  | The mean service time for this origin.                                                                                                            |

## Web application detail line

This is the second level detail line shown directly under the Origin detail line. It quantifies invocation of a Web application.

| Under Heading   | This is Displayed                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                                 |
| Name            | The Web application name.                                                                                                                                          |
| Count           | The number of invocations counted for this Web application within the origin above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this Web application within the origin above. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this Web application within the origin above. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this Web application within the origin above.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this Web application within the origin above.                                                                         |

## Servlet/JSP detail line

This is the third level detail line shown directly under the Web application detail line. It quantifies invocation of a servlet/JSP within the Web application.

| Under Heading | This is Displayed                                  |
|---------------|----------------------------------------------------|
| Seqno         | A level 3 sequence number within the level 2 line. |
| Name          | The servlet/JSP name.                              |

| Under Heading   | This is Displayed                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of invocations counted for this servlet/JSP within its context. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this servlet/JSP within its context.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this servlet/JSP within its context.                                                                         |

## Sample reports

A sample report is shown here with the level 1 lines fully expanded.

```

B09: WAS Servlet/JSP by Origin (0144/AZSR00A) Row 00001 of 00017
Command ==> Scroll ==> CSR

 Origin,Web App, Request --CPU Time-- --Svc Time--
Seqno Servlet/JSP Name Count Total Mean Total Mean
00001 ip addr=99.247.184.65 122 4.21 0.03458 1.18 0.00974
> 00002 PlantsByWebSphere#Plant 122 4.21 0.03458 1.18 0.00974
 sByWebSphere.war
 > 00004 ImageServlet 78 0.64 0.00823 0.56 0.00724
 > 00003 ShoppingServlet 22 3.40 0.15490 0.59 0.02722
 > 00002 /shopping.jsp 8 0.02 0.00279 0.00 0.00087
 > 00006 /product.jsp 7 0.02 0.00296 0.00 0.00028
 > 00010 /cart.jsp 7 0.12 0.01802 0.01 0.00228
00002 ip addr=70.30.134.79 132 1.70 0.01293 0.74 0.00565
> 00002 PlantsByWebSphere#Plant 132 1.70 0.01293 0.74 0.00565
 sByWebSphere.war
 > 00004 ImageServlet 96 0.75 0.00783 0.55 0.00573
 > 00003 ShoppingServlet 18 0.85 0.04774 0.18 0.01016
 > 00002 /shopping.jsp 9 0.02 0.00262 0.00 0.00055
 > 00006 /product.jsp 4 0.01 0.00306 0.00 0.00050
 > 00010 /cart.jsp 4 0.05 0.01297 0.00 0.00100
 > 00014 /login.jsp 1 0.00 0.00812 0.00 0.00100

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B10 WAS Servlet/JSP by Servant

---

### Usage

This report shows quantification of Web application invocations by the servant region in which the Web application ran. You can expand each servant line to see a breakdown and quantification by Web application and servlet/JSP within the Web application.

### Quantification

Each report line shows the following for each servant region and, when expanded, the Web application and servlet/JSP lines that ran in the servant.

- Count of the number of invocations of a Web application or servlet/JSP.
- Total CPU time for the Web application or servlet/JSP.
- Mean CPU time for the Web application or servlet/JSP.
- Total service time for the Web application or servlet/JSP.
- Mean service time for the Web application or servlet/JSP

### Detail Line hierarchy

An unexpanded report shows a line for each unique servant region. You can expand each line to reveal two additional hierarchical levels of detail.

The hierarchy is illustrated here:

- Level 1** WAS servant region
- Level 2** Web application

**Level 3** Servlet/JSP  
**Level 2** Web application  
**Level 3** Servlet/JSP

## Detail Line descriptions

### WAS Request servant detail line

This is the first level detail line. Each line shows information about a WAS servant for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                                  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                  |
| Name            | The job name and job id of the servant region in which the request was processed.                                                                  |
| Count           | The number of Web application invocations counted for this servant. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all Web application invocations counted for this servant. The CPU time includes normalized zIIP and zAAP CPU time.          |
| CPU Time: Mean  | The mean CPU time for this servant. The CPU time includes normalized zIIP and zAAP CPU time.                                                       |
| Svc Time: Total | The total service time (elapsed time) for all Web application invocations counted for this servant.                                                |
| Svc Time: Mean  | The mean service time for this servant.                                                                                                            |

### Web application detail line

This is the second level detail line shown directly under the servant detail line. It quantifies invocation of a Web application.

| Under Heading   | This is Displayed                                                                                                                                                   |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                                  |
| Name            | The Web application name.                                                                                                                                           |
| Count           | The number of invocations counted for this Web application within the servant above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this Web application within the servant above. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this Web application within the servant above. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this Web application within the servant above.                                                         |

| Under Heading  | This is Displayed                                                                           |
|----------------|---------------------------------------------------------------------------------------------|
| Svc Time: Mean | The mean service time for all invocations of this Web application within the servant above. |

## Servlet/JSP detail line

This is the third level detail line shown directly under the Web application detail line. It quantifies invocation of a servlet/JSP within the Web application.

| Under Heading   | This is Displayed                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                        |
| Name            | The servlet/JSP name.                                                                                                                                     |
| Count           | The number of invocations counted for this servlet/JSP within its context. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.                   |
| CPU Time: Mean  | The mean CPU time for all invocations of this servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.                    |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this servlet/JSP within its context.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this servlet/JSP within its context.                                                                         |

## Sample reports

A sample report is shown here with the level 1 lines fully expanded.

```

B10: WAS Servlet/JSP by Servant (0144/AZSR00A) Row 00001 of 00017
Command ==> Scroll ==> CSR

 Servant,Web App, Request --CPU Time-- --Svc Time--
 Seqno Servlet /JSP Name Count Total Mean Total Mean
00001 AZSR00AS STC08061 122 4.21 0.03458 1.18 0.00974
> 00002 PlantsByWebSphere#Plant 122 4.21 0.03458 1.18 0.00974
 sByWebSphere.war
> 00004 ImageServlet 78 0.64 0.00823 0.56 0.00724
> 00003 ShoppingServlet 22 3.40 0.15490 0.59 0.02722
> 00002 /shopping.jsp 8 0.02 0.00279 0.00 0.00087
> 00006 /product.jsp 7 0.02 0.00296 0.00 0.00028
> 00010 /cart.jsp 7 0.12 0.01802 0.01 0.00228
00002 AZSR00AS STC08062 132 1.70 0.01293 0.74 0.00565
> 00002 PlantsByWebSphere#Plant 132 1.70 0.01293 0.74 0.00565
 sByWebSphere.war
> 00004 ImageServlet 96 0.75 0.00783 0.55 0.00573
> 00003 ShoppingServlet 18 0.85 0.04774 0.18 0.01016
> 00002 /shopping.jsp 9 0.02 0.00262 0.00 0.00055
> 00006 /product.jsp 4 0.01 0.00306 0.00 0.00050
> 00010 /cart.jsp 4 0.05 0.01297 0.00 0.00100
> 00014 /login.jsp 1 0.00 0.00812 0.00 0.00100

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to object | Action                                   |
|-----|------------------------|------------------------------------------|
| ?   | Seqno                  | Display context help information.        |
| ++  | Seqno                  | Show additional details about this line. |
| +   | Seqno                  | Expand to reveal next level entries.     |
| -   | Seqno                  | Collapse to hide next level entries.     |
| SV  | Seqno                  | Sort next level entries by value.        |
| SC  | Seqno                  | Sort by CPU time.                        |
| SS  | Seqno                  | Sort by Service time.                    |

### On headings

| Cmd | When applied to object | Action                               |
|-----|------------------------|--------------------------------------|
| ?   | Seqno                  | Display context help information.    |
| +   | Seqno                  | Expand to reveal next level entries. |
| -   | Seqno                  | Collapse to hide next level entries. |
| SV  | Seqno                  | Sort next level entries by value.    |
| SC  | Seqno                  | Sort by CPU time.                    |
| SS  | Seqno                  | Sort by Service time.                |

## B11 - WAS/CICS Calls

---

### Usage

This report shows service times for CICS Distributed Program Link calls from the WAS servant region. You can expand each CICS region line to see a breakdown and quantification of program and start time within the CICS region.

A prerequisite for this report is activation of the WAS and CICS options during the measurement. This report is available only when you view the reports for the WebSphere Application Services servant address space measurements.

### Quantification

Each report line shows the following for each CICS region, and when expanded, the CICS program and start time for each call of the program.



- Count of the number of invocations of the CICS program
- Total service time for the CICS program
- Mean service time for the CICS program

## Detail Line Hierarchy

An unexpanded report shows a line for each CICS region. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

**Level 1** CICS Region

**Level 2** CICS program

**Level 3** Start time of program

## Detail Line Descriptions

### CICS region detail line

This is the first-level detail line. Each line shows the information about a CICS region for which measurement data was recorded.

| Under Heading   | This is Displayed                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The CICS VTAM® application id of the region in which the request was processed.                                                                |
| Count           | The number of CICS program invocations counted for this region. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| Svc Time: Total | The total service time (elapsed time) for all CICS program invocations counted for this region.                                                |
| Svc Time: Mean  | The mean service time for this region.                                                                                                         |

### CICS program detail line

This is the second-level detail line shown directly under the CICS region detail line. It quantifies the invocation of a CICS program within the CICS region.

| Under Heading   | This is Displayed                                                                                                                                               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The CICS program name.                                                                                                                                          |
| Count           | The number of invocations counted for this CICS program within the region above. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| Svc Time: Total | The total service time (elapsed time) for all invocations of this CICS program within the region above.                                                         |
| Svc Time: Mean  | The mean service time for all invocations of this CICS program within the region above.                                                                         |

### Start time detail line

This is the third-level detail line shown directly under the CICS program detail line. It quantifies the invocation of a single program within the CICS region.

| Under Heading   | This is Displayed                                                                                    |
|-----------------|------------------------------------------------------------------------------------------------------|
| Name            | The time the program started.                                                                        |
| Count           | This will always be '1' at this level.                                                               |
| Svc Time: Total | The total service time (elapsed time) for the invocation of this program.                            |
| Svc Time: Mean  | The mean service time for the invocation of this program. This will always be the same as the total. |

## Sample reports

A sample report is shown here. The CICS region has been expanded to the third level (start time).

```

File View Navigate Help

CAZTA001 CICS Calls (7760/BZSR00BS) Row 00001 of 00004
Command ==> ----- Scroll ==> CSR

Name Count --Svc Time--
 Total Mean
CICS42A 2 2.15 1.07763
+ BURNER 2 2.15 1.07763
 → 11:53:16 1 1.08 1.08284
 → 11:53:18 1 1.07 1.07243

```

## Line Commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here: (You can always enter a "/" on any input field to open a menu of line commands available for that field).

### On objects

| Cmd | When applied to | Action                                  |
|-----|-----------------|-----------------------------------------|
| ?   | Name            | Display context help information        |
| +   | Name            | Expand to reveal next level             |
| -   | Name            | Collapse to hide next level             |
| SV  | Name            | Sort next level entries by value        |
| SN  | Name            | Sort next level entries by name         |
| SS  | Name            | Sort next level entries by service time |

### On headings

| Cmd | When applied to heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Name                    | Display context help information  |
| +   | Name                    | Expand to reveal all entries      |
| -   | Name                    | Collapse to show only first level |
| SV  | Name                    | Sort next level by value          |

| Cmd | When applied to heading | Action                          |
|-----|-------------------------|---------------------------------|
| SN  | Name                    | Sort next level by name         |
| SS  | Name                    | Sort next level by service time |

## B12 - WAS/Db2 Calls

### Usage

This report shows exact SQL call counts, SQL processing CPU times and SQL processing service times for Db2 calls initiated from WAS requests. You can expand each WAS request line to see details of the SQL calls made by each WAS request.

A prerequisite for this report is activation of the WAS and Db2+ options during the measurement. This report is available only when viewing the reports for the appropriate WebSphere Application Services servant address space measurements.

### Quantification

Each report line shows the following for each WAS request, and when expanded, the SQL calls made by the request.

- Count of the number of SQL calls from an object
- Total task CPU time for processing the SQL call
- Mean task CPU time or percent of total used
- Total service time for processing the SQL call
- Mean service time or percent of total used

A setup option is available to display the percent used in place of the mean fields.

### Detail Line Hierarchy

An unexpanded report shows a line for each WAS request. You can expand each line to reveal two additional hierarchical levels of detail (using the + line command). The hierarchy is illustrated here:

**Level 1** WAS request  
**Level 2** SQL request  
**Level 3** SQL statement text

### Detail Line Descriptions

#### WAS Request detail line

This is the first level detail line. Each line shows information about a WAS request for which measurement data was recorded.

| Under Heading    | This is Displayed                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Seqno            | A unique level 1 sequence number.                                                                                                |
| WAS Request      | The request name.                                                                                                                |
| Nbr of SQL Calls | The number of SQL calls counted for this request. Large numbers will be expressed in thousands or millions with a K or M suffix. |

| Under Heading   | This is Displayed                                                                                                                                                |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Total | The total task CPU time for all SQL calls counted for this request. Large numbers will be expressed in thousands or millions with a K or M suffix.               |
| CPU Time: Mean  | The mean task CPU time for all SQL calls counted for this request. Large numbers will be expressed in thousands or millions with a K or M suffix.                |
| CPU Time:Pct    | The percent of total CPU time this request used.                                                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all SQL calls counted for this request. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time for all SQL calls counted for this request. Large numbers will be expressed in thousands or millions with a K or M suffix.                 |
| SVC Time:Pct    | The percent of total service time this request used.                                                                                                             |

## SQL Request detail line

This is the second-level detail line. It quantifies an individual SQL statement.

| Under Heading    | This is Displayed                                                                                                                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno            | A sequence number assigned to uniquely identify the SQL statement. Either "S" or "D" precedes the sequence number, indicating whether the SQL statement is static or dynamic.                                                                                                                                              |
| Db2 Call         | The DBRM name, precompiler statement number and SQL function.<br><br>When the statement number is zero, it indicates that the SQL statement was not produced by the Db2 precompiler or the SQL preprocessor, but was generated by some other means. For example, JDBC SQL statements have statement numbers that are zero. |
| Nbr of SQL Calls | The number of SQL calls counted for this SQL statement. Large numbers will be expressed in thousands or millions with a K or M suffix.                                                                                                                                                                                     |
| CPU Time: Total  | The total task CPU time for all SQL calls counted for this SQL statement. Large numbers will be expressed in thousands or millions with a K or M suffix.                                                                                                                                                                   |
| CPU Time: Mean   | The mean task CPU time for all SQL calls counted for this SQL statement. Large numbers will be expressed in thousands or millions with a K or M suffix.                                                                                                                                                                    |
| CPU Time:Pct     | The percent of total CPU time this SQL statement used.                                                                                                                                                                                                                                                                     |

| Under Heading   | This is Displayed                                                                                                                                                      |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SVC Time: Total | The total service time (elapsed time) for all SQL calls counted for this SQL statement. Large numbers will be expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time for all SQL calls counted for this SQL statement. Large numbers will be expressed in thousands or millions with a K or M suffix.                 |
| SVC Time:Pct    | The percent of total service time this SQL statement used.                                                                                                             |

## SQL statement text detail line

This is the third-level detail line shown directly under the SQL request detail line. It shows the SQL statement text. If necessary, more than one line is displayed in order to show the full SQL text.

## Sample reports

A sample report is shown here. The WAS request has been expanded to the second level.

| File View Navigate Help            |                              |                  |                    |                    |                    |          |
|------------------------------------|------------------------------|------------------|--------------------|--------------------|--------------------|----------|
| B12: WAS/Db2 Calls (9043/BZSR00BS) |                              |                  |                    | Row 00001 of 00020 |                    |          |
| Command ==> _____                  |                              |                  |                    | Scroll ==> CSR     |                    |          |
| Seqno                              | WAS Request/Db2 Call         | Nbr of SQL Calls | --CPU Time-- Total | Mean               | --Svc Time-- Total | Mean     |
| 00001                              | /WasDb2Tester/Db2TesterServ1 | 674              | 0.20               | 0.00030            | 0.22               | 0.00033  |
| ± 000004                           | SYSLH200 0 FETCH             | 668              | 0.20               | 0.00030            | 0.22               | 0.00033  |
| → 000006                           | SYSSTAT 0 COMMIT             | 2                | 0.00               | 0.00130            | 0.00               | 0.00139  |
| → 000002                           | SYSLH200 0 DESCRIBE          | 1                | 0.00               | 0.00013            | 0.00               | 0.00001  |
| → 000003                           | SYSLH200 0 OPEN              | 1                | 0.00               | 0.00017            | 0.00               | 0.00001  |
| → 000005                           | SYSLH200 0 CLOSE             | 1                | 0.00               | 0.00018            | 0.00               | 0.00001  |
| → 000007                           | SYSSTAT 0 ROLLBACK           | 1                | 0.00               | 0.00029            | 0.00               | 0.00091  |
| 00002                              | /WasDb2Tester/Db2EjbTesterSe | 674              | 0.21               | 0.00031            | 0.28               | 0.00042  |
| → 000004                           | SYSLH200 0 FETCH             | 668              | 0.20               | 0.00029            | 0.27               | 0.00040  |
| → 000008                           | SYSSTAT 0 CNCT TO U          | 1                | 0.00               | 0.00271            | 0.00               | 0.00495  |
| → 000001                           | SYSLH200 0 PREPARE           | 1                | 0.00               | 0.00659            | 0.00               | 0.00079  |
| → 000002                           | SYSLH200 0 DESCRIBE          | 1                | 0.00               | 0.00029            | 0.00               | 0.00029  |
| → 000003                           | SYSLH200 0 OPEN              | 1                | 0.00               | 0.00021            | 0.00               | 0.00001  |
| → 000010                           | SYSLH200 0 CLOSE             | 1                | 0.00               | 0.00019            | 0.00               | 0.00001  |
| → 000007                           | SYSSTAT 0 ROLLBACK           | 1                | 0.00               | 0.00078            | 0.00               | 0.00553  |
| 00003                              | /WasDb2Tester/Db2SpTesterSer | 5                | 0.01               | 0.00267            | 14.61              | 2.92395  |
| → 000006                           | SYSSTAT 0 COMMIT             | 2                | 0.00               | 0.00252            | 0.02               | 0.01294  |
| → 000008                           | SYSSTAT 0 CNCT TO U          | 1                | 0.00               | 0.00291            | 0.00               | 0.00522  |
| → 000009                           | SYSSTAT 0 CALL STAT          | 1                | 0.00               | 0.00523            | 14.58              | 14.58690 |
| → 000007                           | SYSSTAT 0 ROLLBACK           | 1                | 0.00               | 0.00017            | 0.00               | 0.00177  |

## Line Commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here: (You can always enter a "/" on any input field to popup a menu of line commands available for that field).

### On objects

| Cmd | When applied to | Action                           |
|-----|-----------------|----------------------------------|
| ?   | Seqno           | Display context help information |
| ++  | Seqno           | Show additional details          |

| Cmd | When applied to | Action                                  |
|-----|-----------------|-----------------------------------------|
| +   | Seqno           | Expand to reveal next level             |
| –   | Seqno           | Collapse to hide next level             |
| SV  | Seqno           | Sort next level entries by value        |
| SC  | Seqno           | Sort next level entries by CPU time     |
| SS  | Seqno           | Sort next level entries by service time |

### On headings

| Cmd | When applied to heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Seqno                   | Display context help information  |
| ++  | Seqno                   | Show additional details           |
| +   | Seqno                   | Expand to reveal all entries      |
| –   | Seqno                   | Collapse to show only first level |
| SV  | Seqno                   | Sort next level by value          |
| SC  | Seqno                   | Sort next level by CPU time       |
| SS  | Seqno                   | Sort next level by service time   |

## SETUP options

Enter the SETUP primary command to select options for this report. The following window is displayed:

```
+-----+
| Options for WAS/Db2 Calls |
| Enter "/" to select an option |
| / Display Percent used in place of Mean fields |
+-----+
```

### Display Percent used in place of Mean fields

When selected, this displays the percent of total CPU and total service time used by the WAS request and SQL statement, rather than the mean time.

## B13 - Async Work Requests

### Usage

The B13 report shows request counts, CPU times, and service times for asynchronous requests that are observed during a WebSphere measurement. The B13 report shows quantification by the package or class name of the request. To see a breakdown and quantification by work manager within the package, expand each request line.

To use this report, you must activate the WAS option during the measurement.

## Quantification

Each report line shows the following information for each package/class. When you expand any package/class, the work manager lines for that package/class are displayed.

- Count of the number requests for a package/class or work manager
- Total CPU time for the package/class or work manager
- Mean CPU time for the package/class or work manager
- Total service time for the package/class or work manager
- Mean service time for the package/class or work manager

## Detail Line Hierarchy

A report that is not expanded shows a line for each Package/Class. To reveal an additional hierarchical level of detail, expand each line by using the + line command. The hierarchy is illustrated as follows:

```
Level 1 Package/Class
Level 2 Work Manager
```

## Detail Line Descriptions

### Package/Class detail line

Package/Class detail line is the first-level detail line. Each line shows information about a package/class for which measurement data is recorded.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                          |
| Package/Class   | The package or class name.                                                                                                                 |
| Count           | The number of requests that are counted for this package/class. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests that are counted for this package/class. The CPU time includes normalized zIIP and zAAP CPU time.      |
| CPU Time: Mean  | The mean CPU time per package/class. The CPU time includes normalized zIIP and zAAP CPU time.                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this package/class.                                            |
| SVC Time: Mean  | The mean service time per package/class.                                                                                                   |

### Work Manager detail line

Work Manager detail line is the second-level detail line. It shows information about the work manager used in this request.

| Under Heading | This is Displayed                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno         | A level 2 sequence number within the level 1 line.                                                                                        |
| Work Mgr      | The work manager name                                                                                                                     |
| Count         | The number of requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix. |

| Under Heading   | This is Displayed                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Total | The total CPU time for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                    |
| CPU Time: Mean  | The mean CPU time per work manager. The CPU time includes normalized zIIP and zAAP CPU time.                                                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time per work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                                                        |

## Sample reports

A sample report that is fully expanded is shown as follows.

File View Navigate Help

B13: Async Work Requests (0993/CZSR00C)  
Command ==>

Row 00001 of 00010  
Scroll ==> CSR

| Seqno   | Package/Class<br>Work Mgr                                               | Request<br>Count | --CPU Time--<br>Total Mean | --Svc Time--<br>Total Mean |
|---------|-------------------------------------------------------------------------|------------------|----------------------------|----------------------------|
| 00001   | com.ibm.ws.asynchbeans.CJ<br>WorkListenerRunnable                       | 32               | 0.79 0.02471               | 0.02 0.00079               |
| → 00001 | wm/bnetwm1                                                              | 32               | 0.79 0.02471               | 0.02 0.00079               |
| 00002   | /WasTester/AsyncServletTe<br>ster1                                      | 10               | 24.73 2.47375              | 13.79 1.37989              |
| → 00001 | wm/bnetwm1                                                              | 10               | 24.73 2.47375              | 13.79 1.37989              |
| 00003   | com.banknet.wastester.ser<br>vlets.AsyncServletTester2<br>\$StartupWork | 9                | 22.17 2.46348              | 12.17 1.35254              |
| → 00002 | wm/bnetwm2                                                              | 9                | 22.17 2.46348              | 12.17 1.35254              |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

### on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SC  | Seqno            | Sorts next level entries by CPU time.     |
| SS  | Seqno            | Sorts next level entries by service time. |



## on headings

| Cmd | When Applied To: | Action                              |
|-----|------------------|-------------------------------------|
| ?   | Seqno            | Displays context help information.  |
| +   | Seqno            | Expands to reveal all entries.      |
| –   | Seqno            | Collapses to show first level only. |
| SV  | Seqno            | Sorts next level by value.          |
| SC  | Seqno            | Sorts next level by CPU time.       |
| SS  | Seqno            | Sorts next level by service time.   |

## B14 - Async Work by Work Mgr

### Usage

The B14 report shows request counts, CPU times, and service times for asynchronous requests that are observed during a WebSphere measurement. The B13 report shows quantification by the work manager of the request. To see a breakdown and quantification by package/class within the work manager, expand each request line.

To use this report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for each work manager. When you expand each report line, the package/class lines for that work manager are displayed.

- Count of the number requests for the work manager or package/class
- Total CPU time for the work manager or package/class
- Mean CPU time for the work manager or package/class
- Total service time for the work manager or package/class
- Mean service time for the work manager or package/class

### Detail Line Hierarchy

A report that is not expanded shows a line for each Work Manager. To reveal an additional hierarchical level of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 Work Manager
Level 2 Package/Class
```

### Detail Line Descriptions

#### Work Manager detail line

Work Manager detail line is the first-level detail line. Each line shows information about a work manager for which measurement data is recorded.

| Under Heading | This is Displayed                 |
|---------------|-----------------------------------|
| Seqno         | A unique level 1 sequence number. |
| Work Mgr      | The work manager name             |

| Under Heading   | This is Displayed                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                                 |
| CPU Time: Total | The total CPU time for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                    |
| CPU Time: Mean  | The mean CPU time per work manager. The CPU time includes normalized zIIP and zAAP CPU time.                                                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time per work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                                                        |

## Package/Class detail line

Package/Class detail line is the second-level detail line that is shown directly under the work manager detail line. The Package/Class detail line shows information about the package/class used in this request.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                         |
| Package/Class   | The package or class name.                                                                                                                 |
| Count           | The number of requests that are counted for this package/class. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests that are counted for this package/class. The CPU time includes normalized zIIP and zAAP CPU time.      |
| CPU Time: Mean  | The mean CPU time per package/class. The CPU time includes normalized zIIP and zAAP CPU time.                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this package/class.                                            |
| SVC Time: Mean  | The mean service time per package/class.                                                                                                   |

## Sample reports

A sample report that is fully expanded is shown as follows.

File View Navigate Help

B14: Async Work by Work Mgr (0993/CZSR00C)  
Command ==>

Row 00001 of 00009  
Scroll ==> CSR

| Seqno   | Work Mgr<br>Package/Class                                               | Request<br>Count | --CPU Time-- |         | --Svc Time-- |         |
|---------|-------------------------------------------------------------------------|------------------|--------------|---------|--------------|---------|
|         |                                                                         |                  | Total        | Mean    | Total        | Mean    |
| 00001   | wm/bnetwm1                                                              | 42               | 25.52        | 0.60782 | 13.82        | 0.32915 |
| → 00001 | com.ibm.ws.asynchbeans.<br>CJWorkListenerRunnable                       | 32               | 0.79         | 0.02471 | 0.02         | 0.00079 |
| → 00002 | /WasTester/AsyncServlet<br>Tester1                                      | 10               | 24.73        | 2.47375 | 13.79        | 1.37989 |
| 00002   | wm/bnetwm2                                                              | 9                | 22.17        | 2.46348 | 12.17        | 1.35254 |
| → 00003 | com.banknet.wastester.s<br>ervlets.AsyncServletTes<br>ter2\$StartupWork | 9                | 22.17        | 2.46348 | 12.17        | 1.35254 |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

### on objects

| Cmd | When Applied To: | Action                              |
|-----|------------------|-------------------------------------|
| ?   | Seqno            | Displays context help information.  |
| ++  | Seqno            | Shows additional details            |
| +   | Seqno            | Expands to reveal all entries.      |
| –   | Seqno            | Collapses to show first level only. |
| SV  | Seqno            | Sorts next level by value.          |
| SC  | Seqno            | Sorts next level by CPU time.       |
| SS  | Seqno            | Sorts next level by service time.   |

### on headings

| Cmd | When Applied To: | Action                              |
|-----|------------------|-------------------------------------|
| ?   | Seqno            | Displays context help information.  |
| +   | Seqno            | Expands to reveal all entries.      |
| –   | Seqno            | Collapses to show first level only. |
| SV  | Seqno            | Sorts next level by value.          |
| SC  | Seqno            | Sorts next level by CPU time.       |
| SS  | Seqno            | Sorts next level by service time.   |

## B15 - Async Work by Servant

---

### Usage

The B15 report shows request counts, CPU times, and service times for asynchronous requests that are observed during a WebSphere measurement. The B15 report shows quantification by the WebSphere servant region processing the requests. To see a breakdown and quantification by package/class and work manager within the servant, expand each request line.

To use this report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for each work manager. When you expand each report line, the package/class lines for that work manager are displayed.

- Count of the number requests for the servant region, package/class, or work manager
- Total CPU time for the servant region, package/class, or work manager
- Mean CPU time for the servant region, package/class, or work manager
- Total service time for the servant region, package/class, or work manager

- Mean service time for the servant region, package/class, or work manager

## Detail Line Hierarchy

A report that is not expanded shows a line for each WebSphere servant region. To reveal two additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 WebSphere Servant region
Level 2 Package/Class
Level 3 Work Manager
```

## Detail Line Descriptions

### Servant region detail line

Servant region detail line is the first level detail line. It shows information about the servant region processing the requests.

| Under Heading   | This is Displayed                                                                                                                                                           |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                                           |
| Package/Class   | The servant region name and job id.                                                                                                                                         |
| Count           | The number of requests that are counted for this servant region. Large numbers are expressed in thousands or millions with a K or M suffix.                                 |
| CPU Time: Total | The total CPU time for all requests that are counted for this servant region. Large numbers are expressed in thousands or millions with a K or M suffix.                    |
| CPU Time: Mean  | The mean CPU time per servant region. The CPU time includes normalized zIIP and zAAP CPU time.                                                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this servant region. Large numbers are expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time per servant region. Large numbers are expressed in thousands or millions with a K or M suffix.                                                        |

### Package/Class detail line

Package/Class detail line is the second-level detail line that is shown directly under the work manager detail line. The Package/Class detail line shows information about the package/class used in this request.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                         |
| Package/Class   | The package or class name.                                                                                                                 |
| Count           | The number of requests that are counted for this package/class. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests that are counted for this package/class. The CPU time includes normalized zIIP and zAAP CPU time.      |
| CPU Time: Mean  | The mean CPU time per package/class. The CPU time includes normalized zIIP and zAAP CPU time.                                              |

| Under Heading   | This is Displayed                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------|
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this package/class. |
| SVC Time: Mean  | The mean service time per package/class.                                                        |

## Work Manager detail line

Work Manager detail line is the third level detail line. Each line shows information about a work manager for which measurement data is recorded.

| Under Heading   | This is Displayed                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                                        |
| Work Mgr        | The work manager name.                                                                                                                                                    |
| Count           | The number of requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                                 |
| CPU Time: Total | The total CPU time for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                    |
| CPU Time: Mean  | The mean CPU time per work manager. The CPU time includes normalized zIIP and zAAP CPU time.                                                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this work manager. Large numbers are expressed in thousands or millions with a K or M suffix. |
| SVC Time: Mean  | The mean service time per work manager. Large numbers are expressed in thousands or millions with a K or M suffix.                                                        |

## Sample reports

A sample report that is fully expanded is shown as follows.

File View Navigate Help

B15: Async Work by Servant (0993/CZSR00C)

Row 00001 of 00011

Command ==> \_\_\_\_\_ Scroll ==> CSR

| Servant,Pkg/Class                                                       | Request | --CPU Time-- |         | --Svc Time-- |         |
|-------------------------------------------------------------------------|---------|--------------|---------|--------------|---------|
| Seqno Work Mgr                                                          | Count   | Total        | Mean    | Total        | Mean    |
| 00001 CZSR00CS STC01530                                                 | 51      | 47.69        | 0.93529 | 25.99        | 0.50975 |
| → 00001 com.ibm.ws.asyncbeans.CJWorkListenerRunnable                    | 32      | 0.79         | 0.02471 | 0.02         | 0.00079 |
| → 00001 wm/bnetwm1                                                      | 32      | 0.79         | 0.02471 | 0.02         | 0.00079 |
| → 00002 /WasTester/AsyncServletTester1                                  | 10      | 24.73        | 2.47375 | 13.79        | 1.37989 |
| → 00001 wm/bnetwm1                                                      | 10      | 24.73        | 2.47375 | 13.79        | 1.37989 |
| → 00003 com.banknet.wastester.servlets.AsyncServletTester2\$StartupWork | 9       | 22.17        | 2.46348 | 12.17        | 1.35254 |
| → 00002 wm/bnetwm2                                                      | 9       | 22.17        | 2.46348 | 12.17        | 1.35254 |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

## on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SC  | Seqno            | Sorts next level entries by CPU time.     |
| SS  | Seqno            | Sorts next level entries by service time. |

## on headings

| Cmd | When Applied To: | Action                              |
|-----|------------------|-------------------------------------|
| ?   | Seqno            | Displays context help information.  |
| +   | Seqno            | Expands to reveal all entries.      |
| –   | Seqno            | Collapses to show first level only. |
| SV  | Seqno            | Sorts next level by value.          |
| SC  | Seqno            | Sorts next level by CPU time.       |
| SS  | Seqno            | Sorts next level by service time.   |

## B16 - WOLA Inbound Requests

---

### Usage

The B16 report shows request counts, CPU times and service times for WOLA Inbound requests observed during a WebSphere measurement. The B16 report shows quantification by the request name of the inbound request. To see a breakdown and quantification by object, for example, EJB or Web application, and invocation of method or servlet/JSP within the object, expand each request line.

To use the B16 report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for WOLAInbound request. When you expand each report line, the object invocation lines for the request are displayed.

- Count of the number of requests or invocations of an object
- Total CPU time for the request or invocation
- Mean CPU time for the request or invocation
- Total service time for the request or invocation
- Mean service time for the request or invocation

## Detail Line Hierarchy

A report that is not expanded shows a line for each WOLA Inbound request. To reveal two additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 WOLA Inbound request
 Level 2 EJB or Web application
 Level 3 Method or servlet/JSP
```

## Detail Line Descriptions

### WOLA Inbound request detail line

WOLA Inbound request detail line is the first-level detail line. Each line shows information about a WOLA Inbound request for which measurement data is recorded.

| Under Heading   | This is Displayed                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                      |
| Name            | The request name.                                                                                                                                      |
| Count           | The number of requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix.              |
| CPU Time: Total | The total CPU time for all requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Mean  | The mean CPU time per request. The CPU time includes normalized zIIP and zAAP CPU time.                                                                |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this request name.                                                         |
| SVC Time: Mean  | The mean service time per request.                                                                                                                     |

### Object detail line

Object detail line is the second-level detail line that is shown directly under the WOLA Inbound request detail line. The object detail line quantifies invocation of an EJB or a Web application at the object level.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                                                                                                                                                      |
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                        |
| Count           | The number of invocations that are counted for this object. Large numbers are expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore, the level 2 counts do not necessarily add up to the level 1 count.    |
| CPU Time: Total | The total CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times. |

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Time: Mean  | The mean CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times. |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                          |
| SVC Time: Mean  | The mean service time for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                                          |

## Invocation detail line

Invocation detail line is the third level detail line that is shown directly under the Object detail line. The invocation detail line quantifies invocation of a method or servlet/JSP within the object.

| Under Heading   | This is Displayed                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                    |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                          |
| Count           | The number of invocations that are counted for this method or servlet/JSP. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.     |
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.      |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP within its context.                                           |
| SVC Time: Mean  | The mean service time for all invocations of this method or servlet/JSP within its context.                                                           |

## Sample reports

A sample report that is fully expanded is shown as follows.



File View Navigate Help

B16: WOLA Inbound Requests (0998/CZSR00C)  
Command ==>

Row 00001 of 00005  
Scroll ==> CSR

| Seqno   | Request,EJB/Webapp,<br>Method/Servlet Name       | Request<br>Count | --CPU Time--<br>Total Mean |         | --Svc Time--<br>Total Mean |         |
|---------|--------------------------------------------------|------------------|----------------------------|---------|----------------------------|---------|
| 00001   | ejb/com/ibm/ola/olasample<br>1_echoHome          | 60               | 0.63                       | 0.01054 | 2.86                       | 0.04770 |
| ± 00001 | OLASample2::OLA_Sample2<br>.jar::olasample1_echo | 60               | 0.09                       | 0.00159 | 0.20                       | 0.00333 |
| → 00001 | execute:byte[]                                   | 60               | 0.09                       | 0.00159 | 0.20                       | 0.00333 |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

### on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SC  | Seqno            | Sorts next level entries by CPU time.     |
| SS  | Seqno            | Sorts next level entries by service time. |

### on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SC  | Seqno                   | Sorts next level by CPU time.       |
| SS  | Seqno                   | Sorts next level by service time.   |

## B17 - WOLA Inbound by Origin

### Usage

B17 report shows request counts, CPU times, and service times for WOLA Inbound requests observed during a WebSphere measurement. The B17 report shows quantification by the origin of the request. To see a breakdown and quantification by request, object, for example, EJB or Web application, within the request, and invocation of method or servlet/JSP within the object, expand each request line.

To use the B17 report, you must activate the WAS option during the measurement.

## Quantification

Each report line shows the following information for each request origin. When you expand each report line, the request lines and the object invocation lines for the request are displayed.

- Count of the number of requests or invocations of an object
- Total CPU time for the request or invocation
- Mean CPU time for the request or invocation
- Total service time for the request or invocation
- Mean service time for the request or invocation

## Detail Line Hierarchy

A report that is not expanded shows a line for each Request Origin. To reveal three additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 Request Origin
 Level 2 WOLA Inbound request
 Level 3 EJB or Web application
 Level 4 Method or servlet/JSP
```

## Detail Line Descriptions

### Request Origin detail line

| Under Heading   | This is Displayed                                                                                                              |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                              |
| Name            | The origin name, identifying from whence the request came.                                                                     |
| Count           | The number of requests that are counted for this origin.                                                                       |
| CPU Time: Total | The total CPU time for all requests that are counted for this origin. The CPU time includes normalized zIIP and zAAP CPU time. |
| CPU Time: Mean  | The mean CPU time for this origin. The CPU time includes normalized zIIP and zAAP CPU time.                                    |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this origin.                                       |
| SVC Time: Mean  | The mean service time for this origin.                                                                                         |

### WOLA Inbound request detail line

WOLA Inbound request detail line is the second level detail line that is shown directly under the Request Origin detail line. Each line shows information about a WOLA Inbound request for which measurement data is recorded.

| Under Heading | This is Displayed                 |
|---------------|-----------------------------------|
| Seqno         | A unique level 1 sequence number. |
| Name          | The request name.                 |

| Under Heading   | This is Displayed                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix.              |
| CPU Time: Total | The total CPU time for all requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Mean  | The mean CPU time per request. The CPU time includes normalized zIIP and zAAP CPU time.                                                                |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this request name.                                                         |
| SVC Time: Mean  | The mean service time per request.                                                                                                                     |

## Object detail line

Object detail line is the third level detail line that is shown directly under the WOLA Inbound request detail line. The object detail line quantifies invocation of an EJB or a Web application at the object level.

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                                                                                                                                                                      |
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                        |
| Count           | The number of invocations that are counted for this object. Large numbers are expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore, the level 2 counts do not necessarily add up to the level 1 count.    |
| CPU Time: Total | The total CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times. |
| CPU Time: Mean  | The mean CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times.  |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                           |
| SVC Time: Mean  | The mean service time for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                                           |

## Invocation detail line

Invocation detail line is the fourth level detail line that is shown directly under the Object detail line. The invocation detail line quantifies invocation of a method or servlet/JSP within the object.

| Under Heading   | This is Displayed                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                    |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                          |
| Count           | The number of invocations that are counted for this method or servlet/JSP. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.     |
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.      |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP within its context.                                           |
| SVC Time: Mean  | The mean service time for all invocations of this method or servlet/JSP within its context.                                                           |

## Sample reports

A sample report that is fully expanded is shown as follows.

```

File View Navigate Help

B17: WOLA Inbound by Origin (0998/CZSR00C) Row 00001 of 00008
Command ==> Scroll ==> CSR

 Origin,Req,EJB/Web, Request --CPU Time-- --Svc Time--
Seqno Method/Servlet Name Count Total Mean Total Mean
00001 lcom::QAREX2B ::000000AC0 60 0.63 0.01054 2.86 0.04770
± 00001 ejb/com/ibm/ola/olasamp 60 0.63 0.01054 2.86 0.04770
 le1_echoHome
→ 00001 OLASample2::OLA_Samp1 60 0.09 0.00159 0.20 0.00333
 e2.jar::olasample1_ec
 ho
→ 00001 execute:byte[] 60 0.09 0.00159 0.20 0.00333

```

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input filed.

### on objects

| Cmd | When Applied To: | Action                             |
|-----|------------------|------------------------------------|
| ?   | Seqno            | Displays context help information. |
| ++  | Seqno            | Shows additional details.          |
| +   | Seqno            | Expands to reveal next level.      |
| -   | Seqno            | Collapses to hide next level.      |
| SV  | Seqno            | Sorts next level entries by value. |

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| SC  | Seqno            | Sorts next level entries by CPU time.     |
| SS  | Seqno            | Sorts next level entries by service time. |

### on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SC  | Seqno                   | Sorts next level by CPU time.       |
| SS  | Seqno                   | Sorts next level by service time.   |

## B18 - WOLA Inbound by Servant

### Usage

B18 report shows request counts, CPU times and service times for WOLA Inbound requests observed during a WebSphere measurement. The B18 report shows quantification by the WebSphere servant region that processed the request. To see a breakdown and quantification by request, object, for example, EJB or Web application, within the request, and invocation of method or servlet/JSP within the object, expand each servant region line.

To use this report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for each WebSphere servant region. When you expand each report line, the request lines and the object invocation lines for the WebSphere servant region are displayed.

- Count of the number of requests or invocations of an object
- Total CPU time for the request or invocation
- Mean CPU time for the request or invocation
- Total service time for the request or invocation
- Mean service time for the request or invocation

### Detail Line Hierarchy

A report that is not expanded shows a line for each WebSphere servant region. To reveal three additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```

Level 1 WebSphere Servant Region
 Level 2 WOLA Inbound request
 Level 3 EJB or Web application
 Level 4 Method or servlet/JSP

```

## Detail Line Descriptions

### WebSphere Servant Region detail line

WebSphere Servant Region detail line is the first-level detail line. The WebSphere Servant Region detail line shows information about the servant region processing the requests.

| Under Heading   | This is Displayed                                                                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                           |
| Name            | The servant region name and job id.                                                                                                         |
| Count           | The number of requests that are counted for this servant region. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all requests that are counted for this servant region. The CPU time includes normalized zIIP and zAAP CPU time.      |
| CPU Time: Mean  | The mean CPU time per servant region. The CPU time includes normalized zIIP and zAAP CPU time.                                              |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this servant region.                                            |
| SVC Time: Mean  | The mean service time per servant region.                                                                                                   |

### WOLA Inbound request detail line

WOLA Inbound request detail line is the second-level detail line that is shown directly under the WebSphere Servant Region detail line. Each line shows information about a WOLA Inbound request for which measurement data is recorded.

| Under Heading   | This is Displayed                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                      |
| Name            | The request name.                                                                                                                                      |
| Count           | The number of requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix.              |
| CPU Time: Total | The total CPU time for all requests that are counted for this request name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Mean  | The mean CPU time per request. The CPU time includes normalized zIIP and zAAP CPU time.                                                                |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this request name.                                                         |
| SVC Time: Mean  | The mean service time per request.                                                                                                                     |

### Object detail line

Object detail line is the third level detail line that is shown directly under the WOLA Inbound request detail line. The object detail line quantifies invocation of an EJB or a Web application at the object level.

| Under Heading | This is Displayed                                  |
|---------------|----------------------------------------------------|
| Seqno         | A level 2 sequence number within the level 1 line. |

| Under Heading   | This is Displayed                                                                                                                                                                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name            | The EJB or Web application name.                                                                                                                                                                                                                                                        |
| Count           | The number of invocations that are counted for this object. Large numbers are expressed in thousands or millions with a K or M suffix. There can be multiple invocations of the object in one request. Therefore, the level 2 counts do not necessarily add up to the level 1 count.    |
| CPU Time: Total | The total CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times. |
| CPU Time: Mean  | The mean CPU time for all invocations of this object. The CPU time includes normalized zIIP and zAAP CPU time. There is processing in addition to the CPU time incurred by these invoked objects. Therefore, the level 2 CPU times do not necessarily add up to the level 1 CPU times.  |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                           |
| SVC Time: Mean  | The mean service time for all invocations of this object. There is processing in addition to the service time incurred by these invoked objects. Therefore, the level 2 service times do not necessarily add up to the level 1 service times.                                           |

## Invocation detail line

Invocation detail line is the fourth level detail line that is shown directly under the Object detail line. The invocation detail line quantifies invocation of a method or servlet/JSP within the object.

| Under Heading   | This is Displayed                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                                    |
| Name            | The EJB method name or the Web application servlet/JSP name.                                                                                          |
| Count           | The number of invocations that are counted for this method or servlet/JSP. Large numbers are expressed in thousands or millions with a K or M suffix. |
| CPU Time: Total | The total CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.     |
| CPU Time: Mean  | The mean CPU time for all invocations of this method or servlet/JSP within its context. The CPU time includes normalized zIIP and zAAP CPU time.      |
| SVC Time: Total | The total service time (elapsed time) for all invocations of this method or servlet/JSP within its context.                                           |
| SVC Time: Mean  | The mean service time for all invocations of this method or servlet/JSP within its context.                                                           |

## Sample reports

A sample report that is fully expanded is shown as follows.

```
File View Navigate Help

B18: WOLA Inbound by Servant (0998/CZSR00C) Row 00001 of 00007
Command ==> Scroll ==> CSR

 Servant,Req,EJB/Web, Request --CPU Time-- --Svc Time--
Seqno Method/Servlet Name Count Total Mean Total Mean
00001 CZSR00CS STC01546 60 0.63 0.01054 2.86 0.04770
± 00001 ejb/com/ibm/ola/olasamp 60 0.63 0.01054 2.86 0.04770
 le1_echoHome
→ 00001 OLASample2::OLA_Sampl 60 0.09 0.00159 0.20 0.00333
 e2.jar::olasample1_ec
 ho
→ 00001 execute:byte[] 60 0.09 0.00159 0.20 0.00333
```

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input filed.

### on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SC  | Seqno            | Sorts next level entries by CPU time.     |
| SS  | Seqno            | Sorts next level entries by service time. |

### on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SC  | Seqno                   | Sorts next level by CPU time.       |
| SS  | Seqno                   | Sorts next level by service time.   |



## B19 - WOLA Outbound Requests

### Usage

B19 report shows request counts, number of bytes sent and received, and service times for WOLA Outbound requests observed during a WebSphere measurement. The B19 report shows quantification by the originating request. To see a breakdown and quantification by register name and service name, expand each request line

To use this report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for each Outbound Request. When you expand each report line, the register names and service names for the request are displayed.

- Count of the number of requests
- Bytes sent for the request
- Bytes received for the request
- Total service time for the request
- Mean service time per request

### Detail Line Hierarchy

A report that is not expanded shows a line for each WOLA Outbound Request. To reveal two additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 WOLA Outbound Request
Level 2 Register
Level 3 Service
```

### Detail Line Descriptions

#### WOLA Outbound Request detail line

WOLA Outbound Request detail line is the first-level detail line. The WOLA Outbound Request detail line shows information about the WOLA outbound requests.

| Under Heading   | This is Displayed                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                                                       |
| Name            | The WOLA outbound request name.                                                                                                                                         |
| Count           | The number of requests that are counted for this request name that issued outbound requests. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for outbound requests.                                                                                                                   |
| Bytes Received  | The total number of bytes received for this request name.                                                                                                               |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this request name.                                                                          |
| SVC Time: Mean  | The mean service time per request.                                                                                                                                      |

## Register detail line

Register detail line is the second-level detail line that is shown directly under the WOLA Outbound Request detail line. The register detail line quantifies the use of a particular register name for outbound requests.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                         |
| Name            | The register name.                                                                                                                         |
| Count           | The number of requests that are counted for this register name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this register name.                                                                                     |
| Bytes Received  | The total number of bytes received for this register name.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this register name.                                            |
| SVC Time: Mean  | The mean service time per register name.                                                                                                   |

## Service detail line

Service detail line is the third-level detail line that is shown directly under the Register detail line. The service detail line quantifies requests for a service within the register.

| Under Heading   | This is Displayed                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                   |
| Name            | The service name.                                                                                                                    |
| Count           | The number of requests that are counted for this service. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this service.                                                                                     |
| Bytes Received  | The total number of bytes received for this service.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this service.                                            |
| SVC Time: Mean  | The mean service time for this service.                                                                                              |

## Sample reports

A sample report that is fully expanded is shown as follows.

File View Navigate Help

B19: WOLA Outbound Requests (1005/CZSR00C)

Row 00001 of 00004

Command ==>

Scroll ==> CSR

| Request, Register,<br>Seqno Service             | Request<br>Count | ---Bytes---<br>Sent Rcvd | --Svc Time--<br>Total Mean |
|-------------------------------------------------|------------------|--------------------------|----------------------------|
| 00001 /ATSSample1Web/InvokeWas2<br>BatchServlet | 65               | 1495 7800                | 0.86 0.01325               |
| → 00001 EXER3B                                  | 65               | 1495 7800                | 0.86 0.01325               |
| → 00001 ServiceName                             | 65               | 1495 7800                | 0.86 0.01325               |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

### on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SS  | Seqno            | Sorts next level entries by service time. |

### on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SS  | Seqno                   | Sorts next level by service time.   |

## B20 - WOLA Outbound by Register

---

### Usage

B20 report shows request counts, number of bytes sent and received, and service times for WOLA Outbound requests observed during a WebSphere measurement. The B20 report shows quantification by the register name of the request. To see a breakdown and quantification by service name, expand each register name.

To use this report, you must activate the WAS option during the measurement.

### Quantification

Each report line shows the following information for each register name. When you expand each report line, service names for the request are displayed.

- Count of the number of requests by register or service
- Bytes sent for the register or service
- Bytes received for the register or service
- Total service time for the register or service
- Mean service time per register or service

## Detail Line Hierarchy

A report that is not expanded shows a line for each unique register name. To reveal one additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 Register
Level 2 Service
```

## Detail Line Descriptions

### Register detail line

Register detail line is the first level detail line. Each line shows information about a register for which measurement data is recorded.

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 1 sequence number within the level 1 line.                                                                                         |
| Name            | The register name.                                                                                                                         |
| Count           | The number of requests that are counted for this register name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this register name.                                                                                     |
| Bytes Received  | The total number of bytes received for this register name.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this register name.                                            |
| SVC Time: Mean  | The mean service time per register name.                                                                                                   |

### Service detail line

Service detail line is the second-level detail line that is shown directly under the Register detail line. The service detail line quantifies requests for a service within the register.

| Under Heading   | This is Displayed                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 2 sequence number within the level 1 line.                                                                                   |
| Name            | The service name.                                                                                                                    |
| Count           | The number of requests that are counted for this service. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this service.                                                                                     |
| Bytes Received  | The total number of bytes received for this service.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this service.                                            |
| SVC Time: Mean  | The mean service time for this service.                                                                                              |

## Sample reports

A sample report that is fully expanded is shown as follows:

File View Navigate Help

B20: WOLA Outbound by Register (1005/CZSR00C)  
Command ==>

Row 00001 of 00002  
Scroll ==> CSR

| Seqno   | Register,Service | Request<br>Count | --CPU Time--<br>Total | Mean | --Svc Time--<br>Total | Mean    |
|---------|------------------|------------------|-----------------------|------|-----------------------|---------|
| 00001   | EXER3B           | 65               | 1495                  | 7800 | 0.86                  | 0.01325 |
| → 00001 | ServiceName      | 65               | 1495                  | 7800 | 0.86                  | 0.01325 |

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input filed.

### on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SS  | Seqno            | Sorts next level entries by service time. |

### on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SS  | Seqno                   | Sorts next level by service time.   |

## B21 - WOLA Outbound by Servant

### Usage

B21 report shows request counts, number of bytes sent and received, and service times for WOLA Outbound requests observed during a WebSphere measurement. The B21 report shows quantification by the WebSphere servant region in which the outbound requests were issued. To see a breakdown and quantification by register name and service name, expand each servant region line.

To use the B21 report, you must activate the WAS option during the measurement.

## Quantification

Each report line shows the following information for each WebSphere servant region that processed the request. When you expand each report line, the register names and service names for the request are displayed.

- Count of the number of outbound requests
- Bytes sent for the outbound requests
- Bytes received for the outbound requests
- Total service time for the outbound requests
- Mean service time per outbound requests

## Detail Line Hierarchy

A report that is not expanded shows a line for each WebSphere servant region. To reveal two additional hierarchical levels of detail, expand each line by using the **+ line** command. The hierarchy is illustrated as follows:

```
Level 1 WebSphere Servant
Level 2 Register
Level 3 Service
```

## Detail Line Descriptions

### WebSphere Servant Region detail line

WebSphere Servant Region detail line is the first level detail line. The WebSphere Servant Region detail line shows information about the WebSphere servant region processing the requests.

| Under Heading   | This is Displayed                                                                                                                           |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A unique level 1 sequence number.                                                                                                           |
| Name            | The WebSphere servant region name and job id.                                                                                               |
| Count           | The number of outbound requests counted for this servant region. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for outbound requests.                                                                                       |
| Bytes Received  | The total number of bytes received for this request name.                                                                                   |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this request name.                                              |
| SVC Time: Mean  | The mean service time per request.                                                                                                          |

### Register detail line

Register detail line is the second-level detail line that is shown directly under the WebSphere servant region detail line. The register detail line quantifies the use of a particular register name for outbound requests.

| Under Heading | This is Displayed                                  |
|---------------|----------------------------------------------------|
| Seqno         | A level 2 sequence number within the level 1 line. |
| Name          | The register name.                                 |

| Under Heading   | This is Displayed                                                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Count           | The number of requests that are counted for this register name. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this register name.                                                                                     |
| Bytes Received  | The total number of bytes received for this register name.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this register name.                                            |
| SVC Time: Mean  | The mean service time per register name.                                                                                                   |

## Service detail line

Service detail line is the third-level detail line that is shown directly under the Register detail line. The service detail line quantifies requests for a service within the register.

| Under Heading   | This is Displayed                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Seqno           | A level 3 sequence number within the level 2 line.                                                                                   |
| Name            | The service name.                                                                                                                    |
| Count           | The number of requests that are counted for this service. Large numbers are expressed in thousands or millions with a K or M suffix. |
| Bytes Sent      | The total number of bytes sent for this service.                                                                                     |
| Bytes Received  | The total number of bytes received for this service.                                                                                 |
| SVC Time: Total | The total service time (elapsed time) for all requests that are counted for this service.                                            |
| SVC Time: Mean  | The mean service time for this service.                                                                                              |

## Sample reports

A sample report that is fully expanded is shown as follows.

```

File View Navigate Help

B21: WOLA Outbound by Servant (1005/CZSR00C) Row 00001 of 00003
Command ==> Scroll ==> CSR

 Servant,Register, Request ---Bytes--- --Svc Time--
 Seqno Service Count Sent Rcvd Total Mean
00001 CZSR00CS STC01546 65 1495 7800 0.86 0.01325
± 00001 EXER3B 65 1495 7800 0.86 0.01325
→ 00001 ServiceName 65 1495 7800 0.86 0.01325

```

## Line Commands

The following table summarizes the line commands available in this report and the objects and headings to which they apply. To open a menu of line commands available of any fields, enter a forward slash (/) on the input field.

## on objects

| Cmd | When Applied To: | Action                                    |
|-----|------------------|-------------------------------------------|
| ?   | Seqno            | Displays context help information.        |
| ++  | Seqno            | Shows additional details.                 |
| +   | Seqno            | Expands to reveal next level.             |
| –   | Seqno            | Collapses to hide next level.             |
| SV  | Seqno            | Sorts next level entries by value.        |
| SS  | Seqno            | Sorts next level entries by service time. |

## on headings

| Cmd | When Applied To Heading | Action                              |
|-----|-------------------------|-------------------------------------|
| ?   | Seqno                   | Displays context help information.  |
| +   | Seqno                   | Expands to reveal all entries.      |
| –   | Seqno                   | Collapses to show first level only. |
| SV  | Seqno                   | Sorts next level by value.          |
| SS  | Seqno                   | Sorts next level by service time.   |



# Chapter 10. Multiple address space reports

This section describes the multiple address space reports.

| For information about ...                                                     | See ...                                                                    |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| X01 CICS mean service time by transaction (for multiple CICS address spaces)  | <a href="#">“X01 - CICS mean service time by transaction” on page 593</a>  |
| X02 CICS total service time by transaction (for multiple CICS address spaces) | <a href="#">“X02 - CICS total service time by txn” on page 600</a>         |
| X03 CICS mean service time by terminal ID (for multiple CICS address spaces)  | <a href="#">“X03 - CICS mean service time by terminal ID” on page 608</a>  |
| X04 CICS total service time by terminal ID (for multiple CICS address spaces) | <a href="#">“X04 - CICS total service time by terminal ID” on page 616</a> |
| X05 Combined Db2 IMS MQ Timeline                                              | <a href="#">“X05 - Combined Db2 IMS MQ Timeline” on page 624</a>           |
| X06 IMS MASS Region Summary                                                   | <a href="#">“X06 - IMS MASS Region Summary” on page 628</a>                |
| X07 Db2 Stored Procedures Summary                                             | <a href="#">“X07 - Db2 Stored Procedures Summary” on page 630</a>          |

## X01 - CICS mean service time by transaction

### Usage

Use this report to see an analysis of how time was spent by the CICS transactions that were measured during the observation session in multiple regions. CICS sample data from the selected regions is merged to produce a single report showing multi-region activity. Transaction data from the multiple regions is correlated using the network unit of work ID to relate the remote activity to the local transaction. Since this is based on sample data, there are samples from the remote region that do not match with a local transaction. These are reported under the remote transaction name, such as CSMI.

Expand a CICS transaction report line to see a further breakdown by region, program, CICS command, DLI request and SQL request.

### Quantification

Each report line quantifies time as arithmetic means for each measured transaction. The means are calculated by dividing the total of all time spent servicing all occurrences of a transaction by its number of occurrences. The means are expressed in units of seconds. The mean service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded X01 report shows one line for each measured CICS transaction. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
Level 2 CICS Region Applid
Level 3 CICS Program
Level 4 CICS Command
Level 4 CICS Command
```

```

Level 2 CICS Region Applid
Level 3 CICS Program
Level 4 SQL Request
Level 4 SQL Request

Level 2 CICS Region Applid
Level 3 CICS Program
Level 4 DLI Request
Level 4 DLI Request

Level 2 CICS Region Applid
Level 3 CICS Program
Level 4 Module
Level 4 Module
Level 4 System Services

Level 2 CICS Region Applid
Level 3 CICS Program
Level 4 Adabas Request
Level 4 Adabas Request

Level 2 CICS Region Applid
Level 3 System Services
Level 4 Module
Level 4 Module
Level 4 System Services

```

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                               |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                             |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                                                                                                                                                                                                          |
| Error         | The margin of error for the mean values calculated by using the number of executions of the transaction as the sample size.                                                                                                                                                              |
| Execution     | The mean time, in seconds, that a CPU was actively executing for the transaction.                                                                                                                                                                                                        |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                                         |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction. This includes execution, suspend, and delay time.                                                                                                                                                                                             |

## CICS region applid detail line

This is the second-level detail line shown directly under the CICS transaction detail line. This line represents the VTAM applid of the CICS region sampled. If a transaction shows more than 1 region applid, then activity was measured in multiple regions for that transaction.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS region applid. This is the VTAM applid of the region where the samples were taken.                                                                                                                                                                                                        |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                       |
| Description   | "Region Applid"                                                                                                                                                                                                                                                                                    |
| Execution     | The mean time, in seconds, that a CPU was actively executing for the transaction in the region.                                                                                                                                                                                                    |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction in the region.                                                                                                                                                                                                     |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed in the region.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li><li>• MVS WAIT</li></ul> |
| Service       | The mean service time for the transaction in the region. This includes execution, suspend, and delay time.                                                                                                                                                                                         |

## CICS program or system services detail line

This is a third-level detail line shown directly under the CICS region applid detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fourth-level lines shown under this item can be either CICS command lines, SQL Request lines, DLI Request lines or Module lines.

If no CICS application program was dispatched, "CICS" is shown under the Name heading and "System Services" under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. "CICS" is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays "EXEC CICS." If lines grouped under this line are SQL request lines, the description displays "EXEC SQL." If lines grouped under this line are DLI request lines, the description displays "EXEC DLI." Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and "CICS Program" is displayed if the CICS module name is not recognized; indicating this is likely an application program. "System Services" is displayed if no application program was in control. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The mean time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                              |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                         |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time.                                                                                                                                                                                          |

## CICS command detail line

These lines are displayed under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command description. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command description is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                       |
| Execution     | The mean time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                            |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                       |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                                   |
| Service       | The mean service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                    |

## SQL request detail line

These lines are displayed under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                        |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                      |
| Execution     | The mean time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                |

## DLI request detail line

These lines are displayed under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                        |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                             |
| Execution     | The mean time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                       |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                  |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                               |

## Module/system services detail line

These lines are displayed under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, "CICS" is displayed in the name field and "System Services" is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or "CICS" if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. "System Services" is displayed if the module name could not be determined. |
| Execution     | The mean time, in seconds, for execution of the module within the grouping under which the detail line is displayed.                   |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The mean time, in seconds, that the identified module was preempted by MVS.                                                            |
| Service       | The mean service time for the transaction during which the identified module was executing or delayed.                                 |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                            |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                        |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                   |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                              |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"><li>• CICS dispatch delay</li><li>• MVS dispatch delay</li></ul> |
| Service       | The mean service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                    |

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

```

File View Navigate Help

X01: CICS Mean Service Time by Txn (1682/CICS32A) Row 00001 of 00002
Command ==> ----- Scroll ==> CSR

Name NTxns Description Error Execution + Suspend + Delay = Service

RDDR 2 ±71.4% 0.359 16.333 0.809 17.502
READ 680 ± 3.8% 0.020 2.860 0.068 2.950

```

You can enter the + line command on a transaction to expand to the next level. A sample of the report with a transaction expanded to the third level of the hierarchy (CICS Region Applid and CICS Program) is shown here:

```

File View Navigate Help

X01: CICS Mean Service Time by Txn (1682/CICS32A) Row 00001 of 00010
Command ==> ----- Scroll ==> CSR

Name NTxns Description Error Execution + Suspend + Delay = Service

RDDR 2 ±71.4% 0.359 16.333 0.809 17.502
→ CICS32A Region Applid 0.119 16.333 0.749 17.202
→ READRVR EXEC CICS 0.119 16.333 0.749 17.202

→ CICS32B Region Applid 0.031 0.000 0.007 0.039
→ DFHMIRS EXEC CICS 0.021 0.000 0.001 0.023
→ DFHMIRS CICS Program 0.005 0.000 0.003 0.009
→ CICS System Services 0.003 0.000 0.001 0.005

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                            | Action                            |
|-----|-----------------------------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | Transaction, Region Applid, Load Module                                           | Expand to reveal next level.      |
| -   | Transaction, Region Applid, Load Module                                           | Collapse to hide next level.      |
| SV  | Transaction, Region Applid, Load Module                                           | Sort next level by value.         |
| SN  | Transaction, Region Applid, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                                       | Display load module information.  |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module                      | Display source program mapping.   |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for this report is shown below. This example shows a CICS region:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| CICS32A Region Applid 0.089 17.172 0.929 18.191 |
+-----+
Calculation Details
CICS Transaction RDDR
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are mean times for the command for all executions of the
transaction and are calculated as follows:

(1) Times command observed in txn/program 607
(2) Duration of one sample interval 0.029970
(3) (1) A (2) = total time for command 18.191790
(4) Number of executions of transaction 1
(5) (3) S (4) = mean time for the command 18.191790

The execution measurement counts are
Executing (CPU active) 3
Suspended by CICS 573
Delayed
 CICS dispatch delay 29
 MVS delay (WAIT) 0
 MVS delay (Busy) 2
```

## X02 - CICS total service time by txn

### Usage

Use this report to view an analysis of how time was spent by the CICS transactions that were measured during the observation session in multiple regions. CICS sample data from the selected regions is merged to produce a single report showing multi-region activity. Transaction data from the multiple regions is correlated using the network unit of work ID to relate the remote activity to the local transaction. Since this is based on sample data, there will be samples from the remote region that do not match with a local transaction. These are reported under the remote transaction name, such as CSMI.

Expand a CICS transaction report line to see a further breakdown by region, program, CICS command, DLI request and SQL request.



# Quantification

Each report line quantifies total times for each measured transaction. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

## Detail line hierarchy

An unexpanded X02 report shows one line for each measured CICS transaction. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Transaction
 Level 2 CICS Region Applid
 Level 3 CICS Program
 Level 4 CICS Command
 Level 4 CICS Command

 ...

 Level 2 CICS Region Applid
 Level 3 CICS Program
 Level 4 SQL Request
 Level 4 SQL Request

 ...

 Level 2 CICS Region Applid
 Level 3 CICS Program
 Level 4 DLI Request
 Level 4 DLI Request

 ...

 Level 2 CICS Region Applid
 Level 3 CICS Program
 Level 4 Module
 Level 4 Module
 Level 4 System Services

 ...

 Level 2 CICS Region Applid
 Level 3 CICS Program
 Level 4 Adabas Request
 Level 4 Adabas Request

 ...

 Level 2 CICS Region Applid
 Level 3 System Services
 Level 4 Module
 Level 4 Module
 Level 4 System Services
```

## Detail line descriptions

### CICS transaction detail line

This is the first-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                |
|---------------|--------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                       |
| NTxns         | The number of executions of the transaction.                                                     |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                  |
| Error         | The margin of error based on a sample population of the number of executions of the transaction. |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction.                                                                                                                                                                                             |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                              |
| Delay         | The total time, in seconds, that execution of the transaction was delayed.<br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction. This includes execution, suspend, and delay time.                                                                                                                                                                                  |

### CICS region applid detail line

This is the second-level detail line shown directly under the CICS transaction detail line. This line represents the VTAM applid of the CICS region sampled. If a transaction shows more than 1 region applid, then activity was measured in multiple regions for that transaction.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS region applid. This is the VTAM applid of the region where the samples were taken.                                                                                                                                                                                                  |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                 |
| Description   | "Region Applid"                                                                                                                                                                                                                                                                              |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction in the region.                                                                                                                                                                                             |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction in the region.                                                                                                                                                                                              |
| Delay         | The total time, in seconds, that execution of the transaction was delayed in the region.<br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction in the region. This includes execution, suspend, and delay time.                                                                                                                                                                                  |

### CICS program or system services detail line

This is a third-level detail line shown directly under the CICS region applid detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fourth-level lines shown under this item can be either CICS command lines, SQL Request lines, DLI Request lines or Module lines.

If no CICS application program was dispatched, "CICS" is shown under the Name heading and "System Services" under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. "CICS" is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays "EXEC CICS." If lines grouped under this line are SQL request lines, the description displays "EXEC SQL." If lines grouped under this line are DLI request lines, the description displays "EXEC DLI." Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and "CICS Program" is displayed if the CICS module name is not recognized; indicating this is likely an application program. "System Services" is displayed if no application program was in control. |
| Execution     | The total time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul>                                                                                                                                                                                                                                     |
| Service       | The total service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                                                                                                                                                                              |

## CICS command detail line

These lines are displayed under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command description. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command description is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                       |
| Execution     | The total time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                           |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                  |

## SQL request detail line

These lines are displayed under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                            |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                          |
| Execution     | The total time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                          |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                   |

## DLI request detail line

These lines are displayed under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The DLI function code followed by the PCB name.                                                                                                                      |
| Execution     | The total time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                               |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                        |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                              |
| Delay         | The total time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                           |

### Module/system services detail line

These lines are displayed under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line is displayed.                  |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The total time, in seconds, that the identified module was preempted by MVS.                                                           |
| Service       | The total service time for the transaction during which the identified module was executing or delayed.                                |

### Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                     |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed. |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                           |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                      |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Sample reports

When the report is first displayed, only the first level of the hierarchy is visible (transaction). A sample is shown here:

| File View Navigate Help                            |       |             |        |                    |                         |                       |           |
|----------------------------------------------------|-------|-------------|--------|--------------------|-------------------------|-----------------------|-----------|
| X02: CICS Total Service Time by Txn (1684/CICS32A) |       |             |        | Row 00001 of 00002 |                         |                       |           |
| Command ==> _____                                  |       |             |        | Scroll ==> CSR     |                         |                       |           |
| Name                                               | NTxns | Description | Error  | Execution          | Total Time<br>+ Suspend | in Seconds<br>+ Delay | = Service |
| READ                                               | 340   |             | ± 5.4% | 7.672              | 1028.360                | 27.422                | 1063.455  |
| RDDR                                               | 1     |             | ±99.9% | 0.449              | 17.172                  | 1.018                 | 18.641    |

You can enter the + line command on a transaction to expand to the next level. A sample of the report with a transaction expanded to the third level of the hierarchy (CICS Region Applid and CICS Program) is shown here:

| File View Navigate Help                            |       |                 |        |                    |                         |                       |           |
|----------------------------------------------------|-------|-----------------|--------|--------------------|-------------------------|-----------------------|-----------|
| X02: CICS Total Service Time by Txn (1684/CICS32A) |       |                 |        | Row 00001 of 00011 |                         |                       |           |
| Command ==> _____                                  |       |                 |        | Scroll ==> CSR     |                         |                       |           |
| Name                                               | NTxns | Description     | Error  | Execution          | Total Time<br>+ Suspend | in Seconds<br>+ Delay | = Service |
| READ                                               | 340   |                 | ± 5.4% | 7.672              | 1028.360                | 27.422                | 10623.455 |
| → CICS32B                                          |       | Region Applid   |        | 3.686              | 970.788                 | 3.956                 | 978.430   |
| → SAMPREAD                                         |       | EXEC CICS       |        | 3.416              | 970.788                 | 3.926                 | 978.130   |
| → SAMPREAD                                         |       | CICS Program    |        | 0.149              | 0.000                   | 0.029                 | 0.179     |
| → CICS                                             |       | System Services |        | 0.119              | 0.000                   | 0.000                 | 0.119     |
| → CICS32A                                          |       | Region Applid   |        | 3.986              | 57.572                  | 23.466                | 85.024    |
| → DFHMIRS                                          |       | CICS Program    |        | 2.697              | 57.482                  | 22.327                | 82.507    |
| → CICS                                             |       | System Services |        | 1.288              | 0.089                   | 1.138                 | 2.517     |
| RDDR                                               | 1     |                 | ±99.9% | 0.449              | 17.172                  | 1.018                 | 18.641    |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                            | Action                            |
|-----|-----------------------------------------------------------------------------------|-----------------------------------|
| ?   | Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |

| Cmd | When Applied To Object                                                            | Action                           |
|-----|-----------------------------------------------------------------------------------|----------------------------------|
| ++  | Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.         |
| +   | Transaction, Region Applid, Load Module                                           | Expand to reveal next level.     |
| –   | Transaction, Region Applid, Load Module                                           | Collapse to hide next level.     |
| SV  | Transaction, Region Applid, Load Module                                           | Sort next level by value.        |
| SN  | Transaction, Region Applid, Load Module                                           | Sort next level by name.         |
| M   | Load Module                                                                       | Display load module information. |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module                      | Display source program mapping.  |

## on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for this report is shown below. This example shows a CICS region:

```

File View Navigate Help
+-----+
+-----+----- The following report line was selected -----+
| CICS32B Region Applid 3.686 970.788 3.956 978.430 |
+-----+

Calculation Details
CICS Transaction READ
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times command observed in txn/program 32647
(2) Duration of one sample interval 0.029970
(3) (1) A (2) = total time for command 978.430590

The execution measurement counts are
Executing (CPU active) 123
Suspended by CICS 32392
Delayed
 CICS dispatch delay 103
 MVS delay (WAIT) 0
 MVS delay (Busy) 29

```

## X03 - CICS mean service time by terminal ID

### Usage

Use this report to see an analysis of how time was spent on CICS terminals that were measured during the observation session in multiple regions. CICS sample data from the selected regions is merged to produce a single report showing multiregion activity. Transaction data from the multiple regions is correlated using the network unit of work id to relate the remote activity to the local transaction. Since this is based on sample data, there will be samples from the remote region that do not match with a local transaction. These will be reported under the remote transaction name, such as CSMI.

Expand a CICS terminal report line to see a further breakdown by transaction, region, program, CICS command, DLI request and SQL request.

### Quantification

Each report line quantifies time as arithmetic means for all measured transactions on the terminal. The means are calculated by dividing the total of all time spent servicing all occurrences of transactions on the terminal by the number of occurrences. The means are expressed in units of seconds. The mean service time is shown and is further broken down into execution time, suspend time, and delay time.

### Detail line hierarchy

An unexpanded X03 report shows one line for each measured CICS terminal and 1 line for all non-terminal attached transactions. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```

Level 1 CICS Terminal
 Level 2 CICS Transaction
 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 CICS Command
 Level 5 CICS Command

```



```

Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 SQL Request
 Level 5 SQL Request

Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 DLI Request
 Level 5 DLI Request

Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 Module
 Level 5 Module
 Level 5 System Services

Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 Adabas Request
 Level 5 Adabas Request

Level 3 CICS Region Applid
 Level 4 System Services
 Level 5 Module
 Level 5 Module
 Level 5 System Services

```

## Detail line descriptions

### CICS terminal detail line

This is the first-level detail line. Each line shows information about a CICS terminal for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS terminal ID. This is the terminal ID or N/A if a terminal ID was not available during the sample. A terminal might not be available because the transaction was running non-terminal attached, or the transaction was not attached to the terminal during initialization or termination.      |
| NTxns         | The number of executions of transactions on this terminal.                                                                                                                                                                                                                                             |
| Description   | This is either Terminal Txn or Non-Terminal Txn.                                                                                                                                                                                                                                                       |
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions for this terminal as a sample size.                                                                                                                                                               |
| Execution     | The mean time, in seconds, that a CPU was actively executing transactions on this terminal.                                                                                                                                                                                                            |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of transactions on this terminal.                                                                                                                                                                                                         |
| Delay         | <p>The mean time, in seconds, that execution of transactions on this terminal was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |

| Under Heading | This is Displayed                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------|
| Service       | The mean service time for transactions on this terminal. This includes execution, suspend, and delay time. |

## CICS transaction detail line

This is the second-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                    |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                  |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                                                                                                                                                                                               |
| Error         | The margin of error for the mean values calculated by using the number of executions of the transaction as the sample size.                                                                                                                                                   |
| Execution     | The mean time, in seconds, that a CPU was actively executing for the transaction.                                                                                                                                                                                             |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                              |
| Delay         | The mean time, in seconds, that execution of the transaction was delayed.<br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction. This includes execution, suspend, and delay time.                                                                                                                                                                                  |

## CICS region applid detail line

This is the third-level detail line shown directly under the CICS transaction detail line. This line represents the VTAM applid of the CICS region sampled. If a transaction shows more than 1 region applid, then activity was measured in multiple regions for that transaction.

| Under Heading | This is Displayed                                                                               |
|---------------|-------------------------------------------------------------------------------------------------|
| Name          | The CICS region applid. This is the VTAM applid of the region where the samples were taken.     |
| NTxns         | The number of executions of the transaction.                                                    |
| Description   | "Region Applid"                                                                                 |
| Execution     | The mean time, in seconds, that a CPU was actively executing for the transaction in the region. |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction in the region.  |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed in the region.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The mean service time for the transaction in the region. This includes execution, suspend, and delay time.                                                                                                                                                                                             |

## CICS program or system services detail line

This is a fourth-level detail line shown directly under the CICS region applid detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fifth-level lines shown under this item can be either CICS command lines, SQL Request lines, DLI Request lines or Module lines.

If no CICS application program was dispatched, “CICS” is shown under the Name heading and “System Services” under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. “CICS” is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays “EXEC CICS.” If lines grouped under this line are SQL request lines, the description displays “EXEC SQL.” If lines grouped under this line are DLI request lines, the description displays “EXEC DLI.” Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and “CICS Program” is displayed if the CICS module name is not recognized; indicating this is likely an application program. “System Services” is displayed if no application program was in control. |
| Execution     | The mean time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Delay         | <p>The mean time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul>                                                                                                                                                                                                                                      |

| Under Heading | This is Displayed                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Service       | The mean service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time. |

## CICS command detail line

These lines are displayed under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command description. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command description is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                       |
| Execution     | The mean time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                            |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                       |
| Delay         | The mean time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                                          |
| Service       | The mean service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                    |

## SQL request detail line

These lines are displayed under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red. |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                               |
| Execution     | The mean time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                           |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | The mean time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                            |

## DLI request detail line

These lines are displayed under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                    |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                         |
| Execution     | The mean time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                   |
| Suspend       | The mean time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                              |
| Delay         | The mean time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.<br><br>Transaction execution can be delayed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                           |

## Module/system services detail line

These lines are displayed under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The mean time, in seconds, for execution of the module within the grouping under which the detail line is displayed.                   |
| Suspend       | This field will contain a value of zero.                                                                                               |

| Under Heading | This is Displayed                                                                                      |
|---------------|--------------------------------------------------------------------------------------------------------|
| Delay         | The mean time, in seconds, that the identified module was preempted by MVS.                            |
| Service       | The mean service time for the transaction during which the identified module was executing or delayed. |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                               |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                           |
| Execution     | The mean time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                      |
| Suspend       | The mean time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                 |
| Delay         | The mean time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The mean service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Sample reports

A sample report that has been expanded four levels is shown below .

```

File View Navigate Help

X03: CICS Mean Service Time by Term (1684/CICS32A) Row 00001 of 00033
Command ==> _____ Scroll ==> CSR

Name NTxns Description Error Execution + Suspend + Delay = Service

ET36 1 Terminal Attached ±99.9% 0.449 17.172 1.018 18.641
→ RDDR 1 ±99.9% 0.449 17.172 1.018 18.641
 → CICS32A Region Applid 0.089 17.172 0.929 18.191
 → READDRVR EXEC CICS 0.089 17.172 0.929 18.191
 → +0700 START TRANSID(READ) 0.059 12.377 0.029 12.467
 → +0884 START TRANSID(READ) 0.000 0.719 0.149 0.869
 → +0B84 START TRANSID(READ) 0.000 0.749 0.059 0.809
 → +0984 START TRANSID(READ) 0.000 0.509 0.149 0.659
 → +0904 START TRANSID(READ) 0.000 0.539 0.089 0.629
 → +0A04 START TRANSID(READ) 0.000 0.539 0.059 0.599
 → +0784 START TRANSID(READ) 0.000 0.479 0.089 0.569
 → +0804 START TRANSID(READ) 0.000 0.389 0.119 0.509
 → +0A84 START TRANSID(READ) 0.000 0.329 0.089 0.419
 → +0B04 START TRANSID(READ) 0.000 0.359 0.029 0.389
 → +0BFC SEND TEXT 0.029 0.179 0.059 0.269

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                                      | Action                            |
|-----|---------------------------------------------------------------------------------------------|-----------------------------------|
| ?   | Terminal, Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | Terminal, Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | Terminal, Transaction, Region Applid, Load Module                                           | Expand to reveal next level.      |
| –   | Terminal, Transaction, Region Applid, Load Module                                           | Collapse to hide next level.      |
| SV  | Terminal, Transaction, Region Applid, Load Module                                           | Sort next level by value.         |
| SN  | Terminal, Transaction, Region Applid, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                                                 | Display load module information.  |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module                                | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | Name                   | Display context help information. |
| +   | Name                   | Expand to reveal all entries.     |

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| -   | Name                   | Collapse to show only first level. |
| SV  | Name                   | Sort next level by value.          |
| SN  | Name                   | Sort next level by name.           |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for this report is shown below. This example shows a CICS region:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| CICS32A Region Applid 0.089 17.172 0.929 18.191 |
+-----+
Calculation Details
CICS Transaction RDDR
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are mean times for the command for all executions of the
transaction and are calculated as follows:

(1) Times command observed in txn/program 607
(2) Duration of one sample interval 0.029970
(3) (1) A (2) = total time for command 18.191790
(4) Number of executions of transaction 1
(5) (3) S (4) = mean time for the command 18.191790

The execution measurement counts are
Executing (CPU active) 3
Suspended by CICS 573
Delayed
 CICS dispatch delay 29
 MVS delay (WAIT) 0
 MVS delay (Busy) 2
```

## X04 - CICS total service time by terminal ID

### Usage

Use this report to view an analysis of how time was spent on CICS terminals that were measured during the observation session in multiple regions. CICS sample data from the selected regions is merged to produce a single report showing multiregion activity. Transaction data from the multiple regions is correlated using the network unit of work ID to relate the remote activity to the local transaction. Since this is based on sample data, there will be samples from the remote region that do not match with a local transaction. These are reported under the remote transaction name, such as CSMI.

Expand a CICS terminal report line to see a further breakdown by transaction, region, program, CICS command, DLI request and SQL request.



# Quantification

Each report line quantifies total times for transactions measured on a terminal. The total times are expressed in units of seconds. The total service time is shown and is further broken down into execution time, suspend time, and delay time.

# Detail line hierarchy

An unexpanded X04 report shows one line for each measured CICS terminal and 1 line for all non-terminal attached transactions. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
Level 1 CICS Terminal
 Level 2 CICS Transaction
 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 CICS Command
 Level 5 CICS Command

 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 SQL Request
 Level 5 SQL Request

 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 DLI Request
 Level 5 DLI Request

 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 Module
 Level 5 Module
 Level 5 System Services

 Level 3 CICS Region Applid
 Level 4 CICS Program
 Level 5 Adabas Request
 Level 5 Adabas Request

 Level 3 CICS Region Applid
 Level 4 System Services
 Level 5 Module
 Level 5 Module
 Level 5 System Services
```

# Detail line descriptions

## CICS terminal detail line

This is the first-level detail line. Each line shows information about a CICS terminal for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS terminal ID. This is the terminal ID or N/A if a terminal ID was not available during the sample. A terminal might not be available because the transaction was running non-terminal attached, or the transaction was not attached to the terminal during initialization or termination. |
| NTxns         | The number of executions of transactions on this terminal.                                                                                                                                                                                                                                        |
| Description   | This is either Terminal Txn or Non-Terminal Txn.                                                                                                                                                                                                                                                  |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Error         | The margin of error for the mean values calculated by using the number of executions of transactions for this terminal as a sample size.                                                                                                                                                                |
| Execution     | The total time, in seconds, that a CPU was actively executing transactions on this terminal.                                                                                                                                                                                                            |
| Suspend       | The total time, in seconds, that CICS had suspended execution of transactions on this terminal.                                                                                                                                                                                                         |
| Delay         | <p>The total time, in seconds, that execution of transactions on this terminal was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for transactions on this terminal. This includes execution, suspend, and delay time.                                                                                                                                                                                             |

### CICS transaction detail line

This is the second-level detail line. Each line shows information about a CICS transaction for which measurement data was recorded.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS transaction code.                                                                                                                                                                                                                                                                |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                              |
| Description   | A functional description (if the transaction is a recognized CICS transaction).                                                                                                                                                                                                           |
| Error         | The margin of error based on a sample population of the number of executions of the transaction.                                                                                                                                                                                          |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction.                                                                                                                                                                                                        |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction.                                                                                                                                                                                                         |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction. This includes execution, suspend, and delay time.                                                                                                                                                                                             |

### CICS region applid detail line

This is the third-level detail line shown directly under the CICS transaction detail line. This line represents the VTAM applid of the CICS region sampled. If a transaction shows more than 1 region applid, then activity was measured in multiple regions for that transaction.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The CICS region applid. This is the VTAM applid of the region where the samples were taken.                                                                                                                                                                                                             |
| NTxns         | The number of executions of the transaction.                                                                                                                                                                                                                                                            |
| Description   | "Region Applid"                                                                                                                                                                                                                                                                                         |
| Execution     | The total time, in seconds, that a CPU was actively executing for the transaction in the region.                                                                                                                                                                                                        |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction in the region.                                                                                                                                                                                                         |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed in the region.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction in the region. This includes execution, suspend, and delay time.                                                                                                                                                                                             |

## CICS program or system services detail line

This is a fourth-level detail line shown directly under the CICS region applid detail line. This line represents a CICS program (usually an application) that was in control during execution of the transaction. The fifth-level lines shown under this item can be either CICS command lines, SQL Request lines, DLI Request lines or Module lines.

If no CICS application program was dispatched, "CICS" is shown under the Name heading and "System Services" under the Description heading.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The module name of the CICS program. If lines grouped under this line are CICS command lines, this field is displayed in red. For Module lines grouped under this line, the field is turquoise. "CICS" is displayed here if no application program was in control.                                                                                                                                                                                                                                                                                                                                               |
| Description   | If lines grouped under this line are CICS command lines, the description displays "EXEC CICS." If lines grouped under this line are SQL request lines, the description displays "EXEC SQL." If lines grouped under this line are DLI request lines, the description displays "EXEC DLI." Otherwise, if the program name is a recognized CICS module name (a DFH* name), a functional description is shown, and "CICS Program" is displayed if the CICS module name is not recognized; indicating this is likely an application program. "System Services" is displayed if no application program was in control. |
| Execution     | The total time, in seconds, that CPU execution was observed while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while transaction control was under the CICS program identified in the Name column.                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while transaction control was under the CICS program identified in the Name column.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> <li>• MVS WAIT</li> </ul> |
| Service       | The total service time for the transaction during which control was under the CICS program identified in the Name column. Service time includes execution, suspend, and delay time.                                                                                                                                                                                          |

## CICS command detail line

These lines are displayed under a CICS Program detail line. Each one represents a CICS command issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC CICS command. This hexadecimal offset appears in +xxxx format. If the CSECT containing the EXEC CICS is not the same name as the module identified in the CICS Program line above, this field contains the CSECT name. In this case, the offset is shown in the description field. This field is always displayed in red. |
| Description   | The CICS command description. If, as noted above, the CSECT name containing the EXEC CICS is different from the module name, the CICS command description is preceded by the hexadecimal offset of the command from the start of the CSECT.                                                                                                                                                                       |
| Execution     | The total time, in seconds, that CPU execution was observed while the CICS command was being processed.                                                                                                                                                                                                                                                                                                           |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the CICS command was being processed.                                                                                                                                                                                                                                                                                      |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the CICS command was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul>                                                                                                  |
| Service       | The total service time for the transaction during which the CICS command was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                                                                                                                   |

## SQL request detail line

These lines are displayed under a CICS program detail line. Each line represents an SQL request issued by the program identified in the name field of the CICS program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC SQL command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                            |
| Description   | The SQL request function – SELECT, FETCH, UPDATE, etc.                                                                                                                                                                                                                                                          |
| Execution     | The total time, in seconds, that CPU execution was observed while the SQL request was being processed.                                                                                                                                                                                                          |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the SQL request was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the SQL request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the SQL request was being processed. This includes execution, suspend and delay time.                                                                                                                                                                   |

## DLI request detail line

These lines are displayed under a CICS Program detail line. Each line represents an IMS DLI request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC DLI command. This is in +xxxx format. This field is always displayed in red.                                                                                                                                            |
| Description   | The DLI function code followed by the PCB name.                                                                                                                                                                                                                                                                 |
| Execution     | The total time, in seconds, that CPU execution was observed while the DLI request was being processed.                                                                                                                                                                                                          |
| Suspend       | The total time, in seconds, that CICS had suspended execution of the transaction while the DLI request was being processed.                                                                                                                                                                                     |
| Delay         | <p>The total time, in seconds, that execution of the transaction was delayed while the DLI request was being processed.</p> <p>Transaction execution can be delayed for one of the following reasons:</p> <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the DLI request was being processed. This includes execution, suspend, and delay time.                                                                                                                                                                  |

## Module/system services detail line

These lines are displayed under a CICS Program detail line. Each line represents a module that was executing under control of the program identified in the name field of the CICS Program line under which these lines are grouped. If Application Performance Analyzer was unable to determine a module name, “CICS” is displayed in the name field and “System Services” is displayed in the description field.

| Under Heading | This is Displayed                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The name of the module that was executing or “CICS” if a module name could not be determined.                                          |
| Description   | A functional description of the module if one is available. “System Services” is displayed if the module name could not be determined. |
| Execution     | The total time, in seconds, for execution of the module within the grouping under which the detail line is displayed.                  |
| Suspend       | This field will contain a value of zero.                                                                                               |
| Delay         | The total time, in seconds, that the identified module was preempted by MVS.                                                           |
| Service       | The total service time for the transaction during which the identified module was executing or delayed.                                |

## Adabas request detail line

These lines appear under a CICS Program detail line. Each one represents an Adabas request issued by the program identified in the name field of the CICS Program line under which these lines are grouped.

| Under Heading | This is Displayed                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name          | The hexadecimal offset in the identified CICS program of the return address of the EXEC ADABAS command. This is in +xxxx format. This field is always displayed in red.                                                                                                |
| Description   | The Adabas request function -- OP, CL, L2, etc. When Natural calls Adabas, the Natural program name and statement number are displayed. If the statement is within an INCLUDE member, the INCLUDE member name is displayed.                                            |
| Execution     | The total time, in seconds, during which CPU execution was observed while the Adabas request was being processed.                                                                                                                                                      |
| Suspend       | The total time, in seconds, during which CICS had suspended execution of the transaction while the Adabas request was being processed.                                                                                                                                 |
| Delay         | The total time, in seconds, during which execution of the transaction was delayed while the Adabas request was being processed for one of the following reasons: <ul style="list-style-type: none"> <li>• CICS dispatch delay</li> <li>• MVS dispatch delay</li> </ul> |
| Service       | The total service time for the transaction during which the Adabas request was being processed. This includes execution, suspend and delay time.                                                                                                                       |

## Sample reports

A sample report that has been expanded five levels is shown below .

| File View Navigate Help                             |       |                        |        |           |                       |         |           |
|-----------------------------------------------------|-------|------------------------|--------|-----------|-----------------------|---------|-----------|
| X04: CICS Total Service Time by Term (1684/CICS32A) |       |                        |        |           | Row 00001 of 00098    |         |           |
| Command ==> -----                                   |       |                        |        |           | Scroll ==> CSR        |         |           |
| Name                                                | NTxns | Description            | Error  | Execution | Total Time in Seconds |         | -----     |
|                                                     |       |                        |        |           | + Suspend             | + Delay | = Service |
| N/A                                                 | 340   | Non-Terminal Atta      | ± 5.4% | 7.672     | 1028.360              | 27.422  | 1063.455  |
| → READ                                              | 340   |                        | ± 5.4% | 7.672     | 1028.360              | 27.422  | 1063.455  |
| → CICS32B                                           |       | Region Applid          |        | 3.686     | 970.788               | 3.956   | 978.430   |
| → SAMPREAD                                          |       | EXEC CICS              |        | 3.416     | 970.788               | 3.926   | 978.130   |
| → +04C4                                             |       | READ FILE(FILEA)       |        | 3.266     | 970.788               | 3.926   | 977.981   |
| → ALLOCATE                                          |       | Wait on Interregion    |        | 0.000     | 863.885               | 0.000   | 863.885   |
| → IRLINK                                            |       | Wait on InterRegion Li |        | 0.000     | 106.873               | 0.000   | 106.873   |
| → CICSdly                                           |       | CICS Dispatch Delay    |        | 0.000     | 0.000                 | 3.086   | 3.086     |
| → MVSBusy                                           |       | MVS Delay (Busy)       |        | 0.000     | 0.000                 | 0.839   | 0.839     |
| → CICSSusp                                          |       | Suspend                |        | 0.000     | 0.029                 | 0.000   | 0.029     |
| → +0468                                             |       | RETURN                 |        | 0.089     | 0.000                 | 0.000   | 0.089     |
| → +03E0                                             |       | RETRIEVE               |        | 0.059     | 0.000                 | 0.000   | 0.059     |
| →                                                   |       |                        |        |           |                       |         |           |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object                                                                      | Action                            |
|-----|---------------------------------------------------------------------------------------------|-----------------------------------|
| ?   | Terminal, Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Display context help information. |
| ++  | Terminal, Transaction, Region Applid, Load Module, CSECT, Command, SQL Request, DLI Request | Show additional details.          |
| +   | Terminal, Transaction, Region Applid, Load Module                                           | Expand to reveal next level.      |
| –   | Terminal, Transaction, Region Applid, Load Module                                           | Collapse to hide next level.      |
| SV  | Terminal, Transaction, Region Applid, Load Module                                           | Sort next level by value.         |
| SN  | Terminal, Transaction, Region Applid, Load Module                                           | Sort next level by name.          |
| M   | Load Module                                                                                 | Display load module information.  |
| P   | Command, CSECT, SQL Request, DLI Request, CICS Active Module                                | Display source program mapping.   |

### on headings

| Cmd | When Applied To Object | Action                             |
|-----|------------------------|------------------------------------|
| ?   | Name                   | Display context help information.  |
| +   | Name                   | Expand to reveal all entries.      |
| –   | Name                   | Collapse to show only first level. |

| Cmd | When Applied To Object | Action                    |
|-----|------------------------|---------------------------|
| SV  | Name                   | Sort next level by value. |
| SN  | Name                   | Sort next level by name.  |

## Detail window

You can enter “++” (or press the enter key) on any line to open a window containing additional information.

A sample detail window for this report is shown below. This example shows a CICS region:

```

File View Navigate Help
+-----+
+-----+ The following report line was selected +-----+
| CICS32B Region Applid 3.686 970.788 3.956 978.430 |
+-----+
Calculation Details
CICS Transaction READ
The quantities shown represent the service time for execution of the
indicated CICS command while processing this transaction. The
quantities are total times for all executions of the command within
the transaction and are calculated as follows:

(1) Times command observed in txn/program 32647
(2) Duration of one sample interval 0.029970
(3) (1) A (2) = total time for command 978.430590

The execution measurement counts are
Executing (CPU active) 123
Suspended by CICS 32392
Delayed
 CICS dispatch delay 103
 MVS delay (WAIT) 0
 MVS delay (Busy) 29

```

## X05 - Combined Db2 IMS MQ Timeline

### Usage

This report combines a subset of data from the F02 Db2 SQL Activity Timeline, the I02 IMS DL/I Call Timeline, and the Q11 MQ+ Activity Timeline reports for a single measurement. When additional information for a specific subsystem is required, refer to the individual timeline report.

Use this report to see information about the chronology of calls for Db2, IMS, and MQ that were intercepted over the duration of the measurement and to identify any calls with excessive service time (duration). Each line displays information about one intercepted call for either Db2, IMS, or MQ. One or more of the Db2+, IMS+ or MQ+ features must have been enabled when the measurement was performed.

By default, the detail lines are sorted in ascending chronological sequence (SV). You can also request that the data is sorted by service time (duration). Enter the SD line command on the SeqNo heading field to sort by duration. This brings the calls that had excessive service time to the top of the report. If you enter SV or SD a second time, the calls are sorted in the reverse order.

The number of Db2, IMS, and MQ calls that are displayed in this report is limited:



- The value of the Db2IMaxTraceSize, IMSIMaxTraceSize, and MQIMaxTraceSize parameters that are specified during Application Performance Analyzer installation
- Or by the values on panel 2 of the measurement request (if your installation configured these fields)

The report is truncated when the number of calls that are issued reaches the value that is specified for the appropriate MaxTraceSize parameter.

## Quantification

Each report line shows the following information for one call.

- The sequence number within each subsystem reported.
- The subsystem for this call (Db2, IMS or MQ).
- The function for the call.
- The object of the call.
- The resulting status for the call.
- The time the call was issued.
- The service time (duration) for the call processing.
- The CPU time for the call processing.

The CPU time applies only to the region that is being measured. Any execution in other address spaces is not reported.

## Detail line hierarchy

An unexpanded report shows a line for each intercepted call. You can expand each line for Db2 and MQ to reveal one additional hierarchical level of detail by using the + line command.

The hierarchy is illustrated here:

```

Level 1 Db2 SQL Call Details
 Level 2 SQL text
 ...
Level 1 IMS DLI Call Details
 ...
Level 1 MQ Call Details
 Level 2 MQ Queue Manager and Queue
 ...

```

## Detail line descriptions

### Db2 SQL Call detail line

This is a first-level detail line that shows information about one SQL call.

| Under Heading | This is Displayed                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno         | A sequence number assigned by Application Performance Analyzer that is unique to the SQL call. This is sequential within each subsystem. |
| System        | Db2.                                                                                                                                     |
| Function      | The name of the SQL function.                                                                                                            |
| Object        | The DBRM name.                                                                                                                           |
| Status        | The SQL return code. Blank when zero.                                                                                                    |
| Call Time     | The time of day at which the SQL call started.                                                                                           |

| Under Heading | This is Displayed                                       |
|---------------|---------------------------------------------------------|
| Svc Time      | The service time (duration) of the SQL call in seconds. |
| CPU Time      | The CPU time that the SQL call consumed in seconds.     |

## SQL Text

This is a second-level detail line that is shown directly under the Db2 SQL call detail line. It shows the SQL statement text. If necessary, more than one line is displayed to show the full SQL text.

## IMS DLI Call detail line

This is a first-level detail line that shows the information about one DLI call.

| Under Heading | This is Displayed                                                                                                                        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Seqno         | A sequence number assigned by Application Performance Analyzer that is unique to the DLI call. This is sequential within each subsystem. |
| System        | IMS.                                                                                                                                     |
| Function      | The DLI function code.                                                                                                                   |
| Object        | The PCB name.                                                                                                                            |
| Status        | The PCB status code.                                                                                                                     |
| Call Time     | The time of day when the DLI call started.                                                                                               |
| Svc Time      | The service time (duration) of the DLI call in seconds.                                                                                  |
| CPU Time      | The CPU time that the DLI call consumed in seconds.                                                                                      |

## MQ Call detail line

This is a first-level detail line that shows information about one MQ call.

| Under Heading | This is Displayed                                                                                                                       |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Seqno         | A sequence number assigned by Application Performance Analyzer that is unique to the MQ call. This is sequential within each subsystem. |
| System        | MQ.                                                                                                                                     |
| Function      | The MQ call type.                                                                                                                       |
| Object        | Queue.                                                                                                                                  |
| Status        | The return code and reason code returned by MQ. Blank when both are zero.                                                               |
| Call Time     | The time of day at which the MQ call started.                                                                                           |
| Svc Time      | The service time (duration) of the MQ call in seconds.                                                                                  |
| CPU Time      | The CPU time that the MQ call consumed in seconds.                                                                                      |

## MQ Queue Manager and Queue Name detail line

This is a second-level detail line that is shown directly under the MQ call detail line. It displays the MQ queue manager name and the queue name that are used in the request.

## Sample report

A sample report is shown here:

```

X05: Combined Db2 IMS MQ Timeline (0490/IMSDMPP1) Row 00047 of 00627
Seqno System Function Object Status Call Time Svc Time CPU time
000045 IMS GN IVPDb2 12:06:50.29 0.011088 0.008552
000046 IMS GN IVPDb2 12:06:50.30 0.000156 0.000155
000003 Db2 SELECT FABPGM06 12:06:50.37 0.009207 0.008881
000001 MQ Close Queue 12:06:50.41 0.000215 0.000215
000047 IMS CHNG ALTPCB 12:06:50.41 0.000292 0.000292
000048 IMS ISRT ALTPCB 12:06:50.41 0.000144 0.000143
000049 IMS GU IOPCB 12:06:50.41 0.005714 0.002133
000050 IMS GN IVPDb2 12:06:50.42 0.008603 0.004261
000051 IMS GN IVPDb2 12:06:50.43 0.071402 0.040834
000052 IMS GN IVPDb2 12:06:50.50 0.050327 0.034989
000053 IMS GN IVPDb2 12:06:50.55 0.021318 0.009039
000054 IMS GN IVPDb2 12:06:50.57 0.000168 0.000168
000004 Db2 SELECT FABPGM06 12:06:50.67 0.009888 0.009165
000002 MQ Open Queue 12:06:50.70 0.000684 0.000684
000003 MQ Put Queue 12:06:50.70 0.001024 0.001012
000004 MQ Get Queue 12:06:50.70 0.000860 0.000860
000005 MQ Close Queue 12:06:50.71 0.000180 0.000180
000055 IMS CHNG ALTPCB 12:06:50.73 0.000332 0.000328
000056 IMS ISRT ALTPCB 12:06:50.73 0.000160 0.000160
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here: (You can always enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Seqno                   | Display context help information. |
| ++  | Seqno                   | Show additional details.          |
| +   | Seqno                   | Expand to reveal next level.      |
| –   | Seqno                   | Collapse to hide next level.      |
| M   | Seqno (IMS and MQ only) | Display load module information.  |
| P   | Seqno (IMS and MQ only) | Display source program mapping.   |

### on heading

| Cmd | When Applied To Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Seqno                   | Display context help information. |
| +   | Seqno                   | Expand to reveal all entries.     |
| –   | Seqno                   | Collapse to hide next level.      |
| SV  | Seqno                   | Sort by Call Time.                |
| SD  | Seqno                   | Sort by Svc Time (Duration).      |

## X06 - IMS MASS Region Summary

---

### Usage

Use this report to view a summary of the IMS Dependent Regions in which the measured transaction executed. Each detail line summarizes a region with the count of that transaction and the averages for Service time (duration), CPU time, and DL/I calls. If the Db2+ feature is active, the average SQL calls is also reported. If the MQ+ feature is active, the average MQ calls is also reported. The total line sums the transaction counts and reports the average values across all regions for the other columns.

By default, the detail lines are sorted in ascending region name sequence (SN) with the Total line at the bottom. You can also request that the detail lines be sorted by transaction count (SV). Entering either SN or SV a second time will sort the detail lines in the reverse order (ascending or descending).

### Quantification

Each report line shows the following for one region.

- The IMS Dependent Region name.
- The IMS subsystem name.
- The APA measurement request number for the region.
- The number of times the transaction code executed.
- The average service time (duration) per transaction.
- The average CPU time per transaction.
- The average DL/I calls per transaction.
- The average SQL calls per transaction.
- The average MQ calls per transaction.

Keep in mind that the CPU time applies only to the region being measured. Any execution in other address spaces will not be reported.

### Detail line hierarchy

The X06 report shows only one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading    | This is Displayed                                                                        |
|------------------|------------------------------------------------------------------------------------------|
| Region           | The IMS dependent region name.                                                           |
| IMS              | The IMS subsystem name.                                                                  |
| ReqNum           | The APA measurement request number for this IMS dependent region.                        |
| Txn Count        | The total number of transactions executed for this transaction code.                     |
| Svc time per Trn | The average service time (duration) per transaction execution for this transaction code. |
| CPU time per Trn | The average CPU time per transaction execution for this transaction code.                |
| DLI per Trn      | The average number of DL/I calls per transaction execution for this transaction code.    |
| SQL per Trn      | The average number of SQL calls per transaction execution for this transaction code.     |

| Under Heading | This is Displayed                                                                   |
|---------------|-------------------------------------------------------------------------------------|
| MQ per Trn    | The average number of MQ calls per transaction execution for this transaction code. |

## Sample reports

A sample report is shown here:

```

X06: IMS MASS Region Summary (00054/IMSFMPP5) Row 00001 of 00006
Command ==> Scroll ==> CSR

Transaction Name: IMSQATR

Region IMS ReqNum Txn count Svc/Txn CPU/Txn DLI/Txn SQL/Txn MQ/Txn
IMSFMPP1 IMSF 00050 17 1.6146 0.1865 7.52 0.94 3.76
IMSFMPP2 IMSF 00051 17 1.6041 0.1103 7.47 0.00 0.00
IMSFMPP3 IMSF 00052 17 1.7298 0.1680 7.58 0.94 0.00
IMSFMPP4 IMSF 00053 31 0.8641 0.0740 2.90 0.93 3.87
IMSFMPP5 IMSF 00054 18 1.5979 0.1185 7.44 0.00 3.55
 Total n/a n/a 100 1.3967 0.1233 6.08 0.61 2.48
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here: (You can always enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied to Heading | Action                                   |
|-----|-------------------------|------------------------------------------|
| ?   | Region                  | Display context help information.        |
| ++  | Region                  | Show additional details about this line. |

### on heading

| Cmd | When Applied to Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Region                  | Display context help information. |
| SV  | Region                  | Sort next level entries by value. |
| SN  | Region                  | Sort next level entries by value. |

## Detail window

You can enter “++” or press the Enter key on any line to display a window that contains additional information.

A sample detail window for this report is shown here:

```

X06 - DETAIL Window (00054/IMSFMP5)
Command ==> Scroll ==> CSR

+-----+ The following report line was selected +-----+
| IMSFMPP1 IMSF 00050 17 1.6146 0.1865 7.52 0.94 3.76 |
+-----+

IMS Transaction Information
IMS Trancode IMSQATR IMS system IMSF
PSB name IMSQAPGM Txn count 17
Total time 27.4492 Total CPU time 3.1714
Total DLI call count 128
Total SQL call count 16
Total MQ call count 64

```

## X07 - Db2 Stored Procedures Summary

### Usage

To gain access to the Db2 Stored Procedures Summary report, issue the “X” line command from the Observation Session List. The “X” line command starts Performance Analysis Reporting in a mode that enables access to the Db2 Stored Procedures Summary report. Before entering the line command, you must tag at least one measurement that contains Db2 Stored Procedures data by entering the “T” line command in the Observation Session List. Up to 20 measurements can be tagged at one time.

This report presents a summary of the Db2 Stored Procedures from the tagged measurements. Each detail line summarizes the Stored Procedure information for each DBRM from each measurement. The Number of Invocations reports the number of invocations for the DBRM during that measurement. The reported information also includes the number of total SQL calls, the average number of SQL calls per invocation, the mean CPU time per invocation, and the mean service time per invocation.

By default, the detail lines are sorted in ascending DBRM name sequence (SN). You can also request that the detail lines be sorted by invocation count (SV). Entering either SN or SV a second time sorts the detail lines in the reverse order (ascending or descending).

### Quantification

Each report line shows the following information for one region:

- The DBRM name
- The Db2 subsystem name
- The measurement request number for the region
- The number of Stores Procedure invocations for the DBRM
- The total Db2 SQL calls
- The average SQL calls per invocation
- The mean CPU time per invocation
- The mean Service (elapsed) time per invocation.

### Detail line hierarchy

The X07 report shows only one detail line level. It cannot be expanded.

### Detail line descriptions

| Under Heading | This is Displayed |
|---------------|-------------------|
| Name          | The DBRM name.    |

| Under Heading       | This is Displayed                                                                     |
|---------------------|---------------------------------------------------------------------------------------|
| Db2 Sysid           | The Db2 subsystem name.                                                               |
| ReqNum              | The measurement request number for this Db2 Stored Procedure DBRM.                    |
| Nbr of Invocations  | The total number of invocations that are executed for this Db2 Stored Procedure DBRM. |
| SQL Calls - Total   | The total number of SQL calls for this Db2 Stored Procedure DBRM.                     |
| SQL Calls - Average | The average number of SQL calls per invocation of this Db2 Stored Procedure DBRM.     |
| Mean CPU time       | The average CPU time per invocation of this Db2 Stored Procedure DBRM.                |
| Mean SVC time       | The average Service (elapsed) time per invocation of this Db2 Stored Procedure DBRM.  |

## Sample report

A sample report is shown here:

```

X07: Db2 Stored Procedures Summary (00000/Db2SP) Row 00001 of 00010
Command ==> Scroll ==> CSR
 Db2 Nbr of --- SQL Calls --- Mean Mean
Name Sysid ReqNum Invocations Total Average CPU Time Svc Time

DBSPX01 DBCG 00483 2 25 12.50 0.00313 0.00492
DBSPX04 DBBG 00487 19 30,198 1589.36 0.41540 2.01899
DBSPX04 DBCG 00483 7 16,281 2325.85 0.67438 5.16866
DBSPX04 DBBG 00482 9 14,926 1658.44 0.47700 3.27659
DBSPX05 DBBG 00486 9 29 3.22 0.00315 5.84723
DBSPX05 DBBG 00480 4 13 3.25 0.00333 6.93522
DBSPX06 DBCG 00483 14 20 1.42 0.00150 3.98819
DBUDF01 DBBG 00488 19 9,959 524.15 0.10413 0.13577
DBUDF01 DBCG 00483 8 5,425 678.12 0.15136 0.30382
DBUDF01 DBBG 00484 9 4,979 553.22 0.11495 0.17004
```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized here: (You can always enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied to Heading | Action                                   |
|-----|-------------------------|------------------------------------------|
| ?   | Name                    | Display context help information.        |
| ++  | Name                    | Show additional details about this line. |
| M   | Name                    | Display load module information.         |

## on heading

| Cmd | When Applied to Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | Name                    | Display context help information. |
| SV  | Name                    | Sort next level entries by value. |
| SN  | Name                    | Sort next level entries by name.  |

## Detail window

You can enter “++” or press the Enter key on any line to display a window that contains additional information.

A sample detail window for this report is shown here:

```
X07 - DETAIL Window (00483/DBCGWLM) Scroll ==> CSR
Command ==>

+----- The following report line was selected -----+
| DBSPX01 DBCG 00483 2 25 12.50 0.00313 0.00492|
+-----+

CPU and Service Time for DBRM DBSPX01
 Total CPU Time (seconds) 0.00626
 Total Service Time (seconds) 0.00985

 Nbr of Invocations 2
 Mean CPU per Invocation (seconds) 0.00313
 Mean Time per Invocation (seconds) 0.00492

 Nbr of SQL Calls 25
 Mean CPU per Call (seconds) 0.00025
 Mean Time per Call (seconds) 0.00039
```



# Chapter 11. System Reports

This section describes the System Reports.

| For information about ...            | See ...                                                                |
|--------------------------------------|------------------------------------------------------------------------|
| The System Information extractor     | <a href="#">“Overview of System Information extractor” on page 633</a> |
| Z01 System CPU Usage by Jobname      | <a href="#">“Z01 - System CPU Usage by Jobname” on page 633</a>        |
| Z02 System CPU Usage by ASID         | <a href="#">“Z02 - System CPU Usage by ASID” on page 636</a>           |
| Z03 System/Target CPU Usage Timeline | <a href="#">“Z03 - System/Target CPU Usage Timeline” on page 639</a>   |

## Overview of System Information extractor

To use the System Reports, the System Information extractor must be turned on when the Observation Request is entered. You must select the System Information extractor in the Schedule New Measurement panel.

This data extractor provides the ability to analyze CPU consumption that is not in the target address space selected on the Schedule New Measurement panel.

When the System Information extractor is selected, Application Performance Analyzer will collect CPU consumption relating to address spaces running on the system at the time the observation is run.

## Z01 - System CPU Usage by Jobname

### Usage

Use this report to see a summary of the CPU consumed by address spaces other than the target address space measured during the observation session, sorted by percentage of CPU consumed and identified by jobname.

### Detail line hierarchy

An unexpanded Z01 report shows a line for each address space where CPU consumption was captured outside of the target address space. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
TSO ID:
Level 1 TSO ID
Level 2 TSO ID

Started Task:
Level 1 Started Task Name
Level 2 Started Task Name

Initiator Address Space:
Level 1 Job Name
Level 2 Job Name
```

## Detail line descriptions

Each line represents an item to which captured CPU consumption is attributed. These lines are arranged hierarchically. You can expand a line (using the '+' line command) to reveal a breakdown into subordinate items.

Each line at level 1 represents one of the following 3 items:

- TSO ID
- Started task ID
- Initiator Job

### TSO ID

For each TSO ID, the following information is reported:

| Under Heading                | This is Displayed                                                                                                                                                                                                 |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME                      | The name of the TSO ID running in the address space for both levels 1 and 2.                                                                                                                                      |
| Description                  | This will be blank for level 1. For TSO, there will only be 1 subordinate item reported under this heading which will show the address space id, TSUxxxxx, (or spaces if the address space is in initialization). |
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation.                                                                                         |

### Started task ID

This is the duration of the interval in seconds.

| Under Heading                | This is Displayed                                                                                                                                                    |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME                      | The name of the started task for both levels 1 and 2.                                                                                                                |
| Description                  | This will be blank for level 1. For a started task, there will only be 1 subordinate item. Reported under this heading which will be the address space id, STCxxxxx. |
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation.                                            |

### Initiator Job

This quantifies the significance of the measurement for the interval. This is the percentage of samples in the interval the address space was not Queued – either CPU consumption or WAIT state was observed.

| Under Heading | This is Displayed                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME       | For levels 1 and 2, this will show the job name started by an initiator address space.                                                                                        |
| Description   | For an initiator address space there can be multiple subordinate items. Each item will show the address space id (or spaces if the address space is still in initialization). |

| Under Heading                | This is Displayed                                                                                                         |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation. |

## Sample reports

A sample report is shown here. It has been fully expanded by entering “+” on the Jobname field.

```

File View Navigate Help

Z01: System CPU Usage by Jobname (00297/QARCOBRN) Row 00001 of 00152
Command ==> _____ Scroll ==> CSR

Jobname Description Percent of CPU Time * 10.00% ±1.4%
 *....1....2....3....4....5....6....7....8....9....

ADS04P
→ ADS04P JOB03212 81.10 =====
FF#CAZF1
→ FF#CAZF1 STC01678 8.50 =====
DZSR00DS
→ DZSR00DS STC03207 1.89 =
CICS56A
→ CICS56A STC08894 1.09 =
MXIMAST
→ MXIMAST STC08860 0.75
TN3270
→ TN3270 STC08858 0.60
FF#SG01
→ FF#SG01 STC00942 0.47
MXITCP
→ MXITCP STC08863 0.45
TCPIP
→ TCPIP STC08851 0.40
JES2
→ JES2 0.40

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object   | Action                                   |
|-----|--------------------------|------------------------------------------|
| ?   | SEQN (sampling interval) | Display context help information.        |
| ++  | SEQN (sampling interval) | Show additional details about this line. |
| +   | SEQN (sampling interval) | Expand to reveal next level entries.     |
| -   | SEQN (sampling interval) | Collapse to hide next level entries.     |

# Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
| Z01 - DETAIL Window (00297/QARCOBRN) Scroll ==> CSR |
| Command ==> |
| |
| +-----+ The following report line was selected +-----+ |
| | > DZSR00DS STC03207 1.89 0 | |
| +-----+ |
| |
| Job Name DZSR00DS |
| JOBID STC03207 |
| |
| Execution on GPU processor 10 |
| Execution on zIIP processor 78 |
| Execution on zCBP processor 0 |
| |
+-----+
```

# SETUP options

No SETUP options exist for this report.

# Z02 - System CPU Usage by ASID

## Usage

Use this report to see a summary of the CPU consumed by address spaces other than the target address space measured during the observation session, sorted by percentage of CPU consumed and identified by ASID.

# Detail line hierarchy

An unexpanded Z02 report shows a line for each ASID where CPU consumption was captured outside of the target address space. You can expand each line to reveal additional hierarchical levels of detail.

The hierarchy is illustrated here:

```
TSO ID:
Level 1 ASID
Level 2 TSO ID

Started Task:
Level 1 ASID
Level 2 Started Task Name

Initiator Address Space:
Level 1 ASID
Level 2 Job Name
```

# Detail line descriptions

Each line represents an item to which captured CPU consumption is attributed. These lines are arranged hierarchically. You can expand a line (using the '+' line command) to reveal a breakdown into subordinate items.

Each line at level 1 represents one of the following 3 items:

- TSO ID

- Started task ID
- Initiator Job

### TSO ID

For each TSO ID, the following information is reported:

| Under Heading                | This is Displayed                                                                                                                                                             |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME                      | For level 1, this will be the address space in which the TSO is running. For level 2, this will be the TSO ID.                                                                |
| Description                  | For level 1, this will be TSO:xxxxxxx where xxxxxxx is the TSO ID. For TSO there will only be 1 subordinate item which will show the address space ID in the format TSUxxxxx. |
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation.                                                     |

### Started task ID

This is the duration of the interval in seconds.

| Under Heading                | This is Displayed                                                                                                                                                                                       |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME                      | For level 1, this will be the address space in which the started task is running. For level 2, this will be the started task name.                                                                      |
| Description                  | For level 1, this will be the name of the started task in format STC:xxxxxxx, where xxxxxxx is the name of the started task. For level 2, this will be the name of the started task in format STCxxxxx. |
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation.                                                                               |

### Initiator Job

This quantifies the significance of the measurement for the interval. This is the percentage of samples in the interval the address space was not Queued – either CPU consumption or WAIT state was observed.

| Under Heading                | This is Displayed                                                                                                                                                                                                 |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| JOBNAME                      | For level 1, this will be the address space in which the job is running. For level 2 this will be the job name.                                                                                                   |
| Description                  | For an initiator address space, there can be multiple subordinate items. For level 1, this will be "Initiator" to indicate an initiator address space. For level 2, this will be the job name in format JOBxxxxx. |
| Percent of CPU Time * 10.00% | This shows graphically the percentage of CPU utilized by running system (non-target) for the duration of the observation.                                                                                         |

## Sample reports

A sample report is shown here. It has been fully expanded by entering “+” on the ASID field.

```

File View Navigate Help

Z02: System CPU Usage by ASID (00297/QARCOBRN) Row 00001 of 00152
Command ==> ----- Scroll ==> CSR

ASID Description Percent of CPU Time * 10.00% ±1.4%
 *....1....2....3....4....5....6....7....8....9....

00050 Initiator 81.10 =====
→ ADS04P JOB03212 81.10 =====

00245 STC:FF#CAZF1 8.50 ====
→ FF#CAZF1 STC01678 8.50 ====

00330 STC:DZSR00DS 1.89 =
→ DZSR00DS STC03207 1.89 =

00106 STC:CICS56A 1.09 =
→ CICS56A STC08894 1.09 =

00076 STC:MXIMAST 0.75
→ MXIMAST STC08860 0.75

00074 STC:TN3270 0.60
→ TN3270 STC08858 0.60

00217 STC:FF#SG01 0.47
→ FF#SG01 STC00942 0.47

00027 STC:MXITCP 0.45
→ MXITCP STC08863 0.45

00068 STC:TCPIP 0.40
→ TCPIP STC08851 0.40

00030 STC:JES2 0.40
→ JES2 STC08851 0.40

00066 STC:SDSFAUX 0.40
→ SDSFAUX STC08850 0.40

00079 STC:MXIDB2 0.38
→ MXIDB2 STC08864 0.38

00001 STC:*MASTER* 0.30
→ *MASTER* STC08804 0.30

```

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object   | Action                                   |
|-----|--------------------------|------------------------------------------|
| ?   | SEQN (sampling interval) | Display context help information.        |
| ++  | SEQN (sampling interval) | Show additional details about this line. |
| +   | SEQN (sampling interval) | Expand to reveal next level entries.     |
| -   | SEQN (sampling interval) | Collapse to hide next level entries.     |



### Target %

This is the percentage of the LPARs capacity used in the target address space. For example, for an LPAR with 10 GPUs and 10 zIIPs, if the target address space was using 100% of 2 GPUs, its Target% would be 20%.

### System %

This is the percentage of the LPARs capacity used in the non-target address spaces. For example, for an LPAR with 10 GPUs and 10 zIIPs, if the non-target address spaces were using 100% of 2 GPUs and 100% of a zIIP, their System% would be 30%.

### Percent of CPU Time \* 10.00%

This shows graphically both the target and system(non-target) percentages from the Target% and System% columns. The Target% is in green and the System% is in white.

## Subset reports

This report can generate subset reports for any detail line. By entering a report code on a detail line, a pop-up subset report is displayed for this item. The item selected is scaled to 100 percent. The available subset reports are listed below in “Line commands, on objects.”

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to open a menu of line commands available for that field).

### on objects

| Cmd | When Applied To Object   | Action                                   |
|-----|--------------------------|------------------------------------------|
| ?   | SEQN (sampling interval) | Display context help information.        |
| ++  | SEQN (sampling interval) | Show additional details about this line. |
| C01 | SEQN (sampling interval) | C01 - CPU Usage by Category analysis.    |
| Z01 | SEQN (sampling interval) | Z01 - System CPU Usage by Jobname.       |
| Z02 | SEQN (sampling interval) | Z02 - System CPU Usage by ASID.          |

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:



```
File View Navigate Help

Z03 - DETAIL Window (00297/QARCOBRN)
Command ==> Scroll ==> CSR
More: - +
+----- The following report line was selected -----+
| 0001 15:32:41 30.60 48.77 00000000000000000000000000000000 |
+-----+
Information about sampled interval

Interval Number 1
Nbr of Samples 244
First Sample# 1
Last Sample# 244

Target ASID Active Samples
GPU Specialty CPUs
TCB 224 TCB 0
SRB 3 SRB 0

Non-Target ASID Active Samples
GPU Specialty CPUs
TCB 357 TCB 5
SRB 45 SRB 0
```

## SETUP options

Enter the SETUP primary command to select options for this report.

The following pop-up window will be displayed:

```
File View Navigate Help
+-----+
| Z03 - Report SETUP Window (00297/QARCOBRN)
| Command ==> Scroll ==> CSR
| Options for System/Target CPU Usage Timeline
|
| Number of Intervals 15
| This is the number of equal time intervals within
| the duration of the measurement that are to be
| reported. Each report line will show measurement
| information for one interval.
|
+-----+
```

The following SETUP option can be selected with the SETUP primary command:

### Number of Intervals

This is the number of equal time intervals within the duration of the measurement that are to be reported. Each report line will show measurement information for one interval.



## Chapter 12. Miscellaneous Reports

This section describes Application Performance Analyzer reports that are not categorized in a performance analysis report set.

### A06 – Measured Job JCL

Application Performance Analyzer captures the JCL for a measured batch job. The A06 report presents the captured JCL in an Edit session, which is useful for determining the specific details of the job that was measured, such as execution parameters, STEPLIBs, data files, or instream data. The A06 report can also be useful during the development and testing phase for resubmitting the same JCL to compare similar measurements. The A06 report is not produced for started tasks (STCs) or measured TSO address spaces.

```
File View Navigate Help

R01: IBM APA for z/OS Performance Reports (00929/QACOSA01) Row 00001 of 00007
Command ==> Scroll ==> CSR
Select a category from the list below to view the available reports
A Admin/Miscellaneous I IMS Measurement E CICS Measurement
S Statistics/Storage F DB2 Measurement Q MQ Measurement
C CPU Usage Analysis D DASD I/O Analysis G Coupling Facility
W CPU WAIT Analysis V Variance Reports X Multi Address Space
J Java Measurement B WebSphere App Server H HFS Analysis
K SRB Measurement

Enter S to make a selection or enter the report code on the command line
A01 Source Program Mapping
A02 Request XML, JSON or Printed Reports
A03 Java Source Mapping
A04 Source Mapping Dataset List
A05 Source Mapping Common List
A06 Measured Job JCL
```

Selecting report A06 will place the user in ISPF EDIT of the JCL where they can view, edit or submit the JCL. The temporary dataset will be allocated by using the ZPREFIX ISPF variable as the high level qualifier. If ZPREFIX is not set ( for example, PROFILE NOPREFIX), ISPF variable ZUSER will be used instead.

```
File Edit Edit_Settings Menu Utilities Compilers Test Help

EDIT USER1.CAZJCL1.TEMP Columns 00001 00072
Command ==> Scroll ==> CSR
***** ***** Top of Data *****
000001 //QACOSA01 JOB (), 'COBSAM01',CLASS=A,MSGCLASS=T,NOTIFY=&SYSUID
000002 //*
000003 //* COBOL - COPY SEQUENTIAL INPUT FILE TO SEQUENTIAL OUTPUT FILE
000004 //* PARM SPECIFIES THE NUMBER OF ITERATIONS
000005 //*
000006 //*
000007 //COBSAM EXEC PGM=COBSAM01,PARM='100'
000008 //STEPLIB DD DSN=USER1.LOADLIB,DISP=SHR
000009 // DD DISP=SHR,DSN=CEE.SCEERUN
000010 // DD DISP=SHR,DSN=CEE.SCEELKED
000011 //SYSPRINT DD SYSOUT=*
000012 //SYSOUT DD SYSOUT=*
000013 //IFILE DD DSN=USER1.SRCLIB(SAMP),DISP=SHR
000014 //OFILE DD DUMMY
000015 //SYSUDUMP DD SYSOUT=*
***** ***** Bottom of Data *****
```



## Chapter 13. Source program mapping

This section describes the Source Program Mapping feature.

| For information about ...               | See ...                                                               |
|-----------------------------------------|-----------------------------------------------------------------------|
| Entering source mapping details         | <a href="#">“A01 - Source program mapping panel” on page 647</a>      |
| Java source program mapping             | <a href="#">“A03 - Java source program mapping panel” on page 650</a> |
| Source mapping dataset list             | <a href="#">“A04 - Source mapping dataset list” on page 652</a>       |
| Source mapping common data set list     | <a href="#">“A05 - Source mapping common list” on page 654</a>        |
| Source program mapping pick list        | <a href="#">“A011 - Source program mapping pick list” on page 655</a> |
| The source program attribution report   | <a href="#">“P01 - Source program attribution” on page 656</a>        |
| DWARF Source Program Attribution report | <a href="#">“P03 - DWARF Source Program Attribution” on page 660</a>  |
| DWARF Source Lines report               | <a href="#">“P04 - DWARF Source Lines” on page 662</a>                |

### Introduction to source program mapping

Application Performance Analyzer handles source program mapping differently for Java than for other programming languages.

#### The common data set list

If the Common Data Store (CDS) is enabled during installation of Application Performance Analyzer, users have the ability to create and maintain a common list of source information data sets (for languages other than Java) that is unique to each instance of Application Performance Analyzer. The common data set list is shareable by all users of the Application Performance Analyzer instance. It is accessed from the ‘A05: Source Mapping Common List’ panel. All users may view the common list and authorized users may update the common list. When Application Performance Analyzer is searching for program source, it will search the user’s personal list as defined in the ‘A04: Source Mapping Dataset List’ panel first, and if not found, then search the common list.

#### For languages other than Java

When you specify source program mapping files, many reports allow you to enter a “P” line command to view the program source associated with that entry in the report. The “P” line command is available on many object types: CSECTs, Db2 SQL statements, CICS commands, etc. The data is displayed in the P01: Source Program Attribution report. This report can also be included in a print request.

#### The ‘P’ line command

When you enter the ‘P’ line command, Application Performance Analyzer first checks if the source is loaded. If it is, the source is displayed in the P01: Source Program Attribution report.

If the source is not loaded, your A04: Source Mapping Dataset List is searched for the source member. If no source member is found in any of the data sets, the common list as defined in A05: Source Mapping Common List is searched. If no source member is found in any of the data sets in the list, the A01: Source Program Mapping panel is displayed, allowing you to enter the source mapping information for the current observation session.

When one or more source members are found in your A04: Source Mapping Dataset List or the A05: Source Mapping Common List, the behavior of Application Performance Analyzer depends on whether or not you requested to match the compile date and time. When you request to not match the compile

date and time, the first instance of a source member is loaded regardless of its date and time and the source is displayed in the P01: Source Program Attribution report.

When you request to match the compile date and time, the first source member found that matches the load module compile date and time is loaded and the source is displayed in the P01: Source Program Attribution report.

If none of the source members match the compile date and time, a pick list of datasets that contain the source member is displayed in the A011: Source Programming Mapping Pick List panel. When you select one of these source members, it is loaded and you are returned to the report from which you entered the 'P' line command. You must then re-enter the 'P' line command to display in the P01: Source Program Attribution report.

#### **The 'P' line command for COBOL with DWARF**

When a COBOL program is compiled with the TEST option, the DWARF debugging information (which includes the source) is embedded in the load module. When you enter the 'P' line command against such a program, Application Performance Analyzer recognizes that the DWARF debugging information is available in the load module, and loads the source directly from that load module. The source is displayed in the P01: Source Program Attribution report.

This feature requires READ access to the dataset in which the corresponding load module resides. The Common Data Store is not used for COBOL with DWARF, nor is the A01 Source Program Mapping panel. As an alternative to DWARF, the COBOL compile listing may be used for source mapping in the usual manner.

This feature requires access to the TZ environment variable. The CONFIG BASIC TZ setting must be configured with appropriate values during the installation of Application Performance Analyzer. Contact your system programmer to verify the TZ environment variable is configured in Application Performance Analyzer.

#### **The 'P' line command for C/C++ (without timestamp match)**

When you enter the 'P' line command, Application Performance Analyzer first checks if the source is loaded. If it is, the source is displayed in the P01: Source Program Attribution report.

Typically, source mapping for C/C++ programs is dependent on an exact match between the listing timestamp and the CSECT timestamp generated at compile time. A recompiled C/C++ source listing cannot be loaded directly from the A01, A04 or A11 panels. In some cases, this function is required when the source listing that matches the compiled program is not available. To accommodate this situation, Application Performance Analyzer will allow a listing to be loaded for a specific CSECT with no timestamp matching. You must enter the 'P' line command on a CSECT in one of the supporting reports. You are then directed to the A01: Source Program Mapping panel where you specify the listing to be loaded. This listing will then be loaded and related to the CSECT selected, without timestamp checking, and you are returned to the report. You must then re-enter the 'P' line command to display the P01: Source Program Attribution report.

#### **For Java**

When you specify source program mapping files for Java, the program source is viewed in the detail windows in the Java reports, rather than by using the "P" line command. The detail window from a Java Line Number contains Java source mapping information. This detail window is displayed by entering the "++" command (or the Enter key) on the Java Line Number.

#### **Using DWARF debug files**

If C/C++ programs are compiled with DWARF, you can source map the programs by using DWARF debug files. To source map, you need to specify the "P" line command on a CSECT object in the various CPU reports. This displays the P04: DWARF Source Lines report. In the P04 report, you can use the "P" line command again on a source line object in order to display the P03: DWARF Source Program Attribution report.

You can also go directly to the P03 DWARF Source Program Attribution report (without going through the P04 report), by using the "P" line command on an object code address report line in the C03 report, or an attribution offset line in the W03 report.

The debug file is located within the CSECT for the compiled program. Application Performance Analyzer can extract the debug file name from the executable program during sampling. Therefore, you do not need to identify the debug file via the A01 panel for source mapping. However, Application Performance Analyzer can only extract information from an executable USS file if Application Performance Analyzer can locate the file during sampling. If the USS program is executed by using a relative path name, you must specify the directory in which the executable program can be found. You specify the directory in the Options panel (panel 2) when you create the request.

## A01 - Source program mapping panel

### Overview

This panel allows you to specify and manage associations between source program mapping (SPM) files and observation sessions. Application Performance Analyzer's SPM feature allows measured addresses to be mapped to their corresponding source program statements. You must identify SPM files for each of the observation sessions that use this feature. An SPM file can be sequential or a member in a partitioned data set.

It can be one of the following file types:

- A listing produced by the compiler (COBOL, C, OR C++)
- An ADATA (Associated Data) file produced by High Level Assembler
- A SYSDEBUG file (COBOL or PL/I)
- A side file member produced by the CAZLANGX utility
- A side file member produced by the IPVLANGO utility (for COBOL modules that have been optimized by the Automatic Binary Optimizer for z/OS product).

The SPM files can be retrieved from:

- A PDS(E) or sequential file
- A third party listing (if your installation has enabled support for this)

This panel consists of two sections:

1. An input area in which you can specify an SPM file name and type.
2. A report area in which existing SPM file associations are listed.

A sample Source Program Mapping panel is shown here:

```

File View Navigate Help

A01: Source Program Mapping (1972/TSTJ0B01) Row 00001 of 00058
Command ===> _____ Scroll ===> CSR

Enter the following information to specify a source mapping file to be
used in the analysis of this measurement information.

File type _ (L=listing, A=ADATA, S=LANGX SideFile, D=SYSDEBUG)
Data set name . . _____
 (Leave blank to search A04 dataset list)
Member name . . . _____ Match on Compile Date & Time Y

Seqn ID-ReqNum Type/Status Lang Member DSN
0001 FF21-00002 L-Inact ASM CAZC0010 BNPFF2100B.LISTINGS
0002 DEM0-00003 L-Inact ASM BKNC0120 BN00.TSTP.LISTINGS
0003 DEM0-00004 L-Inact COB CAZC0B01 USER1.TSTP.LISTINGS
0004 DEM0-00005 L-Inact COB SAMCAZ03 USER2.CICS.LISTINGS

```

Another sample Source Program Mapping panel is shown here. Support for third-party listings has been enabled.

```

File View Navigate Help

A01: Source Program Mapping (1971/TSTJOB01) Row 00001 of 00058
Command ==> ----- Scroll ==> CSR

Enter the following information to specify a source mapping file to be
used in the analysis of this measurement information.

File type - (L=listing, A=ADATA, S=LANGX SideFile, D=SYSDEBUG)
Repository. . . . - (T=Third Party, O=Other)
Data set name . . -----
 (Leave blank to search A04 dataset list)
Member name . . . ----- Match on Compile Date & Time Y

Seqn ID-ReqNum Type/Status Lang Member DSN
0001 FF21-00002 L-Inact ASM CAZC0010 BNPFF.FF2100B.LISTINGS
0002 DEM0-00003 L-Inact ASM BKNC0120 BN00.TSTP.LISTINGS
0003 DEM0-00004 L-Inact COB CAZCOB01 USER1.TSTP.LISTINGS
0004 DEM0-00005 L-Inact COB SAMCAZ03 USER2.CICS.LISTINGS

```

## File specification input area

In this area, you enter information about an SPM file to be associated with the current observation session. The fields are described below, but these might vary depending on your installation.

### File type

Specify L for a compiler listing file, A for an assembler ADATA file, S for a LANGX SideFile, or D for a SYSDEBUG file.

Source information files are supported for the following language versions:

COBOL:

- PP 5740 OS/VS COBOL
- PP 5668-958 VS COBOL II
- PP 5688-197 COBOL for MVS/VM
- PP 5648-A25 COBOL for OS/390/VM
- PP 5655-G53 Enterprise COBOL V3
- PP 5655-S71 Enterprise COBOL V4
- PP 5655-W32 Enterprise COBOL V5
- PP 5655-EC6 IBM Enterprise COBOL for z/OS V6

PL/I:

- PP 5655-H31 Enterprise PL/I for z/OS v3 (LANGX side files only)
- PP 5655-W67 Enterprise PL/I for z/OS v4 (LANGX side files & SYSDEBUG)
- PP 5655-PL5 Enterprise PL/I for z/OS v5 (LANGX side files & SYSDEBUG)

C/C++:

- PP 5694-A01 z/OS C/C++ V1.20 and above

For complete information on compiler options, refer to [“Required compiler options for creating listings or CAZLANGX side files”](#) on page 743.

### Repository

T for a third party repository, or O for any other type, such as a PDS or sequential data set.



## Data set name

Specify the name of the sequential or partitioned data set containing the SPM file. Your TSO Prefix will be added as the first qualifier if you enter a name without quotes.

If this field is left blank, the A04 Source Map Dataset List is searched for the member name specified.

## Member name

Include the member name if the data set is partitioned.

A member name is required for SYSDEBUG even if the file is being loaded from a sequential file.

## Match on Compile Date and Time

Specify 'Y' for Yes if you want the compile date and time of the source to be matched to the date and time in the matching CSECT in the measurement data. This feature only works with LE compliant modules.

If you use this feature in conjunction with a blank dataset name, your A04 Source Mapping Dataset List is searched for a source module with a compile date and time matching the CSECT. If one is found, it will be loaded. If matching source members are found, but none have the correct date and time stamp, you are given a Pick List of datasets and you can choose to use one of these.

If you specify 'N' for No in conjunction with a blank dataset name, the first instance of a matching source member in your A04 Source Mapping Dataset List is loaded, regardless of its date and time.

The behavior of this setting applies only to non C/C++ Source Map datasets. For C/C++, the field is ignored. C/C++ source mapping always requires a date/time match.

## List of existing SPM file associations

This section shows a scrollable list of existing associations between SPM files and observation sessions. These SPM associations are “private” to your own TSO userid and are recorded in your TSO profile. Each TSO user needs to set up his or her own SPM information.

Any entries for file associations applicable to the current observation session will appear at the top of the list. The value under the ID-ReqNum field will be displayed in red to indicate this.

Fields displayed in the File Association List are described here:

### Seqn

This is simply the line number of the entry. Line commands can be entered to this field.

### ID-ReqNum

This shows the observation session request number with which the SPM file is associated. The request number is prefixed by the Application Performance Analyzer identifier.

### Type/Status

This indicates the type of SPM file and whether the mapping information has been “loaded” (available for use). “L” indicates a compiler listing file, “A” indicates an assembler ADATA file, “S” indicates a LANGX SideFile, and “D” indicates a SYSDEBUG file.

### Lang

The source program language is shown here: ASM, C, C++, COB, or PLI.

### Member

The member within a partitioned data set is shown here. This field is blank if the data set is non-partitioned.

### DSN

The data set name of the SPM file is shown here.

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                                                              |
|-----|------------------------|---------------------------------------------------------------------|
| ?   | Seqn                   | Display context help information.                                   |
| ++  | Seqn                   | Show additional details.                                            |
| C   | Seqn                   | Copy this SPM file association to the current observation session.  |
| D   | Seqn                   | Delete this entry.                                                  |
| L   | Seqn                   | Load this SPM file and bind it to the current observation session.  |
| F   | Seqn                   | Fill the input fields with the values for this SPM file association |

## A03 - Java source program mapping panel

### Overview

This panel allows you to specify information needed by the Source Program Mapping (SPM) feature for Java programs.

During the measurement, the measurement task determines and records source file names for each of the Java classes in which execution is observed. However, the source file names are not fully qualified. Use this panel to specify sequences of file name prefixes that will be concatenated as high level qualifiers to the captured source program file names in order to form fully qualified HFS path names.

The A03 panel lets you save a set of file name prefixes in an ordered list. Each name in the list is assigned a search sequence ("SrchSeq"): 01, 02, 03, etc.

**Note:** It is helpful to think of the file name prefixes as directory names, and think of stored Java class source file names as files within these directories. Using this analogy, SPM tries to locate a Java class source file by searching each of these directories. It searches the directories in the sequence (01, 02, 03, etc.) indicated by the SrchSeq value.

You can store a default, global list of prefixes and you can store a list for a specific measurement. When attempting to resolve file names, SPM will search the directories specified for the particular measurement first, and then it will search the global list.

If you enable Application Performance Analyzer for jar file source mapping support, the directories specified in the A03 panel are searched for jar files when you attempt to find the Java class source file. If a standalone Java source file is not found in a directory, any jar files in that directory would be searched for a matching Java source file. The jar files must be encoded in UTF-8 format. If you add Java source encoded in EBCDIC to a jar file, the source would not be extracted in readable form. Jar support is provided primarily for applications that are developed on workstations, such as WebSphere applications. Contact your system programmer to verify whether jar file support is enabled.

The Java source program mapping panel consists of two sections:

1. An input area in which you specify a file name prefix to be added to a list, and an option specifying whether you are working with the global (default) list or the list for the current measurement.

2. A scrollable list of file name prefixes. The list you are working with (current measurement or default) appears at the top of the list.

A sample Java source program mapping panel is shown here:

```
File View Navigate Help

A03: Java Source Program Mapping (7544/JVMTST01) Row 00001 of 00007
Command ==> ----- Scroll ==> CSR

Enter "/"
/ To work with file name prefix list for curent measurement. Blank
 for global (default) file name prefix list.

Enter new HFS path name prefix to be added (up to 150 characters)

Seqn ID-ReqNum SrchSeq Path Name
0001 SST -07544 01 /u/java/src
0002 SST -07544 02 /u/jtest/pathOne
0003 SST -07537 01 /u/jtest/pathThree/security/Section/src
0004 SST -07537 02 /u/java/src
0005 SST -07537 03 /u/jtest/pathFive/development/source
0006 SST -07537 04 /u/jtest/pathFour
0007 SST -07537 05 /u/jtest/pathTwo/alphaAlpha/bravoBravo/charlieCharli
```

## File prefix specification input area

Specify either '/' or blank in the option field to indicate whether you want to work with the file prefix list for the current measurement or with the global (default) file prefix list.

To add a new file name prefix to the selected list, enter the prefix name in the two line input field. A prefix name can have up to 150 characters. The name will be added to the end of the ordered list, which means it will be assigned the highest SrchSeq value.

## Detail lines

This area is scrollable. Each detail line displays a file name prefix, which are organized by ordered-list groups.

| Under Heading | This is Displayed                                                                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seqn          | A sequence number indicating the detail line's position in the entire scrollable list. This field accepts line commands. Enter "/" to display a line command menu for this field.                                               |
| ID-ReqNum     | The name of the measurement task and the request number of the measurement to which the file prefix applies. A value of 00000 appears for the request number if the path name is part of the default list and applies globally. |
| SrchSeqn      | A value indicating the relative sequence in which the file prefix is applied. SrchSeq values for an ordered list begin with 01 and appear in sequence (01, 02, 03, etc.). The maximum value is 99.                              |
| Path Name     | The file path name prefix. Do not end this name with a forward slash (/) if your Java source is stored in jar files.                                                                                                            |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a "/" on any input field to open a menu of line commands available for that field.)

## on objects

| Cmd | When Applied To | Action                            |
|-----|-----------------|-----------------------------------|
| ?   | Seqn            | Display context help information. |
| D   | Seqn            | Delete the entry.                 |
| H   | Seqn            | Move higher in search order.      |
| L   | Seqn            | Move lower in search order.       |
| S   | Seqn            | Copy path name to input field.    |

## Java report detail window

Once the Java source program mapping details have been entered in the A03 panel, the source can be viewed in the detail windows of the Java reports. Display the detail window by entering the “++” line command (or enter key) on the Java Line Number object in the Java report.

A sample Java report detail window with source mapping is shown here:

```

File View Navigate Help

+----- The following report line was selected -----+
| → 00817 line # 817 0.33 |
+-----+
Package Name java/lang
Class Name String
Method Signature charAt(int) char
Source File Name /u/java/src/java/lang/String.java

LineNo Source Statement
00814 * string.
00815 */
00816 public char charAt(int index) {
00817 if ((index < 0) || (index >= count)) {
00818 throw new StringIndexOutOfBoundsException(index);
00819 }
00820 return value[index + offset];
00821 }
00822
00823 /**
00824 * Copies characters from this string into the destination char
00825 * array.

```

## A04 - Source mapping dataset list

## Overview

This panel allows you to specify a list of dataset names that Source Program Mapping (SPM) will use to search for a source program. The datasets will be searched in the specified order. The list is saved in the common data store, if enabled, otherwise it is saved in your ISPF profile. The list is searched when the 'P' line command is entered and when you do not specify a dataset name in the A01 Source Program Mapping panel.

A sample panel is shown here:

```

File View Navigate Help

A04: Source Mapping Dataset List (1068/TSTJOB01) Row 00001 of 00020
Command ==> _____ Scroll ==> PAGE

Specify up to 20 listing repository datasets. These will be searched
when the P line command is entered or on the A01 panel when you leave
the dataset name blank on a new entry.

Match on Compile Date & Time Y

Seqn File Type Repository Dataset Name
0001 S 0 USR1.IDILANGX
0002 L 0 USR1.COBO.LISTING
0003 D 0 USR1.TST.COBO.L.DEBUG
0004 A 0 USR1.ADATA
0005 - - _____
0006 - - _____
0007 - - _____
0008 - - _____
0009 - - _____
0010 - - _____
0011 - - _____
0012 - - _____
0013 - - _____
0014 - - _____
0015 - - _____
0016 - - _____
0017 - - _____
0018 - - _____
0019 - - _____
0020 - - _____

```

## Match on Compile Date & Time description

The value entered here applies to all entries in the dataset list. Specify 'Y' for Yes if you want the compile date and time of the source to be matched to the date and time in the matching CSECT in the measurement data. Specify 'N' for No if you want the source to be loaded regardless of its date and time. For more details, refer to [“Match on Compile Date and Time” on page 649](#).

## Dataset list description

A scrollable list of up to 20 dataset names can be maintained here. Each row in the list consists of four parts: a sequence number, a file type, a repository and a dataset name field. These fields are described below.

### Seqn

A sequence number indicating the detail line's position in the list. This field accepts line commands to Move, Insert, and Delete. To display a line command menu for this field, enter / .

### File type

Specify L for a compiler listing file, A for an assembler ADATA file, S for a LANGX SideFile, or D for a SYSDEBUG file.

### Repository

Specify T for a third party repository, or O for any other type.

### Dataset name

The name of the dataset to be searched. This is an input field where you specify a fully qualified dataset name. The name must not be enclosed in quotes.

## Commands to save and edit

This panel supports a limited set of ISPF Edit type line commands. The commands supported are listed below. (Block moves are not supported).

### I

Insert

- D**  
Delete
- M**  
Move
- A**  
After

PF3 or the END command saves the list and terminates the dialog, but you must press Enter first to record any changes. The CANCEL command terminates the dialog without saving any changes.

## A05 - Source mapping common list

### Overview

This panel allows you to specify a common list of dataset names that Source Program Mapping (SPM) uses to search for a source program. This list is common to all users, and is searched in the specified order when the ‘P’ command is used, and a source match is not found in the user’s personal dataset list as defined in their A04: Source Mapping Dataset List panel. The list is saved in the common data store, and can be maintained by any user with AdministerProduct authorization. Users without AdministerProduct authorization can view the list, but update operations are disabled. For details on setting up AdministerProduct authorization, refer to Chapter 2 of the *Application Performance Analyzer for z/OS Customization Guide*.

When datasets in the common list are searched, the user’s setting for ‘Match on Compile Date & Time’ as defined in their A04: Source Mapping Dataset List panel is used. By default, Application Performance Analyzer will not search for an exact match on compile date and time.

A sample panel is shown here:

FileViewNavigateHelp

A05 - Source Mapping Common List (0002/TSTJOB)

Row 00001 of 00050

Command ==>

Scroll ==> CSR

Specify up to 50 listing repository datasets to be used as a common list of datasets for all users when source mapping.

| Seqn | File Type | Repository | Dataset Name        |
|------|-----------|------------|---------------------|
| 0001 | L         | 0          | COMMON.COBOL.SOURCE |
| 0002 | S         | 0          | COMMON.PLI.IDILANGX |
| 0003 | A         | 0          | COMMON.ADATA        |
| 0004 | —         | —          |                     |
| 0005 | —         | —          |                     |
| 0006 | —         | —          |                     |
| 0007 | —         | —          |                     |
| 0008 | —         | —          |                     |
| 0009 | —         | —          |                     |
| 0010 | —         | —          |                     |

### Dataset list description

A scrollable list of up to 50 dataset names can be maintained here. Each one in the list consists of four parts: a sequence number, a file type, a repository, and a dataset name field. These fields are described below.

#### Seqn

A sequence number indicating the detail line's position in the list. This field accepts line commands to Move, Insert, and Delete. To display a line command menu for this field, enter / .

#### File type

Specify L for a compiler listing file, A for an assembler ADATA file, S for a LANGX SideFile, or D for a SYSDEBUG file.

## Repository

Specify T for a third party repository, or O for any other type.

## Dataset name

The name of the dataset to be searched. This is an input field where you specify a fully qualified dataset name. The name must not be enclosed in quotes.

## Commands to save and edit

This panel supports a limited set of ISPF Edit type line commands. The commands supported are listed below. (Block moves are not supported).

### I

Insert

### D

Delete

### M

Move

### A

After

PF3 or the END command saves the list and terminates the dialog, but you must press Enter first to record any changes. The CANCEL command terminates the dialog without saving any changes.

## A011 - Source program mapping pick list

### Overview

This dialog is displayed by the 'P' line command and the A01 Source Program Mapping panel. It is displayed when you have requested that your SPM dataset list be searched for a source member with a compile date/time match, but no date/time match can be found. A list of datasets containing members which match the SPM mapping request, but not the date and time, is presented in the Pick List.

From this list you can select (pick) an SPM dataset that you wish to use for source mapping purposes. After selecting an SPM dataset and pressing Enter, the selected SPM dataset and member will be loaded and bound to the current observation session. Also, when displayed from the A01 Source Program Mapping panel, a new row is added to the A01 SPM list reflecting this addition.

A sample pick list panel is shown here:

```
File View Navigate Help

A011: Source Program Mapping Pick List (2399/TSTJOB01) Row 00001 of 00002
Command ==> _____ Scroll ==> CSR

Member Name: LPFRAYVS
Load Module: LPFRAYVS CSECT: LPFRAYVS
Observed Compile Date and Time: n/a

Seqn Dataset Name Compile Date and Time
0001 USR1.TST.COBOL.LISTING2 2006/01/30 07:09:05
0002 USR1.TST.COBOL.LISTING5 2006/01/30 11:16:09
0003 USR1.TST.COBOL.LISTING7 2007/07/02 13:21:29
0004 USR1.TST.COBOL.LISTINGE 2006/04/17 16:45:02

\+-----+
| No match found. Select a dataset from the list and press Enter, or press PF3 |
| to return to the previous panel without a selection. This Pick List is |
| displayed because you specified a blank dataset name and 'Match on Compile |
| Date & Time', but no date and time matches were found for this member in |
| your list of datasets. |
+-----+
```

## Field descriptions

### Member name

The source member name.

### Load module

The load module name that matched the source member and the measurement.

### CSECT

The CSECT name that matched the source member and the measurement.

### Observed compile date and time

The date and time extracted from the LE entry point for the CSECT. This is only available for LE compliant modules.

## Pick list description

This lower section of this panel is a scrollable list. Each row in the list consists of three fields: a sequence number, a dataset name, and compile date & time. These fields are described below.

The Select line command allows you to select the SPM dataset you want to use. When this dialog is displayed from the A01 Source Program Mapping panel, after selecting a dataset and pressing Enter, the selected dataset is loaded and added to your list of SPM file associations and you are returned to the A01 dialog. When this dialog is displayed from the 'P' line command, the source member from the selected dataset is loaded and after pressing Enter, you are returned to the report from which you entered the 'P' line command. You must then re-enter the 'P' line command to display in the P01: Source Program Attribution report. In either case, press PF3 to return without making a selection.

#### Seqn

A sequence number indicating the detail line's position in the entire scrollable list. This field accepts the 'S' (Select) line command.

#### Dataset name

The name of the SPM dataset containing the SPM data for the CSECT found in the current observation.

#### Compile Date and Time

The date and time when this SPM member was created (compiled).

## P01 - Source program attribution

---

### Overview

This report maps measured CPU activity to its corresponding source program statements. You use the "P" line command, on an eligible line command field, to launch this report. (See the individual Performance Analysis reports to determine which lines allow the "P" command.) Source statements from a single compile (or assembly) unit are shown. Depending on the selected SETUP options, all or part of the source program is shown. A count value is shown for statements in which CPU activity was measured; each count value indicates the number of times execution in the statement was observed. Optionally, depending on a SETUP option, the counts are also shown graphically.

This report also shows attribution of CPU usage measured in system modules referred back to the points of invocation in application modules ("Referred Attribution"). This referred attribution line is displayed directly under the source statement, and is displayed in pink.

A sample report is shown here with the graphics option turned off.



```

File View Navigate Help

P01: Source Program Attribution (0453/TSTJOB01) Row 00001 of 00043
Command ==> ----- Scroll ==> CSR

LineNo Offset Count Source Statement
000120
000121 *- - - - -
000122 00034A Open Input DataFile1
 9 <- CPU time attributed to above statement
000123
000124 00036C If DataFile1-file-status-ok
000128 End-If
000129
000130 000388 Open Output DataFile2
 7 <- CPU time attributed to above statement
000131
000132 0003A6 If DtaFile2-file-status-ok
000167 *- - - - -
000168
000169 0004B0 2 Read DataFile1
000170 At End
000171 0004F4 Set DataFile1-eof To True
000186 00050A Move dataRecord to dataRecordCopy
000187
000188 000510 8 Perform until Char-Column > 80
000189
000190 000524 If dataChar(Char-Column) Not = Space
000193 00056C Move 1 to Word-Length(Word-Count)
000194
000195 000582 6 Perform until dataChar(Char-Column) = Spac
000196 or Char-Column > 80
000197 0005AE Add 1 to Char-Column
000229 00066A Move Word-Length(Word-Subscript1) to ws-Word-
000230
000231 000688 735 Perform until Word-Updated or

```

```

File View Navigate Help

P01: Source Program Attribution (0453/TSTJOB01) Row 00001 of 00043
Command ==> ----- Scroll ==> CSR

LineNo Offset Count Source Statement
000169 0004B0 2 Read DataFile1
000170 At End
000171 0004F4 Set DataFile1-eof To True
000186 00050A Move dataRecord to dataRecordCopy
000187
000188 000510 8 Perform until Char-Column > 80
000189
000190 000524 If dtaChar(Char-Column) Not = Space
000193 00056C Move 1 to Word-Length(Word-Count)
000194
000195 000582 6 Perform until dataChar(Char-Column) = Spac
000196 or Char-Column > 80
000197 0005AE Add 1 to Char-Column
000229 00066A Move Word-Length(Word-Subscript1) to ws-Word-
000230
000231 000688 735 Perform until Word-Updated or
000232 Word-Subscript2 > Total-Word-Co
000233
000235 0006D0 Move Word-Length(Word-Subscript1) to ws-Wo
000236
000237 0006EE 49 If All-Word-Value(Word-Subscript2) =
000238 dataRecordCopy(ws-Word-Column:ws-Word-L
000239 000730 Add 1 to All-Word-Count(Word-Subscript2)
000249 00079E Move Total-Word-Count to Word-Subscript2
000250 0007A8 Move 1 to All-Word-Count(Word-Subscript2)
000251 0007C2 15 Move dataRecordCopy(ws-Word-Column:ws-Word
000252 to All-Word-Value(Word-Subscript2)
000253 End-If

```

## Code segments

The reported CPU activity depends on the item upon which the “P” line command was entered to launch this report. Only the CPU activity which was aggregated to quantify that item is included in the source

mapping report. If, for example, this report was launched from an item on the CPU Usage by Code Slice report, then only activity for the range of addresses in the selected “slice” is reflected in the source statement counts. Statements outside such a selected address range are displayed in blue, while those within the range appear in green.

## Detail line descriptions

### LineNo

This field displays a 6 digit sequence number corresponding to the source statement line position. The sequence values begin at 000001 and increase by 1 for each statement. Gaps in the sequence occur if SETUP options are chosen resulting in some statements being omitted from the report. This field is also an input field and accepts line commands.

### Offset

This field contains the hexadecimal offset of the object code associated with the source statement. The offset is relative to the beginning of the CSECT (Control Section). Blanks are shown here if there is no object code address associated with the statement (comments, continuations, non-procedural statements, etc.).

### Count

The number of times execution was observed at the statement is shown here, or blank if no execution was measured. The maximum value is 9999. Values exceeding 9999 are shown as 9999+.

### Source statement

The source program statement is shown here. For an assembler program, you can select a SETUP option to choose whether to show only the 80 byte source statement or to show the full assembly listing format (including offset, object code etc.)

### Header information

A SETUP option can be selected to display information about the mapped program in the heading section of each page. This information includes: load module name, load library name, CSECT name, source mapping file name, compile date/time, and code segment address range (when applicable). It is usually preferable to turn off this option as it occupies several lines at the top of the screen.

## SETUP options

Enter the SETUP primary command to select options for this report. The following pop-up window will be displayed:

```

File View Navigate Help
- +-----+-----+
P | Options for Source Program Mapping 001 of 00068
C | 11 ==> CSR
L | Nbr of adjacent lines to display 2
 | This specifies the number of statements
 | without measured activity to be displayed
 | before/after lines with activity.
0 |
0 |
0 | Enter "/" to select an option
0 | - Display ALL statements of the source program.
0 | (otherwise only those at or near statements
0 | with measured activity are displayed.)
0 | - Include assembler object code.
0 | / Show statement count graphically.
0 | - Show detailed information in heading.
0 | - Show C/C++ pseudo-assembly.
0 | - Display values as a percent.
0 | (Not applicable to all reports)
0 |
0 | pace
- +-----+-----+

```

## Number of adjacent lines to display

Use this parameter to control how many adjacent source lines you would like to see on either side on a source line with activity. This is used to give context to the active source lines displayed. This parameter is ignored if you turn on the Display ALL statements option.

## Display ALL statements

Choose this option if you would like to see the entire source program. Otherwise, only source statements with activity, or statements adjacent to statements with activity are included.

## Include assembler object code

Use this option to choose whether to show only the 80 byte source statement or to show the full assembly listing format (including offset, object code etc.). This is for Assembler programs only.

## Show statement count graphically

This option will cause a graph to be displayed on top of the source statements, indicating how much activity each active source statement has.

## Show detailed information in heading

This option will cause detailed information about the source program to be displayed. This includes the load module, name of library it was loaded from, the CSECT, the source mapping file name, compiler name, and compile date and time.

## Show C/C++ pseudo assembly

This option will cause pseudo-assembly for C/C++ programs to be displayed.

## Display values as a percent

This option will cause the values for the source statement to be displayed as a percentage (instead of a count). This is only applicable when you are source mapping from a report which shows percentages.

## Detail window

You can enter “++” (or the Enter key) on any line to display a pop-up window containing additional information.

A sample detail window for this report is shown here:

```

File View Navigate Help

Source Statement Information
 Perform until Char-Column > 80
CSECT Name: COB01
Offset: 000510
Object Code Size: 20 bytes
Activity Count: 8 times

Module Information for COB01
Load Address 08B00B38 to 08B01FFF
Module Size 5,320
Attributes REUS,NORENT,APFLIB
Module Location JPA
Loadlib DDNAME STEPLIB
Load Library BNPF.UTIL.LOADLIB

ESD Information for COB01
External Offset Length Start Addr End Addr
COB01 000000 4152 08B00B38 08B01B6F
IGZEBST 001038 1168 09B01B70 08B01FFF

```

## P03 - DWARF Source Program Attribution

### Overview

The P03 report is used for source mapping DWARF programs. It requires the programs to have debug files in the ELF/DWARF format associated with them.

This report maps measured CPU or Wait activity to its corresponding source program statements. Use the "P" line command, on an eligible line command field (see below), to launch this report. Source statements from a single compile unit are shown. A count or percent value is shown for the statement selected in which CPU activity was measured; the count value indicates the number of times execution of the statement was observed. A percent value shows the percent as calculated on the report. Optionally, depending on a SETUP option, the counts are also shown graphically.

A sample report is shown here.

|                                                       |       |          |                                 |
|-------------------------------------------------------|-------|----------|---------------------------------|
| File                                                  | View  | Navigate | Help                            |
| -----                                                 |       |          |                                 |
| P03: DWARF Source Program Attribution (0539/JVMTST01) |       |          | Row 00028 of 00047              |
| Command ==> -----                                     |       |          | Scroll ==> PAGE                 |
| LineNo                                                | Count | Source   | Statement                       |
| 000028                                                |       |          | l = i + m;                      |
| 000029                                                |       | /*       | printf(" a[I]=%d a[L]=%d        |
| 000030                                                |       |          | c++;                            |
| 000031                                                | 120   |          | if (a[i-1] <= a[l-1]) {         |
| 000032                                                |       |          | i = 0;                          |
| 000033                                                |       |          | } else {                        |
| 000034                                                |       |          | t = a[i-1];                     |
| 000035                                                |       |          | a[i-1] = a[l-1];                |
| 000036                                                |       |          | a[l-1] = t;                     |
| 000037                                                |       |          | i = i - m;                      |
| 000038                                                |       |          | s++;                            |
| 000039                                                |       |          | }                               |
| 000040                                                |       |          | }                               |
| 000041                                                |       |          | j += 1;                         |
| 000042                                                |       |          | }                               |
| 000043                                                |       |          | m = m >> 1;                     |
| 000044                                                |       |          | }                               |
| 000045                                                |       |          | printf(" iterations=%d swaps=%d |
| 000046                                                |       |          | }                               |

## Eligible line commands

The P03 report can be launched with a “P” line command from one of the following:

- A DWARF Source Line in the P04: DWARF Source Lines report
- An object code address report line in the C03 report
- An attribution offset line in the W03 report

## Detail line descriptions

| Table 8. Detail Line Descriptions |                                                                                                                                                                                                                     |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Under Heading                     | This is Displayed                                                                                                                                                                                                   |
| LineNo                            | This field displays a 6 digit sequence number corresponding to the source statement line position.                                                                                                                  |
| Count                             | The number of times execution was observed at the statement is shown here. The maximum value is 9999. Values exceeding 9999 are shown as 9999+.                                                                     |
| Prcnt                             | If the percent option has been selected in the SETUP for source mapping, the values for the statement are displayed as a percentage. This percentage is the same as percent shown on the report for that line item. |
| Source Statement                  | The source program statement is shown here.                                                                                                                                                                         |

## Header information

A SETUP option can be selected to display information about the mapped program in the heading section of each page.

| Table 9. Mapped Program Header Information |                                                                                                                                                                                                                                                      |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Under Heading                              | This is Displayed                                                                                                                                                                                                                                    |
| Debug file                                 | This is the absolute path name of the DWARF debug file that was generated by the compiler for the selected CSECT (Control Section).                                                                                                                  |
| Debug file date                            | This is the current file modification date and time of the DWARF debug file. A zero value indicates that the date is unknown.                                                                                                                        |
| Compile date                               | This is the date and time that the CSECT was compiled, as recorded in the executable program. If the current file modification date and time of the debug file differs from the compile date and time by more than 1 minute, a warning is displayed. |
| Source file name                           | This is the absolute path name of the source file that contains the requested source statement line.                                                                                                                                                 |
| Source file date                           | This is the current file modification date and time of the source file. A zero value indicates that the date is unknown.                                                                                                                             |

| Table 9. Mapped Program Header Information (continued) |                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Under Heading                                          | This is Displayed                                                                                                                                                                                                                                                                          |
| Source compile date                                    | This is the date and time that the source file was compiled, as recorded in the DWARF debug file. If the current file modification date and time of the source file is not the same as the compile date and time, a warning is displayed. A zero value indicates that the date is unknown. |

## SETUP options

The following SETUP options can be selected with the SETUP primary command:

### Show statement count graphically

This option will cause a graph to be displayed on top of the source statements, indicating how much activity each active source statement has.

### Show detailed information in heading

This option will show the following additional header fields: Debug file, Debug file date, Compile date, Source file name, Source file date, and Source compile date.

### Display values as a percent

This option will cause the values for the source statement to be displayed as a percentage (instead of a count). Not applicable to all reports.

## P04 - DWARF Source Lines

### Overview

The P04 report is used for mapping source lines in DWARF programs. It requires the programs to have debug files in the ELF/DWARF format associated with them.

This report maps measured CPU or Wait activity to specific source lines within a CSECT. Use the "P" line command, on an eligible line command field, to launch this report. Source statements from a single compile unit are shown. A percent value is shown for source statements in which CPU activity was measured. A "P" command can be entered on the LineNo field to see the source for that line.

A sample report is shown here.

```

File View Navigate Help

P04: DWARF Source Lines (0539/JVMTST01) Row 00001 of 00017
Command ==> _____ Scroll ==> CSR

Debug file name /u/aif04/xcs5d.dbg
Debug file date 2007-11-12 15:13:11
Compile date 2007-11-12 15:13:10

LineNo FileNo Percent of CPU Time * 10.00% ±3.2%
 ...1...2...3...4...5...6...7...8...9...

000031 1 12.77=====
000027 1 6.60 =====
000035 1 4.89 ==
000034 1 4.57 ==
000028 1 4.36 ==
000036 1 4.36 ==
000040 1 3.19 ==
000025 1 2.55 =
000030 1 2.44 =
000033 1 2.44 =
000041 1 2.34 =
000038 1 2.02 =
000037 1 1.91 =
000039 1 1.70 =
000032 1 1.38 =
000026 1 0.63
000042 1 0.53

```

## Detail line descriptions

| Table 10. DWARF Source Detail Line Descriptions |                                                                                                                     |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Under Heading                                   | This is Displayed                                                                                                   |
| LineNo                                          | This field displays a 6 digit sequence number corresponding to the source statement line number.                    |
| Fileno                                          | This field contains the file number for the source module within the CSECT (Control Section).                       |
| Percent of CPU Time                             | Displays the percent of CPU active samples on this line number out of the total number of CPU active samples taken. |

## Header information

| Table 11. DWARF Source Header Information |                                                                                                                                                                                                                                                      |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Under Heading                             | This is Displayed                                                                                                                                                                                                                                    |
| Debug file                                | This is the absolute path name of the DWARF debug file that was generated by the compiler for the selected CSECT (Control Section).                                                                                                                  |
| Debug file date                           | This is the current file modification date and time of the DWARF debug file. A zero value indicates that the date is unknown.                                                                                                                        |
| Compile date                              | This is the date and time that the CSECT was compiled, as recorded in the executable program. If the current file modification date and time of the debug file differs from the compile date and time by more than 1 minute, a warning is displayed. |

## Line commands

The line commands available in this report, and the objects and headings to which they apply, are summarized below. (You can enter a “/” on any input field to popup a menu of line commands available for that field.)

### on objects

| Cmd | When Applied To Object | Action                            |
|-----|------------------------|-----------------------------------|
| ?   | LineNo                 | Display context help information. |
| ++  | LineNo                 | Show additional details.          |
| P   | LineNo                 | Display source program mapping.   |

### on headings

| Cmd | When Applied To Heading | Action                            |
|-----|-------------------------|-----------------------------------|
| ?   | LineNo                  | Display context help information. |
| SV  | LineNo                  | Sort next level by value.         |

## Detail window

You can enter “++” (or the Enter key) on any line to display a popup window containing additional information.

A sample detail window for this report is shown here:

```
File View Navigate Help
+-----+
+----- The following report line was selected -----+
| 000031 7 12.77 ===== |
+-----+

Calculation Details
CPU measurements 120
In the csect .P000014
File Number 7
Line Number 31
Total CPU measurements 939
Percent of total 12.77%

000031 if (a[i-1] <= a[l-1]) {
```



## Chapter 14. Printing reports and creating XML or JSON documents

This section explains how to produce Application Performance Analyzer performance analysis reports suitable for printing, or in XML or JSON document format suitable for further processing. You generate a printable report or an XML or JSON document, in batch, by submitting JCL. In most situations, you can use Application Performance Analyzer's ISPF-based report request facility which will generate and submit the JCL for you. This facility is discussed in the first two sections of this chapter. The remaining sections explain the JCL and control statements; these sections are of interest only if you intend to prepare the JCL and control statements manually.

| For information about ...                                                                                                | See ...                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| The available options, and overall capabilities of the report printing facility                                          | <a href="#">“About Application Performance Analyzer’s report printing and XML or JSON document feature” on page 665</a> |
| Using Application Performance Analyzer’s ISPF-based report request facility                                              | <a href="#">“Using the ISPF report request facility” on page 666</a>                                                    |
| How to prepare JCL to produce reports                                                                                    | <a href="#">“Preparing JCL to print reports or create XML or JSON documents” on page 670</a>                            |
| Control statements to specify report options                                                                             | <a href="#">“Specifying control statements” on page 673</a>                                                             |
| Producing, viewing and printing high-quality reports in PDF format                                                       | <a href="#">“Reports in PDF format” on page 676</a>                                                                     |
| Processing and transferring report data contained in XML document files                                                  | <a href="#">“Reports in XML document format” on page 677</a>                                                            |
| Processing and transferring report data contained in JSON document files                                                 | <a href="#">“Reports in JSON document format” on page 677</a>                                                           |
| The sections that you can include in a performance analysis report and how to specify them in SECTION control statements | <a href="#">“Report SECTION descriptions ” on page 677</a>                                                              |

### About Application Performance Analyzer’s report printing and XML or JSON document feature

Most of the Application Performance Analyzer’s interactive performance analysis reports are available in a format suitable for printing or in XML or JSON document format suitable for further processing. Application Performance Analyzer allows you to generate reports and XML or JSON documents by submitting JCL that executes the program CAZPRINT. You can use Application Performance Analyzer’s ISPF-based report request facility to build the necessary JCL and CAZPRINT control statements. Alternatively, you can manually prepare and submit your own JCL. CAZPRINT can produce report output in three different formats:

#### Line printer

The traditional FBA 121 character-per-line SYSOUT format.

#### PDF

Adobe Portable Document Format.

#### XML

Extensible Markup Language document format.

## JSON

JavaScript Object Notation.

### Line printer format

You would typically route line printer format as a JES SYSOUT file. You produce this by specifying a PRINT control statement. You specify a DD name in the PRINT statement and supply a DD statement for that name. This is the most direct (and convenient) way of producing report output, but formatting is constrained by inherent line printer device limitations.

### PDF format

PDF is the preferable format because it offers high quality printed output as well as advanced viewing capabilities. You produce a PDF file by specifying a CONVERT control statement. You specify a DD name in the CONVERT statement and supply a DD statement for that name which defines the output file. You then need to transfer the file to a PC platform on which you can view and print the report.

## XML or JSON document format

### XML document format

When you wish to further process the report data, you can produce an XML document file. You produce an XML document file by specifying a CONVERT control statement. You specify a DD name in the CONVERT statement and supply a DD statement for that name which defines the XML document file. You may browse, edit or further process the XML document on the mainframe, or transfer it to another platform. XML documents are produced in the English language only.

### JSON document format

When you wish to further process the report data, you can produce a JSON document file. You produce a JSON document file by specifying a CONVERT control statement. You specify a DD name in the CONVERT statement and supply a DD statement for that name which defines the JSON document file. You may browse, edit or further process the JSON document on the mainframe, or transfer it to another platform. JSON documents are produced in the English language only.

### Report sections

A single performance analysis report is comprised of a number of report Sections. A report section typically has a counterpart report in the ISPF reporting environment. For example, *C01: CPU Analysis by Category* is implemented as a single report in the ISPF environment and can be included as one section of a printed report. The same 3- character identifiers used to denote ISPF reports are used to denote report sections. You specify that a report section is to be included by supplying a SECTION control statement.

## Using the ISPF report request facility

To request a batch performance analysis report or XML or JSON document using Application Performance Analyzer's ISPF facility, select an observation session item in the usual way – enter the “R” line command on the observation session list screen. Then, from the report selection menu, select A02.

A screen will then be displayed listing the available report sections that you can select to be included in the report or XML/JSON document.

An example of the A02 dialog is shown here.

```

File View Navigate Help

A02: Request Printed Reports (00739/TSTJOB01) Row 00001 of 00036
Command ==> Scroll ==> CSR

Enter / to include a section in the report or file, blank to exclude
the section,S to include the section and set formatting options.
Enter / to select all/category sections, D to deselect. Use UP/DOWN
(PF7/PF8) to scroll the list of report sections. After entering your
selections, press ENTER to generate the JCL.

Select Report Section
-
- ALL Available Reports
-
 / ALL Statistics/Storage Reports
 / S01 Measurement Profile
 / S02 Load Module Attributes
 / S03 Load Module Summary
 / S04 TCB Summary
 / S05 Memory Usage Timeline
 / S06 Data Space Usage Timeline
 / S07 TCB Execution Summary
 / S08 Processor Utilization Summary
 / S09 Measurement Analysis
 / S10 Observation Session Messages

- ALL CPU Usage Analysis Reports
-
 / C01 CPU Usage by Category
 / C02 CPU Usage by Module
 / C03 CPU Usage by Code Slice
 / C04 CPU Usage Timeline
 / C05 CPU Usage Task/Category

```

You simply make your selections, press ENTER, and Application Performance Analyzer will build and submit the JCL. The selectable report sections—as illustrated above—include only those applicable to the selected measurement file. Db2 report sections, for example, will not appear as available selections if no Db2 data exists in the measurement file. By default, all the applicable reports are selected. However, if you prefer to have the previous selections “remembered”, you can request this using the SETUP primary command while you are in this panel.

## Specifying formatting options

You can modify the format of some report sections by specifying formatting options. To do so, select the report section with the “S” line command instead of a slash (/) character. A pop-up window will appear in which you can modify the current option values.

If you enter more than one “S” line command, the formatting option pop-up window for only the first one encountered will appear; you should enter “S” line commands one at a time. The following illustrates the formatting options pop-up window, which will appear if you enter the “S” line command on the C01: CPU Usage by Category report section.

```

File View Navigate Help
+-----+
| A02: Report Parameters (01611/QAMQBGET) |
| Command ==> |
| |
| 9 Number of levels (1 to 9) of report line |
| hierarchical expansion. |
| |
| VALUE Report sort sequence: NAME or VALUE |
| |
| / / to categorize modules by "Group". Unselect |
| to categorize by "SubGroup" |
| |
| 0.00 Minimum percentage of CPU activity measured |
| for which an item is to be included in the |
| report. |
| |
| / / to show DB2SQL category. Unselect to omit |
| DB2SQL |
| |
| / / to show DATAMG category. Unselect to omit |
| DATAMG |
| |
| / / to show IMSDLI category. Unselect to omit |
| IMSDLI |
| |
| / / to show ADABAS category. Unselect to omit |
| ADABAS |
| |
| / / to report description fields on more than |
| one line. Unselect to report on a single line |
| with truncation. |
| |
+-----+

```

Modify the values and press the ENTER key and you will be returned to the report section selection dialog.

Application Performance Analyzer will “remember” the option values you specify. These will become your new default values and will be used for future printed report requests.

## The JCL submission/EDIT dialog

Pressing ENTER to the report section selection dialog will take you to the JCL submission dialog – if you did not modify any input fields prior to pressing ENTER. The report section selection dialog will continue to display until you have pressed ENTER without having modified any input fields.

The JCL submission dialog is illustrated below. Pressing the ENTER key will cause the generated JCL to be submitted directly, or will launch EDIT for the generated JCL member. This dialog is illustrated here.

```

File View Navigate Help
+-----+
| A02: Report JCL Submission (00739/TSTJOB01) |
| Command ==> _____ Scroll ==> CSR |
| More: + |
| Specify the following and press ENTER to either SUBMIT the JCL or to |
| launch EDIT for the generated JCL. |
| |
| Enter "/" to select options |
| / produce PDF (Portable Document Format) file |
| / generate JES-managed report file (SYSOUT=*) |
| _ produce XML (Extensible Markup Language) file |
| _ produce JSON (JavaScript Object Notation) file |
| |
| / EDIT the generated JCL member, otherwise SUBMIT |
| |
| Job Statement - edit if necessary |
| ==> //USER1P___JOB_(), 'CAZRPT01', CLASS=A, MSGCLASS=T, NOTIFY=&SYSUID |
| ==> /*_____ |
| ==> /*_____ |
| ==> /*_____ |
| ==> /*_____ |
| |
| PDF File DSN (if applicable) |
| ==> 'USER1.PDF' |
| |
| XML File DSN (if applicable) |
| ==> 'USER1.XML' |
| JSON File DSN (if applicable) |
| ==> 'USER1.JSON' |
| |
| Location where generated JCL is to be saved |
| JCL Library ==> 'USER1.JCL' |
| JCL Member ==> CAZRPT1 |
+-----+

```

## Input to the JCL submission/EDIT dialog

### Produce PDF file

Enter a slash (/) to select this option or a space to deselect it. CAZPRINT will write a file in downloadable PDF (Portable Document Format) file.

### Generate JES-managed report file

Enter a slash (/) to select this option or a space to deselect it. CAZPRINT will write a standard SYSOUT format report file.

### Produce XML file

Enter a slash (/) to select this option or a space to deselect it. CAZPRINT will write a file in XML (Extensible Markup Language) document format. This option cannot be selected when any one of the PDF file, JES-managed report file, or the JSON document file options are selected.

### Produce JSON file

Enter a slash (/) to select this option or a space to deselect it. CAZPRINT will write a file in JSON (JavaScript Object Notation) document format. This option cannot be selected when any one of the PDF file, JES-managed report file, or the XML document file options are selected.

### EDIT the generated JCL

Enter a slash (/) if you want EDIT to be launched for the generated JCL member when you press the ENTER key. Blank in this field will cause the JCL to be SUBMITTED immediately when you press the ENTER key.

### Job Statement

The generated JOB statement is shown. You can modify the statement to suit your preferences or to comply with your installation. Be aware, however, that no validation is done on your input; an input error can cause a JCL error when the job is submitted.

This JOB statement can be customized for your installation. For more information, see “Customizing CAZJCLCM for your installation” in the *Application Performance Analyzer Customization Guide*.

### PDF File DSN

If you have specified that a PDF file is to be written, you must specify the DSN of the file in this field. The file must be a sequential dataset with fixed length 80 byte records. If the file is not pre-allocated and cataloged, Application Performance Analyzer allocates and catalogs it.

### XML File DSN

If you have specified that an XML document file is to be written, you must specify the DSN of the file in this field. The file must be a sequential dataset with fixed or variable length 255 byte records. If the file is not pre-allocated and cataloged, Application Performance Analyzer allocates and catalogs it.

### JSON File DSN

If you have specified that a JSON document file is to be written, you must specify the DSN of the file in this field. The file must be a sequential dataset with fixed or variable length 255 byte records. If the file is not pre-allocated and cataloged, Application Performance Analyzer allocates and catalogs it.

### JCL Library

Enter the DSN of a JCL library. This is a partitioned data set in which the generated JCL member will be stored before it is submitted (or EDITed). If the dataset is not pre-allocated and pre-cataloged, Application Performance Analyzer allocates and catalogs it.

### JCL Member

Enter the name of the JCL member here. If the member does not exist, Application Performance Analyzer creates it.

## Source program mapping

The report section selection dialog displays one selectable line for the P01 Source Program Attribution report section for each applicable program. However, you must first load the source mapping data. For details on loading source mapping data, refer to [Chapter 13, “Source program mapping,” on page 645](#). Each P01 selection line displays the name of the source mapped program.

```
File View Navigate Help

A02: Request Printed Reports (0464/TSTJOB01) Row 00031 of 00035
Command ==> ----- Scroll ==> CSR

Enter / to include a section in the report, blank to exclude the section,
S to include the section and set formatting options. Use UP/DOWN (PF7/PF8)
to scroll the list of report sections. After entering your selection,
press ENTER to generate the report JCL.

Select Report Section

/ P01 Source Program Attribution for SAMPFINQ
/ P01 Source Program Attribution for PFSAMPA
/ P01 Source Program Attribution for PFSAMPB
/ P01 Source Program Attribution for PFSAMPC
```

## Preparing JCL to print reports or create XML or JSON documents

You have the option of manually preparing and submitting your own report JCL. The ISPF report request facility will meet most requirements, but by preparing your own JCL and control statements you can use the full formatting flexibility of the CAZPRINT program.

The following CAZPRINT capabilities that are not available directly by using the ISPF report request facility are available if you prepare your own JCL and control statements:

- Include multiple instances of the same report section in a single report. For example, you can include two instances of C01: CPU Usage by Category in your report. Having multiple instances allows you to sort reports using more than one category. For example, one can be sorted by VALUE (most intense CPU activity at the top) and another sorted by program NAME.
- Include report sections from different measurement files in a single report.
- Customize the sequence in which report sections appear in the report.

The following illustrates an example of JCL and control statements to produce a performance analysis report:

```
//CAZRPT01 JOB (job parameters)
//*
//STEP1 EXEC PGM=CAZPRINT
//STEPLIB DD DISP=SHR,DSN=hlq.SCAZAUTH
//SFILE01 DD DISP=SHR,DSN=measurement.file.name
//CAZLOG DD SYSOUT=*
//PRINT1 DD SYSOUT=*
//PDFFILE DD DISP=SHR,DSN=any.file
//*
/* Instream control statements.
/*
//CAZCTL DD *
*
 PROFILE 01 Input=SFILE01
*
 SECTION S01 Profile=01
 SECTION S02 Profile=01
 SECTION S03 Profile=01
 SECTION S04 Profile=01
 SECTION S05 Profile=01
 SECTION S06 Profile=01
 SECTION S07 Profile=01
*
 SECTION C01 Profile=01
 SECTION C02 Profile=01
 SECTION C03 Profile=01
 SECTION C04 Profile=01
 SECTION C05 Profile=01
*
 SECTION W01 Profile=01
*
 SECTION D01 Profile=01
 SECTION D02 Profile=01
 SECTION D03 Profile=01
 SECTION D04 Profile=01
*
 CONVERT Format=PDF DDNAME=PDFFILE
 PRINT DDNAME=PRINT1
*
/*
```

The above illustrates JCL and control statements that produce output in both line printer format and in PDF format. A brief explanation of the JCL statements is presented below. Detailed descriptions of each of the DD statements are then presented later in this section. For detailed descriptions of the control statements (ddname CAZCTL) see, [“Specifying control statements” on page 673](#).

#### **STEPLIB**

The load library containing Application Performance Analyzer components. This can be omitted if Application Performance Analyzer is installed in a linklist library.

#### **SFILE01**

The measurement file.

#### **CAZLOG**

Output file for error and informational message.

#### **PRINT1**

Output file for the line printer report.

#### **PDFFILE**

Output file for the PDF report.

#### **CAZCTL**

Control statements.

## **The input measurement file**

You must provide a DD statement for the file (the “sample file”) containing the Application Performance Analyzer measurement data. You can choose any DD name for this file; the DD name is referred to in a PROFILE control statement. The DSN of the measurement file can be determined by displaying the

ISPF report S01: Session Statistics or by entering the “++” line command to the item in the Observation Session List ISPF dialog.

## Multiple measurement files

Typically you will produce a report to analyze data from a single measurement file. Application Performance Analyzer also allows you to produce multiple reports in a single job step. You can even include report sections from separate measurement files in a single report. In either event, you need to specify a separate DD statement and a separate PROFILE control statement for each measurement file.

## The CAZLOG log file

You must supply a DD statement for DD name CAZLOG. Application Performance Analyzer reports any errors or informational messages to this file. Typically, you will route this as a JES file.

## The report output file

If you include a PRINT control statement to produce a line printer format report, you must also supply a DD statement for this output. Typically you will specify a JES output file. If you prefer to write this to a permanent file, specify a FB or FBA file with LRECL=121. If your job step is to produce multiple line printer reports, you must supply a DD statement (and a corresponding PRINT statement) for each one.

## The PDF output file

If you include a CONVERT control statement to produce a report in PDF format, you must also supply a DD statement for this file. This must be a FB, LRECL=80 file. If your job step is to produce multiple PDF reports, you must supply a DD statement (and a corresponding CONVERT statement) for each report.

## Downloading and viewing a PDF file

In order to view or print a PDF file you must perform a file transfer operation to download the file to a PC. When downloading (using IND\$FILE or FTP) be sure to download in binary. Do not specify ASCII translation or CRLF. Once you have download the file you can use any version of the Adobe PDF Viewer (Acrobat) program capable of displaying PDF version 1.3.

## The XML or JSON document file

### The XML document file

If you include a CONVERT control statement to produce a report in XML document format, you must also supply a DD statement for this file. This must be a FB or VB, LRECL=255 file.

If your job step is to produce multiple XML document files, you must supply a DD statement (and corresponding CONVERT statement) for each document file.

Application Performance Analyzer creates a version 1.0 self-contained XML document using EBCDIC encoding (ebcdic-cp-us/Cp037). See [Appendix C, “XML or JSON document layout,” on page 747](#) for a complete description of the XML document.

### The JSON document file

If you include a CONVERT control statement to produce a report in JSON document format, you must also supply a DD statement for this file. This must be a FB or VB, LRECL=255 file.

If your job step is to produce multiple JSON document files, you must supply a DD statement (and corresponding CONVERT statement) for each document file.

Application Performance Analyzer creates a version 1.0 self-contained XML document using EBCDIC encoding (ebcdic-cp-us/Cp037). See [Appendix C, “XML or JSON document layout,” on page 747](#) for a complete description of the XML document.



## Processing and transferring an XML or JSON document file

### Processing and transferring an XML document file

The XML document file containing the report data can be browsed or edited on the mainframe, or transferred to another platform for further processing. When transferring to another platform, appropriate character set translation may be required; including carriage return and line feed characters.

### Processing and transferring a JSON document file

The JSON document file containing the report data can be browsed or edited on the mainframe, or transferred to another platform for further processing. When transferring to another platform, appropriate character set translation may be required; including carriage return and line feed characters.

## Specifying control statements

The CAZCTL DD statement specifies a file containing a sequence of control statements. These control statements can be included as instream data or the DD statement can allocate a SYSIN-type member. The DD statement and the control statements are mandatory.

### General syntax rules

The syntax rules for control records are as follows:

- An asterisk (\*) in column 1 indicates a comment record.
- Double slashes (//) and any characters to the right are ignored. This can be used to include comment text to the right of the statement text.
- Data in columns 73 to 80 is ignored.
- A statement consists of a verb followed by positional and keyword parameters. The allowable verbs are: PROFILE, SECTION, MAP, CONVERT, PRINT, and DESC. If there are positional parameters, they must be coded before any keyword parameters.
- The verb and the positional and keyword parameters must be separated from each other by a comma and/or at least one space.
- A value containing embedded spaces must be enclosed in quotes.
- A statement can span multiple records, but a single parameter expression must be on a single record.
- Unless otherwise noted, commands are not case sensitive.

### The PROFILE statement

The PROFILE statement specifies a measurement file. The format of the PROFILE statement is shown here:

```
PROFILE nn INPUT=ddn|INPUTDSN=dsn
```

The PROFILE statement requires two parameters. The first mandatory parameter is positional and specifies a numeric value from 01 to 99. This effectively labels the PROFILE statement. There is a special case where multiple PROFILE statements with the same numeric label are specified. This is for Variance reporting and is described below.

In most cases, you will only specify one PROFILE statement and this value will be 01. Specify multiple PROFILE statements if you want to report on input from more than one measurement file in a single CAZPRINT step (or print a Variance report as described below). When you specify more than one PROFILE statement, each must specify a unique value in this parameter.

You must also code either the INPUT or INPUTDSN keyword parameter. The INPUT keyword parameter specifies the DD name of the input measurement file. There must be a corresponding DD statement in the

JCL. The INPUTDSN keyword parameter specifies the dataset name of the input measurement file. In this case, it is not necessary to include a corresponding DD statement in the JCL.

## TYPE keyword for Variance report

To print a Variance report, you need to specify the Tagged measurement files as well as the base measurement file to which they are to be compared. In this case, additional PROFILE statements with the same numeric label are coded, and a TYPE=TAGGED keyword is added. Up to 20 PROFILE statements with TYPE=TAGGED are permitted. An example of two PROFILE statements for Variance reporting is shown below:

```
PROFILE 01 INPUT=SFILE02 TYPE=TAGGED
PROFILE 01 INPUT=SFILE01
```

There must be corresponding DDNAMEs for the two PROFILE INPUT keywords.

## TYPE keyword for WebSphere servant region observations

To print WebSphere servant region observation reports, you must specify the WAS servant region measurement file and the WAS control region measurement file. In this case, additional PROFILE statements with the same numeric label are coded, and a TYPE=(TAGGED,WASS) keyword is added to the WAS servant region measurement file PROFILE statement.

Here is an example of two PROFILE statements for WebSphere servant region measurement reporting:

```
PROFILE 01 INPUT=SFILE01,TYPE=(TAGGED,WASS)
PROFILE 01 INPUT=SFILE02
```

There must be corresponding DDNAMEs for the two PROFILE INPUT keywords.

## The MAP statement

The MAP statement specifies source program mapping information. This statement is required if you want the report to include mapping of addresses to application source statements, with the exception of COBOL v5 DWARF. The MAP statement is not required for COBOL v5 DWARF source mapping.

An example of a MAP statement is shown here:

```
MAP TYPE=L FILE=TEST1.PGM.LISTINGS MEMBER=COBTEST1 PROFILE=01
```

MAP statements are optional and must be placed after their corresponding PROFILE statement(s) and before PRINT or CONVERT statements. Each MAP statement specifies a file that contains information enabling Application Performance Analyzer to map sampled addresses to source program statements.

## MAP statement parameters

### TYPE

This keyword parameter is mandatory and specifies the type of source mapping input data. You must specify one of the following values:

#### L

To specify that the input file is a compiler listing.

#### S

To specify that the input file is a LANGX SideFile.

#### A

To specify that the input file is an assembler ADATA file.

#### D

To specify that the input file is a SYSDEBUG file.

**FILE**

This keyword parameter is mandatory and specifies the data set name of the file containing source mapping information.

**MEMBER**

This keyword parameter is optional and specifies the member name of the file. You must include the MEMBER parameter if the FILE parameter specifies a partitioned data set.

**PROFILE**

This keyword parameter is optional. Specify the profile number here – a numeric value between 01 and 99. The value must match a value specified in the first parameter of a PROFILE statement. If omitted, a value of 01 is assumed.

## The SECTION statement

The SECTION statement specifies a section to be included in the report. At least one SECTION statement is required. SECTION statements must be placed after their corresponding PROFILE statement(s) and before PRINT or CONVERT statements. An example of a SECTION statement is shown here:

```
SECTION C01 PROFILE=01 Levels=9 Minimum=2.5 MLD=Y
```

The above example specifies that the C01 section (CPU Analysis by Category) be included in the report. PROFILE=01 refers to the PROFILE statement that specifies the measurement file from which the report section is to be produced.

Each SECTION statement can specify common parameters (those that apply to all report sections) and section-specific parameters (those that apply to specific section types). The common parameters are described here. Descriptions of the section-specific parameters are presented in [“Report SECTION descriptions” on page 677](#).

### SECTION statement common parameters

**Section code**

This is the first (and only) positional parameter and is mandatory. It specifies a code identifying the type of report section. It is always 3 characters in length. The first character is alphabetic and the second and third characters are numeric.

**PROFILE**

This keyword parameter is optional. Specify the profile number here – a numeric value between 01 and 99. The value must match a value specified in the first parameter of a PROFILE statement. If omitted, a value of 01 is assumed. By referring to a PROFILE statement, this parameter specifies the measurement file from which the report section is to be built.

## The PRINT statement

The PRINT statement tells CAZPRINT to write the report in conventional line printer format – a sequential file with ANSI carriage control characters. The report will contain each of the sections specified in SECTION statements. The sections are arranged in the report in the same sequence in which the SECTION statements appeared.

An example of a PRINT statement is shown here:

```
PRINT DDNAME=PRINT1 MLD=N
```

### PRINT statement parameters

**DDNAME**

The DDNAME keyword parameter is mandatory. This specifies the DD name for the report output. A corresponding DD statement must be provided in the JCL.

## LANG

The LANG keyword parameter is optional. If omitted it defaults to ENU to indicate the reports are to be created in the English language. Other acceptable values are JPN for Japanese and KOR for Korean.

## MLD

The MLD keyword parameter is optional, if omitted it defaults to Y. This specifies whether or not Multi-Line Descriptions should be printed (Y=Yes, N=No). This is similar to the PREF option in Application Performance Analyzer ISPF: “Show long descriptions on multiple lines,” and when generating JCL with Application Performance Analyzer ISPF, the PREF setting will be used to set MLD.

## The CONVERT statement

A CONVERT statement can be specified instead of or in addition to a PRINT statement. Like PRINT, CONVERT tells CAZPRINT to write the report and specifies the output destination. Instead of writing the report in conventional line printer format, the CONVERT statement creates a report file in an alternate format; either PDF, XML, or or JSON. When XML or JSON is specified, a PRINT statement cannot be included in the job step. You cannot include a CONVERT statement for PDF and a CONVERT statement for XML or JSON in the same job step.

Two examples of CONVERT statements are shown here.

```
CONVERT DDNAME=PDF1 FORMAT=PDF MLD=N
CONVERT DDNAME=XML1 FORMAT=XML LANG=ENU MLD=N
```

## CONVERT statement parameters

### DDNAME

This mandatory parameter specifies the DD name of a file to which the converted report is to be written. A corresponding DD statement must be included in the JCL. When requesting a PDF, the file must be sequential, in FB format with 80 byte records. When requesting an XML or JSON document, the file must be sequential, in FB or VB format with 255 byte records.

### FORMAT

This mandatory parameter specifies the format to which the report is to be converted. It must specify PDF, XML or JSON.

### LANG

The LANG keyword parameter is optional. If omitted it defaults to ENU to indicate the reports are to be created in the English language. Other acceptable values for PDF files are JPN for Japanese and KOR for Korean. ENU is the only acceptable value for XML or JSON documents.

### MLD

The MLD keyword parameter is optional, if omitted it defaults to Y. This specifies whether or not multi-line descriptions should be printed (Y=Yes, N=No). This is similar to the PREF option in Application Performance Analyzer ISPF: “Show long descriptions on multiple lines,” and when generating JCL with Application Performance Analyzer ISPF, the PREF setting will be used to set MLD.

## The DESC Statement

The DESC statement tells CAZPRINT to change the observation description in the printed reports.

An example of a DESC statement is shown here:

```
DESC= "Description updated for printed report"
```

## Reports in PDF format

Application Performance Analyzer can produce a report in the form of a PDF (Portable Document Format) file. On the mainframe, this is written to a sequential file with fixed-length 80 byte records. To view or print the file you will need to download it to a PC using either IND\$FILE file transfer or FTP. No

data conversion is required, so be sure to specify a binary file transfer. The content in an Application Performance Analyzer PDF report is essentially the same as a corresponding SYSOUT report. However, PDF's advanced formatting capabilities make this format more readable than a SYSOUT report.

## Reports in XML document format

Application Performance Analyzer can produce an XML (Extensible Markup Language) document file containing the selected report information in the English language only. On z/OS, this is written to a sequential file with fixed or variable length 255 byte records. It is encoded in EBCDIC (ebcdic-cp-us/Cp037) and may be viewed, edited, or processed on the mainframe. If the XML document file is required on another platform, it may need character set translation, including carriage return and line feed characters. After the document file has been transferred to the target platform, ensure that the encoding attribute on the XML declaration is changed to the appropriate value. For example, when downloading the file to a Windows platform, using IND\$FILE file transfer, the ASCII and CRLF parameters must be specified. After the file transfer is complete, the encoding attribute on the XML declaration must be changed to UTF-8 in the Windows document file.

The XML file is a stand-alone document and has been declared as such. For the most part, the XML elements and tags can be related to their corresponding report fields by the element names and structure. For a complete description of the XML document, see [Appendix C, "XML or JSON document layout,"](#) on page 747.

## Reports in JSON document format

Application Performance Analyzer can produce a JSON (JavaScript Object Notation) document file containing the selected report information in the English language only. On z/OS, this is written to a sequential file with fixed or variable length 255 byte records. It is encoded in EBCDIC (ebcdic-cp-us/Cp037) and may be viewed, edited, or processed on the mainframe. If the JSON document file is required on another platform, it may need character set translation, including carriage return and line feed characters. After the document file has been transferred to the target platform, ensure that the encoding attribute on the JSON declaration is changed to the appropriate value. For example, when downloading the file to a Windows platform, using IND\$FILE file transfer, the ASCII and CRLF parameters must be specified. After the file transfer is complete, the encoding attribute on the JSON declaration must be changed to UTF-8 in the Windows document file.

The JSON file is a stand-alone document and has been declared as such. For the most part, the JSON elements and tags can be related to their corresponding report fields by the element names and structure. For a complete description of the JSON document, see [Appendix C, "XML or JSON document layout,"](#) on page 747.

## Report SECTION descriptions

This section describes the report sections that you can include in a performance analysis report and the parameters that can be specified on the corresponding SECTION statements.

### SECTION statement parameter summary

Each section requires a SECTION statement. SECTION statements for some report sections accept (or require) certain keyword parameters that allow you to set formatting options. The following table summarizes the available report sections, their parameters, and their default values. The Sequence parameter accepts different values, depending on the report section. For each report section, the acceptable values are listed, with the default value listed first.

These defaults only apply until you change them by selecting the report in A02: Request Printed Reports, after that Application Performance Analyzer will "remember" your selections.

| Report section      | Section ID | Parameters and default values |
|---------------------|------------|-------------------------------|
| Measurement Profile | S01        |                               |

| Report section                | Section ID | Parameters and default values                                                                                            |
|-------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------|
| Load Module Attributes        | S02        | Sequence=NAME/ADDRESS/<br>SIZE/LIBRARY<br>OmitESD=N<br>OmitNUC=N<br>OmitPLPA=N<br>Omitdup=N                              |
| Load Module Summary           | S03        | Sequence=NAME/ADDRESS/<br>SIZE/LIBRARY<br>Omitdup=N                                                                      |
| TCB Summary                   | S04        |                                                                                                                          |
| Memory Usage Timeline         | S05        | Intervals=45                                                                                                             |
| Data Space Usage Timeline     | S06        | Intervals=45                                                                                                             |
| TCB Execution Summary         | S07        |                                                                                                                          |
| Processor Utilization Summary | S08        |                                                                                                                          |
| Measurement Analysis          | S09        |                                                                                                                          |
| Observation Session Messages  | S10        | Levels=3<br>MsgD=Y<br>MsgE=Y<br>MsgI=Y<br>MsgW=Y                                                                         |
| CPU Usage by Category         | C01        | Levels=9<br>Sequence=VALUE/NAME<br>DPAGroup=Y<br>ShowDB2=Y<br>Minimum=0.00<br>MLD=Y<br>Datamg=Y<br>ShowIMS=Y<br>ADABAS=Y |
| CPU Usage by Module           | C02        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00<br>MLD=Y                                                                 |
| CPU Usage by Code Slice       | C03        | Levels=9<br>Sequence=VALUE/<br>ADDRESS/LOCATION<br>SliceSize=64<br>Minimum=0.00                                          |
| CPU Usage Timeline            | C04        | Intervals=45                                                                                                             |
| CPU Usage Task/Category       | C05        | Levels=9<br>Sequence=VALUE/NAME<br>DPAGroup=Y<br>ShowDB2=Y<br>ShowInact=Y<br>MLD=Y<br>Datamg=Y<br>ShowIMS=Y<br>ADABAS=Y  |

| Report section                 | Section ID | Parameters and default values                           |
|--------------------------------|------------|---------------------------------------------------------|
| CPU Usage Task/Module          | C06        | Levels=9<br>Sequence=VALUE/NAME<br>ShowInact=Y<br>MLD=Y |
| CPU Usage by Procedure         | C07        | Sequence=VALUE/NAME<br>OmitCPU=N                        |
| CPU Usage Referred Attribution | C08        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y<br>SysView=N   |
| CPU Usage by PSW/ObjCode       | C09        | Levels=2<br>Sequence=VALUE/ADDRESS                      |
| CPU Usage by Natural Program   | C10        | Levels=9<br>Sequence=VALUE/NAME                         |
| DASD Usage by Device           | D01        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00         |
| DASD Usage by DDNAME           | D02        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00         |
| DASD Usage by Dataset          | D03        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00         |
| Dataset Attributes             | D04        | Sequence=FILE/DSN                                       |
| DASD EXCP Summary              | D05        | Sequence=VALUE/NAME<br>OmitEXCP=N                       |
| DASD VSAM Statistics           | D06        | Sequence=VALUE/NAME<br>OmitEXCP=N                       |
| DASD Activity Timeline         | D07        | Sequence=VALUE/NAME<br>OmitEXCP=N                       |
| DASD I/O Wait Time             | D08        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                |
| VSAM Buffer Pool Usage         | D09        |                                                         |

| Report section                 | Section ID | Parameters and default values                                                                                           |
|--------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------|
| Wait Time by Task/Category     | W01        | Levels=9<br>Sequence=VALUE/NAME<br>DPAGroup=Y<br>ShowDB2=Y<br>ShowInact=Y<br>MLD=Y<br>Datamg=Y<br>ShowIMS=Y<br>ADABAS=Y |
| Wait Time by Task/Module       | W02        | Levels=9<br>Sequence=VALUE/NAME<br>ShowInact=Y<br>MLD=Y                                                                 |
| Wait Time Referred Attribution | W03        | Levels=9<br>Sequence=VALUE/NAME<br>ShowInact=Y<br>MLD=Y                                                                 |
| Wait Time by Task ENQ/RESERVE  | W04        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |
| Wait Time by Tape DDNAME       | W05        | Sequence=VALUE/NAME                                                                                                     |
| IMS Measurement Profile        | I01        |                                                                                                                         |
| IMS DL/I Call Timeline         | I02        |                                                                                                                         |
| IMS Transaction Timeline       | I03        | Levels=9                                                                                                                |
| IMS Txn Activity Timeline      | I04        | Sequence=VALUE/NAME                                                                                                     |
| IMS CPU Usage by PSB           | I05        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |
| IMS CPU Usage by Transaction   | I06        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |
| IMS CPU Usage by DL/I Call     | I07        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |
| IMS WAIT Time by PSB           | I08        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |
| IMS WAIT Time by Transaction   | I09        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                                                |



| Report section                 | Section ID | Parameters and default values                            |
|--------------------------------|------------|----------------------------------------------------------|
| IMS WAIT Time by DL/I Call     | I10        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |
| IMS DL/I Activity by PSB       | I11        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |
| IMS DL/I Activity by Txn       | I12        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |
| IMS DL/I Activity by DL/I Call | I13        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |
| IMS PSB/PCB Attributes         | I14        |                                                          |
| IMS DL/I Call Attributes       | I15        |                                                          |
| IMS Transaction Service Times  | I16        |                                                          |
| IMS Transaction DL/I Counts    | I17        | Levels=9                                                 |
| IMS CPU/Svc Time by DL/I Call  | I18        | Sequence=VALUE/NAME                                      |
| IMS CPU/Svc Time by PSB        | I19        | Sequence=VALUE/NAME                                      |
| IMS CPU/Svc Time by Txn        | I20        | Sequence=VALUE/NAME                                      |
| IMS CPU/Svc Time by PCB        | I21        | Sequence=VALUE/NAME                                      |
| IMS Region Transaction Summary | I22        | Sequence=NAME/VALUE                                      |
| CICS Session Statistics        | E01        |                                                          |
| CICS CPU and Use Counts by Pgm | E02        | Sequence=VALUE/NAME/COUNT                                |
| CICS CPU Usage by Txn          | E03        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00<br>MLD=Y |
| CICS Mean Service Time by Txn  | E04        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |
| CICS Total Service Time by Txn | E05        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                 |

| Report section                                                     | Section ID | Parameters and default values                |
|--------------------------------------------------------------------|------------|----------------------------------------------|
| CICS Service Time by Task ID                                       | E06        | Levels=1<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS WAIT by Txn                                                   | E07        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Mean Service Time by Trm                                      | E08        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Total Service Time by Trm                                     | E09        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Mean Service Time by user ID                                  | E10        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Total Service Time by user ID                                 | E11        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS CPU/Service Time by Txn                                       | E12        | Levels=2<br>Sequence=VALUE/NAME              |
| CICS Mean Service Time by Txn (for multiple CICS address spaces)   | X01        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Total Service Time by Txn (for multiple CICS address spaces)  | X02        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Mean Service Time by Term (for multiple CICS address spaces)  | X03        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| CICS Total Service Time by Term (for multiple CICS address spaces) | X04        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y     |
| Combined Db2 IMS MQ Timeline                                       | X05        | Levels=9<br>Sequence=VALUE/DURATION<br>MLD=Y |
| IMS MASS Region Summary                                            | X06        | Sequence=NAME/VALUE                          |
| Db2 Stored Procedures Summary                                      | X07        | Sequence=NAME/VALUE                          |
| Db2 Measurement Profile                                            | F01        |                                              |

| Report section                    | Section ID | Parameters and default values                                                              |
|-----------------------------------|------------|--------------------------------------------------------------------------------------------|
| Db2 SQL Activity Timeline         | F02        | Levels=9<br>Sequence=THREAD/CPU/<br>DURATION                                               |
| Db2 SQL Activity by DBRM          | F03        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00                                            |
| Db2 SQL Activity by Statement     | F04        | Levels=9<br>Sequence=VALUE/NAME<br>Minimum=0.00                                            |
| Db2 SQL Activity by Plan          | F05        | Levels=9<br>Sequence=VALUE<br>Minimum=0.00                                                 |
| Db2 SQL Statement Attributes      | F06        |                                                                                            |
| Db2 SQL Wait Time by DBRM         | F07        | Levels=9<br>Sequence=VALUE/NAME<br>OfTotal=Y                                               |
| Db2 SQL Wait Time by Statement    | F08        | Levels=9<br>Sequence=VALUE/NAME<br>OfTotal=Y                                               |
| Db2 SQL Wait Time by Plan         | F09        | Levels=9<br>Sequence=VALUE<br>OfTotal=Y                                                    |
| Db2 SQL CPU/Svc Time by DBRM      | F10        | Levels=1<br>Sequence=VALUE/NAME/<br>DURATION<br>stmtPct=N                                  |
| Db2 SQL CPU/Svc Time by Stmt      | F11        | Levels=2<br>Sequence=VALUE/NAME/DURATION<br>posSQL=Y<br>negSQL=Y<br>stmtSQL=N<br>stmtPct=N |
| Db2 SQL CPU/Svc Time by Plan      | F12        | Levels=2<br>Sequence=VALUE/DURATION<br>stmtPct=N                                           |
| Db2 SQL Threads Analysis          | F13        |                                                                                            |
| Db2 CPU by Plan/Stored Proc       | F14        | Levels=9<br>Sequence=VALUE/NAME<br>DPAGroup=Y<br>ShowDB2=Y<br>MLD=Y                        |
| Db2 SQL CPU/Svc Time by Rq<br>Loc | F15        | Levels=2<br>Sequence=VALUE/NAME/<br>DURATION<br>stmtPct=N                                  |

| Report section                       | Section ID | Parameters and default values                             |
|--------------------------------------|------------|-----------------------------------------------------------|
| Db2 SQL CPU/Svc Time by Enclav       | F16        | Levels=2<br>Sequence=VALUE/NAME/<br>DURATION<br>stmtPct=N |
| Db2 SQL CPU/Svc Time by Corrid       | F17        | Levels=2<br>Sequence=VALUE/NAME/<br>DURATION<br>stmtPct=N |
| Db2 SQL CPU/Svc Time by Wkstn        | F18        | Levels=2<br>Sequence=VALUE/NAME/DURATION<br>stmtPct=N     |
| Db2 SQL CPU/Svc Time by EndUsr       | F19        | Levels=2<br>Sequence=VALUE/NAME/DURATION<br>stmtPct=N     |
| Db2 Class 3 Wait Times               | F30        |                                                           |
| Coupling Facility Summary            | G01        |                                                           |
| Coupling Facility Mean Times         | G02        | Levels=9                                                  |
| Coupling Facility Total Times        | G03        | Levels=9                                                  |
| K01 CPU SRB Usage by SRB Type        | K01        | Levels=9<br>Sequence=VALUE/NAME<br>TCBSRB=Y               |
| K02 CPU SRB Usage by PSW/<br>ObjCode | K02        | Levels=9<br>Sequence=VALUE/ADDRESS                        |
| MQ Activity Summary                  | Q01        |                                                           |
| MQ CPU Usage by Queue                | Q02        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                  |
| MQ CPU Usage by Request              | Q03        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                  |
| MQ CPU Usage by Txn                  | Q04        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                  |
| MQ Serv Time by Queue                | Q05        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                  |
| MQ Serv Time by Request              | Q06        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                  |

| Report section              | Section ID | Parameters and default values                                                                        |
|-----------------------------|------------|------------------------------------------------------------------------------------------------------|
| MQ Serv Time by Txn         | Q07        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                             |
| MQ Wait Time by Queue       | Q08        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                             |
| MQ Wait Time by Request     | Q09        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                             |
| MQ Wait Time by Txn         | Q10        | Levels=9<br>Sequence=VALUE/NAME<br>MLD=Y                                                             |
| MQ+ Activity Timeline       | Q11        | Levels=9<br>Sequence=VALUE/DURATION<br>MLD=Y                                                         |
| MQ+ CPU/SVC Time by Queue   | Q12        | Levels=9<br>Sequence=VALUE/DURATION<br>MLD=Y<br>stmtPct=N                                            |
| MQ+ CPU/SVC Time by Request | Q13        | Levels=9<br>Sequence=VALUE/DURATION<br>MLD=Y<br>stmtPct=N                                            |
| MQ+ CPU/SVC Time by Txn     | Q14        | Levels=9<br>Sequence=VALUE/DURATION<br>MLD=Y<br>stmtPct=N                                            |
| Source Program Attribution  | P01        | Program=pgmname (no default value)<br>AdjLines=4<br>AllSource=N<br>AsmObj=Y<br>Header=Y<br>Percent=N |
| Java Summary/Attributes     | J01        |                                                                                                      |
| Java Heap Usage Timeline    | J02        | Intervals=15<br>Totals=Y                                                                             |
| Java CPU Usage by Thread    | J03        | Sequence=VALUE/NAME<br>MLD=Y                                                                         |
| Java CPU Usage by Package   | J04        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                                                             |

| Report section                | Section ID | Parameters and default values                                    |
|-------------------------------|------------|------------------------------------------------------------------|
| Java CPU Usage by Class       | J05        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java CPU Usage by Method      | J06        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java CPU Usage by Call Path   | J07        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Svc Time by Package      | J09        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Svc Time by Class        | J10        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Svc Time by Method       | J11        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Svc Time by Call Path    | J12        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Wait Time by Package     | J14        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Wait Time by Class       | J15        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Wait Time by Method      | J16        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| Java Wait Time by Call Path   | J17        | Levels=2<br>Sequence=VALUE/NAME<br>MLD=Y                         |
| HFS Service Time by Path Name | H01        | Sequence=VALUE/FILEID/PATHNAME<br>Minimum=0.00<br>MLD=Y          |
| HFS Service Time by Device    | H02        | Levels=2<br>Sequence=VALUE/DEVID/DEVICE<br>Minimum=0.00<br>MLD=Y |
| HFS File Activity             | H03        | Sequence=VALUE/FILEID/PATHNAME<br>OmitEXCP=N                     |

| Report section               | Section ID | Parameters and default values                                     |
|------------------------------|------------|-------------------------------------------------------------------|
| HFS File Attributes          | H04        |                                                                   |
| HFS Device Activity          | H05        | Sequence=VALUE/DEVID/DEVICE<br>OmitEXCP=N                         |
| HFS Device Attributes        | H06        |                                                                   |
| HFS Activity Timeline        | H07        | Sequence=VALUE/FILEID/PATHNAME<br>OmitEXCP=N                      |
| HFS Wait Time by Path Name   | H08        | Sequence=VALUE/FILEID/PATHNAME<br>Minimum=0.00<br>MLD=Y           |
| HFS Wait Time by Device      | H09        | Levels=2<br>Sequence=VALUE/DEVID/DEVICE<br>Minimum=0.00<br>MLD=Y  |
| HFS Service Time by Request  | H10        | Levels=2<br>Sequence=VALUE/REQID/REQUEST<br>Minimum=0.00<br>MLD=Y |
| HFS Wait Time by Request     | H11        | Levels=2<br>Sequence=VALUE/REQID/REQUEST<br>Minimum=0.00<br>MLD=Y |
| Measurement Variance Summary | V01        |                                                                   |
| CICS Variance Summary        | V02        |                                                                   |
| Db2 Variance Summary         | V03        |                                                                   |
| IMS Variance Summary         | V04        |                                                                   |
| WAS Summary                  | B01        |                                                                   |
| WAS Activity                 | B02        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y                   |
| WAS Activity by Origin       | B03        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y                   |
| WAS Activity by Servant      | B04        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y                   |
| WAS EJB Activity             | B05        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y                   |
| WAS EJB Activity by Origin   | B06        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y                   |

| Report section              | Section ID | Parameters and default values                    |
|-----------------------------|------------|--------------------------------------------------|
| WAS EJB Activity by Servant | B07        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| WAS Servlet/JSP Activity    | B08        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| WAS Servlet/JSP by Origin   | B09        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| WAS Servlet/JSP by Servant  | B10        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| WAS/CICS Calls              | B11        | Levels=9<br>Sequence=VALUE/NAME/SERVICE          |
| WAS/Db2 Calls               | B12        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| Async Work Requests         | B13        | Levels=9<br>Sequence=VALUE/CPU/SERVICE<br>MLD=Y  |
| Async Work by Work Mgr      | B14        | Levels=9<br>Sequence= VALUE/CPU/SERVICE<br>MLD=Y |
| Async Work by Servant       | B15        | Levels=9<br>Sequence= VALUE/CPU/SERVICE<br>MLD=Y |
| WOLA Inbound Requests       | B16        | Levels=9<br>Sequence= VALUE/CPU/SERVICE<br>MLD=Y |
| WOLA Inbound by Origin      | B17        | Levels=9<br>Sequence= VALUE/CPU/SERVICE<br>MLD=Y |
| WOLA Inbound by Servant     | B18        | Levels=9<br>Sequence= VALUE/CPU/SERVICE<br>MLD=Y |
| WOLA Outbound Requests      | B19        | Levels=9<br>Sequence= VALUE/SERVICE<br>MLD=Y     |
| WOLA Outbound by Register   | B20        | Levels=9<br>Sequence= VALUE/SERVICE<br>MLD=Y     |



| Report section           | Section ID | Parameters and default values                |
|--------------------------|------------|----------------------------------------------|
| WOLA Outbound by Servant | B21        | Levels=9<br>Sequence= VALUE/SERVICE<br>MLD=Y |

## SECTION parameter descriptions

The SECTION statement parameters are described in the following list. They are presented in alphabetical keyword sequence.

### ADABAS

This parameter applies to report sections that can attribute measured system activity to Adabas while it is processing Adabas calls. Specify Y to display measurements in routines that were processing Adabas calls in a separate ADABAS category.

### AdjLines

Specifies the number of adjacent source lines. This applies to the reporting of source program lines and attribution of system activity to source statements. Source statements for which system activity is measured will be reported, but those statements for which no activity is measured are normally omitted. The value of this parameter specifies the number of source lines immediately preceding and following any line with measured activity that are also to be included in the report. This helps provide some context for isolated source lines with measured activity.

### AllSource

This applies to the reporting of source program lines. A value of Y specifies that all source lines are to be shown in the report, including those for which no system activity is attributed. A value of Y in this parameter overrides any value specified in the AdjLines parameter. Specify N to control which lines are reported using the AdjLines parameter.

### AsmObj

This applies to the reporting of source program lines for an assembler program. Specify Y to include object code (from the assembly listing) in each source line. Specify N to omit object code.

### Datamg

This parameter applies to report sections that attribute measured system activity to the data management processing category. Specify Y to display measurements in routines that were servicing data management requests in a separate DATAMG category. This includes basic access functions (such as READ and WRITE) to files. Processing of OPEN and CLOSE functions is not included in this category.

### DPAGroup

This parameter applies to report sections that attribute measured system activity to program categories. This attribution can be done to Groups or Subgroups. A group is a higher level (more inclusive) categorization than a subgroup. For example, activity in Db2 modules can be attributed to the group "Db2 Subsystem" or, alternatively, to subgroups such as "Buffer Manager," "Call Attachment Facility," "Data Manager," etc. Specify DPAGroup=Y to attribute to group and DPAGroup=N to attribute to subgroup.

### Header

This applies to the P01 source program report. A value of Y specifies that detailed information about the source program is to appear in the heading area in each page in the report section. This information includes: source mapping file name and type, compile date and time, compiler product and version.

### Intervals

This applies to "timeline" report sections in which measurement information is reported in equal time intervals. It specifies the number of intervals into which the report section is to be divided, which is generally, one line per interval. The value must be between 2 and 256.

### Levels

This applies to report sections in which lines are arranged in a hierarchy. The value, a single numeric digit: 0 to 9, specifies the number of hierarchical levels to be included in the report. These are

equivalent to the ISPF report line items in which the “+” line command is used to expand the hierarchy.

**Minimum**

This applies to report sections that allow you to exclude measurements of objects when those measurement values are below the specified minimum. The unit is percentage and is expressed as two digits, followed by an optional decimal point and up to two decimal places.

**MLD**

This applies to report sections where DPA descriptions are reported. The MLD=Y parm is used to specify that Multi Line Descriptions should be printed, so that you can see all of the description text. MLD=N specifies that Multi Line Descriptions should not be printed, in which case only one line per module/csect will be printed, and the description will be truncated if it does not fit on one line.

**MsgD**

This applies to report sections that display Application Performance Analyzer messages. Specify Y to display diagnostic level messages.

**MsgE**

This applies to report sections that display Application Performance Analyzer messages. Specify Y to display severe level and error level messages.

**MsgI**

This applies to report sections that display Application Performance Analyzer messages. Specify Y to display informational level messages.

**MsgW**

This applies to report sections that display Application Performance Analyzer messages. Specify Y to display warning level messages.

**negSQL**

This applies to report sections where CPU/Service time is reported by SQL statement. Specify Y to include SQL statements that end in a negative SQLCODE.

**Oftotal**

This applies to report sections in which SQL wait time is reported. Specify Y to quantify wait time as a percentage of total measurement interval. Specify N to quantify as a percentage of the SQL service time.

**OmitCPU**

This parameter applies to reports where CPU activity is attributed to program procedures. Specify Y to exclude procedures for which no CPU activity was measured, N to include them.

**Omitdup**

This parameter applies to report sections in which load modules are reported. A value of Y specifies that modules that have been reloaded at a new address, but have the same name and size to be reported only once.

**OmitESD**

This applies to report sections in which detailed information about load modules is reported. A value of Y specifies that ESD (External Symbol Dictionary) information is not to be reported.

**OmitEXCP**

This applies to report sections in which the number of EXCPs or read/write count is reported for files or devices. Specify Y to exclude files or devices for which no EXCPs or read/writes were counted, or specify N to include them.

**OmitNUC**

This applies to report sections in which load modules are reported. A value of Y specifies that Nucleus modules are to be excluded from the report.

**OmitPLPA**

This applies to report sections in which load modules are reported. A value of Y specifies that PLPA (Pageable Link Pack Area) modules are to be excluded from the report.

**Percent**

This applies to the source mapping report section - P01. Specify Y to display the values for the source statement as a percentage, or specify N to display values as a count. This is only applicable when source mapping a report that shows percentages.

**posSQL**

This applies to report sections where CPU/Service time is reported by SQL statement. Specify Y to include SQL statements that end successfully; that is, with a zero or positive SQLCODE.

**Program**

This applies to the source mapping report section (P01). It specifies the name of the source program to reported.

**Pseudo**

This applies to the source mapping report section - P01. Specify Y to display C/C++ pseudo-assembly.

**Sequence**

This specifies the sequence in which items in the report are to be sorted. Possible values for this parameter are listed below. Not all values are appropriate for each report.

- ADDRESS to sort in ascending sequence by load module address
- CPU to sort in descending sequence by SQL CPU time
- DSN to sort in ascending sequence by dataset name
- DURATION to sort in descending sequence by SQL call duration or service time
- FILE to sort in ascending sequence by DDName
- LIBRARY/LOADLIB to sort in ascending sequence by load library name
- LOCATION to sort in ascending sequence by the address of the start of the code slice in the form of csect or module plus offset
- NAME to sort in ascending sequence by item name
- SERVICE to sort in descending sequence by service time
- SIZE to sort in ascending sequence by load module size
- THREAD to sort chronologically by Db2 thread
- VALUE to sort in descending sequence by amount of measured activity

**ShowDb2**

This parameter applies to report sections that can attribute measured system activity to Db2 while it is processing SQL requests. Specify Y to display measurements in routines that were processing SQL requests in a separate Db2SQL category.

**ShowIMS**

This parameter applies to report sections that can attribute measured system activity to IMS while it is processing DLI calls. Specify Y to display measurements in routines that were processing DLI calls in a separate IMSDLI category.

**ShowInact**

This parameter is generally applicable to report sections that present information by TCB (Task). A value of Y (normally the default) specifies that information for inactive tasks is to be included in the report. An inactive task is one which was observed to be in a wait state for the full duration of the observation session.

**SliceSize**

This parameter applies to report sections that present information by code slice (block of storage containing object code). Use this parameter to vary the code slice size. A code slice size value must be between 4 and 99992 and must be an even value that is divisible by 4.

**stmtPct**

This parameter applies to Db2 reports that display mean times. When 'Y' is specified, the mean times are replaced with the percent of total used.

**stmtSQL**

This applies to report sections where CPU/Service time is reported by SQL statement. Specify Y to consolidate dynamic SQL statements by statement number, ignoring differences in SQL statement text. When 'Y' is specified, one line is displayed per statement number regardless of the contents of the SQL statement text. When 'N' is specified, one line is displayed for each unique dynamic SQL statement.

**SysView**

This applies to the CPU usage referred attribution report to indicate how the data is to be displayed. When 'N' is specified, data is referred back to the application modules. When 'Y' is specified, data is referred back to the system modules.

**TCBSRB**

This parameter applies to the CPU SRB Usage by SRB Type report. When 'Y' is specified, CPU percentages are calculated as a percentage of TCB and SRB counts. When 'N' is specified, CPU percentages are calculated as a percentage of SRB counts only.

**Totals**

This applies to report sections where total values can be displayed graphically, in addition to usage values. Specify Y to report on usage and total values.

## Chapter 15. Batch interface commands

Application Performance Analyzer has a command language which allows you to submit requests using JCL. The command language can be used to create the same types of requests available in Application Performance Analyzer/ISPF.

Application Performance Analyzer also provides a batch import program to load the sample file of a completed observation request, or a hierarchy of requests created by an EXPH command. This program can be used as an alternative to the IMPORT command.

| For information about ...                                      | See ...                                               |
|----------------------------------------------------------------|-------------------------------------------------------|
| General syntax, types of commands and examples                 | <a href="#">“Command syntax” on page 693</a>          |
| Command summary diagram                                        | <a href="#">“Command summary diagram” on page 694</a> |
| Setting up the JCL                                             | <a href="#">“Sample JCL” on page 696</a>              |
| Coding the NEW command, with keyword descriptions and examples | <a href="#">“NEW” on page 701</a>                     |
| Coding the TNEW command                                        | <a href="#">“TNEW” on page 712</a>                    |
| Coding the DELETE command                                      | <a href="#">“DELETE” on page 713</a>                  |
| Coding the KEEP command                                        | <a href="#">“KEEP” on page 713</a>                    |
| Coding the CANCEL command                                      | <a href="#">“CANCEL” on page 713</a>                  |
| Batch Import command                                           | <a href="#">“Batch import” on page 713</a>            |

### Command syntax

The batch interface command format consists of a single high level command keyword (NEW, TNEW, DELETE, KEEP, or CANCEL) followed by a series of keywords and parameters in the format: KEYWORD=(parameter1, parameter2,...).

If there is only one parameter specified for a keyword, then the parentheses “(...)” are optional. For example, DURATION=120 and DURATION=(120) are both acceptable.

When a list of parameters is specified, the parentheses “(...)” are mandatory. For example, FEATURES=(CICS,IMS,Db2).

A semicolon must be present at the end of the command string.

### Example of NEW command

The following example create a new observation request. It requests that job CAZTEST01 be measured for 60 seconds and 10000 samples, with the IMS and Db2 features turned on.

```
NEW JOBNAME=CAZTEST01
ACTIVE=NO
SAMPLES=10000 DURATION=60
FEATURES=(IMS,Db2)
;
```

### Example of TNEW command

The following example creates a new threshold observation request. It requests that the second step in job TSTJOB01 be measured for 60 seconds and 10000 samples. The measurement starts only when the CPU time for step 2 in TSTJOB01 exceeds 30 seconds and the EXCP count exceeds 20000.

```
TNEW JOBNAME=TSTJOB01
ACTIVE=NO
STEP=(2)
SAMPLES=10000 DURATION=60
TMSEL=("CPU=30 EXCP=20000")
;
```

## Example of DELETE command

The following example deletes observation 0985.

```
DELETE REQNUM=0985
;
```

You can also choose to delete a range of requests as the following example:

```
DELETE REQNUM=(1,12,35,76)
;
DELETE REQNUM=(654-722)
;
DELETE REQNUM=(2,5-10,84)
;
```

**Note:** A maximum of 20 REQNUM parameters is allowed for the DELETE command.

## Example of KEEP command

The following example applies the KEEP command to observation 00985. This means the request will be kept until it is manually deleted, no expiration date will apply.

```
KEEP REQNUM=00985
;
```

## Example of CANCEL command

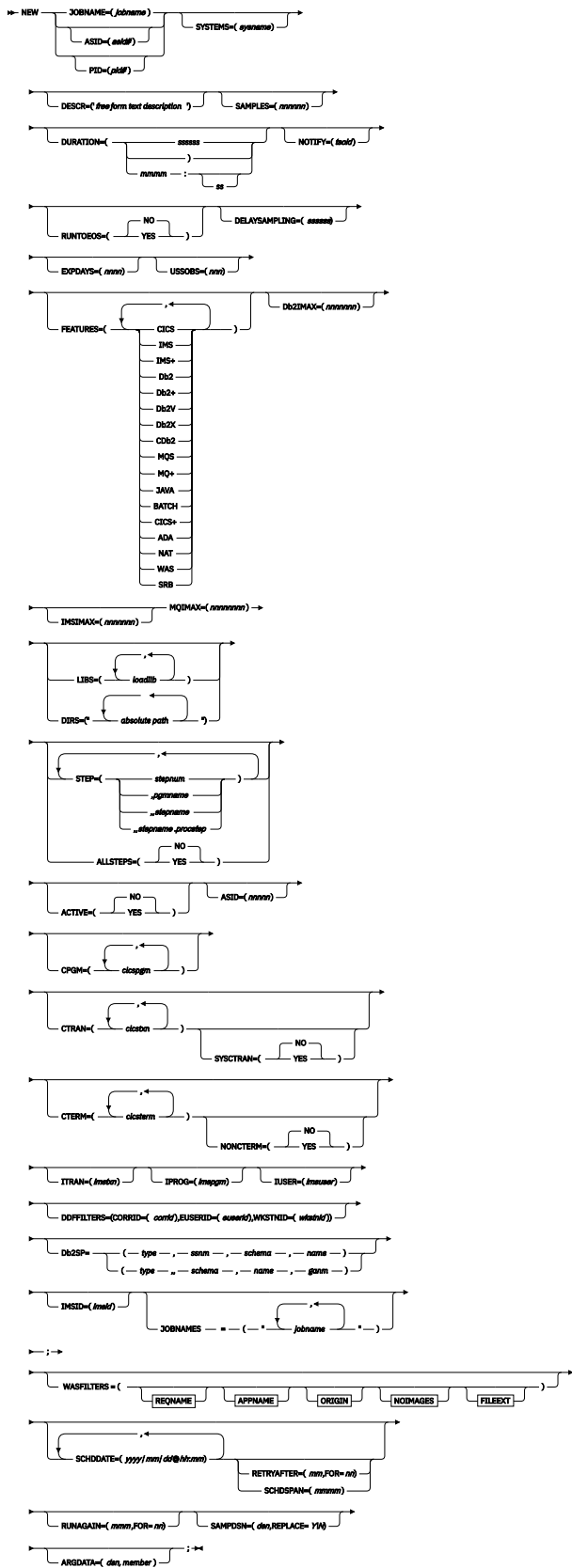
The following example cancels active observation 00985.

```
CANCEL REQNUM=00985
;
```

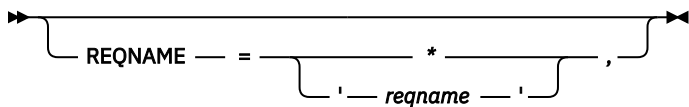
## Command summary diagram

---

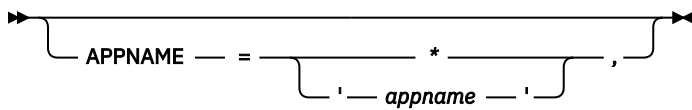
This diagram shows a summary of the parameters allowed in a NEW command, they are described in detail on the following pages.



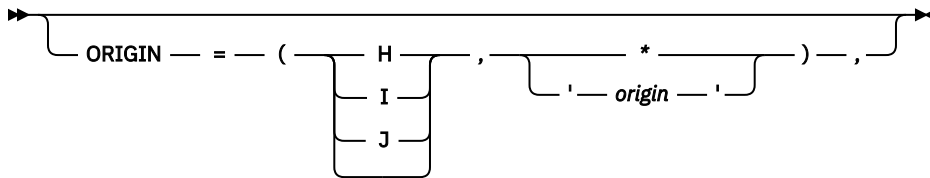
## REQNAME



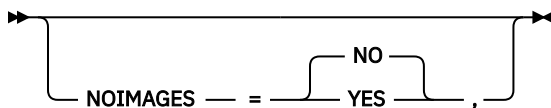
## APPNAME



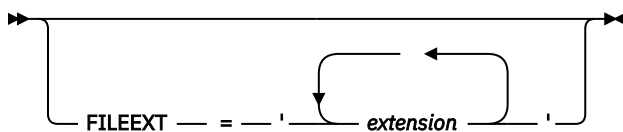
## ORIGIN



## NOIMAGES



## FILEEXT



## Sample JCL

The following illustrates an example of how to set up the Batch Interface JCL and create a basic measurement request. There is a sample template of this JCL supplied in *hlq*.SCAZSAMP in member CAZBATCH.

```
//SAMPJOB1 JOB (job parameters)
//*
//CAZBATCH EXEC PGM=CAZBATCH,PARM='STCID=CAZ0'
//STEPLIB DD DISP=SHR,DSN=hlq.SCAZAUTH
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
NEW JOBNAME=APPJOB01
ACTIVE=NO
SAMPLES=5000 DURATION=30
DESCR='Sample request for APPJOB01'
;
/*
//
```

The above example uses the Application Performance Analyzer started task named CAZ0 as specified on the EXEC statement as PARM= 'STCID=CAZ0'. You must specify your Application Performance Analyzer started task name here. This parameter can be omitted if only one instance of Application Performance Analyzer is running on your image.

In STEPLIB, replace *hlq* with the high-level qualifier used for Application Performance Analyzer in your installation.

The commands in the above example create a NEW request to measure job APPJOB01, which is not yet active, for 5000 samples with a duration of 30 seconds. A user composed description is also specified.

## Using the API to submit a command

This section describes how to code a call to the Application Performance Analyzer command API in an application program. The command API can be called from Assembler, COBOL, PL/I, C or C++ programs. Sample programs for each language are shipped in *hlq*.SCAZSAMP.



The sample program names for each language are:

- Assembler: CAZAPASM
- C: CAZAPC
- C++: CAZAPCC
- COBOL: CAZAPCOB
- PL/I: CAZAPPLI

**Note:**

1. You must modify the sample code to contain the started task and the system parameters.
2. You must modify the COBOL sample code CAZAPCOB.

## Environment

**Authorization**

Problem state key 8, Supervisor state any key

**Dispatchable unit mode**

TCB

**Cross memory mode**

PASN = SASN = HASN

**Amode**

24-bit, 31-bit, or 64-bit

**ASC mode**

Primary or AR

**Interrupt status**

Enabled for I/O and external interrupts

**Locks**

No locks held

**Control parameters**

Must be in the primary address space, key 8, and below the bar

**Error recovery**

The API does not provide error recovery

## Input registers

Upon entry to CAZAPI01, the general purpose registers (GPRs) contain:

| Register | Contents                                                                                                     |
|----------|--------------------------------------------------------------------------------------------------------------|
| 1        | Address of a standard CALL parameter list.                                                                   |
| 13       | Address of a standard register 72-byte save area that must be addressable in primary mode and below the bar. |
| 14       | Return address.                                                                                              |
| 15       | Entry address of CAZAPI01.                                                                                   |

## Output registers

When control returns to the caller, the general purpose registers (GPRs) contain:

| Register | Contents                             |
|----------|--------------------------------------|
| 0        | Reason code.                         |
| 1        | Used as a work register by CAZAPA01. |

| Register | Contents                             |
|----------|--------------------------------------|
| 2-13     | Unchanged.                           |
| 14       | Used as a work register by CAZAPI01. |
| 15       | Return code.                         |

When control returns to the caller, the access registers (ARs) contain:

| Register | Contents                             |
|----------|--------------------------------------|
| 0        | Used as a work register by CAZAPI01. |
| 1-15     | Unchanged.                           |

## Syntax

```
CALL CAZAPI01, (Command,
Reply,
STCID,
return_code,
reason_code,
), VL
```

It is recommended that the calling program pre-fetch CAZAPI01 instead of including the module in your load module during the link-edit step. This way you can avoid relinking your load module if a newer version of CAZAPI01 becomes available.

## Parameters

### Command

Specifies a 2-byte length field followed by the input command string to be submitted to Application Performance Analyzer. The length field describes the length of the command string only; it does not include the length of this length field.

### Reply

Specifies a 2-byte length field followed by a buffer used by CAZAPI01 to return one or more information/error messages describing the result of processing the command. The length field must contain the maximum length of this buffer; it does not include the length of this length field. It is recommended that the buffer be a minimum of 512 bytes long and be initialized to nulls so that the caller can easily determine whether messages have been returned or not.

If messages are returned then each message will be terminated by a single null character, the last message will be terminated by two consecutive null characters. The length field will be updated to contain the length of the messages including all null characters.

### STCID

Specifies a 4-byte field that contains the Application Performance Analyzer STCID to which the command will be submitted. The STCID must be left justified and blank padded.

If the first byte of this field is blank or null then CAZAPI01 will attempt to connect to the currently executing Application Performance Analyzer started task. If more than one Application Performance Analyzer STC is active the request will fail.

### return\_code

Specifies a 4-byte field to contain the return code.

### reason\_code

Specifies a 4-byte field to contain the reason code.

### VL

Must be coded and causes the high-order bit of the last parameter address to set to 1.

## Return codes

When CAZAPI01 returns control to your program, GPR 15 and *return\_code* contain a return code. The following list identifies return codes in hexadecimal format and describes what each means:

**00**

The operation was successful.

**08**

The operation failed because of an error. (Refer to reason code for an explanation of the error.)

## Reason codes

When CAZAPI01 returns control to your program, GPR 0 and *reason\_code* contain a reason code. The following table identifies reason codes in hexadecimal and decimal formats and describes what each means:

| Table 12. Reason codes |         |                                                                                                                                                                                             |
|------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hexadecimal            | Decimal | Explanation                                                                                                                                                                                 |
| 00                     | 00      | Not applicable.                                                                                                                                                                             |
| 04                     | 04      | Caller is not running in TCB mode.                                                                                                                                                          |
| 08                     | 08      | Caller's PASN and SASN are not equal.                                                                                                                                                       |
| 0C                     | 12      | Caller is not running with DAT-on.                                                                                                                                                          |
| 10                     | 16      | Caller is running disabled.                                                                                                                                                                 |
| 14                     | 20      | Caller is in problem state and not key 8.                                                                                                                                                   |
| 18                     | 24      | Caller is not in primary or AR ASC modes.                                                                                                                                                   |
| 1C                     | 28      | The STCID field contained a null or blank first character, CAZAPI01 attempted to access the currently executing Application Performance Analyzer STC but found more than one STC executing. |
| 20                     | 32      | The specified STCID was not defined to this system.                                                                                                                                         |
| 24                     | 36      | There are no Application Performance Analyzer STCs active on this system.                                                                                                                   |
| 28                     | 40      | The specified STCID is not currently active on this system.                                                                                                                                 |
| 2C                     | 44      | Application Performance Analyzer's name token was not created. This indicates that no Application Performance Analyzer STC has ever been started on this system since the last IPL.         |

| <i>Table 12. Reason codes (continued)</i> |         |                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hexadecimal                               | Decimal | Explanation                                                                                                                                                                                                                                                                                        |
| 30                                        | 48      | Command string contains an unrecognized command verb. Currently, only the CANCEL, DELETE, KEEP, NEW and TNEW commands are allowed to be submitted via this API.                                                                                                                                    |
| 34                                        | 52      | The Application Performance Analyzer STC detected an error while processing the command. Refer to the message(s) returned in the Reply buffer for more information.                                                                                                                                |
| 38                                        | 56      | The Application Performance Analyzer STC command interface has abended. Depending on the error, an SVC dump may have been created. If an SVC dump was not produced then, the interface's error recovery will have percolated the abend up to the next error handler in the caller's address space. |
| 3C                                        | 60      | Registration has been denied for Application Performance Analyzer. See message CAZ3969S on <i>Message Guide</i> for details. This message returned in the API caller's reply area.                                                                                                                 |

## Abend code

CAZAPI01 will produce a user abend code: 4085 in the event of an recoverable error. The following table identifies abend reason codes in hexadecimal and decimal formats and explains the reason for the abend:

| <i>Table 13. Abend code</i> |         |                                                                                |
|-----------------------------|---------|--------------------------------------------------------------------------------|
| Hexadecimal                 | Decimal | Explanation                                                                    |
| FA0                         | 4000    | The input parameter pointer was zero.                                          |
| FA4                         | 4004    | Either the input command pointer was zero or the length field contained zeros. |
| FA8                         | 4008    | Either the reply command pointer was zero or the length field contained zeros. |
| FAC                         | 4012    | The STCID pointer was zero.                                                    |
| FB0                         | 4016    | The return_code pointer was zero.                                              |

| Table 13. Abend code (continued) |         |                                                       |
|----------------------------------|---------|-------------------------------------------------------|
| Hexadecimal                      | Decimal | Explanation                                           |
| FB4                              | 4020    | The reason_code pointer was zero.                     |
| FB8                              | 4024    | The VL bit was turned on prior to the last parameter. |
| FAC                              | 4028    | The VL bit was not turned on on the last parameter.   |
| FC0                              | 4032    | Internal error. Contact product support.              |
| FC4                              | 4036    | Internal error. Contact product support.              |

## Command descriptions

### NEW

The NEW command is used to create a new Observation Request.

#### NEW

Mandatory.

Indicates that this is a NEW request.

#### JOBNAME

Optional.

Specifies the name of the job (or started task or TSO user) to be measured. JOBNAME might be specified in conjunction with ASID and/or PID. If specified together, the JOBNAME must match the ASID and/or PID.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

#### Creating multi-job measurements (%)

You can also specify a special pattern character of percent sign “%”. This acts as a place holder for zero or more characters in the name. It can be placed anywhere in the name. A patterned name indicates that you want to measure all active or inactive jobs whose JOBNAME matches the pattern. You cannot specify a JOBNAME pattern of “%”.

The maximum number of jobs that can be measured from a multi-job request is defined during the installation of Application Performance Analyzer. When this limit is exceeded, Application Performance Analyzer stops creating measurements for this request, and the status of the request is displayed as ‘Stoppd’. The measurements that executed (within the limit) are accessible for report viewing under the request. To increase the limit, contact your system programmer.

Example: %MSMPP% causes one sampling request to be created for each active job whose JOBNAME contains “MSMPP”.

The ASID and PID keywords are not permitted when the JOBNAME specifies a pattern.

#### Measuring a specific Db2 stored procedure or user-defined function

To measure a specific Db2 stored procedure or user-defined function, use a dash (-) for the JOBNAME. The information that identifies the Db2 stored procedure or user-defined function must be supplied in the Db2SP keyword. The following keywords are also accepted; SYSTEMS, DESCR, SAMPLES, DURATION, NOTIFY, EXPDAYS, USSOBS, FEATURES, LIBS, DIRS, and Db2IMAX. All other keywords are invalid and will result in an error. This feature is only available when the WLM

Intercept is activated during Application Performance Analyzer installation, and you are given appropriate security access to it. Contact your system programmer for access if necessary.

The ASID and PID keywords are not permitted when the JOBNAME specifies a dash (-).

### **Measuring a specific IMS transaction across multiple MPP regions**

To measure a group of IMS MPP regions that are eligible to schedule a specific IMS transaction code, use a dash (-) for the JOBNAME. The IMS subsystem ID is specified in the IMSID keyword. The transaction code is specified in the ITRAN keyword. The region names are specified in the JOBNAMES keyword. The following keywords are also accepted: SYSTEMS, DESCR, SAMPLES, DURATION, NOTIFY, EXPDAYS, FEATURES, LIBS, and IMSIMAX. All other keywords are invalid and will be ignored or result in an error. This feature is only available when the IMS Intercept is activated during Application Performance Analyzer installation, and you are given appropriate security access to it. Contact your system programmer for access if necessary.

The ASID and PID keywords are not permitted when the JOBNAME specifies a dash (-).

### **ASID**

Optional.

Specifies the ASID of a job to be measured. ASID must be specified as a decimal number and might be specified in conjunction with JOBNAME and/or PID. If specified together, the ASID must match the JOBNAME and/or PID. The ASID keyword is valid only when ACTIVE=YES.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

Example: ASID=1023

### **PID**

Optional.

Specifies the USS Process ID of a UNIX process to be measured. PID must be specified as a decimal number and might be specified in conjunction with JOBNAME and/or ASID. If specified together, the PID must match the JOBNAME and/or ASID. The PID keyword is valid only when ACTIVE=YES.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

Example: PID=33620804

### **SYSTEMS**

Mandatory within a sysplex.

Specifies a target system within a sysplex. You can also enter an asterisk (\*), in which case the target job is measured on the first system to run it. When an asterisk (\*) is entered, the keyword ACTIVE=YES is invalid. An asterisk (\*) is not allowed when ASID or PID is specified. This keyword is invalid in a non-sysplex environment.

Example: SYSTEMS=SYS3

### **DESCR**

Optional unless set as mandatory during installation.

Specifies a free form text description for this observation request. The text must be within single quotes, and if mandatory must be a minimum of 8 characters.

Example: DESCR= 'Any user text goes here'

### **SAMPLES**

Optional.

If omitted, the default number of samples will be used. Specifies the number of samples to take during the measurement.

Example: SAMPLES=10000

**DURATION**

Optional.

If omitted, the default duration will be used. Specifies the duration of the measurement in seconds.

Example: DURATION=120

**NOTIFY**

Optional.

Specifies a TSO userid to notify when the measurement ends.

Example: NOTIFY=USER01

**RUNTOEOS**

Optional.

Specify YES to indicate that the measurement should continue to run until the job step has completed, even if the target number of observations has been reached.

**DELAYSAMPLING**

Optional.

This indicates that sampling should be delayed for the specified amount of time (in seconds). After the target job step starts, Application Performance Analyzer will delay the start of the measurement for the number of seconds specified.

**EXPDAYS**

Optional.

If omitted the installation default will be used.

Specifies the number of days the measurement data for this observation request should be retained on before being automatically deleted. To keep the measurement data indefinitely, use EXPDAYS=0.

Example: EXPDAYS=30

**USSOBS**

Optional.

Specify the maximum number of spawned address spaces or substeps to measure for a USS observation, up to the maximum defined in the system configuration. The same sampling frequency will be used for each spawned address space or substep. Sampling overhead can be high if several spawned address spaces are running simultaneously.

When this field is specified, the collection of measurements will be grouped under a USS master record on the Observation List panel.

**FEATURES**

Optional.

Specifies which data extractors, if any, need to be turned on for this measurement. The data extractor values are: CICS, CICS+, IMS, IMS+, Db2, Db2+, Db2V, Db2X, CDb2, MQS, MQ+, Java, ADA, NAT, WAS, SRB, SYS. A list of data extractors is separated by commas.

If your installation has any default extractors set, the FEATURES command will override these. If you need to override default extractors and want to turn all extractors off, specify FEATURES=(BATCH).

Example: FEATURES=(CICS, Db2)

**Db2IMAX**

Optional.

Enter the value to limit the number of Db2+ SQL call interceptions for which full details will be written to the sample file. Collecting full details on every interception allows the F02 Timeline report to report exact times for all SQL calls. The F02 report will be truncated at the number of calls specified in this field. The Db2+ data extractor continues to collect the data it requires for the other reports for the duration of the measurement. The value cannot exceed the default value specified for Db2IMaxTraceSize during Application Performance Analyzer installation.

Example: Db2IMAX=(10000)

### **IMSIMAX**

Optional.

Enter the value to limit the number of IMS+ DLI call interceptions for which full details will be written to the sample file. Collecting full details on every interception allows the I02 and I03 Timeline reports to report exact times for all DLI calls and IMS transactions. The I02 and I03 reports will be truncated at the number of calls specified in this field. The IMS+ data extractor continues to collect the data it requires for the other reports for the duration of the measurement. The value cannot exceed the default value specified for IMSIMaxTraceSize during Application Performance Analyzer installation.

Example: IMSIMAX=(10000)

### **MQIMAX**

Optional.

Enter the value to limit the number of MQ+ call interceptions for which full details are written to the sample file. The Q11 MQ+ Activity Timeline report is truncated at the number of calls that is specified in this field. The MQ+ data extractor continues to collect the data that it requires for the other reports during the measurement. The value cannot exceed the default value that is specified for MQIMaxTraceSize during the installation of Application Performance Analyzer.

Example: MQIMAX=(10000)

### **LIBS**

Optional.

Specifies additional load libraries to be searched. A list of data set names is separated by commas. A maximum of 10 data set names is allowed.

Example: LIBS=(USER1.LOADLIB,TEST1.LOADLIB)

### **DIRS**

Optional.

Specifies up to 440 bytes of HFS directory path names to be searched by Application Performance Analyzer, enclosed in quotes and each separated by one or more spaces. These are applicable only when sampled HFS programs have relative path names. The LIBS and DIRS keywords are mutually exclusive.

Example: DIRS=("/u/axx01 /u/axx01/cpp")

### **STEP**

Optional.

If omitted, the first step will be measured.

Multiple STEP keywords can be specified. Specifying multiple STEP keywords creates a multistep request. A maximum of 20 STEP keywords is allowed.

Each STEP can have multiple positional parameters:

1. stepnum specifies the step number. If stepnum is specified, none of the other 3 step specification parameters can be included.
2. pgmname specifies the program name. If pgmname is specified, none of the other 3 step specification parameters can be included.
3. stepname specifies the step name. It can be specified as just a step name, or in the format stepname.procstep. If this parameter is specified, the stepnum and pgmname parameters must not be specified. If stepname is specified without .procstep, it identifies an EXEC statement that contains a PGM parameter, not one that invokes a procedure.

If the format stepname.procstep is coded, then stepname identifies an EXEC statement that invoked a procedure, and procstep identifies the EXEC statement containing a PGM parameter within that procedure.



This parameter can not be specified when selecting an active job.

**Example 1: STEP=3**

This indicates that the third step in the job should be measured.

**Example 2: STEP=(,TESTPGM1)**

This indicates that the first step that runs the program TESTPGM1 should be measured.

**Example 3: STEP=(,STEP007)**

This indicates that the step named STEP007 should be measured, where STEP007 is the step name on and EXEC statement that executes a program (not an EXEC statement that invokes a procedure).

**Example 4: STEP=(,PROC02.STEP007)**

This indicates that the step named STEP007 within the procedure invoked by step PROC02 should be measured.

**Example 5:STEP=3 STEP=5 STEP=6 STEP=(,STEP012)**

This shows STEP being repeated to create a multistep measurement.

**ALLSTEPS**

Optional.

Specify ALLSTEPS=YES to create a multi-step request which measures all steps in the job. When specified for a threshold measurement on the TNEW command, all steps in the job that meet the threshold criteria are measured. When ALLSTEPS=YES is specified, the STEP keyword is meaningless, and will be ignored if coded.

Example: ALLSTEPS=YES

**ACTIVE**

Mandatory.

Specify YES if the job is active, or NO if the job is not active.

Example: ACTIVE=YES

**CPGM**

Optional.

Specifies one or more 1 to 8 character program names. These names or name patterns, will be used as a filter criteria such that only transactions that execute any of the programs in the list will be measured.

You can specify up to 8 program names or name patterns. A name pattern can specify a 1 to 7 character program name prefix followed by an asterisk (\*), or an asterisk itself. The asterisk indicates that all program names starting with the prefix are to be filtered. An asterisk on its own indicates that no program is to be filtered, that is, it accepts all program names and therefore all transactions.

**Note:** Other filtering keywords such as **CTRAN** or **CTERM** may also limit which transactions can be measured.

Example:

```
CPGM=(DB2PROG1,DB2PROG2,DB2PROG3,DB2PROG4)
CPGM=DB2PROG*
CPGM=*
```

**CTRAN**

Mandatory when CICS is specified in FEATURES, otherwise does not apply.

Specifies one or more CICS trancodes to measure. For all transactions, use CTRAN=\*. A list of transactions is separated by commas. A maximum of 16 transactions is allowed.

Example 1: CTRAN=(TRNA,TRNB,TRNC)

Example 2: CTRAN=\*

## **SYSCTRAN**

Optional, if omitted the default of NO will be used.

Specify YES if you want to measure the CICS system transactions.

## **CTERM**

Optional.

Specifies one or more CICS terminal ids to measure. A list of terminal ids is separated by commas. You can also specify a terminal id pattern, such as a terminal id prefix followed by an asterisk (\*) or an asterisk itself. The asterisk indicates that all terminals starting with the prefix are to be included in the measurement. The asterisk on its own indicates that all terminals are to be included. A maximum of 8 terminal ids / patterns is allowed.

Example:

```
CTERM=(TRM1,TRM2,TRM3)
CTERM=TRM*
CTERM=*
```

## **NONCTERM**

Optional. If omitted, the default value of YES will be used.

Specify NO if you do not want to measure CICS transactions that run non-terminal attached.

## **ITRAN**

Optional.

When measuring a single IMS/MPP or IMS/IFP region as entered in the JOBNAME parameter, this specifies an IMS transaction to include when measuring that IMS/MPP or IMS/IFP region. You can also specify a transaction ID pattern, such as a transaction ID prefix followed by an asterisk (\*) or an asterisk by itself. The asterisk indicates that all transaction ids starting with the prefix are to be included in the measurement. The asterisk on its own indicates that all transactions are to be included.

Example:

```
ITRAN=IMSTRN1
ITRAN=IMSTRN*
ITRAN=*
```

**Note:** Values in ITRAN, IPROG and IUSER are ANDed together to determine which transactions are included in a measurement.

**Note:** When limiting the observation to specific IMS transactions in an MPP or IFP region, Application Performance Analyzer samples only when the transactions are running. The observation continues to run for the requested duration.

When measuring multiple IMS/MPP regions simultaneously, as indicated by a dash '-' in the JOBNAME parameter and a list of IMS/MPP regions in the JOBNAMES parameter, this specifies a single IMS transaction to include when measuring the IMS/MPP regions. In this case, the complete transaction code must be provided and the IPROG and IUSER parameters are not applicable.

Example:

```
JOBNAME=(-) ITRAN=(TXNA) JOBNAMES=("IMSMPP1,IMSMPP2,IMSMPP3")
```

## **I PROG**

Optional.

Specifies an IMS program to include when measuring an MPP or IFP region. You can also specify a program name pattern, such as a program name prefix followed by an asterisk (\*) or an asterisk by itself. The asterisk indicates that all programs starting with the prefix are to be included in the measurement. The asterisk on its own indicates that all programs are to be included.

Example:

```
IPROG=IMSPGM1
IPROG=IMSPGM*
IPROG=*
```

**Note:** Values in ITRAN, IPROG and IUSER are ANDed together to determine which transactions are included in a measurement.

**Note:** When limiting the observation to specific IMS programs in an MPP or IFP region, Application Performance Analyzer samples only when the transactions associated with the programs are running. The observation continues to run for the requested duration.

## IUSER

Optional.

Specifies an IMS user id to include when measuring an MPP or IFP region. You can also specify a user id pattern, such as a user id prefix followed by an asterisk (\*) or an asterisk by itself. The asterisk indicates that transactions initiated by user IDs starting with the prefix are to be included in the measurement. The asterisk on its own indicates that transactions initiated by all users are to be included.

Example:

```
IUSER=IMSUSR1
IUSER=IMSUSR*
IUSER=*
```

**Note:** Values in ITRAN, IPROG and IUSER are ANDed together to determine transactions that are included in a measurement.

**Note:** When limiting the observation to specific IMS users in an MPP or IFP region, Application Performance Analyzer samples only when the transactions initiated by the IMS users are running. The observation continues to run for the requested duration.

## DDFFILTERS

Optional

Identifies the DDF filtering criteria that are used to limit the scope of a DDF measurement, to specific correlation id, end user id or workstation id or any combination. It accepts up to three sub-keywords; CORRID, EUSERID and WKSTNID. Values in CORRID, EUSERID, and WKSTNID are ANDed together to determine SQL requests that are included in the measurement. In any of these sub-keywords, you may also specify a wildcard pattern using an asterisk (\*) or a percent sign (%). An asterisk is used to indicate one or more characters that can appear in place of the asterisk. It can be used as a prefix or a suffix, or both. Alternatively, a percent sign is used to indicate any single character, and can appear any number of times.

### CORRID=(*corrid*)

Optional.

Specify a Db2 correlation id or pattern. This identifies a Db2 correlation id to be included in the measurement when measuring a DDF address space. A correlation id of null (binary zero) may be specified by entering 'NULL' as the *corrid*.

### EUSERID=(*euserid*)

Optional. Specify an end user id or pattern. This identifies an end user id to be included in the measurement when measuring a DDF address space. An end user id of null (binary zero) may be specified by entering 'NULL' as the *euserid*.

### WKSTNID=(*wkstnid*)

Optional. Specify a workstation id or pattern. This identifies a workstation id to be included in the measurement when measuring a DDF address space. A workstation id of null (binary zero) may be specified by entering 'NULL' as the *wkstnid*.

Example:

```
DDFFILTERS=(CORRID=(, NULL),EUSERID=(DDFUSER1),WKSTNID=(*))
```

This indicates that remote SQL with a null correlation id, originating from the user DDFUSER1 from any workstation will be included for the measurement for the observed DDF address space.

### Db2SP

Optional.

Identifies the Db2 stored procedure or user-defined function to be measured. The keyword is valid only when you enter a dash (-) for the JOBNAME. It requires 4 out of 5 positional parameters to identify the type (stored procedure or user-defined function), the Db2 subsystem name or group attach name, the schema name and the name of the procedure or function, in the format `Db2SP=(type,ssnm,schema,name,ganm)`. The *ssnm* and *ganm* positional parameters are mutually exclusive.

*Type* can be either P for stored procedure or F for user-defined function. For both *schema* and *name*, you can also specify a name pattern, for example, a name prefix followed by an asterisk (\*) or an asterisk by itself. Application Performance Analyzer will measure the first Db2 stored procedure or user-defined function executed by the Db2 subsystem that matches the schema and name concatenation. If a single asterisk is coded in both schema and name, Application Performance Analyzer will measure the first stored procedure or user-defined function executed by the Db2 subsystem.

```
Example1: Db2SP=(P,DSN1,SCHEMA1,SP1)
```

This indicates that the first occurrence of Db2 stored procedure SCHEMA.SP1, which runs in the Db2 Subsystem DSN1 is to be measured.

```
Example2: Db2SP=(F,,SCHEMA2,UDF2,DGRP)
```

This indicates that the first occurrence of user-defined function SCHEMA2.UDF2 that runs in the Db2 Subsystem belonging to group DGRP is to be measured.

```
Example3: Db2SP=(P,DSN1,SCH*,SP1)
```

This indicates that the first occurrence of stored procedure SP1 with a schema that begins with SCH, that runs in the Db2 Subsystem DSN1 is to be measured.

### IMSID

Optional.

Specifies the IMS subsystem ID for an IMS Multiple Region request. An IMS Multiple Region request is identified by specifying a dash in the JOBNAME keyword. Refer to the JOBNAME parameter description for details.

Example:

```
IMSID=(IMSA)
```

### JOBNAMES

Optional.

Specifies the names of the IMS MPP regions to be measured for an IMS Multiple Region request. The region names must be separated by commas and enclosed in quotes. An IMS Multiple Region request is identified by specifying a dash in the JOBNAME keyword. Refer to the JOBNAME parameter description for details.

Example:

```
JOBNAMES=("IMSAMPP1,IMSAMPP4,IMSAMPP5")
```

### WASFILTERS

Optional

Identifies the filtering criteria that are used to limit the scope of a WebSphere control region measurement to specific requests, applications, and origins. It is also used to exclude image files and

specific file extensions from the measurement. It accepts the following sub-keywords; REQNAME, APPNAME, ORIGIN, NOIMAGES, and FILEEXT. Values in REQNAME, APPNAME, and ORIGIN are ANDed together to determine the WebSphere activity that is included in the measurement. NOIMAGES and FILEEXT are specified to exclude image files and specific file extensions from the reports.

**REQNAME=('reqname')**

Optional.

Specify a WebSphere request name or pattern. This identifies a WebSphere request to be included in the measurement. It is a string of non-blank characters up to 79 bytes long. A trailing asterisk can be used as a wildcard character. Embedded asterisks are not treated as wildcards.

**APPNAME=('appname')**

Optional.

Specify a WebSphere application name or pattern. This identifies a WebSphere application to be included in the measurement. It is a string of non-blank characters up to 79 bytes long. A trailing asterisk can be used as a wildcard character. Embedded asterisks are not treated as wildcards.

**ORIGIN=(H|I|J,'origin')**

Optional.

Specify the origin type, and an IP address, a host name or a job name to determine the WebSphere activity to be included in the measurement. It is a string of non-blank characters up to 79 bytes long.

H - Indicates the origin is a host name. In this case, the origin is a string of non-blank characters up to 79 bytes long. A trailing asterisk can be used as a wildcard character. WebSphere can sometimes show an IP address as a host name. To filter these, you must specify the filter value as an IP address, not a host name.

I - Indicates the origin is an IPv4 or IPv6 address. If a wildcard is used, it can only appear after a dot separator (for IPv4) or a colon separator (for IPv6). For example: 207.245.47.\* or 2001:db8:85a3:0:\*. However, a wildcard cannot be used with an IPv6 filter if it contains two consecutive colons. For example, the following filter value is invalid: 2001:db8:85a3::8a2e:\*. This is because the two consecutive colons and the asterisk wildcard both represent a varying number of missing values.

J – Indicates the origin is a job name. It can be from 1 to 8 alpha-national characters. A trailing asterisk can be used as a wildcard.

**NOIMAGES=(Y|N)**

Optional.

Specify whether images are to be excluded (Y) or included (N) from the measurement. Image files are identified by request names that end in any of the following file extensions:

```
.gif .jpg .jpeg .png .ico
```

**FILEEXT=('extensions')**

Optional.

Specify file extensions that are to be excluded from the measurement. One or more file extensions may be specified, each separated by a space. Any requests for those file types will be filtered out. For example: .

```
css .pdf .txt
```

Any WebSphere request whose request name ends in one of the specified file extensions will be filtered out. Each file extension must begin with a period and must be followed by at least one non-blank character. Wildcards cannot be used in this filter.

**Example:**

```
JOBNAME=(AZSR00A)
WASFILTERS=(REQNAME='*',APPNAME='*',ORIGIN=(I,'99.233.166.160'),
NOIMAGES=Y,FILEEXT='.ccc .txt')
```

This indicates WebSphere activity managed by the WebSphere control region AZSR00A will be measured. It will include all requests and applications that originate from the IP address 99.233.166.160. Images and files with the extension .ccc and .txt will not be included in the measurement.

**SCHDDATE**

Mandatory if this is a Future Schedule request, otherwise does not apply.

Multiple SCHDDATE keywords can be specified to schedule future requests on multiple dates and times. Date/time is specified in the format: yyyy/mm/dd@hh:mm.

Example:

```
SCHDDATE=2004/12/03@16:00
SCHDDATE=2004/12/10@16:00
SCHDDATE=2004/12/17@16:00
SCHDDATE=2004/12/24@16:00
```

This creates a future schedule request to run a measurement on each of the four dates and times specified.

**RETRYAFTER**

Optional.

This is only used for future schedule requests (one or more SCHDDATE keywords must be present), where the job is expected to be active (ACTIVE=YES specified). Specifies that Application Performance Analyzer should retry the request if the target job was not active on the first attempt. Also specifies how many times to retry.

Specified in the format: (mm, FOR=nn), where mm is the number of minutes between retry attempts, and nn is the number of times to retry.

Example: RETRYAFTER=(15, FOR=3)

**SCHDSPAN**

Optional.

This is only used for future schedule requests (one or more SCHDDATE keywords must be present), where the measurement is to begin when the job becomes active (ACTIVE=NO specified). Specifies the number of minutes that this request will wait for the job to become active before Application Performance Analyzer expires the request.

Example: SCHDSPAN=120

**RUNAGAIN**

Optional.

This indicates that for a specified time interval, if the target job runs again, the measurement should be run again. The For= parm indicates how many times the measurement should potentially be repeated. The time interval is reset after each rerun of the target job. The maximum time interval for a future schedule request is 999 minutes. The maximum time interval for a single occurrence request is 31,680 minutes (22 days).

Example: RUNAGAIN=(60, FOR=3)

This means that for 60 minutes after the target job starts, Application Performance Analyzer will run the measurement again, if the job starts again. It will do this up to three times.

RUNAGAIN=(0, FOR=5)

This means that Application Performance Analyzer will run the measurement the first time the job runs, and again the next five times the job runs.

## SAMPDSN

Optional.

Specifies the name of the sample data set to be created for this measurement. This keyword is applicable only when the resulting measurement generates a single observation request. The following options that could potentially generate multiple observation requests will cause the request to fail:

- Multi-step or all steps
- Schedule with more than one date/time combination
- RunAgain
- Collateral Db2
- WebSphere Requests
- IMS Multiple Region Requests
- USS Requests

The SAMPDSN keyword accepts the positional parameter *dsn* and the keyword parameter REPLACE, in the format SAMPDSN=(*dsn*,REPLACE=Y|N) where:

- *dsn* - is the data set name for the sample file. Symbol substitution is not allowed for this data set name. You must ensure that appropriate security rules are in place to secure this data set against unauthorized access, while allowing access where necessary. For more details on security access and rules, please refer to the *Application Performance Analyzer for z/OS Customization Guide*.
- REPLACE indicates whether the sample data set is to be replaced, if it already exists. The default is 'N' - don't replace. The rules regarding REPLACE are as follows:
  - When the request is submitted, Application Performance Analyzer checks if the data set exists. If it does and REPLACE=Y is specified, the request is accepted, otherwise it is failed.
  - When sampling completes, Application Performance Analyzer again checks if the data set exists. If it does and REPLACE=Y is specified, the original sample file is deleted and reallocated, otherwise the request is failed.

**Note:** Use REPLACE=Y with caution. If the data set already exists and is replaced, it is possible that multiple observations may now point to the same sample file. For example: If Request #2 specifies a SAMPDSN data set name that is the same as that of Request #1; and Request #2 replaces this data set with sample data from Request #2; then both requests will now point to the same sample file. Therefore the reports for both requests will be identical.

Example: SAMPDSN=(CAZ.SAMPLE,REPLACE=Y)

This means for this observation request, Application Performance Analyzer will create a sample file with the name CAZ.SAMPLE. If that sample file already exists, Application Performance Analyzer will replace it with the sampling data for this request.

## ARGDATA

Optional.

Specifies the dataset name and optional member name containing JCL and PRINT control statements that will be used to submit the batch job to generate the reports.

The ARGDATA keyword accepts the parameters *dsn* and *member*, in the format ARGDATA(*dsn*,*member*):

- *dsn* is the dataset name for Automatic Report Generation. This dataset might be partitioned or physical sequential, and it must have a record format that is fixed length and LRECL=80. The dataset or member contains the complete JCL stream to create observation reports. The JCL stream will be submitted after the observation completes.
- *member* is the member name of a PDS for Automatic Report Generation. The member must reside in a PDS that contains fixed length, LRECL=80 records. The member contains the complete JCL stream to create observation reports. The JCL stream will be submitted after the observation completes.

See *hlq*.SCAZSAMP(CAZARG) for a sample ARG member.

Example: ARGDATA=( ' CAZ . ARG ' , ARG1 )

## TNEW

The TNEW command is used to create a new Observation Request which starts only when the specified threshold criteria has been satisfied for the target job-step or job-steps. The criteria are: CPU Time, Elapsed Time, and EXCP Count.

### TNEW

Mandatory.

Indicates that this is a new threshold request.

### JOBNAME

Optional.

Specifies the name of the job (or started task or TSO user) to be measured. JOBNAME might be specified in conjunction with ASID and/or PID. If specified together, the JOBNAME must match the ASID and/or PID.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

### ASID

Optional.

Specifies the ASID of a job to be measured. ASID must be specified as a decimal number and might be specified in conjunction with JOBNAME and/or PID. If specified together, the ASID must match the JOBNAME and/or PID. The ASID keyword is valid only when ACTIVE=YES.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

Example: ASID=1023

### PID

Optional.

Specifies the USS Process ID of a UNIX process to be measured. PID must be specified as a decimal number and might be specified in conjunction with JOBNAME and/or ASID. If specified together, the PID must match the JOBNAME and/or ASID. The PID keyword is valid only when ACTIVE=YES.

**Note:** At least one of JOBNAME, ASID or PID must be specified. Any combinations of the three can be specified.

Example: PID=33620804

### TMSEL

Mandatory.

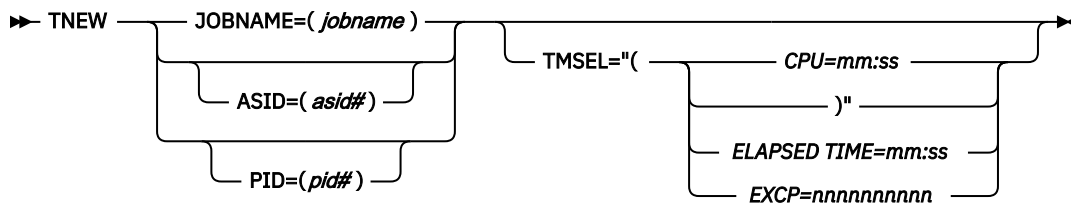
Specifies the criteria upon which the measurement will begin. The TMSEL keyword accepts the following parameters: CPU, ELAPSED TIME, and EXCP, in the format TMSEL=(“CPU=mm:ss ELAPSED TIME=mm:ss EXCP=nnnnnnnnnn”). When more than one threshold criteria is specified, all the criteria must be met for the measurement to begin.

CPU=mm:ss specifies the threshold amount of CPU time. When the target job-step exceeds this amount of CPU time, the measurement begins. Time can be entered in seconds or in minutes and seconds. To specify the threshold time in minutes and seconds, separate the minutes value from the seconds value using a colon.

ELAPSED TIME=mm:ss specifies the threshold amount of elapsed time. When the target job-step exceeds this amount of elapsed time, the measurement begins. Time can be entered in seconds or in minutes and seconds. To specify the threshold time in minutes and seconds, separate the minutes value from the seconds value using a colon.



EXCP=nnnnnnnnnn specifies the threshold EXCP count. When the target job-step exceeds this EXCP count, the measurement begins.



Example:

```
TNEW JOBNAME=TSTJOB01
TMSEL=("CPU=30 ELAPSEDTIME=5:00 EXCP=5000");
```

TNEW accepts the same keywords as the NEW command, with the exception of the Schedule, Db2 stored procedure or user-defined function, and IMS multiple address space keywords, which are not applicable for Threshold Monitor requests. The following keywords are not accepted on the TNEW command: DELAYSAMPLING, Db2SP, IMSID, JOBNAMEs, RUNAGAIN, SCHDDATE, RETRYAFTER, and SCHDSPAN. Only one STEP keyword is accepted. The ALLSTEPS keyword can be used to measure all steps in the job that meet the threshold criteria.

## DELETE

The DELETE command is used to delete one or multiple observation requests.

### REQNUM

Mandatory.

Specifies the request number(s) to be deleted.

## KEEP

The KEEP command is used to override the expiration date on an observation request, and keep it until it is manually removed.

### REQNUM

Mandatory.

Specifies the request number to be kept.

## CANCEL

The CANCEL command is used to cancel an active observation request.

### REQNUM

Mandatory.

Specifies the request number to be cancelled.

## Batch import

The batch import program CAZIMPRT is used to load one or multiple observations or hierarchies of observations into the Application Performance Analyzer R02 Observation Session List. These can be native sample files, previously exported observations, or exported hierarchies of observations. The import program creates a new observation(s) in the target system, assigning a new request number to each observation and maintaining the hierarchies as exported. The date and time of the imported requests are set to the current date and time and the expiry date is recalculated based on the rules of the importing system.

Sample template JCL is supplied in *hlq.SCAZSAMP* in member CAZIMPRT.

```
//CAZIMPRT JOB <job parameters>
//*
//S1 EXEC PGM=CAZIMPRT,REGION=4M,PARM='STCID=stcid'
//STEPLIB DD DISP=SHR,DSN=#hlq.SCAZAUTH
//SYSPRINT DD SYSOUT=*
//SAMP0001 DD DSN=#prefix.request.XMIT,DISP=SHR
//*SAMP0002 DD DSN=#prefix.request.XMIT,DISP=SHR
//*SAMP0003 DD DSN=#prefix.request.XMIT,DISP=SHR
//*SAMP0004 DD DSN=#prefix.request.XMIT,DISP=SHR
//*
//*
//*
//*SAMP9999 DD DSN=#prefix.request.XMIT,DISP=SHR
```

1. Add the JOB parameters to meet your system requirements.
2. On the EXEC statement, replace *stcid* with the Application Performance Analyzer instance id of the system you want to import into. This parameter can be omitted if only one instance of Application Performance Analyzer is running on your image.
3. On the STEPLIB DD statement, replace *hlq.SCAZAUTH* with the name of your installation's authorized library containing Application Performance Analyzer's load modules.
4. To import multiple sample files, include a SAMP*nnnn* DD statement for each file, where *nnnn* is a value between 0001 and 9999.
5. On the SAMP*nnnn* DD statement, replace *#prefix.request.XMIT* with the names of the native sample files or TSO XMIT files containing the sample to be imported.

**Note:** For compatibility, the SAMPIN DD statement is supported for importing a single sample file. When SAMPIN is specified, all other SAMP*nnnn* DD statements are ignored.

## Using the MVS START command to schedule a new measurement

A new Application Performance Analyzer measurement request can be entered by using an MVS START command. The JCL procedure specified in the START command will run a REXX EXEC, which, in turn, calls CAZBATCH with the Application Performance Analyzer NEW command specification. The Application Performance Analyzer NEW command options may be coded in a PDS member (specified on the MVS START command) or as parameters on the MVS START command itself. When NEW command parameters are specified in both the SYSIN member and the START command, the START command parameters override the SYSIN member parameters.

A sample JCL procedure is provided in *your.prefix.SCAZSAMP* member CAZ\$NEW.

```
//CAZ$NEW PROC APARM=
//CAZSTEP EXEC PGM=IKJEFT01,DYNAMNBR=50,PARM='CAZSTART &APARM'
//STEPLIB DD DISP=SHR,DSN=#hlq.SCAZAUTH
//SYSEXEC DD DISP=SHR,DSN=#hlq.SCAZEXEC
//SYSTSPRT DD SYSOUT=*
//SYSTSIN DD DUMMY
//CAZSYSIN DD DISP=SHR,DSN=#hlq.SCAZSAMP
```

You must customize this sample as follows:

1. Change *your.prefix* with high level qualifiers that are appropriate for your installation for the Application Performance Analyzer libraries.
2. Update CAZSYSIN if a different library is to be used for the CAZBATCH statements.

When you complete the above changes, place this member in a library that is part of the JES procedure concatenation for started tasks.

A sample REXX EXEC is provided in *your.prefix.SCAZEXEC* member CAZSTART. This EXEC calls CAZBATCH. You need to customize this sample as follows:

1. Change *your.prefix* with high level qualifiers that are appropriate for your installation for the Application Performance Analyzer libraries.
2. Add a value for dsnHLQ if a value other than "sysuid" is required for the HLQ for work data sets.

Sample SYSIN members for procedure CAZ\$NEW are provided in *your.prefix*.SCAZSAMP:

- CAZNEWCI contains a sample NEW command string for a CICS/Db2 measurement.
- CAZNEWIM contains a sample NEW command string for an IMS/Db2/MQ measurement.

Syntax: S CAZ\$NEW,APARM='MEMBER=*pdsmembername NewCommandParms*'

#### **MEMBER**

Optional.

Specifies the SYSIN PDS member name that contains the NEW command options.

#### ***NewCommandParms***

Optional.

Options for the Application Performance Analyzer NEW command that override those coded in the CAZSYSIN member. A subset of NEW command options is supported in the CAZSTART EXEC with abbreviations, due to the 100-byte APARM length limitation. For more information, see *your.prefix*.SCAZEXEC(CAZSTART). Any other options will be passed to CAZBATCH as is.

Example: S CAZ\$NEW,APARM='MEMBER=CAZNEWCI STC=CAZ0 JOBN=CICS54A'



---

## Chapter 16. Realtime Monitor

The Realtime Monitor facility lets you view information about an in-progress measurement. Start this facility by selecting an active measurement from Observation Session List using the “R” line command. You can also choose to have the Realtime Monitor launched automatically when you start a measurement for an active job. Use SETUP in the Observation Session List to select this option.

---

### Auto-refresh mode

In this mode the panel is refreshed automatically to show changing data as it is measured. In auto-refresh mode the keyboard is locked. To halt auto-refresh mode, and unlock the keyboard, press the Attention key. You can then refresh the panel manually by repeatedly pressing the ENTER key.

To re-activate the auto-refresh mode, enter the PULSE primary command. You can abbreviate this as P.

---

### Monitor views

The Realtime Monitor facility offer various views of the measurement data. The upper portion of the screen shows a menu of the available monitor views. To select a view, either enter its code on the command line or place the cursor on the field and press the ENTER key.

---

### ACCUM and CURRENT modes

Some monitor views display data based on either all the accumulated (ACCUM) data for the measurement, or for the last measured “time slice” (CURRENT). “(ACCUM)” or “(CURRENT)” is displayed on the heading line of views affected by this mode setting.

Enter the ACCUM command to set the mode to report accumulate data. You can abbreviate this as A. Enter the CURRENT command to set the mode to report on the most recent time slice. You can abbreviate this as C. Use the SETUP command to adjust the size of the time slice (expressed as number of samples). The default value is 100 samples.

---

### SETUP command

Use the SETUP command to change various default options. You can change the following:

- Panel displayed at startup
- Display auto-refresh enabled
- Auto-refresh interval
- Length of current time slice

---

### View 1. Measurement overview

View 1. Measurement Overview shows an at-a-glance summary of the measurement status and shows a very high level overview of observed resource usage. If in 'autorefresh' mode, data in this screen will refresh automatically at the specified rate. Otherwise press ENTER to refresh the data.

A sample report is shown here:

```

File View Navigate Help

M01: IBM APA for z/OS Realtime Monitor (2132/CICS22A) Row 00001 of 00025
Command ==> ----- Scroll ==> PAGE
 1. Overview 3. Environment 5. Data Mgmt
 2. CPU Util. 4. CPU/Modules

View 1. Measurement Overview

+Measurement Progress-----+
| Requested 90,000 100.0% |
| Samples Done 39,673 44.0% |
| CPU Active 4,314 10.8% |
| WAIT 34,393 86.6% |
| Queued 966 2.4% |
+-----+

+System Resource Usage-----+
CPU time TCB 21.96 sec	No.of TCBs 9
CPU time SRB 3.50 sec	EXCPs 0
Storage frames 6,611	Dataspace frames 0
Pages in 0	Pages out 0
+-----+

+Db2 Activity-----+
| SQL call count 7,809 | Db2 plan PFSAMPA |
| SQL samples 2,287 | Db2 DBRM PFSAMPC |
+-----+

+CICS Transactions-----+
| Active txns 0 | Current TranId n/a |
| Suspended txns 8 | CICS taskId 1,672 |
+-----+

```

## Measurement progress

This section shows the progress of the measurement by reporting the total number of samples completed. The sample counts are further subdivided by CPU Active samples, TCB WAIT samples, and Queued samples.

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Requested     | The number of samples requested. A fixed percentage value of 100 percent is shown here as this number of samples represents the entire measurement. The actual number of samples performed could exceed this value if the “run to end of step” option was selected. Similarly the measurement could terminate before the indicated number of samples is done if the measured step terminates first. |
| Samples Done  | The number of samples done. This is the number of samples performed so far. A percentage value and histogram indicate the ratio of samples completed to the number of requested samples.                                                                                                                                                                                                            |
| CPU Active    | The number of samples done in which one or more CPUs were executing instructions in the measured region. A percentage value and histogram indicate the ratio of the number of CPU Active samples to the total number of samples completed so far.                                                                                                                                                   |
| WAIT          | The number of samples done in which all TCBs were in WAIT (non dispatchable) state. A percentage value and histogram indicate the ratio of the number of WAIT samples to the total number of samples completed so far.                                                                                                                                                                              |

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Queued        | The number of samples done in which no TCBs were CPU active and at least one TCB was dispatchable. This indicates a state in which work was not being done in the measured region because no CPU (or memory) was available. A percentage value and histogram indicates the ratio of the number of Queued samples to the total number of samples completed so far. |

## System resource usage

This section shows various aspects of general resource usage observed during the measurement interval. Resources quantified here are: CPU time, storage usage, EXCPs, and paging.

| Under heading     | This is displayed                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Time TCB      | The number of CPU seconds consumed by all TCBs in the measured region for the duration of the measurement interval.                         |
| No. of TCBs       | The number of TCBs in existence at the time of the last data refresh.                                                                       |
| CPU Time SRB      | The number of CPU seconds consumed in SRB mode in the measured region for the duration of the measurement interval.                         |
| EXCPs             | The number of EXCPs (Execute Channel Program) performed during the measurement interval.                                                    |
| Storage Frames    | The number of 4K byte page frames (real storage) for virtual storage assigned to the address space at the time of the last data refresh.    |
| Data Space Frames | The number of 4K byte page frames (real storage) for Data Space storage assigned to the address space at the time of the last data refresh. |
| Pages in          | The number of page in operations performed during the measurement interval.                                                                 |
| Pages out         | The number of page out operations performed during the measurement interval.                                                                |

## Db2 activity

This section shows information about Db2 activity observed during the measurement interval.

| Under heading  | This is displayed                                                                                                                                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQL call count | The number of SQL calls counted during the measurement interval. This information is available only if the Db2+ feature was enabled for the measurement.              |
| SQL samples    | The number of samples in which SQL call processing was in progress.                                                                                                   |
| Db2 Plan       | The name of the Db2 Plan for the last SQL request whose execution was sampled. This information is available only if the Db2 feature was enabled for the measurement. |
| Db2 DBRM       | The name of the Db2 DBRM for the last SQL request whose execution was sampled. This information is available only if the Db2 feature was enabled for the measurement. |

## CICS transactions

This section shows information about CICS transactions that are currently active. This information is available only if the address space being measured is a CICS region and the CICS measurement feature is enabled.

| Under heading  | This is displayed                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------|
| Active txns    | The number of CICS transactions currently active (includes suspended transactions).                         |
| Current TranId | The transaction ID of the currently executing CICS transaction.                                             |
| Suspended txns | The number of CICS transactions currently suspended. This number is also included in the Active txns value. |
| CICS TaskId    | The task number of the CICS transaction currently executing.                                                |

## View 2. CPU utilization

---

View 2. CPU Utilization quantifies distribution of CPU usage. The quantifications are reported in two modes: Overall and Current.

Overall mode appears on the left side of the screen and shows accumulated quantifications based on the overall measurement. Each quantity is an overall sample count. It is also expressed as a percentage and illustrated by a histogram.

Current mode appears on the right side of the screen and shows quantifications representing the last measured time slice. Each quantity is a sample count for the time slice and is also illustrated by a histogram. (Use the SETUP command to adjust the size of the time slice.)

If in “auto-refresh” mode data in this screen will refresh automatically at the specified rate. Otherwise press ENTER to refresh the data.

A sample report is shown here:



```

File View Navigate Help

M01: IBM APA for z/OS Realtime Monitor (2132/CICS22A) Row 00001 of 00028
Command ==>----- Scroll ==> PAGE

 1. Overview 3. Environment 5. Data Mgmt
 2. CPU Util. 4. CPU/Modules

View 2. CPU Utilization

+Overall CPU Activity 7 min 7.81 sec -----+ +Current 0.66 sec -----+
Samples 64,179 71.3% -----+	100 ' ' ' ' ' ' ' '	
CPU Active 5,597 8.7% -		39 =====
WAIT 57,303 89.2% -----+	52 =====	
Queued 1,279 1.9% -		9 =
+-----+ +-----+

+CPU Usage Distribution -----+ +Current -----+
CPU Active 5,597 8.7% -		39 ' ' ' ' ' ' ' '
Application 104 1.8% -		1 =
System 2,119 37.8% -----+	18 =====	
Db2 SQL 217 3.8% -		0
Data Mgmt 0 0.0% -----+	0	
Unresolved 3,164 56.4% -----+	20 =====	
+-----+ +-----+

+CPU Modes -----+ +Current -----+
CPU Active 5,604 8.7% -		39 ' ' ' ' ' ' ' '
Supv Mode 3,828 68.3% -----+	23 =====	
Prob Mode 1,776 31.6% -----+	16 =====	
In SVC 424 7.5% -		2 =
AMODE 24 0 0.0% -----+	0	
AMODE 31 5,604 100.0% -----+	39 =====	
AMODE 64 0 0.0% -----+	0	
User key 1,887 33.6% -----+	16 =====	
System key 3,717 66.3% -----+	23 =====	
+-----+ +-----+

```

## CPU activity

This section shows sample counts for the overall measurement and for the current time slice. These are categorized as CPU Active, WAIT and Queued.

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples performed in the overall measurement and in the time slice. The percentage shown in the Overall CPU Activity section represents the ratio of the number of samples completed to the number of samples requested.                                                                                                                                                                                                                                                                                                                                                     |
| CPU Active    | The number of samples done in which one or more CPUs were executing instructions in the measured region. The percentage value indicates the ratio of the total number of CPU Active samples to the total number of samples completed so far. The first histogram represents this percentage and shows the proportion of the overall measurement time in which CPU activity was observed. The second sample count shows the number of CPU Active samples in the current time slice. The second histogram shows the proportion of the current time slice in which CPU activity was observed. |
| CPU WAIT      | The number of samples done in which all TCBs were in WAIT (non dispatchable) state. The percentage value indicates the ratio of the total number of CPU WAIT samples to the total number of samples completed so far. The first histogram represents this percentage and shows the proportion of the overall measurement time in which all TCBs were in WAIT state. The second sample count shows the number of CPU WAIT samples in the current time slice. The second histogram shows the proportion of the current time slice in which all TCBs were observed to be in WAIT state.       |

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Queued        | The number of samples done in which no TCBs were CPU active and at least one TCB was dispatchable. This indicates a state in which work was not being done in the measured region because no CPU (or memory) was available. The percentage value indicates the ratio of the total number of Queued samples to the total number of samples completed so far. The first histogram represents this percentage and shows the proportion of the overall measurement time in which a TCB was dispatchable and not serviced. The second sample count shows the number of Queued samples in the current time slice. The second histogram shows the proportion of the current time slice in which one or more TCBs was dispatchable and not serviced. |

## CPU usage distribution

This section shows a breakdown of CPU active TCB observations. CPU active observations are broken down by categories: Application code, System services, Db2 and Data management.

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Active    | The number of observations of CPU Active TCBs. This value could be higher than the number of CPU Active samples because each CPU Active TCB is counted. Two or more TCBs could be serviced concurrently by separate CPUs. The percentage value indicates the ratio of the total number of CPU Active samples to the total number of samples completed so far. The first histogram represents this percentage and shows the proportion of the overall measurement time for which CPU activity was observed. The second sample count shows the number of CPU Active TCB observations in the current time slice.                                               |
| Application   | The number of CPU Active TCB observations in which execution was observed in application programs. This is a subset of the CPU Active observation count. The percentage value indicates the ratio of the number of application program observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed in application code. The second count shows the number of application code CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in application code in this time slice. |
| System        | The number of CPU Active TCB observations in which execution was observed in system services. This is a subset of the CPU Active observation count. The percentage value indicates the ratio of the number of system services observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed in system routines. The second count shows the number of system services CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in system services in this time slice.             |

| Under heading   | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Db2 SQL         | The number of CPU Active TCB observations in which execution was in Db2 routines servicing SQL requests. This is a subset of the CPU Active observation count. The percentage value indicates the ratio of the number of Db2 observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be processing SQL requests. The second count shows the number of Db2 services CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in Db2 services in this time slice.                                                                                                                                                                                                                |
| Data management | The number of CPU Active TCB observations in which execution was in the servicing of Data Management requests. This is a subset of the CPU Active observation count. The percentage value indicates the ratio of the number of Data Management service observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be processing Data Management requests. The second count shows the number of Data Management services CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in Data Management services in this time slice.                                                                                                                                                  |
| Unresolved      | The number of CPU Active TCB observations in which execution was in object code in storage locations for which no load module information could be obtained. This can occur for modules fetched into CSA by a region other than the one being measured. This quantity is a subset of the CPU Active observation count. The percentage value indicates the ratio of the number of unresolved location observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in unresolved storage locations. The second count shows the number of unresolved storage location CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in unresolved storage locations in this time slice. |

## CPU modes

This section shows a breakdown of CPU active TCB observations by mode of CPU execution. These modes are not all mutually exclusive. For example, execution in Problem State could also be counted as execution in AMODE 31.

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU Active    | The number of observations of CPU Active TCBs. This value could be higher than the number of CPU Active samples because each CPU Active TCB is counted. Two or more TCBs could be serviced concurrently by separate CPUs. The percentage value indicates the ratio of the total number of CPU Active samples to the total number of samples completed so far. The first histogram represents this percentage and shows the proportion of the overall measurement time for which CPU activity was observed. The second sample count shows the number of CPU Active TCB observations in the current time slice. |

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supv Mode     | The number of CPU Active TCB observations in which execution was in Supervisor Mode. The percentage value indicates the ratio of the number of Supervisor Mode observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in Supervisor Mode. The second count shows the number of Supervisor Mode CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in Supervisor Mode in this time slice. |
| Prob Mode     | The number of CPU Active TCB observations in which execution was in Problem Mode. The percentage value indicates the ratio of the number of Problem Mode observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in Problem Mode. The second count shows the number of Problem Mode CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in Problem Mode in this time slice.                |
| In SVC        | The number of CPU Active TCB observations in which execution was in a Supervisor Call. The percentage value indicates the ratio of the number of SVC execution observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in a Supervisor Call. The second count shows the number of Problem Mode CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in SVC execution in this time slice.    |
| AMODE 24      | The number of CPU Active TCB observations in which execution was in 24 bit addressing mode. The percentage value indicates the ratio of the number of AMODE 24 observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in AMODE 24. The second count shows the number of AMODE 24 CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in AMODE 24 in this time slice.                      |
| AMODE 31      | The number of CPU Active TCB observations in which execution was in 31 bit addressing mode. The percentage value indicates the ratio of the number of AMODE 31 observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in AMODE 31. The second count shows the number of AMODE 31 CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in AMODE 31 in this time slice.                      |
| AMODE 64      | The number of CPU Active TCB observations in which execution was in 64 bit addressing mode. The percentage value indicates the ratio of the number of AMODE 64 observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in AMODE 64. The second count shows the number of AMODE 64 CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in AMODE 64 in this time slice.                      |

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User key      | The number of CPU Active TCB observations in which execution was in user storage key (Key 8). The percentage value indicates the ratio of the number of user key observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in user key. The second count shows the number of user key CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in user key in this time slice.               |
| System key    | The number of CPU Active TCB observations in which execution was in system storage key (not key 8). The percentage value indicates the ratio of the number of system key observations to the number of CPU Active observations. The first histogram represents this percentage and shows the proportion of the overall CPU time for which CPU activity was observed to be in system key. The second count shows the number of system key CPU Active observations in the current time slice. The histogram represents the proportion of CPU time in system key in this time slice. |

## View 3. Measurement environment

The data reported here is static and shows the measurement request parameters and information about the measurement environment.

A sample report is shown here:

|                                                       |  |                   |                    |
|-------------------------------------------------------|--|-------------------|--------------------|
| File View Navigate Help                               |  |                   |                    |
| M01: IBM APA for z/OS Realtime Monitor (2132/CICS22A) |  |                   | Row 00001 of 00028 |
| Command ==>                                           |  |                   | Scroll ==> PAGE    |
| 1. Overview                                           |  | 3. Environment    | 5. Data Mgmt       |
| 2. CPU Util.                                          |  | 4. CPU/Modules    |                    |
| View 3. Measurement Environment                       |  |                   |                    |
| +Request Parameters-----+                             |  |                   |                    |
| Request number                                        |  | 2132              |                    |
| Description                                           |  | CICS region       |                    |
| Data extractors                                       |  | CICS,Db2,Db2+     |                    |
| +-----+                                               |  |                   |                    |
| Requesting user                                       |  | Nbr of samples    | 90,000             |
| Time of request                                       |  | Duration          | 600 sec            |
| Date of request                                       |  | Active/pending    | Active             |
| Job name                                              |  | Proc step name    | n/a                |
| Step name/number                                      |  | Delay time        | none               |
| Step program                                          |  | n/a               |                    |
| +-----+                                               |  |                   |                    |
| +Measurement Environment-----+                        |  |                   |                    |
| Job name                                              |  | Region size <16MB | 1,712,128K         |
| Job number                                            |  | Region size >16MB | 4K                 |
| Step name                                             |  | Step program      | DFHSIP             |
| ASID                                                  |  | Region type       | CICS TS 2.2        |
| Db2 Attach type                                       |  | CICS              |                    |
| +-----+                                               |  |                   |                    |
| System ID                                             |  | IBM APA Version   | 1.100A             |
| SMFID                                                 |  | O/S level         | z/OS 01.06.00      |
| +-----+                                               |  |                   |                    |
| Nbr of CPUs                                           |  | CPU model         | 1247               |
| CPU rate factor                                       |  | CPU version       | 0A                 |
| MIPS per CPU                                          |  | SUS per second    | 2660.0             |
| +-----+                                               |  |                   |                    |

## Request parameters

These values were established when the measurement was requested.

| Under heading     | This is displayed                                                                                                                                                     |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Request number    | The unique 5-digit identifier assigned to the measurement.                                                                                                            |
| Description       | A description specified when the measurement was requested.                                                                                                           |
| Data extractors   | The specified data extractors (Db2, CICS, etc.)                                                                                                                       |
| Requesting user   | The TSO user ID of the user that requested the measurement.                                                                                                           |
| Time of request   | The time of day the request was made.                                                                                                                                 |
| Date of request   | The date upon which the request was made.                                                                                                                             |
| Job name          | The name of the job that was specified to be measured.                                                                                                                |
| Step name/number  | The step name or step number that was specified to be measured, if applicable.                                                                                        |
| Step program      | The name of the step program that was specified to be measured, if applicable.                                                                                        |
| Number of samples | The number of samples specified.                                                                                                                                      |
| Duration          | The specified measurement duration.                                                                                                                                   |
| Active/pending    | Indicates whether the measurement request specified an active job (an immediate measurement) or one that was to run later when execution of the job step is detected. |
| Proc step name    | The procedure step name, if specified.                                                                                                                                |
| Delay time        | The number of seconds specified for which the start of the measurement was to be delayed from the start of the job step.                                              |

## Measurement environment

Values relating to the environment in which the measurement took place are reported here.

| Under heading      | This is displayed                                                                            |
|--------------------|----------------------------------------------------------------------------------------------|
| Job name           | The name of the measured job.                                                                |
| Job number         | The job number of the measured job assigned by JES.                                          |
| Step name          | The name of the measured step.                                                               |
| ASID               | The ASID (address space ID) of the measured job.                                             |
| Db2 attach type    | The type of Db2 attachment, if Db2 data recorded.                                            |
| Region size < 16MB | The region size in the 24 bit address range.                                                 |
| Region size > 16MB | The region size above the 24 bit address range.                                              |
| Step program       | The name of the measurement step program (specified in the EXEC JCL statement).              |
| Region type        | The type of region (Batch, TSO, IMS, CICS, etc.) measured.                                   |
| System ID          | The system identifier of the system on which the measurement took place.                     |
| SMFID              | The SMF ID assigned to the system on which the measurement took place.                       |
| IBM APA vers.      | The version of IBM Application Performance Analyzer for z/OS that performed the measurement. |
| O/S Level          | The operating system and level.                                                              |

| Under heading   | This is displayed                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------|
| Nbr of CPUs     | The number of CPUs in the system on which the measurement took place.                                 |
| CPU rate factor | The factor used to determine CPU performance.                                                         |
| MIPS per CPU    | The speed, in machine instructions per second, of one CPU. This is derived using the CPU rate factor. |
| CPU model       | The CPU model number.                                                                                 |
| CPU version     | The CPU version.                                                                                      |
| SUs per second  | The number of service units per CPU second.                                                           |

## View 4. CPU active modules

### Overall CPU activity

A sample report is shown here:

```

File View Navigate Help

M01: IBM APA for z/OS Realtime Monitor (2132/CICS22A) Row 00001 of 00034
Command ==>----- Scroll ==> PAGE
 1. Overview 3. Environment 5. Data Mgmt
 2. CPU Util. 4. CPU/Modules

View 4. CPU Active Modules (CURRENT)

+Overall CPU Activity 8 min 14.33 sec -----+ +Current 0.66 sec -----+
| Samples 74,159 82.3% -----+ | | 100 '-----' |
| CPU Active 7,584 10.2% --+ | | 42 =====+
+-----+ +-----+
Name Description Percent of CPU Time * 10.00% ±15.6%
 *....1....2....3....4....5....6....7....8....9
DFHSIP CICS Services 11.90 =====
DFHPGDM PG domain - initi 7.14 =====
185C6xxx Unresolved Addres 4.76 ==
152D3xxx Unresolved Addres 4.76 ==
186E3xxx Unresolved Addres 2.38 =
17AEFxxx Unresolved Addres 2.38 =
17D88xxx Unresolved Addres 2.38 =
DFHMCX BMS fast path mod 2.38 =
18227xxx Unresolved Addres 2.38 =
18542xxx Unresolved Addres 2.38 =
17848xxx Unresolved Addres 2.38 =

```

| Under heading | This is displayed                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples performed in the overall measurement. The percentage shown section represents the ratio of the number of samples completed to the number of samples requested. This percentage is also represented by a histogram.                                                                                                                                           |
| CPU Active    | The number of samples done in which one or more CPUs were executing instructions in the measured region. The percentage value indicates the ratio of the total number of CPU Active samples to the total number of samples completed so far. The histogram represents this percentage and shows the proportion of the overall measurement time in which CPU activity was observed. |

## Current

This shows the number of samples in the current time slice and the number of these samples in which CPU activity was observed. The heading shows the elapsed time of the time slice.

| Under heading | This is displayed                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Samples       | The number of samples performed in the current time slice.                                                                                                                                                                  |
| CPU Active    | The number of samples in the current time slice in which one or more CPUs were executing instructions in the measured region. The histogram represents the proportion of the time slice in which CPU activity was observed. |

## Module attribution

Each detail line in this section shows a load module name and the percentage of observed CPU activity attributed to the module. The quantifications shown in this section apply to the full measurement if in ACCUM mode and to the last time slice if in CURRENT mode. Enter the ACCUM command or the CURRENT command to switch between these two modes.

| Under heading       | This is displayed                                                                                                                                                                                                                                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                | The name of the module in which CPU activity was observed. Use the “+” line command to expand this line to show CSECT information. For an address range for which a module name could not be determined, this shows a hexadecimal address range. |
| Description         | A functional description of the module if one is available.                                                                                                                                                                                      |
| Percent of CPU Time | The percentage of CPU time consumed while executing in the module. This is the ratio of the number of CPU Active TCB observations in the module to the total number of CPU Active observations.                                                  |

## View 5. Data mgmt service time

In ACCUM mode, files for which EXCPs were processed during the measurement are shown. In CURRENT mode, files for which EXCPs were processed since the last data refresh are shown. In both cases the detail lines are sorted in descending sequence by EXCP count since the last data refresh.

A sample report is shown here:

```
File View Navigate Help

M01: IBM APA for z/OS Realtime Monitor (2133/CICS22A) Row 00001 of 00004
Command ==>----- Scroll ==> PAGE
 1. Overview 3. Environment 5. Data Mgmt
 2. CPU Util. 4. CPU/Modules

View 5. Data Mgmt Service Time (ACCUM)

DDNAME Type EXCPs CPU-Wait-Queued Dataset Name
VSAM1 VSAM 4,568 ===== USR01.DATA.TESTPF
INFILE QSAM 45 USR01.TESTPF2.INFILE
OUTFILE QSAM 20 USR01.TESTPF2.OUTFILE
STEPLIB 2 APL1.RTEST.LOADLIB

```

| Under heading | This is displayed                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDNAME        | The DDNAME to which the file is allocated. A separate line appears for each OPEN of the DDNAME. A separate line also appears for each data set in a concatenation. |



| <b>Under heading</b> | <b>This is displayed</b>                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                 | The type of file access (QSAM, BSAM, etc.) is reported if this information was determined. Measurement of execution in a data management routine for the file must have taken place for this to be reported.                                                                                                                                                                  |
| EXCPs                | In ACCUM mode, the number of EXCPs since the first file activity measurement. In CURRENT mode, the number of EXCPs since the last data refresh.                                                                                                                                                                                                                               |
| CPU-Wait-Queued      | A histogram showing the proportion of samples in which execution was observed in data management routines servicing access of the file. The colors green, red and yellow indicate CPU active, Wait and Queued respectively. The width of the field represents 100 percent of the measurement interval for ACCUM mode and 100 percent of the last time slice for CURRENT mode. |
| Data set Name        | The name of the data set.                                                                                                                                                                                                                                                                                                                                                     |



---

# Chapter 17. Application Performance Analyzer plug-in

---

## Overview of Application Performance Analyzer plug-in

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The Application Performance Analyzer plug-in is a desktop application that can be used as an alternative to the main Application Performance Analyzer ISPF interface. This Eclipse-based plug-in encompasses both the observation request and reporting functions. You can use this plug-in to submit new observation requests and to browse the reports that are generated from observation requests.

---

## Installing the Application Performance Analyzer plug-in

---

The Application Performance Analyzer plug-in is an Eclipse tool for mainframe development. You can download the plug-in from the IBM Mainframe Development website at <https://developer.ibm.com/mainframe/#products>. It is included with IBM Explorer for z/OS Aqua, and available as an installation package along with other IBM Problem Determination Tools plug-ins. After you download the plug-in, follow the installation instructions and select the Application Performance Analyzer plug-in from the plug-ins list.

---

## Connecting to Application Performance Analyzer on z/OS

---

You need a Connection and Credential to log on to z/OS and connect to Application Performance Analyzer on z/OS. The Application Performance Analyzer plug-in uses a “Problem Determination for z/OS” connection type. Application Performance Analyzer is automatically connected when a PD Tools connection is established. To configure and start a Problem Determination Tools connection, follow the instructions in the "IBM Application Delivery Foundation for z Systems Common Components" section of the desktop Help.

---

## Using the Application Performance Analyzer plug-in

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You can find details on using the Application Performance Analyzer plug-in in the desktop Help. In the action bar click **Help**. Scroll down and select **Help Contents**. In the subsequent help window, there is a section called "IBM Application Performance Analyzer User Guide".



---

## Appendix A. Support resources and problem solving information

This section shows you how to quickly locate information to help answer your questions and solve your problems. If you have to call IBM support, this section provides information that you need to provide to the IBM service representative to help diagnose and resolve the problem.

For a comprehensive multimedia overview of IBM software support resources, see the IBM Education Assistant presentation “IBM Software Support Resources for System z® Enterprise Development Tools and Compilers products” at <https://www.ibm.com/support/knowledgecenter>.

- [“Searching knowledge bases” on page 733](#)
- [“Getting fixes” on page 734](#)
- [“Subscribing to support updates” on page 734](#)
- [“Contacting IBM Support ” on page 736](#)

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### Searching knowledge bases

You can search the available knowledge bases to determine whether your problem was already encountered and is already documented.

- [“Searching the Knowledge Center” on page 733](#)
- [“Searching product support documents” on page 733](#)

### Searching the Knowledge Center

You can find this publication and documentation for many other products in the IBM Application Performance Analyzer Knowledge Center at <https://www.ibm.com/support/knowledgecenter/SSFMBH/product.html>. Using the Knowledge Center, you can search product documentation in a variety of ways. You can search across the documentation for multiple products, search across a subset of the product documentation that you specify, or search a specific set of topics that you specify within a document. Search terms can include exact words or phrases, wild cards, and Boolean operators.

To learn more about how to use the search facility provided in the IBM Knowledge Center, you can view the multimedia presentation at <http://www-01.ibm.com/support/knowledgecenter/>.

### Searching product support documents

If you need to look beyond the Knowledge Center to answer your question or resolve your problem, you can use one or more of the following approaches:

- Find the content that you need by using the IBM Support Portal at [www.ibm.com/software/support](http://www.ibm.com/software/support) or directly at [www.ibm.com/support/entry/portal](http://www.ibm.com/support/entry/portal).

The IBM Support Portal is a unified, centralized view of all technical support tools and information for all IBM systems, software, and services. The IBM Support Portal lets you access the IBM electronic support portfolio from one place. You can tailor the pages to focus on the information and resources that you need for problem prevention and faster problem resolution.

Access the IBM Software site (<https://www.ibm.com/products/software>) for specific product details.

- Application Performance Analyzer for z/OS Support
- IBM z/OS Debugger Support
- Enterprise COBOL for z/OS Support
- Enterprise PL/I for z/OS Support

- Fault Analyzer for z/OS Support
- File Export for z/OS Support
- File Manager for z/OS Support
- WebSphere Developer Debugger for System z Support
- WebSphere Studio Asset Analyzer for Multiplatforms Support
- Workload Simulator for z/OS and OS/390® Support
- Search for content by using the IBM masthead search. You can use the IBM masthead search by typing your search string into the Search field at the top of any [ibm.com](http://ibm.com)® page.
- Search for content by using any external search engine, such as Google, Yahoo, or Bing. If you use an external search engine, your results are more likely to include information that is outside the [ibm.com](http://ibm.com) domain. However, sometimes you can find useful problem-solving information about IBM products in newsgroups, forums, and blogs that are not on [ibm.com](http://ibm.com). Include "IBM" and the name of the product in your search if you are looking for information about an IBM product.
- The IBM Support Assistant (also referred to as ISA) is a free local software serviceability workbench that helps you resolve questions and problems with IBM software products. It provides quick access to support-related information. You can use the IBM Support Assistant to help you in the following ways:
  - Search through IBM and non-IBM knowledge and information sources across multiple IBM products to answer a question or solve a problem.
  - Find additional information through product and support pages, customer news groups and forums, skills and training resources and information about troubleshooting and commonly asked questions.

In addition, you can use the built in Updater facility in IBM Support Assistant to obtain IBM Support Assistant upgrades and new features to add support for additional software products and capabilities as they become available.

General information about the IBM Support Assistant can be found on the IBM Software site at <https://www.ibm.com/products/software>.

## Getting fixes

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A product fix might be available to resolve your problem. To determine what fixes and other updates are available, select a link from the following list:

- [Latest PTFs for Application Performance Analyzer for z/OS](#)
- [Latest PTFs for IBM z/OS Debugger](#)
- [Latest PTFs for Fault Analyzer for z/OS](#)
- [Latest PTFs for File Export for z/OS](#)
- [Latest PTFs for File Manager for z/OS](#)
- [Latest PTFs for Optim™ Move for DB2®](#)
- [Latest PTFs for WebSphere Studio Asset Analyzer for Multiplatforms](#)
- [Latest PTFs for Workload Simulator for z/OS and OS/390](#)

When you find a fix that you are interested in, click the name of the fix to read its description and to optionally download the fix.

Subscribe to receive email notifications about fixes and other IBM Support information as described in [Subscribing to Support updates](#).

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To stay informed of important information about the IBM products that you use, you can subscribe to updates. By subscribing to receive updates, you can receive important technical information and updates for specific Support tools and resources. You can subscribe to updates by using the following:

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3. After you sign in My notifications, enter the name of the product that you want to subscribe in the **Product lookup** field. The look-ahead feature lists products matching what you typed. If the product does not appear, use the **Browse for a product** link.
4. Next to the product, click the **Subscribe** link. A green check mark is shown to indicate the subscription is created. The subscription is listed under Product subscriptions.
5. To indicate the type of notices for which you want to receive notifications, click the **Edit** link. To save your changes, click the **Submit** at the bottom of the page.
6. To indicate the frequency and format of the email message you receive, click **Delivery preferences**. Then, click **Submit**.
7. Optionally, you can click the RSS/Atom feed by clicking **Links**. Then, copy and paste the link into your feeder.
8. To see any notifications that were sent to you, click **View**.

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For general information about RSS, including steps for getting started and a list of RSS-enabled IBM web pages, visit the IBM Software Support RSS feeds site at <https://www.ibm.com/products/software>. For information about the RSS feed for the IBM Application Performance Analyzer Knowledge Center, refer to the Knowledge Center at <https://www.ibm.com/support/knowledgecenter>.

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4. Next to the product, click the **Subscribe** link. A green check mark is shown to indicate the subscription is created. The subscription is listed under Product subscriptions.
5. To indicate the type of notices for which you want to receive notifications, click the **Edit** link. To save your changes, click the **Submit** at the bottom of the page.
6. To indicate the frequency and format of the email message you receive, click **Delivery preferences**. Then, click **Submit**.
7. Optionally, you can click the RSS/Atom feed by clicking **Links**. Then, copy and paste the link into your feeder.
8. To see any notifications that were sent to you, click **View**.

## Contacting IBM Support

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IBM Support provides assistance with product defects, answering FAQs, and performing rediscovery.

After trying to find your answer or solution by using other self-help options such as technotes, you can contact IBM Support. Before contacting IBM Support, your company must have an active IBM maintenance contract, and you must be authorized to submit problems to IBM. For information about the types of available support, see the information below or refer to the Support portfolio topic in the Software Support Handbook at <https://www-01.ibm.com/support/docview.wss?uid=ibm10733923>.

- For IBM distributed software products (including, but not limited to, Tivoli®, Lotus®, and Rational® products, as well as Db2 and WebSphere products that run on Windows, or UNIX operating systems), enroll in Passport Advantage® in one of the following ways:

### Online

Go to the Passport Advantage Web site at <https://www.ibm.com/software/passportadvantage/> and click **How to Enroll**.

### By phone

For the phone number to call in your country, go to the Contacts page of the *IBM Software Support Handbook* on the Web at <https://www-01.ibm.com/support/docview.wss?uid=ibm10733923> and click the name of your geographic region.

- For customers with Subscription and Support (S & S) contracts, go to the Software Service Request Web site at <http://www.ibm.com/support/servicerequest>.
- For IBM eServer™ software products (including, but not limited to, Db2 and WebSphere products that run in zSeries, pSeries, and iSeries environments), you can purchase a software maintenance agreement by working directly with an IBM sales representative or an IBM Business Partner. For more information about support for eServer software products, go to the IBM Technical Support Advantage Web site at <http://www.ibm.com/servers/eserver/techsupport.html>.

If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States. From other countries, go to the Contacts page of the *IBM Software Support Handbook* on the Web at <https://www-01.ibm.com/support/docview.wss?uid=ibm10733923> and click the name of your geographic region for phone numbers of people who provide support for your location.

Complete the following steps to contact IBM Support if you run into a problem.

1. [“Define the problem and determine the severity of the problem” on page 736](#)
2. [“Gather diagnostic information” on page 737](#)
3. [“Submit the problem to IBM Support” on page 737](#)

## Define the problem and determine the severity of the problem

Define the problem and determine severity of the problem When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Support can help you solve the problem efficiently.

IBM Support needs you to supply a severity level. Therefore, you need to understand and assess the business impact of the problem that you are reporting. Use the following criteria:

### Severity 1

The problem has a **critical** business impact. You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.

### Severity 2

The problem has a **significant** business impact. The program is usable, but it is severely limited.

### Severity 3

The problem has **some** business impact. The program is usable, but less significant features (not critical to operations) are unavailable.



#### Severity 4

The problem has **minimal** business impact. The problem causes little impact on operations, or a reasonable circumvention to the problem was implemented.

For more information, see the Getting IBM support topic in the Software Support Handbook at <https://www-01.ibm.com/support/docview.wss?uid=ibm10733923>.

## Gather diagnostic information

To save time, if there is a Mustgather document available for the product, refer to the Mustgather document and gather the information specified. Mustgather documents contain specific instructions for submitting your problem to IBM and gathering information needed by the IBM support team to resolve your problem. To determine if there is a Mustgather document for this product, go to the product support page (<https://www.ibm.com/support/home/>) and search on the term Mustgather.

If the product does not have a Mustgather document, please provide answers to the following questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can you re-create the problem? If so, what steps were performed to re-create the problem?
- Did you make any changes to the system? For example, did you make changes to the hardware, operating system, networking software, and so on.
- Are you currently using a workaround for the problem? If so, be prepared to explain the workaround when you report the problem.

## Submit the problem to IBM Support

You can submit your problem to IBM Support in one of three ways:

#### Online using the IBM Support Portal

Click **Service request** on the IBM Software Support site at <http://www.ibm.com/software/support>. On the right side of the Service request page, expand the Product related links section. Click Software support (general) and select ServiceLink/IBMLink to open an Electronic Technical Response (ETR). Enter your information into the appropriate problem submission form.

#### Online using the Service Request tool

The Service Request tool can be found at <http://www.ibm.com/software/support/servicerequest>.

#### By phone

Call 1-800-IBMSERV (1-800-426-7378) in the United States or, from other countries, go to the Contacts page of the *IBM Software Support Handbook* on [IBM Support](#) website and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM Support website daily, so that other users who experience the same problem can benefit from the same resolution.

After a Problem Management Record (PMR) is open, you can submit diagnostic MustGather data to IBM using one of the following methods:

- FTP diagnostic data to IBM. For more information, refer to <http://www-01.ibm.com//support/docview.wss?uid=swg21154524>.
- If FTP is not possible, email diagnostic data to [techsupport@mainz.ibm.com](mailto:techsupport@mainz.ibm.com). You must add PMR xxxxx bbb ccc in the subject line of your email. xxxxx is your PMR number, bbb is your branch office, and ccc is your IBM country code. Go to <http://itcenter.mainz.de.ibm.com/ecurep/mail/subject.html> for more details.

Always update your PMR to indicate that data has been sent. You can update your PMR online or by phone as described above.



## Appendix B. Creating side files using CAZLANGX

Refer to chapter *Quick start guide for compiling and assembling programs for use with IBM Problem Determination Tools products* in *IBM Application Delivery Foundation for z Systems Common Components: Customization Guide and User Guide* for the recommended method of preparing your programs for use with the IBM Problem Determination Tools products. Alternatively, you may use LANGX side files for your source information files in *Application Performance Analyzer*. This appendix explains the process required to create side files from compiler listings, using the program CAZLANGX. The CAZLANGX module resides in the *IBM Application Delivery Foundation for z Systems Common Components library SIPVMODA*.

The sample JCL below:

- Allocates a new data set *yourhlq.CAZLANGX* to hold the side file, which will be created in the next step.
- Compiles an Enterprise COBOL program.

**Note:** You can only compile one program per compile step in order to name the compiler listing PDS(E) member (if using a partitioned data set), and to ensure that only one compiler listing is written to the output file.

- Executes CAZLANGX to process the listing and store it as a side file where Application Performance Analyzer can access it.
- Writes the listing as part of the job output.

The sample JCL is provided as member CAZSCMPS in the *hlq.SCAZSAMP* data set.

```
//CAZSCMPS JOB <JOB PARAMETERS>
// JCLLIB ORDER=(IGY.V3R3M0.SIGYPROC) <== INSTALLATION
// IGYWC PROC
//*****
//* Licensed Materials - Property of IBM *
//* 5697-N37 *
//* (C) Copyright IBM Corp. 2005 *
//* All Rights Reserved *
//* US Government Users Restricted Rights - Use, duplication *
//* or disclosure restricted by GSA ADP Schedule Contract *
//* with IBM Corp. *
//*****
//* IBM Application Performance Analyzer for z/OS *
//* Version 1 Release 1 Modification 0 *
//* This JCL compiles a COBOL program and produces a side file *
//* from the program listing that Application Performance *
//* Analyzer uses to obtain the source information. *
//* The compiled output is then written to SYSUT2 in the *
//* IEBGENER step. *
//* CAUTION: This is neither a JCL procedure nor a complete *
//* job. Before using this job step, you will have to *
//* make the following modifications: *
//* 1) Add the job parameters to meet your system requirements. *
//* 2) This job invokes the COBOL procedure IGYWC. *
//* Update the procedure library name on the JCLLIB *
//* statement as appropriate. *
//* 3) Change "#hlq" to the appropriate high-level qualifier. *
//* 4) Change "#yourhlq" to the appropriate high-level *
//* qualifier. *
//*****
//* Pre-allocate data set CAZLANGX to which the side file *
//* will be written. *
//* EXEC PGM=IEFBR14 *
//CAZLANGX DD DSN=#yourhlq.CAZLANGX,DISP=(NEW,CATLG),
// UNIT=SYSALLDA,SPACE=(TRK,(20,20,10)),
// DCB=(RECFM=VB,LRECL=1562,BLKSIZE=0)
//*
```

```

/** Compile a COBOL program.
/**
//CBLRUN EXEC IGYWC,PARM=COBOL='LIST,MAP,SOURCE,XREF'
//COBOL.SYSIN DD DATA,DLM='##'
CBL APOST,NOOPT,DYNAM,SSRANGE,RENT
 IDENTIFICATION DIVISION.
 PROGRAM-ID. CAZSCBL1
 ENVIRONMENT DIVISION.
 INPUT-OUTPUT SECTION.
 FILE-CONTROL.
 DATA DIVISION.
 FILE SECTION.

 WORKING-STORAGE SECTION.
 01 FILLER PIC X(20) VALUE 'WORKING-STORAGE'.
 01 NUMBERX PIC 999999 COMP-3.
 01 ERROR-FLD.
 05 ERROR-COUNT PIC 999999 COMP-3.
 05 FLDY REDEFINES ERROR-COUNT.
 07 FLDZ PIC XXXX.
 01 BAD-RESULT PIC 99 COMP-3.

 PROCEDURE DIVISION.
 MAIN SECTION.
 DISPLAY '*** CAZSCBL1 - START OF PROGRAM'.
 LOOP SECTION.
 START000.
 MOVE 3 TO ERROR-COUNT.
 ADD 986885 TO ERROR-COUNT GIVING NUMBERX.
 MOVE 'ABCD' TO FLDZ.
 IF NUMBERX > 0 THEN PERFORM CLEAR.
 DISPLAY '*** CAZSCBL1 - END OF PROGRAM'.
 GOBACK.
 CLEAR SECTION.
 START001.
 DIVIDE NUMBERX BY ERROR-COUNT GIVING BAD-RESULT.
 EXIT.
 END PROGRAM CAZSCBL1.

##
//COBOL.SYSPRINT DD DSN=&&COBLIST(CAZSCBL1),
// DISP=(,PASS),SPACE=(TRK,(10,5,5),RLSE),
// DCB=(RECFM=FBA,LRECL=133,BLKSIZE=0)
/**
/** Create a side file.
/**
//CAZLANGX EXEC PGM=CAZLANGX,REGION=4096K,
// PARM='CAZSCBL1 (COBOL ERROR '
//STEPLIB DD DISP=SHR,DSN=#hlq.SIPVMODA
//LISTING DD DISP=(OLD,PASS),DSN=&&COBLIST 1
//IDILANGX DD DISP=SHR,DSN=#yourhlq.CAZLANGX
//SYSUDUMP DD SYSOUT=*
/**
/** Print the COBOL listing.
/**
//IEBGENER EXEC PGM=IEBGENER,REGION=4096K
//SYSUT1 DD DISP=OLD,DSN=&&COBLIST(CAZSCBL1)
//SYSUT2 DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
/**

```

**Note:** 1 DDname must be LISTING for all types of compiler listings, or SYSADATA for an assembler SYSADATA file.

After you have created and stored a side file, there is no benefit to Application Performance Analyzer in retaining the listing.

If you already have listings, you can turn them into side files. Here is sample JCL to do this:

```

//CAZLANGX JOB <JOB PARAMETERS>
//*****
/** This job produces a side file from a program listing
/** that Application Performance Analyzer can use
/** for obtaining source information.
/** This particular example is set up for a COBOL extraction
/** from CAZ.LISTING.COBOLE(COBOLA) to CAZ.CAZLANGX
//*****
//CAZLANGX EXEC PGM=CAZLANGX,REGION=4096K,
// PARM='COBOLA (COBOL ERROR'

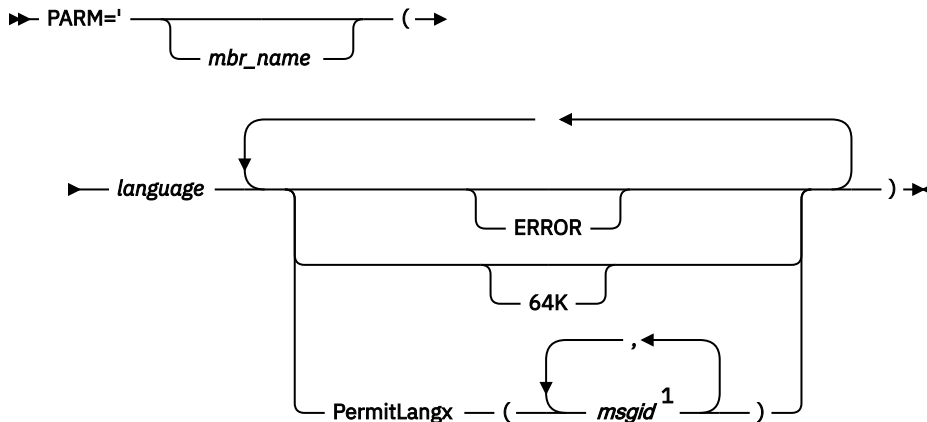
```

```
//STEPLIB DD DISP=SHR,DSN=#hlq.SIPVMODA
//LISTING DD DISP=SHR,DSN=yourhlq.LISTING.COBOL 1
//IDILANGX DD DISP=SHR,DSN=yourhlq.CAZLANGX
//SYSUDUMP DD SYSOUT=*
```

**Note:** 1 DDname must be LISTING for all types of compiler listings, or SYSADATA for an assembler SYSADATA file.

## CAZLANGX parameters

The PARM string passed to CAZLANGX should contain:



Notes:

<sup>1</sup> Either a comma or a blank character is permitted as a delimiter.

## Parameters

### **mbr\_name (Optional)**

The compiler listing or ADATA file member name in the input data set identified by the LISTING DD name (for a compiler listing) or the SYSADATA DD name (if an ADATA file). If this parameter is omitted, the JCL must specify for the compiler listing or ADATA file, either a sequential data set, or a PDS(E) data set with member name. Also, the output CAZLANGX member will be named according to the input program name. In the case of COBOL, for example, this is the name found on the PROGRAM-ID source line.

### **language (Required)**

The language of the compiler listing or ADATA file. The options are:

- COBOL
- PLI
- ASM

### **ERROR (Optional)**

A parameter that provides additional diagnostics on variables for which information is incomplete.

### **64K (Optional)**

A parameter that provides side file compatibility with IBM z/OS Debugger. For more information see, [“Side file compatibility with IBM z/OS Debugger” on page 741.](#)

### **PermitLangx (msgid, ...) (Optional)**

A parameter that specifies message IDs for compiler error messages that should be ignored.

## Side file compatibility with IBM z/OS Debugger

If using IBM z/OS Debugger, the 64K option should be included as stated for z/OS Debugger EQALANGX when generating side files with the z/OS Debugger EQALANGX or the Application Performance Analyzer

CAZLANGX utilities. This option is also recognized by CAZLANGX, and the side file produced by EQALANGX or CAZLANGX, will then be usable by both z/OS Debugger and Application Performance Analyzer.

For details of how to specify the 64K option, see [“CAZLANGX parameters” on page 741](#).

## Including a CAZLANGX step in your SCLM translator

If you use the ISPF/PDF Software Configuration and Library Manager (SCLM) to manage your application software, then you might want to include a CAZLANGX step in your SCLM translator, since Application Performance Analyzer side files generally take up less disk space than compiler listings. Shown in the following are examples of a CAZLANGX step inserted into a High Level Assembler and a COBOL SCLM translator.

### High Level Assembler SCLM example

```
* SYSADATA DDNAME used in HLASM step.
* (* SYSADATA *)
* FLMALLOC IOTYPE=W,DDNAME=SYSADATA,RECFM=VB,RECNUM=90000, C
* LRECL=8188,BLKSIZE=8192,PRINT=Y
*
* * CAZLANGX BUILD TRANSLATOR
*
* FLMTRNSL CALLNAM='CAZLANGX', C
* FUNCTN=BUILD, C
* COMPILE=CAZLANGX, C
* DSNNAME=#hlq.SIPVMODA, C
* VERSION=3.5.2, C
* GOODRC=0, C
* PORORDER=1, C
* OPTIONS='@@FLMMBR(ASM ERROR OFT CAZLANGX FAULT'
*
* (* SYSADATA *)
* FLMALLOC IOTYPE=U,DDNAME=SYSADATA
*
* (* CAZLANGX *)
* FLMALLOC IOTYPE=P,DDNAME=IDILANGX,DFLTYP=IDILANGX, C
* KEYREF=OUT2,BLKSIZE=27998,LRECL=1562,RECFM=VB, C
* RECNUM=100000,DIRBLKS=50,DFLTMEM=*
```

### COBOL SCLM example

```

* --COPY SYSPRINT FILE TO LISTING
* * The COPYFILE EXEC, in dataset PDFTDEV.PROJDEFS.EXEC contains the
* * following:
*
* /* REXX */
* /*****
* /* Copy file I to file O. Both are assumed to be pre-allocated. */
* /*****
* /* PARSE UPPER ARG I", "O .
* /* "EXECIO * DISKR "I" (STEM R. FINIS "
* /* "EXECIO * DISKW "O" (STEM R. FINIS "
* /* RETURN
*
* *****
*
* FLMTRNSL CALLNAM='COPY FILES', C
* FUNCTN=BUILD, C
* COMPILE=COPYFILE, C
* DSNNAME=PDFTDEV.PROJDEFS.EXEC, C
* CALLMETH=TSOLNK, C
* VERSION=1.0, C
* PORORDER=1, C
* OPTIONS=(SYSPRINT,LISTING), C
* GOODRC=0
* FLMALLOC IOTYPE=W,RECFM=VBA,LRECL=133, C
* RECNUM=90000,DDNAME=LISTING
*
* FLMTRNSL CALLNAM='CAZLANGX', C
```

```

 FUNCTN=BUILD,
 COMPILE=CAZLANGX,
 DSNAME=#hlq.SIPVMODA,
 VERSION=3.5.2,
 GOODRC=0,
 PORDER=1,
 OPTIONS='@@FLMMBR(COBOL ERROR OFT CAZLANGX FAULT'
*
* (* LISTING *)
* FLMALLOC IOTYPE=U, DDNAME=LISTING
*
* (* CAZLANGX *)
* FLMALLOC IOTYPE=P, DDNAME=CAZLANGX, DFLTTP=CAZLANGX,
 KEYREF=OUT2, BLKSIZE=27998, LRECL=1562, RECFM=VB,
 RECNUM=10000, DIRBLKS=50, DFLTMEM=*

```

## COBOL Report Writer Precompiler

If you are using the COBOL Report Writer Precompiler (program number 5798-DYR), it is important that you run it as a stand-alone precompiler as opposed to invoking it via the COBOL compiler EXIT option. Otherwise, information that is required by Application Performance Analyzer to identify the point of failure source code statement might be missing from the compiler listing.

Symptoms that you might experience if using the COBOL Report Writer Precompiler as a COBOL compiler exit are:

- Return code 3114 from CAZLANGX if trying to convert the COBOL compiler listing file to a side file.
- The following messages issued during fault analysis:
  - IDISF8100S COBOL LISTING file contains NO recognized records
  - IDISF8132S Input or Output file format invalid
- Failure to determine point of failure source line.

## Required compiler options for creating listings or CAZLANGX side files

The following are the compiler options needed to produce listings or CAZLANGX side files suitable for Application Performance Analyzer:

### OS/VS COBOL:

- DMAP
- NOCLIST
- NOLST
- NOOPT (Note 1)
- PMAP
- SOURCE
- VERB
- XREF

### COBOL compilers (other than OS/VS COBOL):

- LIST,NOOFFSET (Note 2)
- NOOPT (Note 1)
- MAP
- SOURCE
- XREF(SHORT) (Note 3)

### VisualAge® PL/I:

- AGGREGATE
- ATTRIBUTES(FULL)
- LIST
- NEST
- OPTIONS
- SOURCE
- XREF(FULL)

**Enterprise PL/I:**

- AGGREGATE
- ATTRIBUTES(FULL)
- LIST
- MAP
- NEST
- SOURCE
- STMT
- NONNUMBER
- OFFSET
- XREF(FULL)
- OPTIONS
- NOBLKOFF

**PL/I compilers (other than VisualAge PL/I and Enterprise PL/I):**

- AGGREGATE
- ATTRIBUTES(FULL)
- ESD
- LIST
- MAP
- NEST
- OPTIONS
- SOURCE
- STMT
- XREF(FULL)

**Assembler:**

- ADATA

**C/C++:**

- LIST
- NOOFFSET

**Note:**

1. Although NOOPT is recommended, the use of OPTIMIZE is allowed (including OPT(1) or OPT(2) for C) , in which case the compiler merges and rearranges statement numbers in the compiled code. The Application Performance Analyzer analysis will be limited to what can be determined from the optimized compiler listing, which can vary from having no effect on the Application Performance Analyzer report, to inaccurate identification of the source line that failed. The source line number will usually be close, but not necessarily accurate with OPTIMIZE. It is dependent on the compiler's rearrangement or elimination of source statements during its optimization processing.



2. Although LIST and NOOFFSET are recommended, the use of NOLIST and OFFSET is allowed, in which case Application Performance Analyzer will not be able to warn the user if the compiler listing is not a good match with what is in storage.
3. XREF(SHORT) is a minimum requirement; XREF(FULL) is permitted and has no detrimental effect.
4. ATTRIBUTES is a minimum requirement; ATTRIBUTES(FULL) is permitted and has no detrimental effect.

## TEST option considerations

With all compilers, the additional use of the TEST option may provide program information in addition to what is available via the side files.

If TEST(,SEPARATE) is used when compiling a COBOL program, then a COBOL SYSDEBUG file is written.

If the SYSDEBUG file is to be used instead of a compiler listing, or a CAZLANGX side file created from a compiler listing, then it should be retained for use by z/OS Debugger and Application Performance Analyzer.

## Naming compiler listings or side files

Store compiler listings or side files in sequential data sets, or as members of PDS(E) data sets.

If stored in PDS(E) data sets, then the member name must be equal to the primary entry point name or CSECT name of your application program. If the application program contains multiple CSECTs, then they must be compiled separately in order to create separate compiler listing or side file members. If you store with any other name, Application Performance Analyzer will be unable to find the side file or listing.

**Note:** The PL/I compiler typically renames CSECTs according to an internal compiler algorithm. Therefore, it is not recommended to store PL/I compiler listings or side files using CSECT names as they might not be found by Application Performance Analyzer. Instead, use the primary entry point name.

If compiler listings or side files are stored in sequential data sets, and the data set names follow a convention that permits the program name to be part of the data set name, then the specification of these data sets in the DataSets option can be done easily using variable substitution.

## Naming CSECTs for Application Performance Analyzer

To facilitate source code information, Application Performance Analyzer must be able to match CSECT names with the compiler listings or side files provided. For this to be possible, all CSECTs must be named. Whereas the names of CSECTs in programs written in most high-level languages are automatically assigned, special requirements apply to programs written assembler, as explained in the following. Failure to follow these requirements will prevent source code information from being determined for these types of programs.

### Assembler programs

It is a requirement that CSECTs in assembler programs are named using either:

- csect\_name CSECT
- csect\_name START

If using a PDS(E), the csect\_name must match the SYSADATA or side file data set member name.

## Compiler listings and side file attributes

Compiler listings and side files must be allocated using the following attributes:

### DDname Attributes:

#### CAZADATA

Sequential data set or PDS(E), RECFM=VB, LRECL=8188

**CAZLC**

Sequential data set or PDS(E), and either:

- RECFM=VB or VBA and LRECL=137
- RECFM=FB or FBA and LRECL=133

**CAZLCOB**

Sequential data set or PDS(E), RECFM=FBA, LRECL=133

**CAZLCOBO**

Sequential data set or PDS(E), RECFM=FBA, LRECL=121

**CAZSYSDB**

Sequential data set or PDS(E), RECFM=FB, LRECL=1024

**CAZLANGX**

Sequential data set or PDS(E), RECFM=VB, LRECL=1562

**CAZLPLI**

Sequential data set or PDS(E), RECFM=VBA, LRECL=125

**CAZLPLIE**

Sequential data set or PDS(E), RECFM=VBA, LRECL=137

For variable length records, the indicated record lengths (LRECL) are minimum values.

In order for Application Performance Analyzer to read the compiler listings or side files, they must not be allocated as temporary data sets (for example, using &&dsname-type data set names in your JCL).

For the purpose of conserving disk space, compiler listings can be stored in ISPF packed format. This is done by using the PACK ON option from within ISPF edit of the file. The ISPF packed format is not permitted for IDILANGX or IDIADATA data sets.

---

## | Appendix C. XML or JSON document layout

- | This appendix describes the layout of the XML or JSON documents and associates each element to the matching field in the online report.

### XML declaration

---

The XML declaration is included as the first line in the document. It describes the version, encoding and standalone attributes as follows:

```
<?xml version="1.0" encoding="ebcdic-cp-us" standalone="yes" ?>
```

### XML root tag

---

The tag pair <ReportSet> and </ReportSet> define the root element.

### JSON root object

---

The JSON object "Report Set" contains a set of name-value pairs that describes the set of requested reports.

### Layout standards

---

#### XML reports

Immediately following the root tag <ReportSet>, elements describing the details of the completed request are enclosed within a <MeasurementInformation> and </MeasurementInformation> tag pair. This data is viewed online by typing the line command "++" on top of the Request Number on the R02 panel.

The data for individual report sections (e.g., S01, C02, etc.) follow the </MeasurementInformation> closing tag and are enclosed within separate <Report> and </Report> tag pairs.

Immediately following the <Report> tag, every report section contains the following 4 common elements:

- <ReportId>*Report Code*</ReportId>
- <ReportName>*Report Name*</ReportName>
- <MarginOfError>*Margin of Error %*</MarginOfError>
- <MeasurementDivisor>*Measurement Divisor*</MeasurementDivisor>

*Report Code* and *Report Name* are unique for each report. The *Margin of Error %* value reflects the level of precision calculated for the report. When margin of error is not applicable for a report, this value is empty. The *Measurement Divisor* value contains the total number of samples taken and is used to calculate percentages in the report. Where there are no percentages presented in the report, this value is empty.

In the following tables, numeric data is represented by n, regardless of the size and format of the data.

#### JSON reports

Immediately following the root tag "Report Set" object, name-value pairs describing the details of the completed request are enclosed within the "MeasurementInformation" object. This data is viewed online by typing the line command "++" on top of the Request Number on the R02 panel.

The data for individual report sections (e.g., S01, C02, etc.) follow the "MeasurementInformation" object and are enclosed within separate JSON objects, all nested within the "ReportSet" object.

Immediately following the start of the <Report> object, every report section contains the following 4 common name-value pairs:

- "ReportId": "Report Code"
- "ReportName": "Report Name"
- "MarginOfError": "Margin of Error %"
- "MeasurementDivisor": "Measurement Divisor"

*Report Code* and *Report Name* are unique for each report. The *Margin of Error %* value reflects the level of precision calculated for the report. When margin of error is not applicable for a report, this value is empty. The *Measurement Divisor* value contains the total number of samples taken and is used to calculate percentages in the report. Where there are no percentages presented in the report, this value is empty.

In the following tables, numeric data is represented by *n*, regardless of the size and format of the data.

## Measurement information

The measurement information data is displayed online after typing the line command “++” on top of the Request Number in the R02 panel. In the XML document file, this data is enclosed within the <MeasurementInformation> and </MeasurementInformation> tag pair. In the JSON document file, this data is enclosed within the “MeasurementInformation” object. The table below lists the sub elements for this data. For JSON reports, the same XML tag names presented in the tables that follow are also used in the JSON object names.

| Field title in online report | XML element                                                      |
|------------------------------|------------------------------------------------------------------|
|                              | <MeasurementTaskId>stcid</MeasurementTaskId>                     |
|                              | <MeasurementVersionNumber>version</MeasurementVersionNumber>     |
|                              | <MeasurementAPARNumber>APAR</MeasurementAPARNumber>              |
| Request Number               | <RequestNumber>nnnnn</RequestNumber>                             |
| Request Description          | <RequestDescription>description</RequestDescription>             |
| Request Status               | <RequestStatus>status</RequestStatus>                            |
| Owner Id                     | <OwnerId>owner</OwnerId>                                         |
| Time of Request              | <TimeOfRequest>Day Mon-dd-yyyy hh:mm:ss.ss</TimeOfRequest>       |
| Session Start Time           | <SessionStartTime>Day Mon-dd-yyyy hh:mm:ss.ss</SessionStartTime> |
| Session End Time             | <SessionEndTime>Day Mon-dd-yyyy hh:mm:ss.ss</SessionEndTime>     |
| Session Duration             | <SessionDuration>duration</SessionDuration>                      |
| Session Delete Date          | <SessionDeleteDate>Day Mon-dd-yyyy</SessionDeleteDate>           |
| Select by Job Name           | <Jobname>name</Jobname>                                          |
| Select by Sys Name           | <SysName>name</SysName>                                          |
| Sample Interval              | <SampleInterval>interval</SampleInterval>                        |
| Duration                     | <Duration>duration</Duration>                                    |
| Sample File DSN              | <SampleFileDSN>dsn</SampleFileDSN>                               |
| Samples Requested            | <SamplesRequested>n</SamplesRequested>                           |
| Samples Done                 | <SamplesDone>n</SamplesDone>                                     |
| ASID                         | <ASID>asid</ASID>                                                |

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| Job ID                       | <JobId> <i>jobid</i> </JobId>                        |
| Data Extractors              | <Extractors>                                         |
|                              | <Extractor>None</Extractor> if none selected         |
| CICS                         | <Extractor>CICS</Extractor> omitted if not selected  |
| CICS+                        | <Extractor>CICS+</Extractor> omitted if not selected |
| IMS                          | <Extractor>IMS</Extractor> omitted if not selected   |
| IMS+                         | <Extractor>IMS+</Extractor> omitted if not selected  |
| Db2                          | <Extractor>Db2</Extractor> omitted if not selected   |
| Db2+                         | <Extractor>Db2+</Extractor> omitted if not selected  |
| Db2 Variables                | <Extractor>Db2V</Extractor> omitted if not selected  |
| Static Db2 Explain           | <Extractor>Db2X</Extractor> omitted if not selected  |
| Collateral Db2               | <Extractor>CDb2</Extractor> omitted if not selected  |
| MQ                           | <Extractor>MQS</Extractor> omitted if not selected   |
| MQ+                          | <Extractor>MQ+</Extractor> omitted if not selected   |
| JAVA                         | <Extractor>JAVA</Extractor> omitted if not selected  |
| ADA                          | <Extractor>ADA</Extractor> omitted if not selected   |
| NAT                          | <Extractor>NAT</Extractor> omitted if not selected   |
| WAS                          | <Extractor>WAS</Extractor> omitted if not selected   |
| SRB                          | <Extractor>SRB</Extractor> omitted if not selected   |
|                              | </Extractors>                                        |

## Performance analysis reports

### S01 Measurement Profile

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
| Overall CPU Activity         | <OverallCPUActivity>                             |
| Samples                      | <Samples> <i>n</i> </Samples>                    |
|                              | <SamplesPercent> <i>n</i> %</SamplesPercent>     |
| Reports                      | <Reports>C01 C02 C03 C05 C07 W01 W02</Reports>   |
| CPU Active                   | <CPUActive> <i>n</i> </CPUActive>                |
|                              | <CPUActivePercent> <i>n</i> %</CPUActivePercent> |
| Wait                         | <Wait> <i>n</i> </Wait>                          |
|                              | <WaitPercent> <i>n</i> %</WaitPercent>           |
| Queued                       | <Queued> <i>n</i> </Queued>                      |
|                              | <QueuedPercent> <i>n</i> %</Queued>              |
|                              | </OverallCPUActivity>                            |

| Field title in online report | XML element                                 |
|------------------------------|---------------------------------------------|
| CPU Usage Distribution       | <CPUUsageDistribution>                      |
| CPU Active                   | <CPUActive>n</CPUActive>                    |
|                              | <CPUActivePercent>n%</CPUActivePercent>     |
|                              | <Reports>C01 C05 C08 W01</Reports>          |
| Application                  | <Application>n</Application>                |
|                              | <ApplicationPercent>n%</ApplicationPercent> |
| System                       | <System>n</System>                          |
|                              | <SystemPercent>n%</SystemPercent>           |
| Db2 SQL                      | <Db2SQL>n</Db2SQL>                          |
|                              | <Db2SQLPercent>n%</Db2SQLPercent>           |
| Data Mgmt                    | <DataMgt>n</DataMgt>                        |
|                              | <DataMgtPercent>n%</DataMgtPercent>         |
| Unresolved                   | <Unresolved>n</Unresolved>                  |
|                              | <UnresolvedPercent>n%</UnresolvedPercent>   |
| IMS DLI Call                 | <IMSDLICall>n</IMSDLICall>                  |
|                              | <IMSDLICallPercent>n%</IMSDLICallPercent>   |
|                              | </CPUUsageDistribution>                     |
| Most CPU Active Modules      | <MostCPUActiveModules>                      |
| CPU Active                   | <CPUActive>n</CPUActive>                    |
|                              | <CPUActivePercent>n%</CPUActivePercent>     |
|                              | <Reports>C02</Reports>                      |
|                              | <CPUActiveModules>                          |
| Module Name                  | <Module>name</Module>                       |
|                              | <CPUActive>n</CPUActive>                    |
|                              | <CPUActivePercent>n%</CPUActivePercent>     |
|                              | </CPUActiveModules>                         |
|                              | </MostCPUActiveModules>                     |
| Most CPU Active CSECTS       | <MostCPUActiveCSECTS>                       |
| Active CPU                   | <CPUActive>n</CPUActive>                    |
|                              | <CPUActivePercent>n%</CPUActivePercent>     |
|                              | <Reports>C02</Reports>                      |
|                              | <CPUActiveCSECTS>                           |
| CSECT in Module              | <CSECT>csect in module</CSECT>              |
|                              | <CPUActive>n</CPUActive>                    |
|                              | <CPUActivePercent>n%</CPUActivePercent>     |

| Field title in online report  | XML element                             |
|-------------------------------|-----------------------------------------|
|                               | </CPUActiveCSECTs>                      |
|                               | </MostCPUActiveCSECTs>                  |
| CPU Modes                     | <CPUModes>                              |
| Active CPU                    | <CPUActive>n</CPUActive>                |
|                               | <CPUActivePercent>n%</CPUActivePercent> |
| Reports                       | <Reports>S08</Reports>                  |
| Supv Mode                     | <SupvModeActive>n</SupvModeActive>      |
|                               | <SupvModePercent>n%</SupvModePercent>   |
| Prob Mode                     | <ProbModeActive>n</ProbModeActive>      |
|                               | <ProbModePercent>n%</ProbModePercent>   |
| In SVC                        | <InSVCActive>n</InSVCActive>            |
|                               | <InSVCPercent>n%</InSVCPercent>         |
| AMODE 24                      | <AMODE24Active>n</AMODE24Active>        |
|                               | <AMODE24Percent>n%</AMODE24Percent>     |
| AMODE 31                      | <AMODE31Active>n</AMODE31Active>        |
|                               | <AMODE31Percent>n%</AMODE31Percent>     |
| AMODE 64                      | <AMODE64Active>n</AMODE64Active>        |
|                               | <AMODE64Percent>n%</AMODE64Percent>     |
| User Key                      | <UserKeyActive>n</UserKeyActive>        |
|                               | <UserKeyPercent>n%</UserKeyPercent>     |
| System Key                    | <SystemKeyActive>n</SystemKeyActive>    |
|                               | <SystemKeyPercent>n%</SystemKeyPercent> |
|                               | </CPUModes>                             |
| Most Active Db2 Plans         | <MostActiveDb2Plans>                    |
| Samples                       | <Samples>n</Samples>                    |
|                               | <Percent>n%</Percent>                   |
| Reports                       | <Reports>F05</Reports>                  |
|                               | <Plans>                                 |
| Plan Name                     | <PlanName>name</PlanName>               |
|                               | <CPUActive>n</CPUActive>                |
|                               | <CPUActivePercent>n%</CPUActivePercent> |
|                               | </Plans>                                |
|                               | </MostActiveDb2Plans>                   |
| Most Active Package/<br>DBRMs | <MostActivePackageDBRMs>                |
| Samples                       | <Samples>n</Samples>                    |

| Field title in online report                          | XML element                                                |
|-------------------------------------------------------|------------------------------------------------------------|
|                                                       | <Percent>n%</Percent>                                      |
| Reports                                               | <Reports>F03</Reports>                                     |
|                                                       | <DBRMs>                                                    |
| <i>DBRM Name</i>                                      | <DBRM>name</DBRM>                                          |
|                                                       | <CPUActive>n</CPUActive>                                   |
|                                                       | <CPUActivePercent>n%</CPUActivePercent>                    |
|                                                       | </DBRMs>                                                   |
|                                                       | </MostActivePackageDBRMs>                                  |
| Most Active SQL Statements                            | <MostActiveSQLStatements>                                  |
| Samples                                               | <Samples>n</Samples>                                       |
|                                                       | <Percent>n%</Percent>                                      |
| Reports                                               | <Reports>F04</Reports>                                     |
|                                                       | <SQLStatement>                                             |
| <i>Program:offset:verb</i>                            | <ProgramOffsetVerb>program:offset:verb</ProgramOffsetVerb> |
|                                                       | <CPUActive>n</CPUActive>                                   |
|                                                       | <CPUActivePercent>n%</CPUActivePercent>                    |
|                                                       | </SQLStatement>                                            |
|                                                       | </MostActiveSQLStatements>                                 |
| Most Active IMS PSBs                                  | <MostActiveIMSPSBs>                                        |
| Samples                                               | <Samples>n</Samples>                                       |
|                                                       | <Percent>n%</Percent>                                      |
| Reports                                               | <Reports>I05 I08 I11</Reports>                             |
|                                                       | <ActiveIMSPSBs>                                            |
| <i>PSB Name</i>                                       | <PSBName>name</PSBName>                                    |
|                                                       | <CPUActive>n</CPUActive>                                   |
|                                                       | <CPUActivePercent>n%</CPUActivePercent>                    |
|                                                       | </ActiveIMSPSBs>                                           |
|                                                       | </MostActiveIMSPSBs>                                       |
| Most Active IMS DLI Calls                             | <MostActiveIMSDLICalls>                                    |
| Samples                                               | <Samples>n</Samples>                                       |
|                                                       | <Percent>n%</Percent>                                      |
| Reports                                               | <Reports>I07 I10 I13</Reports>                             |
|                                                       | <ActiveIMSDLICalls>                                        |
| <i>Sequence Number:DLI<br/>Function Code:PCB Name</i> | <IMSCall>imscall</IMSCall>                                 |



| Field title in online report   | XML element                                     |
|--------------------------------|-------------------------------------------------|
|                                | <CPUActive>n</CPUActive>                        |
|                                | <CPUActivePercent>n%</CPUActivePercent>         |
|                                | </ActiveIMSDLICalls>                            |
|                                | </MostActiveIMSDLICalls>                        |
| Request Parameters             | <RequestParameters>                             |
| Request Number                 | <RequestNumber>nnnnn</RequestNumber>            |
| Description                    | <Description>description</Description>          |
| Sample file DSN                | <SampleFileDSN>dsn</SampleFileDSN>              |
| Retention                      | <Retention>Day Mon-dd-yyyy</Retention>          |
| Data Extractors                | <DataExtractors>extractor list</DataExtractors> |
| Data Extractors<br>(continued) | <DataExtractor2>extractor list</DataExtractor2> |
| Max Db2 Trace Entries          | <MaxDb2>max entries</MaxDb2>                    |
| Max IMS Trace Entries          | <MaxIMS>max entries</MaxIMS>                    |
| Max MQ Trace Entries           | <MaxMQ>max entries</MaxMQ>                      |
| Requesting user                | <RequestingUser>userid</RequestingUser>         |
| Nbr of samples                 | <NumberOfSamples>n</NumberOfSamples>            |
| Time of request                | <TimeOfRequest>hh:mm:ss</TimeOfRequest>         |
| Duration                       | <Duration>n sec</Duration>                      |
| Date of request                | <DateOfRequest>Day Mon-dd-yyyy</DateOfRequest>  |
| Active/pending                 | <ActivePending>Status</ActivePending>           |
| Job name                       | <JobName>name</JobName>                         |
| Proc step name                 | <ProcStepName>procstepname</ProcStepName>       |
| Step name/number               | <StepName>stepname</StepName>                   |
| Delay time                     | <DelayTime>n</DelayTime>                        |
| Step program                   | <StepProgram>steppgm</StepProgram>              |
| Specific Db2 Parms             | <SpecificDb2Parms>P F</SpecificDb2Parms>        |
| Db2 Subsystem                  | <Db2SubSystem>systemid</Db2SubSystem>           |
| Db2 Group name                 | <Db2GroupName>groupid</Db2GroupName>            |
| Schema                         | <Schema>name</Schema>                           |
| Name                           | <Name>name</Name>                               |
| Stored Procedure Name          | <SSPR_name>SSPRname</SSPR_name>                 |
| Correlation ID filters         | <CorrelationId>correlID</CorrelationId>         |
| User ID filters                | <EndUserId>userID</EndUserId>                   |
| Workstation ID filters         | <WorkstationId>workstationID</WorkstationId>    |
| CICS transaction filters       | <CICSTxnsLine1>tran</CICSTxnsLine1>             |

| Field title in online report            | XML element                                              |
|-----------------------------------------|----------------------------------------------------------|
| CICS transaction filters<br>(continued) | <CICSTxnsLine2> <i>tran</i> </CICSTxnsLine2>             |
| CICS terminal ID filters                | <CICSTermIds> <i>termID</i> </CICSTermIds>               |
| CICS System Transactions                | <SystemTxns> <i>Y/N</i> </SystemTxns>                    |
| CICS Non-terminal Transactions          | <NontermTxns> <i>Y/N</i> </NontermTxns>                  |
| IMS Transaction Code                    | <IMSTransactionCode> <i>tranid</i> </IMSTransactionCode> |
| IMS Program Name                        | <IMSProgramName> <i>name</i> </IMSProgramName>           |
| IMS User Id                             | <IMSUserID> <i>userid</i> </IMSUserID>                   |
| IMS Subsystem Id                        | <IMSSubsystemId> <i>systemid</i> </IMSSubsystemId>       |
| IMS Tran Code                           | <IMSTransCode> <i>trancode</i> </IMSTransCode>           |
|                                         | </RequestParameters>                                     |
| Measurement environment                 | <MeasurementEnvironment>                                 |
| Job name                                | <JobName> <i>name</i> </JobName>                         |
| Region size <16MB                       | <RegionSizeBelow> <i>nK</i> </RegionSizeBelow>           |
| Job number                              | <JobNumber> <i>number</i> </JobNumber>                   |
| Region size >16MB                       | <RegionSizeAbove> <i>nK</i> </RegionSizeAbove>           |
| Step name                               | <StepName> <i>stepname</i> </StepName>                   |
| Step program                            | <StepProgram> <i>steppgm</i> </StepProgram>              |
| Proc step name                          | <ProcStepName> <i>procstepname</i> </ProcStepName>       |
| Region type                             | <RegionType> <i>regiontype</i> </RegionType>             |
| ASID                                    | <ASID> <i>asid</i> </ASID>                               |
| Db2 Attach type                         | <Db2AttachType> <i>type</i> </Db2AttachType>             |
| System ID                               | <SystemID> <i>sysid</i> </SystemID>                      |
| APA Version                             | <APAVersion> <i>version</i> </APAVersion>                |
| SMFID                                   | <SMFID> <i>smfid</i> </SMFID>                            |
| IBM APA APAR                            | <APAApar> <i>APAR</i> </APAApar>                         |
| O/S level                               | <OSLevel> <i>oslevel</i> </OSLevel>                      |
| Db2 subsystem name                      | <Db2SubsystemName> <i>Db2sysname</i> </Db2SubsystemName> |
| IMS system id                           | <IMSSystemId> <i>imssysid</i> </IMSSystemId>             |
| General CPUs                            | <NbrOfCPUs> <i>n</i> </NbrOfCPUs>                        |
| CPU model                               | <CPUModel> <i>model</i> </CPUModel>                      |
| Specialty CPUs                          | <SpecialtyCPUs> <i>n</i> </SpecialtyCPUs>                |
| CPU rate factor                         | <CPURateFactor> <i>n</i> </CPURateFactor>                |
| MIPS per CPU                            | <MIPSPerCPU> <i>n</i> </MIPSPerCPU>                      |
| SUs per second                          | <SUsPerSecond> <i>n</i> </SUsPerSecond>                  |

| Field title in online report | XML element                                           |
|------------------------------|-------------------------------------------------------|
|                              | </MeasurementEnvironment>                             |
| Measurement statistics       | <MeasurementStatistics>                               |
| Start time                   | <StartTime>hh:mm:ss</StartTime>                       |
| Start date                   | <StartDate>Day Mon-dd-yyyy</StartDate>                |
| End time                     | <EndTime>hh:mm:ss</EndTime>                           |
| End date                     | <EndDate>Day Mon-dd-yyyy</EndDate>                    |
| Total samples                | <TotalSamples>n</TotalSamples>                        |
| Duration                     | <Duration>n min n sec</Duration>                      |
| Sampling rate                | <SamplingRate>n per sec</SamplingRate>                |
| Report dataspace             | <ReportDataspace>nMB</ReportDataspace>                |
| CPU/WAIT samples             | <CPUWaitSamples>n</CPUWaitSamples>                    |
| Sample dataspace             | <SampleDataspace>nMB</SampleDataspace>                |
| TCB samples                  | <TCBSamples>n</TCBSamples>                            |
| Meas significance            | <MeasurementSignificance>n%</MeasurementSignificance> |
| CPU queued samples           | <CPUQueuedSamples>n</CPUQueuedSamples>                |
| Pages in                     | <PagesIn>n</PagesIn>                                  |
| Overall CPU                  | <OverallCPU>n%</OverallCPU>                           |
| Pages out                    | <PagesOut>n</PagesOut>                                |
| Overall zAAP CPU             | <OverallzAAPCPU>n%</OverallzAAPCPU>                   |
| EXCPs                        | <EXCPs>n</EXCPs>                                      |
| Overall zIIP CPU             | <OverallzIIPCPU>n%</OverallzIIPCPU>                   |
|                              | </MeasurementStatistics>                              |
| CPU consumption              | <CPUConsumption>                                      |
| CPU active samples           | <CPUActiveSamples>n</CPUActiveSamples>                |
| CPU time TCB                 | <CPUTimeTCB>n sec</CPUTimeTCB>                        |
| CPU active time              | <CPUActiveTime>n%</CPUActiveTime>                     |
| CPU time SRB                 | <CPUTimeSRB>n sec</CPUTimeSRB>                        |
| CPU WAIT samples             | <CPUWaitSamples>n</CPUWaitSamples>                    |
| Service Units                | <ServiceUnits>n</ServiceUnits>                        |
| CPU WAIT time                | <CPUWaitTime>n%</CPUWaitTime>                         |
| Measurement SRB              | <MeasurementSRB>n sec</MeasurementSRB>                |
|                              | <zAAPCPUConsumption>                                  |
| zAAP CPU Time                | < zAAPCPUTime>n sec< /zAAPCPUTime>                    |
| zAAP Time on CP              | < zAAPTimeonCP >n sec</ zAAPTimeonCP >                |
| Task Time on CP              | < TaskTimeonCP>n sec</TaskTimeonCP>                   |

| Field title in online report | XML element                                       |
|------------------------------|---------------------------------------------------|
| Norm. Factor                 | < NormFactor> <i>n</i> </ NormFactor>             |
| Normalized Time              | < NormalizedTime> <i>n sec</i> </ NormalizedTime> |
| Enclave CPU time             | <EnclaveCPUTime> <i>n sec</i> </EnclaveCPUTime>   |
|                              | </zAAPCPUConsumption>                             |
|                              | </CPUConsumption>                                 |
| DDF CPU consumption          | <DDFCPUConsumption>                               |
| Task CPU time                | <TaskCPUTime> <i>n sec</i> </TaskCPUTime>         |
| zIIP time                    | <zIIPTime> <i>n sec</i> </zIIPTime>               |
| Enclave CPU time             | <EnclaveCPUTime> <i>n sec</i> </EnclaveCPUTime>   |
| zIIP on CP time              | <zIIPonCPTime> <i>n sec</i> </zIIPonCPTime>       |
|                              | </DDFCPUConsumption>                              |
|                              | <ClientEnclaveConsumption>                        |
| Client SRB Time              | <ClientSRBTime> <i>n sec</i> </ClientSRBTime>     |
| Total TCB Time               | <TotalTCBTime> <i>n sec</i> </TotalTCBTime>       |
|                              | </ClientEnclaveConsumption>                       |
| Virtual Storage Map          | <VirtualStorageMap>                               |
|                              | <Region>                                          |
| Storage Type                 | <Name> <i>storage type</i> </Name>                |
| Start Address                | <Start> <i>start address</i> </Start>             |
| End Address                  | <End> <i>end address</i> </End>                   |
| Length of Storage            | <Length> <i>length of storage</i> </Length>       |
|                              | </Region>                                         |
|                              | </VirtualStorageMap>                              |

## S02 Load Module Attributes

The table below lists all possible report tag pairs and their sub-elements hierarchically. When the XML document is created, the report tag pairs may be repeated, nested or eliminated as appropriate for the data in the report, and depending on the setup options chosen.

| Field title in online report | XML element                                                |
|------------------------------|------------------------------------------------------------|
|                              | <LoadModuleAttributes>                                     |
| Module Information for       | <ModuleInformationFor> <i>name</i> </ModuleInformationFor> |
| Load Address                 | <LoadAddress> <i>n to n</i> </LoadAddress>                 |
| Module Size                  | <ModuleSize> <i>n</i> </ModuleSize>                        |
| Attributes                   | <Attributes> <i>attributes</i> </Attributes>               |
| Module Location              | <ModuleLocation> <i>location</i> </ModuleLocation>         |
| SVC Module for               | <SVCMODULEFor> <i>n</i> </SVCMODULEFor>                    |

| Field title in online report | XML element                                            |
|------------------------------|--------------------------------------------------------|
| Loadlib DDNAME               | <DDName> <i>ddname</i> </DDName>                       |
| Load Library                 | <LoadLibrary> <i>dsn</i> </LoadLibrary>                |
| Program Group                | <ProgramGroup> <i>pgmgroup</i> </ProgramGroup>         |
| Subgroup                     | <SubGroup> <i>subgroup</i> </SubGroup>                 |
| Function                     | <Function> <i>function</i> </Function>                 |
|                              | <ESDInformationFor>                                    |
| ESD Information for          | <ModuleName< <i>name</i> >/ModuleName>                 |
|                              | <ESDInformation>                                       |
| External                     | <External> <i>external</i> </External>                 |
| Offset                       | <Offset> <i>n</i> </Offset>                            |
| Length                       | <Length> <i>n</i> </Length>                            |
| Start Addr                   | <StartAddr> <i>n</i> </StartAddr>                      |
| End Addr                     | <EndAddr> <i>n</i> </EndAddr>                          |
| Entry Points                 | <EntryPointCompiler>                                   |
| Compiled by                  | <CompilerLanguage> <i>language</i> </CompilerLanguage> |
|                              | <CompilerVersion> <i>version</i> </CompilerVersion>    |
| at                           | <TimeStamp> <i>yyyy/mm/dd hh:mm:ss</i> </TimeStamp>    |
|                              | <EntryPointOffset>                                     |
|                              | <HexOffset> <i>+n</i> </HexOffset>                     |
|                              | <EntryPointName< <i>name</i> >/EntryPointName>         |
|                              | </EntryPointOffset>                                    |
|                              | </EntryPointCompiler>                                  |
|                              | </ESDInformation>                                      |
|                              | </ESDInformationFor>                                   |
|                              | </LoadModuleAttributes>                                |

## S03 Load Module Summary

The LoadModuleSummary tag pair and sub-elements are repeated for each module in the report.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <LoadModuleSummary>                    |
| Module                       | <ModuleName> <i>name</i> </ModuleName> |
| Locn                         | <Location> <i>location</i> </Location> |
| Address                      | <Address> <i>n</i> </Address>          |
| Count                        | <Count> <i>n</i> </Count>              |
| Size(bytes)                  | <Size> <i>n</i> </Size>                |

| Field title in online report | XML element                                  |
|------------------------------|----------------------------------------------|
| Attributes                   | <Attributes> <i>attributes</i> </Attributes> |
| DDName                       | <DDName> <i>ddname</i> </DDName>             |
| LoadLibrary                  | <DatasetName> <i>dsn</i> </DatasetName>      |
|                              | </LoadModuleSummary>                         |

## S04 TCB Summary

The TCBSummary tag pair and sub-elements are repeated for each task in the report. These tag pairs and sub-elements are also nested, with the ATTACHED subtasks relative to the parent tasks that performed the ATTACH function.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <TCBSummary>                           |
| TCB_Name                     | <TCBName> <i>name-index</i> </TCBName> |
| Address                      | <Address> <i>n</i> </Address>          |
| Samples                      | <Samples> <i>n</i> </Samples>          |
| CPU Active                   | <CPUActive> <i>n%</i> </CPUActive>     |
| CPU WAIT                     | <CPUWait> <i>n%</i> </CPUWait>         |
| Queued                       | <Queued> <i>n%</i> </Queued>           |
|                              | </TCBSummary>                          |

## S05 Memory Usage Timeline

The UsageTimeline tag pair and sub-elements are repeated for each time interval.

| Field title in online report | XML element                                 |
|------------------------------|---------------------------------------------|
|                              | <UsageTimeline>                             |
| SEQN                         | <SequenceNumber> <i>n</i> </SequenceNumber> |
| Seconds                      | <Seconds> <i>n</i> </Seconds>               |
| Storage                      | <Storage> <i>nK</i> </Storage>              |
|                              | </UsageTimeline>                            |

## S06 Data Space Usage Timeline

The UsageTimeline tag pair and sub-elements are repeated for each time interval.

| Field title in online report | XML element                                 |
|------------------------------|---------------------------------------------|
|                              | <UsageTimeline>                             |
| SEQN                         | <SequenceNumber> <i>n</i> </SequenceNumber> |
| Seconds                      | <Seconds> <i>n</i> </Seconds>               |
| Storage                      | <Storage> <i>nK</i> </Storage>              |
|                              | </UsageTimeline>                            |

## S07 TCB Execution Summary

The TCBExecutionSummary tag pair and sub-elements are repeated for each task in the report. These tag pairs and sub-elements are also nested, with the ATTACHED subtasks relative to the parent tasks that performed the ATTACH function.

| Field title in online report | XML element                              |
|------------------------------|------------------------------------------|
|                              | <TCBExecutionSummary>                    |
| TCB_Name                     | <TCBName> <i>name-index</i> </TCBName>   |
| Seconds                      | <MeasuredCPU> <i>n</i> Sec</MeasuredCPU> |
| Storage                      | <TCBTotalCPU> <i>n</i> Sec</TCBTotalCPU> |
|                              | <FirstSample> <i>n</i> </FirstSample>    |
|                              | <LastSample> <i>n</i> </LastSample>      |
|                              | </TCBExecutionSummary>                   |

## S08 Processor Utilization Summary

The ProcessorUtilizationSummary tag pair and sub-elements are repeated for each CPU state in the report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <ProcessorUtilizationSummary>                   |
| Processor State              | <ProcessorState> <i>state</i> </ProcessorState> |
| Nbr of Samples               | <NumberOfSamples> <i>n</i> </NumberOfSamples>   |
| Percentage                   | <Percentage> <i>n</i> %</Percentage>            |
|                              | </ProcessorUtilizationSummary>                  |

## S09 Measurement Analysis

The DetailLine element data is limited to 200 characters. When the details are greater than 200 characters, multiple DetailLine elements are included.

| Field title in online report | XML element                                 |
|------------------------------|---------------------------------------------|
|                              | <MeasurementAnalysis>                       |
|                              | <Summary> <i>summary</i> </Summary>         |
|                              | <Reports> <i>list of reports</i> </Reports> |
|                              | <AnalysisDetail>                            |
|                              | <DetailLine> <i>details</i> </DetailLine>   |
|                              | </AnalysisDetail>                           |
|                              | </MeasurementAnalysis>                      |

## S10 Observation Session Messages

Table 14. S10 Observation Session Messages

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <Sysout>                                                      |
| Name                         | <SysoutName> <i>name</i> </SysoutName>                        |
| Description                  | <SysoutDescription> <i>description</i> </SysoutDescription>   |
|                              | <Message>                                                     |
| Name                         | <MessageId> <i>Id</i> </MessageId>                            |
|                              | <MessageSeverity> <i>severity</i> </MessageSeverity>          |
| Description                  | <MessageDescription> <i>description</i> </MessageDescription> |
|                              | <MessageLines>                                                |
| Description                  | <MessageText> <i>text</i> </MessageText>                      |
|                              | </MessageLines>                                               |
|                              | </Message>                                                    |
|                              | </Sysout>                                                     |

## C01 CPU Usage by Category

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
|                                 | <Category>                                                                       |
| Name                            | <CategoryName> <i>name</i> </CategoryName>                                       |
| Description                     | <CategoryDescription> <i>description</i> </CategoryDescription>                  |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </Category>                                                                      |
|                                 | <SQLRequest>                                                                     |
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <ProgramStatementFunction> <i>name(stmt)function</i> </ProgramStatementFunction> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SQLRequest>                                                                    |
|                                 | <LoadModule>                                                                     |



| Field title in online report    | XML element                                                           |
|---------------------------------|-----------------------------------------------------------------------|
| Name                            | <LoadModuleName> <i>name</i> </LoadModuleName>                        |
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>   |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </LoadModule>                                                         |
|                                 | <CSECT>                                                               |
| Name                            | <CSECTName> <i>name</i> </CSECTName>                                  |
| Description                     | <CSECTDescription> <i>description</i> </CSECTDescription>             |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </CSECT>                                                              |
|                                 | <NoSymAddressRange>                                                   |
| Name                            | <AddressRange> <i>address</i> </AddressRange>                         |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription> |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </NoSymAddressRange>                                                  |
|                                 | <DPAGroup>                                                            |
| Name                            | <DPAGroupName> <i>name</i> </DPAGroupName>                            |
| Description                     | <DPAGroupDescription> <i>description</i> </DPAGroupDescription>       |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </DPAGroup>                                                           |
|                                 | <SVCRoutine>                                                          |
| Name                            | <SVCIId> <i>svcid</i> </SVCIId>                                       |
| Description                     | <SVCDescription> <i>description</i> </SVCDescription>                 |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </SVCRoutine>                                                         |
|                                 | <DLICall>                                                             |
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                           |

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
| Description                     | <FunctionPCBProgramOffset> <i>FuncNameNameOffset</i> </FunctionPCBProgramOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DLICall>                                                                       |
|                                 | <File>                                                                           |
| Name                            | <DDName> <i>ddname</i> </DDName>                                                 |
| Description                     | <AccessMethod> <i>accessmethod</i> </AccessMethod>                               |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </File>                                                                          |
|                                 | <DMRequest>                                                                      |
| Name                            | <MacroName> <i>name</i> </MacroName>                                             |
| Description                     | <MacroLocation> <i>location</i> </MacroLocation>                                 |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DMRequest>                                                                     |
|                                 | <ADABASCommand>                                                                  |
| Name                            | <Command> <i>n</i> </Command>                                                    |
| Description                     | <CSECTOffset> <i>offset</i> </CSECTOffset>                                       |
|                                 | <Measurement> <i>n</i> </Measurement>                                            |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </ADABASCommand>                                                                 |

## C02 CPU Usage by Module

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                                         |
|------------------------------|---------------------------------------------------------------------|
|                              | <LoadModule>                                                        |
| Name                         | <LoadModuleName> <i>name</i> </LoadModuleName>                      |
| Description                  | <LoadModuleDescription> <i>description</i> </LoadModuleDescription> |
|                              | <Measurements> <i>n</i> </Measurements>                             |

| Field title in online report    | XML element                                                           |
|---------------------------------|-----------------------------------------------------------------------|
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | <CSECT>                                                               |
| Name                            | <CSECTName> <i>name</i> </CSECTName>                                  |
| Description                     | <CSECTDescription> <i>description</i> </CSECTDescription>             |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </CSECT>                                                              |
|                                 | </LoadModule>                                                         |
|                                 | <NoSymAddressRange>                                                   |
| Name                            | <AddressRange> <i>address</i> </AddressRange>                         |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription> |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </NoSymAddressRange>                                                  |

## C03 CPU Usage by Code Slice

The Code Slice tag pair and sub-elements are repeated for each code slice in the report.

| Field title in online report    | XML element                                              |
|---------------------------------|----------------------------------------------------------|
|                                 | <CodeSlice>                                              |
| Address                         | <CodeSliceAddress> <i>n</i> </CodeSliceAddress>          |
| Size Location                   | <SizeAndLocation> <i>n loc+offset</i> </SizeAndLocation> |
|                                 | <Measurements> <i>n</i> </Measurements>                  |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                            |
|                                 | <CodeAddress>                                            |
| Address                         | <Address> <i>address</i> </Address>                      |
| Location                        | <Location> <i>loc+offset</i> </Location>                 |
|                                 | <Measurements> <i>n</i> </Measurements>                  |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                            |
|                                 | </CodeAddress>                                           |
|                                 | </CodeSlice>                                             |

## C04 CPU Usage Timeline

The Interval tag pair and sub-elements are repeated for each interval reported.

| Field title in online report    | XML element                                 |
|---------------------------------|---------------------------------------------|
|                                 | <Interval>                                  |
| SEQN                            | <SequenceNumber> <i>n</i> </SequenceNumber> |
| Seconds                         | <Seconds> <i>n</i> </Seconds>               |
| Sig                             | <Significance> <i>n</i> %</Significance>    |
|                                 | <Measurements> <i>n</i> </Measurements>     |
| Percent of Interval *<br>10.00% | <Percent> <i>n</i> </Percent>               |
|                                 | </Interval>                                 |

## C05 CPU Usage by Task/Category

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
|                                 | <Task>                                                                           |
| Name                            | <TaskName> <i>name</i> </TaskName>                                               |
| Description                     | <TCBAddress>TCB= <i>address</i> </TCBAddress>                                    |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </Task>                                                                          |
|                                 | <Category>                                                                       |
| Name                            | <CategoryName> <i>name</i> </CategoryName>                                       |
| Description                     | <CategoryDescription> <i>description</i> </CategoryDescription>                  |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </Category>                                                                      |
|                                 | <SQLRequest>                                                                     |
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <ProgramStatementFunction> <i>name(stmt)function</i> </ProgramStatementFunction> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SQLRequest>                                                                    |

| Field title in online report    | XML element                                                           |
|---------------------------------|-----------------------------------------------------------------------|
|                                 | <LoadModule>                                                          |
| Name                            | <LoadModuleName> <i>name</i> </LoadModuleName>                        |
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>   |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </LoadModule>                                                         |
|                                 | <CSECT>                                                               |
| Name                            | <CSECTName> <i>name</i> </CSECTName>                                  |
| Description                     | <CSECTDescription> <i>description</i> </CSECTDescription>             |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </CSECT>                                                              |
|                                 | <NoSymAddressRange>                                                   |
| Name                            | <AddressRange> <i>address</i> </AddressRange>                         |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription> |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </NoSymAddressRange>                                                  |
|                                 | <DPAGroup>                                                            |
| Name                            | <DPAGroupName> <i>name</i> </DPAGroupName>                            |
| Description                     | <DPAGroupDescription> <i>description</i> </DPAGroupDescription>       |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </DPAGroup>                                                           |
|                                 | <SVCRoutine>                                                          |
| Name                            | <SVCIId> <i>svcid</i> </SVCIId>                                       |
| Description                     | <SVCDDescription> <i>description</i> </SVCDDescription>               |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </SVCRoutine>                                                         |
|                                 | <DLICall>                                                             |

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <FunctionPCBProgramOffset> <i>FuncNameNameOffset</i> </FunctionPCBProgramOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DLICall>                                                                       |
|                                 | <File>                                                                           |
| Name                            | <DDName> <i>ddname</i> </DDName>                                                 |
| Description                     | <AccessMethod> <i>accessmethod</i> </AccessMethod>                               |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </File>                                                                          |
|                                 | <DMRequest>                                                                      |
| Name                            | <MacroName> <i>name</i> </MacroName>                                             |
| Description                     | <MacroLocation> <i>location</i> </MacroLocation>                                 |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DMRequest>                                                                     |
|                                 | <ADABASCommand>                                                                  |
| Name                            | <Command> <i>n</i> </Command>                                                    |
| Description                     | <CSECTOffset> <i>offset</i> </CSECTOffset>                                       |
|                                 | <Measurement> <i>n</i> </Measurement>                                            |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </ADABASCommand>                                                                 |

## C06 CPU Usage by Task/Module

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <Task>                                  |
| Name                         | <TaskName> <i>name</i> </TaskName>      |
| Description                  | <TCBAddress>TCB= <i>n</i> </TCBAddress> |
|                              | <Measurements> <i>n</i> </Measurements> |

| Field title in online report    | XML element                                                           |
|---------------------------------|-----------------------------------------------------------------------|
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </Task>                                                               |
|                                 | <LoadModule>                                                          |
| Name                            | <LoadModuleName> <i>name</i> </LoadModuleName>                        |
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>   |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </LoadModule>                                                         |
|                                 | <CSECT>                                                               |
| Name                            | <CSECTName> <i>name</i> </CSECTName>                                  |
| Description                     | <CSECTDescription> <i>description</i> </CSECTDescription>             |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </CSECT>                                                              |
|                                 | <NoSymAddressRange>                                                   |
| Name                            | <AddressRange> <i>address</i> </AddressRange>                         |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription> |
|                                 | <Measurements> <i>n</i> </Measurements>                               |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                 | </NoSymAddressRange>                                                  |

## C07 CPU Usage by Procedure

| Field title in online report    | XML element                                                     |
|---------------------------------|-----------------------------------------------------------------|
|                                 | <SourceProgramProcedure>                                        |
| Program                         | <Program> <i>name</i> </Program>                                |
| Procedure Name                  | <ProcedureName> <i>name</i> </ProcedureName>                    |
|                                 | <Measurements> <i>n</i> </Measurements>                         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                   |
|                                 | </SourceProgramProcedure>                                       |
|                                 | <Category>                                                      |
| Program                         | <CategoryName> <i>name</i> </CategoryName>                      |
| Procedure Name                  | <CategoryDescription> <i>description</i> </CategoryDescription> |

| Field title in online report    | XML element                             |
|---------------------------------|-----------------------------------------|
|                                 | <Measurements> <i>n</i> </Measurements> |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>           |
|                                 | </Category>                             |

## C08 CPU Usage Referred Attribution

| Field title in online report    | XML element                                                            |
|---------------------------------|------------------------------------------------------------------------|
|                                 | <LoadModule>                                                           |
| Name                            | <LoadModuleName> <i>name</i> </LoadModuleName>                         |
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>    |
|                                 | <Measurements> <i>n</i> </Measurements>                                |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                          |
|                                 | <CSECT>                                                                |
| Name                            | <CSECTName> <i>name</i> </CSECTName>                                   |
| Description                     | <CSECTDescription> <i>description</i> </CSECTDescription>              |
|                                 | <Measurements> <i>n</i> </Measurements>                                |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                          |
|                                 | <AttributionOffset>                                                    |
| Name                            | <Offset> <i>n</i> </Offset>                                            |
| Description                     | <OffsetInCSECT>Attribution Offset in <i>name</i> </OffsetInCSECT>      |
|                                 | <Measurements> <i>n</i> </Measurements>                                |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                          |
|                                 | <SourceStatements>                                                     |
| Source Statement in:            | <ProcedureName> <i>n</i> </ProcedureName>                              |
|                                 | <SourceStatement> <i>source</i> </SourceStatement>                     |
|                                 | </SourceStatements>                                                    |
|                                 | </AttributionOffset>                                                   |
|                                 | </CSECT>                                                               |
|                                 | </LoadModule>                                                          |
|                                 | <NoSymAddressRange>                                                    |
| Name                            | <AddressRange> <i>address</i> </AddressRange>                          |
| Description                     | <AddressRangeDescription>Unresolved Address </AddressRangeDescription> |
|                                 | <Measurements> <i>n</i> </Measurements>                                |



| Field title in online report    | XML element                   |
|---------------------------------|-------------------------------|
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent> |
|                                 | </NoSymAddressRange>          |

## C09 CPU Usage by PSW/Object Code

| Field title in online report    | XML element                                                          |
|---------------------------------|----------------------------------------------------------------------|
|                                 | <PSW Location>                                                       |
| Address                         | <Address> <i>n</i> </Address>                                        |
| Module                          | <ModuleName> <i>name</i> </ModuleName>                               |
| AM                              | <AddressingMode> <i>n</i> </AddressingMode>                          |
| S/P                             | <SVCNumberorStateStorageKey> <i>aa</i> </SVCNumberorStateStorageKey> |
| AS                              | <AddressSpaceMode> <i>mode</i> </AddressSpaceMode>                   |
| ASID                            | <ASID> <i>asid</i> </ASID>                                           |
|                                 | <Measurements> <i>n</i> </Measurements>                              |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                        |
|                                 | <MachineInstruction>                                                 |
|                                 | <ModuleOffset> <i>name+offset</i> </ModuleOffset>                    |
|                                 | <ObjectCode> <i>object code</i> </ObjectCode>                        |
|                                 | <DisassembledCode> <i>object code</i> </DisassembledCode>            |
|                                 | </MachineInstruction>                                                |
|                                 | </PSWLocation>                                                       |

## C10 CPU Usage by Natural Program

| Field title in online report    | XML element                                          |
|---------------------------------|------------------------------------------------------|
|                                 | <NaturalProgram>                                     |
| Program                         | <ProgramName> <i>name</i> </ProgramName>             |
| Library                         | <Library> <i>library</i> </Library>                  |
|                                 | <Measurements> <i>n</i> </Measurements>              |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                        |
|                                 | <NaturalStatement>                                   |
| Program                         | <StatementNumberKey> <i>n</i> </StatementNumberKey>  |
| Library                         | <StatementNumber> <i>stmt # n</i> </StatementNumber> |
|                                 | <Measurements> <i>n</i> </Measurements>              |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                        |

| Field title in online report | XML element         |
|------------------------------|---------------------|
|                              | </NaturalStatement> |
|                              | </NaturalProgram>   |

## W01 WAIT Time by Task/Category

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report     | XML element                                                                      |
|----------------------------------|----------------------------------------------------------------------------------|
|                                  | <Task>                                                                           |
| Name                             | <TaskName> <i>name</i> </TaskName>                                               |
| Description                      | <TCBAddress>TCB= <i>n</i> </TCBAddress>                                          |
|                                  | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT * 10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                  | </Task>                                                                          |
|                                  | <Category>                                                                       |
| Name                             | <CategoryName> <i>name</i> </CategoryName>                                       |
| Description                      | <CategoryDescription> <i>description</i> </CategoryDescription>                  |
|                                  | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT * 10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                  | </Category>                                                                      |
|                                  | <SQLRequest>                                                                     |
| Name                             | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                      | <ProgramStatementFunction> <i>name(stmt)function</i> </ProgramStatementFunction> |
|                                  | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT * 10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                  | </SQLRequest>                                                                    |
|                                  | <LoadModule>                                                                     |
| Name                             | <LoadModuleName> <i>name</i> </LoadModuleName>                                   |
| Description                      | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>              |
|                                  | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT * 10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                  | </LoadModule>                                                                    |
|                                  | <CSECT>                                                                          |

| Field title in online report        | XML element                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------|
| Name                                | <CSECTName> <i>name</i> </CSECTName>                                             |
| Description                         | <CSECTDescription> <i>description</i> </CSECTDescription>                        |
|                                     | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                     | </CSECT>                                                                         |
|                                     | <NoSymAddressRange>                                                              |
| Name                                | <AddressRange> <i>address</i> </AddressRange>                                    |
| Description                         | <AddressRangeDescription>Unresolved Address</AddressRangeDescription>            |
|                                     | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                     | </NoSymAddressRange>                                                             |
|                                     | <DPAGroup>                                                                       |
| Name                                | <DPAGroupName> <i>name</i> </DPAGroupName>                                       |
| Description                         | <DPAGroupDescription> <i>description</i> </DPAGroupDescription>                  |
|                                     | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                     | </DPAGroup>                                                                      |
|                                     | <SVCRoutine>                                                                     |
| Name                                | <SVCIId> <i>svcid</i> </SVCIId>                                                  |
| Description                         | <SVCDDescription> <i>description</i> </SVCDDescription>                          |
|                                     | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                     | </SVCRoutine>                                                                    |
|                                     | <DLICall>                                                                        |
| Name                                | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                         | <FunctionPCBProgramOffset> <i>FuncNameNameOffset</i> </FunctionPCBProgramOffset> |
|                                     | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                     | </DLICall>                                                                       |
|                                     | <File>                                                                           |
| Name                                | <DDName> <i>ddname</i> </DDName>                                                 |

| Field title in online report        | XML element                                        |
|-------------------------------------|----------------------------------------------------|
| Description                         | <AccessMethod> <i>accessmethod</i> </AccessMethod> |
|                                     | <Measurements> <i>n</i> </Measurements>            |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                      |
|                                     | </File>                                            |
|                                     | <DMRequest>                                        |
| Name                                | <MacroName> <i>name</i> </MacroName>               |
| Description                         | <MacroLocation> <i>location</i> </MacroLocation>   |
|                                     | <Measurements> <i>n</i> </Measurements>            |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                      |
|                                     | </DMRequest>                                       |
|                                     | <ADABASCommand>                                    |
| Name                                | <Command> <i>n</i> </Command>                      |
| Description                         | <CSECTOffset> <i>offset</i> </CSECTOffset>         |
|                                     | <Measurement> <i>n</i> </Measurement>              |
| Percent of CPU Time *<br>10.00%     | <Percent> <i>n</i> </Percent>                      |
|                                     | </ADABASCommand>                                   |

## W02 WAIT Time by Task/Module

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report        | XML element                                                         |
|-------------------------------------|---------------------------------------------------------------------|
|                                     | <Task>                                                              |
| Name                                | <TaskName> <i>name</i> </TaskName>                                  |
| Description                         | <TCBAddress>TCB= <i>n</i> </TCBAddress>                             |
|                                     | <Measurements> <i>n</i> </Measurements>                             |
| Percent of TIME in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                       |
|                                     | </Task>                                                             |
|                                     | <LoadModule>                                                        |
| Name                                | <LoadModuleName> <i>name</i> </LoadModuleName>                      |
| Description                         | <LoadModuleDescription> <i>description</i> </LoadModuleDescription> |
|                                     | <Measurements> <i>n</i> </Measurements>                             |
| Percent of TIME in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                       |

| Field title in online report        | XML element                                                           |
|-------------------------------------|-----------------------------------------------------------------------|
|                                     | </LoadModule>                                                         |
|                                     | <CSECT>                                                               |
| Name                                | <CSECTName> <i>name</i> </CSECTName>                                  |
| Description                         | <CSECTDescription> <i>description</i> </CSECTDescription>             |
|                                     | <Measurements> <i>n</i> </Measurements>                               |
| Percent of TIME in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                     | </CSECT>                                                              |
|                                     | <NoSymAddressRange>                                                   |
| Name                                | <AddressRange> <i>address</i> </AddressRange>                         |
| Description                         | <AddressRangeDescription>Unresolved Address</AddressRangeDescription> |
|                                     | <Measurements> <i>n</i> </Measurements>                               |
| Percent of TIME in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                         |
|                                     | </NoSymAddressRange>                                                  |

### W03 WAIT Referred Attribution by Task

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report        | XML element                                                         |
|-------------------------------------|---------------------------------------------------------------------|
|                                     | <Task>                                                              |
| Name                                | <TaskName> <i>name</i> </TaskName>                                  |
| Description                         | <TCBAddress>TCB= <i>n</i> </TCBAddress>                             |
|                                     | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                       |
|                                     | </Task>                                                             |
|                                     | <LoadModule>                                                        |
| Name                                | <LoadModuleName> <i>name</i> </LoadModuleName>                      |
| Description                         | <LoadModuleDescription> <i>description</i> </LoadModuleDescription> |
|                                     | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                       |
|                                     | <CSECT>                                                             |
| Name                                | <CSECTName> <i>name</i> </CSECTName>                                |
| Description                         | <CSECTDescription> <i>description</i> </CSECTDescription>           |

| Field title in online report        | XML element                                                            |
|-------------------------------------|------------------------------------------------------------------------|
|                                     | <Measurements> <i>n</i> </Measurements>                                |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                          |
|                                     | <AttributionOffset>                                                    |
| Name                                | <Offset> <i>n</i> </Offset>                                            |
| Description                         | <OffsetInCSECT>Attribution Offset in <i>csectname</i> </OffsetInCSECT> |
|                                     | <Measurements> <i>n</i> </Measurements>                                |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>                                          |
|                                     | <SourceStatements>                                                     |
| Source Statement in:                | <ProcedureName> <i>name</i> </ProcedureName>                           |
|                                     | <SourceStatement> <i>source</i> </SourceStatement>                     |
|                                     | </SourceStatements>                                                    |
|                                     | </AttributionOffset>                                                   |
|                                     | </CSECT>                                                               |
|                                     | </LoadModule>                                                          |

## W04 WAIT Time by Task ENQ/RESERVE

| Field title in online report        | XML element                             |
|-------------------------------------|-----------------------------------------|
|                                     | <Task>                                  |
| Name                                | <TaskName> <i>name</i> </TaskName>      |
| Description                         | <TCBAddress>TCB= <i>n</i> </TCBAddress> |
|                                     | <Measurements> <i>n</i> </Measurements> |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>           |
|                                     | <Enqueue>                               |
| Name                                | <QName> <i>name</i> </QName>            |
| Description                         | <RName> <i>name</i> </RName>            |
|                                     | <Measurements> <i>n</i> </Measurements> |
| Percent of Time in WAIT *<br>10.00% | <Percent> <i>n</i> </Percent>           |
|                                     | </Enqueue>                              |
|                                     | </Task>                                 |

## W05 WAIT Time by Tape DDNAME

| Field title in online report | XML element   |
|------------------------------|---------------|
|                              | <WaitForTape> |

| Field title in online report     | XML element                    |
|----------------------------------|--------------------------------|
| DDNAME                           | <DDName>ddname</DDName>        |
| Device                           | <Device>description</Device>   |
|                                  | <Measurements>n</Measurements> |
| Percent of Time in WAIT * 10.00% | <Percent>n</Percent>           |
|                                  | </WaitForTape>                 |

## D01 DASD Usage Time by Device

| Field title in online report | XML element                          |
|------------------------------|--------------------------------------|
|                              | <ByVolser>                           |
| Volume>Cyl                   | <Volser>volser</Volser>              |
| Unit-Dev>DD                  | <UnitDevice>unit-device</UnitDevice> |
|                              | <Measurements>n</Measurements>       |
| Percent of Time * 10.00%     | <Percent>n</Percent>                 |
|                              | <ByCylinder>                         |
| Volume>Cyl                   | <Cylinder>Cyl_n</Cylinder>           |
| Unit-Dev>DD                  | <DDName>ddname</DDName>              |
|                              | <Measurements>n</Measurements>       |
| Percent of Time * 10.00%     | <Percent>n</Percent>                 |
|                              | </ByCylinder>                        |
|                              | </ByVolser>                          |

## D02 DASD Usage Time by DDNAME

| Field title in online report | XML element                          |
|------------------------------|--------------------------------------|
|                              | <ByDDName>                           |
| DDNAME>Cyl                   | <DDName>ddname</DDName>              |
| Volume>Unit                  | <Volser>volser</Volser>              |
|                              | <Measurements>n</Measurements>       |
| Percent of Time * 10.00%     | <Percent>n</Percent>                 |
|                              | <ByCylinder>                         |
| DDNAME>Cyl                   | <Cylinder>Cyl_n</Cylinder>           |
| Volume>Unit                  | <UnitDevice>unit-device</UnitDevice> |
|                              | <Measurements>n</Measurements>       |
| Percent of Time * 10.00%     | <Percent>n</Percent>                 |
|                              | </ByCylinder>                        |
|                              | </ByDDName>                          |

## D03 DASD Usage Time by Dataset

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <ByDataset>                             |
| Dataset Name>DDName          | <DatasetName> <i>dsn</i> </DatasetName> |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | <ByDDName>                              |
| Dataset Name>DDName          | <DDName> <i>ddname</i> </DDName>        |
|                              | <Volser> <i>volser</i> </Volser>        |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | </ByDDName>                             |
|                              | </ByDataset>                            |

## D04 Dataset Attributes

| Field title in online report | XML element                                       |
|------------------------------|---------------------------------------------------|
|                              | <DatasetAttributes>                               |
|                              | <FileType> <i>filetype</i> </FileType>            |
|                              | <DDName> <i>ddname</i> </DDName>                  |
| OPENed at                    | <OpenTime> <i>hh:mm:ss.ss</i> </OpenTime>         |
|                              | <OpenDate> <i>Day Month dd yyyy</i> </OpenDate>   |
|                              | <FileDefinition>                                  |
| DDNAME                       | <DDName> <i>ddname</i> </DDName>                  |
| Open Intent                  | <OpenIntent> <i>intent</i> </OpenIntent>          |
| Dataset Name                 | <DatasetName> <i>dsn</i> </DatasetName>           |
|                              | <ManagementClass> <i>class</i> </ManagementClass> |
|                              | <StorageClass> <i>class</i> </StorageClass>       |
|                              | <DataClass> <i>class</i> </DataClass>             |
| Device Type                  | <DeviceType> <i>type</i> </DeviceType>            |
| Nbr of Extents               | <NbrOfExtents> <i>n</i> </NbrOfExtents>           |
| Dataset Org                  | <DatasetOrg> <i>dsorg</i> </DatasetOrg>           |
| Block Size(BLKSIZE)          | <BlockSize> <i>n</i> </BlockSize>                 |
| RECFM                        | <RecordFormat> <i>rfm</i> </RecordFormat>         |
| Record Size (LRECL)          | <RecordSize> <i>n</i> </RecordSize>               |
| Data Buffers                 | <DataBuffers> <i>n</i> </DataBuffers>             |
|                              | <VOLERS>                                          |



| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| Volume Serial                | <Volser>volser</Volser>                              |
|                              | </VOLSERS>                                           |
|                              | </FileDefinition>                                    |
|                              | <VSAMDataComponent>                                  |
| DDNAME                       | <DDName>ddname</DDName>                              |
| Open Intent                  | <OpenIntent>intent</OpenIntent>                      |
| Dataset Name                 | <DatasetName>dsn</DatasetName>                       |
|                              | <ManagementClass>class</ManagementClass>             |
|                              | <StorageClass>class</StorageClass>                   |
|                              | <DataClass>class</DataClass>                         |
| Device Type                  | <DeviceType>type</DeviceType>                        |
| % Free Bytes in CI           | <PercentFreeBytesInCI>n%</PercentFreeBytesInCI>      |
| CI Splits (Initial)          | <CISplitsInitial>n</CISplitsInitial>                 |
| CI Splits (Last)             | <CISplitsLast>n</CISplitsLast>                       |
| CI Size                      | <CISize>n</CISize>                                   |
| CA Splits (Initial)          | <CASplitsInitial>n</CASplitsInitial>                 |
| CA Splits (Last)             | <CASplitsLast>n</CASplitsLast>                       |
| Record Size (LRECL)          | <RecordSize>n</RecordSize>                           |
| Logical Records (Initial)    | <RecordsInitial>n</RecordsInitial>                   |
| Logical Records (Last)       | <RecordsLast>n</RecordsLast>                         |
| Number of Extents            | <NbrOfExtents>n</NbrOfExtents>                       |
| Deleted Records (Initial)    | <DeletedRecordsInitial>n</DeletedRecordsInitial>     |
| Deleted Records (Last)       | <DeletedRecordsLast>n</DeletedRecordsLast>           |
| SHAREOPTIONS                 | <ShareOptions>(n n)</ShareOptions>                   |
| Insrted Records (Initial)    | <InsertedRecordsInitial>n</InsertedRecordsInitial>   |
| Insrted Records (Last)       | <InsertedRecordsLast>n</InsertedRecordsLast>         |
| Organization                 | <Organization>org</Organization>                     |
| Retrvd Records (Initial)     | <RetrievedRecordsInitial>n</RetrievedRecordsInitial> |
| Retrvd Records (Last)        | <RetrievedRecordsLast>n</RetrievedRecordsLast>       |
| CI's per CA                  | <CIsPerCa>n</CIsPerCa>                               |
| Updated Records (Initial)    | <UpdatedRecordsInitial>n</UpdatedRecordsInitial>     |
| Updated Records (Last)       | <UpdatedRecordsLast>n</UpdatedRecordsLast>           |
| Free CI's per CA             | <FreeCIsPerCa>n</FreeCIsPerCa>                       |
| Bytes Free Space (Initial)   | <BytesFreeSpaceInitial>n</BytesFreeSpaceInitial>     |
| Bytes Free Space (Last)      | <BytesFreeSpaceLast>n</BytesFreeSpaceLast>           |

| Field title in online report | XML element                                        |
|------------------------------|----------------------------------------------------|
| Free Bytes per CI            | <FreeBytesPerCI>n</FreeBytesPerCI>                 |
| Number of EXCPs (Initial)    | <NumberOfEXCPsInitial>n</NumberOfEXCPsInitial>     |
| Number of EXCPs (Last)       | <NumberOfEXCPsLast>n</NumberOfEXCPsLast>           |
| % Free CIs in CA             | <PercentFreeCisInCA>n%</PercentFreeCisInCA>        |
| Strings                      | <Strings>n</Strings>                               |
| String Waits                 | <StringWaits>n</StringWaits>                       |
| String Waist HWM             | <StringWaitsHWM>n</StringWaitsHWM>                 |
| Data Buffers                 | <DataBuffers>n</DataBuffers>                       |
| Index Buffers                | <IndexBuffers>n</IndexBuffers>                     |
|                              | <VOLSERS>                                          |
| Volume Serial                | <Volser>volser</Volser>                            |
|                              | </VOLSERS>                                         |
|                              | </VsamDataComponent>                               |
|                              | <VSAMIndexComponent>                               |
| Dataset Name                 | <DatasetName>dsn</DatasetName>                     |
|                              | <ManagementClass>class</ManagementClass>           |
|                              | <StorageClass>class</StorageClass>                 |
|                              | <DataClass>class</DataClass>                       |
| Device Type                  | <DeviceType>type</DeviceType>                      |
| % Free Bytes in CI           | <PercentFreeBytesInCI>n%</PercentFreeBytesInCI>    |
| CI Splits (Initial)          | <CISplitsInitial>n</CISplitsInitial>               |
| CI Splits (Last)             | <CISplitsLast>n</CISplitsLast>                     |
| CI Size                      | <CISize>n</CISize>                                 |
| CA Splits (Initial)          | <CASplitsInitial>n</CASplitsInitial>               |
| CA Splits (Last)             | <CASplitsLast>n</CASplitsLast>                     |
| Record Size (LRECL)          | <RecordSize>n</RecordSize>                         |
| Logical Records (Initial)    | <RecordsInitial>n</RecordsInitial>                 |
| Logical Records (Last)       | <RecordsLast>n</RecordsLast>                       |
| Number of Extents            | <NbrOfExtents>n</NbrOfExtents>                     |
| Deleted Records (Initial)    | <DeletedRecordsInitial>n</DeletedRecordsInitial>   |
| Deleted Records (Last)       | <DeletedRecordsLast>n</DeletedRecordsLast>         |
| SHAREOPTIONS                 | <ShareOptions>(n n)</ShareOptions>                 |
| Insrted Records (Initial)    | <InsertedRecordsInitial>n</InsertedRecordsInitial> |
| Insrted Records (Last)       | <InsertedRecordsLast>n</InsertedRecordsLastl>      |
| Organization                 | <Organization>org</Organization>                   |

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| Retrved Records (Initial)    | <RetrievedRecordsInitial>n</RetrievedRecordsInitial> |
| Retrved Records (Last)       | <RetrievedRecordsLast>n</RetrievedRecordsLast>       |
| CIs per CA                   | <CIsPerCa>n</CIsPerCa>                               |
| Updated Records (Initial)    | <UpdatedRecordsInitial>n<UpdatedRecordsInitial>      |
| Updated Records (Last)       | <UpdatedRecordsLast>n<UpdatedRecordsLast>            |
| Free CIs per CA              | <FreeCIsPerCa>n</FreeCIsPerCa>                       |
| Bytes Free Space (Initial)   | <BytesFreeSpaceInitial>n</BytesFreeSpaceInitial>     |
| Bytes Free Space (Last)      | <BytesFreeSpaceLast>n</BytesFreeSpaceLast>           |
| Free Bytes per CI            | <FreeBytesPerCI>n</FreeBytesPerCI>                   |
| Number of EXCPs (Initial)    | <NumberOfEXCPsInitial>n</NumberOfEXCPsInitial>       |
| Number of EXCPs (Last)       | <NumberOfEXCPsLast>n</NumberOfEXCPsLast>             |
| % Free CIs in CA             | <PercentFreeCisInCA>n%</PercentFreeCisInCA>          |
|                              | <VOLSER>                                             |
| Volume Serial                | <Volser>volser</Volser>                              |
|                              | </VOLSER>                                            |
|                              | </VsamIndexComponent>                                |
|                              | <DasdPerformance>                                    |
| Avg Response Time            | <AvgResponseTime>n</AvgResponseTime>                 |
| Avg Pending Time             | <AvgPendingTime>n</AvgPendingTime>                   |
| Avg Disconnect Time          | <AvgDisconnectTime>n</AvgDisconnectTime>             |
| Avg Connect Time             | <AvgConnectTime>n</AvgConnectTime>                   |
| Avg Queued Time              | <AvgQueuedTime>n</AvgQueuedTime>                     |
| Total I/Os                   | <TotalIOs>n</TotalIOs>                               |
| Cache Candidates             | <CacheCandidates>n</CacheCandidates>                 |
| Cache Hits                   | <CacheHits>n</CacheHits>                             |
| Write Candidates             | <WriteCandidates>n</WriteCandidates>                 |
| Write Hits                   | <WriteHits>n</WriteHits>                             |
|                              | </DasdPerformance>                                   |
| Concatenated Datasets        | <ConcatenatedDatasets>                               |
|                              | <DSName>dsn</DSName> Repeated as necessary           |
|                              | </ConcatenatedDatasets>                              |
|                              | </DatasetAttributes>                                 |

## D05 DASD EXCP Summary

| Field title in online report | XML element                                   |
|------------------------------|-----------------------------------------------|
|                              | <DASDEXCPSummary>                             |
| DDNAME                       | <DDName>ddname</DDName>                       |
| Type                         | <Type>type</Type>                             |
| Concat                       | <ConcatenationNumber>+n</ConcatenationNumber> |
| At Start                     | <StartEXCPs>n</StartEXCPs>                    |
| At End                       | <EndEXCPs>n</EndEXCPs>                        |
| During Measurement           | <DifferenceEXCPs>n</DifferenceEXCPs>          |
|                              | </DASDEXCPSummary>                            |

## D06 DASD VSAM Statistics

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <VSAMStatistics>                       |
| DDNAME                       | <DDName>ddname</DDName>                |
| Retrvd                       | <RecordsRetrieved>n</RecordsRetrieved> |
| Added                        | <RecordsAdded>+n</RecordsAdded>        |
| Insrtd                       | <RecordsInserted>n</RecordsInserted>   |
| Deletd                       | <RecordsDeleted>n</RecordsDeleted>     |
| Updatd                       | <RecordsUpdated>n</RecordsUpdated>     |
| EXCPs                        | <EXCPs>n</EXCPs>                       |
| FreeSpc                      | <ChangeFreeSpace>+n</ChangeFreeSpace>  |
| CISplts                      | <ChangeCISplits>+n</ChangeCISplits>    |
| CASplts                      | <ChangeCASplits>+n</ChangeCASplits>    |
| Str Wt                       | <StringWaits>n</StringWaits>           |
| StrHWM                       | <StringWaitsHWM>n</StringWaitsHWM> >   |
|                              | </VSAMStatistics>                      |

## D07 DASD Activity Timeline

| Field title in online report | XML element            |
|------------------------------|------------------------|
|                              | <DASDActivityTimeline> |
|                              | <Samples>n</Samples>   |
|                              | <Duration>n</Duration> |
| DDN                          | <DDN>ddname</DDN>      |
| Type                         | <Type>type</Type>      |
| Vol                          | <Vol>volser</Vol>      |

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
| Unit                         | <Unit> <i>unit</i> </Unit>                              |
|                              | <Intervals>                                             |
|                              | <IntervalPct> <i>n</i> </IntervalPct> Repeated 50 times |
|                              | </Interval>                                             |
|                              | </DASDActivityTimeline>                                 |

## D08 DASD I/O Wait Time

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                                         |
|------------------------------|---------------------------------------------------------------------|
|                              | <ByDDName>                                                          |
| Name                         | <DDName> <i>ddname</i> </DDName>                                    |
| Description                  | <Volser> <i>volser</i> </Volser>                                    |
|                              | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                       |
|                              | <SVCRoutine>                                                        |
| Name                         | <SVCIId> <i>svcid</i> </SVCIId>                                     |
| Description                  | <SVCDescription> <i>description</i> </SVCDescription>               |
|                              | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                       |
|                              | </SVCRoutine>                                                       |
|                              | <DMRequest>                                                         |
| Name                         | <MacroName> <i>name</i> </MacroName>                                |
| Description                  | <MacroLocation> <i>location</i> </MacroLocation>                    |
|                              | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                       |
|                              | </DMRequest>                                                        |
|                              | <LoadModule>                                                        |
| Name                         | <LoadModuleName> <i>name</i> </LoadModuleName>                      |
| Description                  | <LoadModuleDescription> <i>description</i> </LoadModuleDescription> |
|                              | <Measurements> <i>n</i> </Measurements>                             |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                       |
|                              | </LoadModule>                                                       |
|                              | <CSECT>                                                             |
| Name                         | <CSECTName> <i>name</i> </CSECTName>                                |

| Field title in online report | XML element                                               |
|------------------------------|-----------------------------------------------------------|
| Description                  | <CSECTDescription> <i>description</i> </CSECTDescription> |
|                              | <Measurements> <i>n</i> </Measurements>                   |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                             |
|                              | </CSECT>                                                  |
|                              | </ByDDName>                                               |

## D09 VSAM Buffer Pool Usage

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <LSRPool>                                                     |
| LSR Pool                     | <PoolNumber> <i>n</i> </PoolNumber>                           |
| Type (Data/Index)            | <Type> <i>type</i> </Type>                                    |
| Reads (Initial)              | <ReadsInitial> <i>n</i> </ReadsInitial>                       |
| Reads (Last)                 | <ReadsLast> <i>n</i> </ReadsLast>                             |
| Reads (Difference)           | <ReadsDifference> <i>n</i> </ReadsDifference>                 |
| Buffer Size                  | <BufferSize> <i>n</i> </BufferSize>                           |
| Reads Avoided (Initial)      | <ReadsAvoidedInitial> <i>n</i> </ReadsAvoidedInitial>         |
| Reads Avoided (Last)         | <ReadsAvoidedLast> <i>n</i> </ReadsAvoidedLast>               |
| Reads Avoided (Difference)   | <ReadsAvoidedDifference> <i>n</i> </ReadsAvoidedDifference>   |
| Buffers                      | <Buffers> <i>n</i> </Buffers>                                 |
| User Writes (Initial)        | <UserWritesInitial> <i>n</i> </UserWritesInitial>             |
| User Writes (Last)           | <UserWritesLast> <i>n</i> </UserWritesLast>                   |
| User Writes (Difference)     | <UserWritesDifference> <i>n</i> </UserWritesDifference>       |
| Hiperspace Buffers           | <HiperspaceBuffers> <i>n</i> </HiperspaceBuffers>             |
| Non-user Writes (Initial)    | <NonUserWritesInitial> <i>n</i> </NonUserWritesInitial>       |
| Non-user Writes (Last)       | <NonUserWritesLast> <i>n</i> </NonUserWritesLast>             |
| Non-user Writes (Difference) | <NonUserWritesDifference> <i>n</i> </NonUserWritesDifference> |
|                              | </LSRPool>                                                    |

## G01 Coupling Facility Statistics

| Field title in online report | XML element                                |
|------------------------------|--------------------------------------------|
|                              | <CouplingFacilityStatistics>               |
| Facility Summary             | <CFName> <i>name</i> </CFName>             |
| CF Storage                   | <CFStorage> <i>nK</i> </CFStorage>         |
| CF Storage Used              | <CFStorageUsed> <i>nK</i> </CFStorageUsed> |

| Field title in online report    | XML element                                                      |
|---------------------------------|------------------------------------------------------------------|
| CF Dump Storage                 | <CFDumpStorage>nK</CFDumpStorage>                                |
| CF Storage for Structures       | <CFStorageForStructures>nK</CFStorageForStructures>              |
| Subchannel Contention Count     | <SubchannelContentionCount>n</SubchannelContentionCount>         |
| Subchannel Contention Time uSec | <SubchannelContentionCountuSec>n</SubchannelContentionCountuSec> |
| Failed Request Count            | <FailedRequestCount>n</FailedRequestCount>                       |
| Failed Request Time uSec        | <FailedRequestTimeuSec>n</FailedRequestTimeuSec>                 |
| Number of Processors            | <NumberOfProcessors>n</NumberOfProcessors>                       |
| Processor Utilization           | <ProcessorUtilization>n%</ProcessorUtilization>                  |
|                                 | </CouplingFacilityStatistics>                                    |

## G02 Coupling Facility Mean Service Times

| Field title in online report | XML element                                                  |
|------------------------------|--------------------------------------------------------------|
|                              | <CouplingFacilityServiceTimes>                               |
| Name                         | <CFName>name</CFName> or <StructureName>name</StructureName> |
| Number of Requests (Sync)    | <RequestsSync>n</RequestsSync>                               |
| Number of Requests (Async)   | <RequestsAsynch>n</RequestsAsynch>                           |
| Number of Requests (Queued)  | <RequestsQueued>n</RequestsQueued>                           |
| Number of Requests (Delay)   | <RequestsDelay>n</RequestsDelay>                             |
| Mean uSeconds (Sync)         | <SecondsSync>n</SecondsSync>                                 |
| Mean uSeconds (Async)        | <SecondsAsynch>n</SecondsAsynch>                             |
| Mean uSeconds (Queued)       | <SecondsQueued>n</SecondsQueued>                             |
| Mean uSeconds (Delay)        | <SecondsDelay>n</SecondsDelay>                               |
|                              | </CouplingFacilityServiceTimes>                              |

## G03 Coupling Facility Total Service Times

| Field title in online report | XML element                                                  |
|------------------------------|--------------------------------------------------------------|
|                              | <CouplingFacilityServiceTimes>                               |
| Name                         | <CFName>name</CFName> or <StructureName>name</StructureName> |
| Number of Requests (Sync)    | <RequestsSync>n</RequestsSync>                               |
| Number of Requests (Async)   | <RequestsAsynch>n</RequestsAsynch>                           |

| Field title in online report | XML element                                 |
|------------------------------|---------------------------------------------|
| Number of Requests (Queued)  | <RequestsQueued> <i>n</i> </RequestsQueued> |
| Number of Requests (Delay)   | <RequestsDelay> <i>n</i> </RequestsDelay>   |
| Total uSeconds (Sync)        | <SecondsSync> <i>n</i> </SecondsSync>       |
| Total uSeconds (Async)       | <SecondsAsynch> <i>n</i> </SecondsAsynch>   |
| Total uSeconds (Queued)      | <SecondsQueued> <i>n</i> </SecondsQueued>   |
| Total uSeconds (Delay)       | <SecondsDelay> <i>n</i> </SecondsDelay>     |
|                              | </CouplingFacilityServiceTimes>             |

## K01 CPU SRB Usage by SRB Type

The following elements might be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CPUSRBUsageBySRBType>                          |
| Name                         | <Name> <i>name</i> </Name>                      |
| Description                  | <Description> <i>description</i> </Description> |
| zIIP                         | <zIIPPercent> <i>n</i> </zIIPPercent>           |
| zAAP                         | <zAAPPercent> <i>n</i> </zAAPPercent>           |
| GPU                          | <CPUPercent> <i>n</i> </CPUPercent>             |
| Total                        | <TotalPercent> <i>n</i> </TotalPercent>         |
|                              | </CPUSRBUsageBySRBType>                         |

## K02 CPU SRB Usage by PSW/OBbjCode

| Field title in online report | XML element                                                          |
|------------------------------|----------------------------------------------------------------------|
|                              | <PSWLocation>                                                        |
| Address                      | <Address> <i>n</i> </Address>                                        |
| Module                       | <ModuleName> <i>name</i> </ModuleName>                               |
| AM                           | <AddressingMode> <i>n</i> </AddressingMode>                          |
| S/P                          | <SVCNumberorStateStorageKey> <i>aa</i> </SVCNumberorStateStorageKey> |
| AS                           | <AddressSpaceMode> <i>mode</i> </AddressSpaceMode>                   |
| ASID                         | <ASID> <i>asid</i> </ASID>                                           |
|                              | <Measurements> <i>n</i> </Measurements>                              |
| Percent                      | <Percent> <i>n</i> </Percent>                                        |
|                              | <MachineInstruction>                                                 |



| Field title in online report | XML element                                               |
|------------------------------|-----------------------------------------------------------|
| Address                      | <ModuleOffset> <i>offset</i> </ModuleOffset>              |
|                              | <ObjectCode> <i>object code</i> </ObjectCode>             |
|                              | <DisassembledCode> <i>object code</i> </DisassembledCode> |
|                              | </MachineInstruction>                                     |
|                              | </PSWLocation>                                            |

## V01 Measurement Variance Summary

The following tag pairs are repeated multiple times in each variance report. The first occurrence of the tag pair reports the base measurement (Ref 01). Following Ref 01, the tag pairs are repeated for every tagged measurement (Ref *n*).

- <MeasurementsAnalyzed></MeasurementsAnalyzed>
- <CPUTimeTCBVariance></CPUTimeTCBVariance>
- <CPUTimeSRBVariance></CPUTimeSRBVariance>
- <EXCPRequestsVariance></EXCPRequestsVariance>
- <ServiceUnitsVariance></ServiceUnitsVariance>
- <CPUActiveSamplesVariance></CPUActiveSamplesVariance>
- <WaitSamplesVariance></WaitSamplesVariance>
- <QueuedSamplesVariance></QueuedSamplesVariance>

| Field title in online report            | XML element                                     |
|-----------------------------------------|-------------------------------------------------|
| The Following Measurements are Analyzed | <MeasurementsAnalyzed>                          |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| ReqNum                                  | <ReqNum> <i>n</i> </ReqNum>                     |
| Job Name                                | <JobName> <i>name</i> </JobName>                |
| Date                                    | <Date> <i>Mon-dd-yyyy</i> </Date>               |
| Time                                    | <Time> <i>hh:mm</i> </Time>                     |
| Description                             | <Description> <i>description</i> </Description> |
|                                         | </MeasurementsAnalyzed>                         |
| CPU Time TCB                            | <CPUTimeTCBVariance>                            |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| CPU Time TCB                            | <CPUTimeTCB> <i>n sec</i> </CPUTimeTCB>         |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </CPUTimeTCBVariance>                           |
| CPU Time SRB                            | <CPUTimeSRBVariance>                            |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| CPU Time SRB                            | <CPUTimeSRB> <i>n sec</i> </CPUTimeSRB>         |

| Field title in online report     | XML element                    |
|----------------------------------|--------------------------------|
| Variance                         | <Variance>variance</Variance>  |
|                                  | </CPUTimeSRBVariance>          |
| EXCP Requests                    | <EXCPRequestsVariance>         |
| Ref                              | <Ref>n</Ref>                   |
| EXCP Requests                    | <EXCPRequests>n</EXCPRequests> |
| Variance                         | <Variance>variance</Variance>  |
|                                  | </EXCPRequestsVariance>        |
| Service Units                    | <ServiceUnitsVariance>         |
| Ref                              | <Ref>n</Ref>                   |
| Service Units                    | <ServiceUnits>n</ServiceUnits> |
| Variance                         | <Variance>variance</Variance>  |
|                                  | </ServiceUnitsVariance>        |
| Percentage of CPU Active Samples | <CPUActiveSamplesVariance>     |
| Ref                              | <Ref>n</Ref>                   |
| Sample Count (CPU Active)        | <CPUActive>n</CPUActive>       |
| Sample Count (Total)             | <Total>n</Total>               |
| Percentage                       | <Percentage>n%</Percentage>    |
| Variance                         | <Variance>variance</Variance>  |
|                                  | </CPUActiveSamplesVariance>    |
| Percentage of WAIT Samples       | <WaitSamplesVariance>          |
| Ref                              | <Ref>n</Ref>                   |
| Sample Count (TCB Wait)          | <TCBWait>n</TCBWait>           |
| Sample Count (Total)             | <Total>n</Total>               |
| Percentage                       | <Percentage>n%</Percentage>    |
| Variance                         | <Variance>variance</Variance>  |
|                                  | </WaitSamplesVariance>         |
| Percentage of Queued Samples     | <QueuedSamplesVariance>        |
| Ref                              | <Ref>n</Ref>                   |
| Sample Count (Queued)            | <Queued>n</Queued>             |
| Sample Count (Total)             | <Total>n</Total>               |
| Percentage                       | <Percentage>n%</Percentage>    |
| Variance                         | <Variance>variance</Variance>  |
|                                  | </QueuedSamplesVariance>       |

## V02 CICS Variance Summary

The following tag pairs are repeated multiple times in each variance report. The first occurrence of the tag pair reports the base measurement (Ref 01). Following Ref 01, the tag pairs are repeated for every tagged measurement (Ref *n*).

- <MeasurementsAnalyzed></MeasurementsAnalyzed>
- <CICSTransactionVariance></CICSTransactionVariance>
- <CICSCPUTimeVariance></CICSCPUTimeVariance>
- <CICSSuspendTimeVariance></CICSSuspendTimeVariance>
- <CICSDispatchTimeVariance></CICSDispatchTimeVariance>
- <CICSMVSDispatchTimeVariance></CICSMVSDispatchTimeVariance>
- <CICSServiceTimeVariance></CICSServiceTimeVariance>

| Field title in online report            | XML element                                     |
|-----------------------------------------|-------------------------------------------------|
| The Following Measurements are Analyzed | <MeasurementsAnalyzed>                          |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| ReqNum                                  | <ReqNum> <i>n</i> </ReqNum>                     |
| Job Name                                | <JobName> <i>name</i> </JobName>                |
| Date                                    | <Date> <i>Mon-dd-yyyy</i> </Date>               |
| Time                                    | <Time> <i>hh:mm</i> </Time>                     |
| Description                             | <Description> <i>description</i> </Description> |
|                                         | </MeasurementsAnalyzed>                         |
| CICS Transaction Statistics             | <CICSTransactionVariance>                       |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Task Number Start                       | <TaskStart> <i>n</i> </TaskStart>               |
| Task Number End                         | <TaskEnd> <i>n</i> </TaskEnd>                   |
| Transaction Count                       | <TranCount> <i>n</i> </TranCount>               |
| Transaction Obsvd                       | <TranObserved> <i>n</i> </TranObserved>         |
| Rate                                    | <TranRate> <i>n</i> per sec</TranRate>          |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </CICSTransactionVariance>                      |
| Mean Execution Time                     | <CICSCPUTimeVariance>                           |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Time                                    | <MeanCPUTime> <i>n</i> sec</MeanCPUTime>        |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </CICSCPUTimeVariance>                          |
| Mean Suspend Time                       | <CICSSuspendTimeVariance>                       |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |

| Field title in online report  | XML element                                              |
|-------------------------------|----------------------------------------------------------|
| Time                          | <MeanSuspendTime> <i>n</i> sec</MeanSuspendTime>         |
| Variance                      | <Variance> <i>variance</i> </Variance>                   |
|                               | </CICSSuspendTimeVariance>                               |
| Mean CICS Dispatch Delay Time | <CICSDispatchTimeVariance>                               |
| Ref                           | <Ref> <i>n</i> </Ref>                                    |
| Time                          | <MeanDispatchTime> <i>n</i> sec</MeanDispatchTime>       |
| Variance                      | <Variance> <i>variance</i> </Variance>                   |
|                               | </CICSDispatchTimeVariance>                              |
| Mean MVS Dispatch Delay Time  | <CICSMVSDispatchTimeVariance>                            |
| Ref                           | <Ref> <i>n</i> </Ref>                                    |
| Time                          | <MeanMVSDispatchTime> <i>n</i> sec</MeanMVSDispatchTime> |
| Variance                      | <Variance> <i>variance</i> </Variance>                   |
|                               | </CICSMVSDispatchTimeVariance>                           |
| Mean Service Time             | <CICSServiceTimeVariance>                                |
| Ref                           | <Ref> <i>n</i> </Ref>                                    |
| Time                          | <MeanServiceTime> <i>n</i> sec</MeanServiceTime>         |
| Variance                      | <Variance> <i>variance</i> </Variance>                   |
|                               | </CICSServiceTimeVariance>                               |

## V03 Db2 Variance Summary

The following tag pairs are repeated multiple times in each variance report. The first occurrence of the tag pair reports the base measurement (Ref 01). Following Ref 01, the tag pairs are repeated for every tagged measurement (Ref *n*).

- <MeasurementsAnalyzed></MeasurementsAnalyzed>
- <Db2SQLVariance></Db2SQLVariance>
- <SQLObservations></SQLObservations>
- <SQLCallsExecuted></SQLCallsExecuted>
- <SQLCallRate></SQLCallRate>
- <SQLCallsCounted></SQLCallsCounted>
- <SQLThroughput></SQLThroughput>
- <SQLServiceTime></SQLServiceTime>
- <SQLCallMaxTime></SQLCallMaxTime>
- <SQLCallMinTime></SQLCallMinTime>
- <SQLCPUTime></SQLCPUTime>
- <SQLCallMaxCPUTime></SQLCallMaxCPUTime>
- <SQLCallMinCPUTime></SQLCallMinCPUTime>

| Field title in online report            | XML element                                     |
|-----------------------------------------|-------------------------------------------------|
| The Following Measurements are Analyzed | <MeasurementsAnalyzed>                          |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| ReqNum                                  | <ReqNum> <i>n</i> </ReqNum>                     |
| Job Name                                | <JobName> <i>name</i> </JobName>                |
| Date                                    | <Date> <i>Mon-dd-yyyy</i> </Date>               |
| Time                                    | <Time> <i>hh:mm</i> </Time>                     |
| Description                             | <Description> <i>description</i> </Description> |
|                                         | </MeasurementsAnalyzed>                         |
| SQL calls sampled                       | <Db2SQLVariance>                                |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Subsys                                  | <Subsystem> <i>name</i> </Subsystem>            |
| Version                                 | <Version> <i>version</i> </Version>             |
| Calls Sampled                           | <CallsSampled> <i>n</i> </CallsSampled>         |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </Db2SQLVariance>                               |
| SQL observations                        | <SQLObservations>                               |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Count                                   | <SQLCount> <i>n</i> </SQLCount>                 |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </SQLObservations>                              |
| SQL calls executed                      | <SQLCallsExecuted>                              |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Count                                   | <SQLCount> <i>n</i> </SQLCount>                 |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </SQLCallsExecuted>                             |
| Avg SQL call rate                       | <SQLCallRate>                                   |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Rate                                    | <SQLRate> <i>n</i> per sec</SQLRate>            |
| Variance                                | <Variance> <i>variance</i> </Variance>          |
|                                         | </SQLCallRate>                                  |
| SQL calls counted                       | <SQLCallsCounted>                               |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| Count                                   | <SQLCount> <i>n</i> </SQLCount>                 |
| Variance                                | <Variance> <i>variance</i> </Variance>          |

| Field title in online report | XML element                      |
|------------------------------|----------------------------------|
|                              | </SQLCallsCounted>               |
| SQL throughput               | <SQLThroughput>                  |
| Ref                          | <Ref>n</Ref>                     |
| Rate                         | <SQLRate>n per sec</SQLRate>     |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLThroughput>                 |
| SQL service time             | <SQLServiceTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLServiceTime>                |
| SQL call max                 | <SQLCallMaxTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLCallMaxTime>                |
| SQL call min time            | <SQLCallMinTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLCallMinTime>                |
| SQL CPU time                 | <SQLCPUTime>                     |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLCPUTime>                    |
| SQL call max CPU time        | <SQLCallMaxCPUTime>              |
| Ref                          | <Ref>n</Ref> >                   |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |
|                              | </SQLCallMaxCPUTime>             |
| SQL call min CPU time        | <SQLCallMinCPUTime>              |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |

| Field title in online report | XML element          |
|------------------------------|----------------------|
|                              | </SQLCallMinCPUTime> |

## V04 IMS Variance Summary

The following tag pairs are repeated multiple times in each variance report. The first occurrence of the tag pair reports the base measurement (Ref 01). Following Ref 01, the tag pairs are repeated for every tagged measurement (Ref *n*).

- <MeasurementsAnalyzed></MeasurementsAnalyzed>
- <TxnObservations></TxnObservations>
- <TxnsCounted></TxnsCounted>
- <TransactionRate></TransactionRate>
- <TxnThroughput></TxnThroughput>
- <TxnServiceTime></TxnServiceTime>
- <TxnCallMaxTime></TxnCallMaxTime>
- <TxnCallMinTime></TxnCallMinTime>
- <TxnCPUTime></TxnCPUTime>
- <TxnCallMaxCPUTime></TxnCallMaxCPUTime>
- <TxnCallMinCPUTime></TxnCallMinCPUTime>
- <DLIObservations></DLIObservations>
- <DLICallsCounted></DLICallsCounted>
- <DLICallRate></DLICallRate>
- <DLICallThroughput></DLICallThroughput>
- <DLICallServiceTime></DLICallServiceTime>
- <DLICallMaxTime></DLICallMaxTime>
- <DLICallMinTime></DLICallMinTime>
- <DLICallCPUTime></DLICallCPUTime>
- <DLICallMaxCPUTime></DLICallMaxCPUTime>
- <DLICallMinCPUTime></DLICallMinCPUTime>

| Field title in online report            | XML element                                     |
|-----------------------------------------|-------------------------------------------------|
| The Following Measurements are Analyzed | <MeasurementsAnalyzed>                          |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |
| ReqNum                                  | <ReqNum> <i>n</i> </ReqNum>                     |
| Job Name                                | <JobName> <i>name</i> </JobName>                |
| Date                                    | <Date> <i>Mon-dd-yyyy</i> </Date>               |
| Time                                    | <Time> <i>hh:mm</i> </Time>                     |
| Description                             | <Description> <i>description</i> </Description> |
|                                         | </MeasurementsAnalyzed>                         |
| Txn observations                        | <TxnObservations>                               |
| Ref                                     | <Ref> <i>n</i> </Ref>                           |

| Field title in online report | XML element                              |
|------------------------------|------------------------------------------|
| IMS Subsys                   | <Subsystem> <i>name</i> </Subsystem>     |
| IMS Version                  | <Version> <i>version</i> </Version>      |
| Txns Sampled                 | <TxnsSampled> <i>n</i> </TxnsSampled>    |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnObservations>                       |
| IMS Txns counted             | <TxnsCounted>                            |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Count                        | <TxnCount> <i>n</i> </TxnCount>          |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnsCounted>                           |
| Transaction rate             | <TransactionRate>                        |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Rate                         | <TxnRate> <i>n</i> per sec</TxnRate>     |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TransactionRate>                       |
| Txn throughput               | <TxnThroughput>                          |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Rate                         | <TxnRate> <i>n</i> per sec</TxnRate>     |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnThroughput>                         |
| IMS Txn svc time             | <TxnServiceTime>                         |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Time                         | <ServiceTime> <i>n</i> sec</ServiceTime> |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnServiceTime>                        |
| IMS Txn max svc              | <TxnCallMaxTime>                         |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Time                         | <ServiceTime> <i>n</i> sec</ServiceTime> |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnCallMaxTime>                        |
| IMS Txn min svc              | <TxnCallMinTime>                         |
| Ref                          | <Ref> <i>n</i> </Ref>                    |
| Time                         | <ServiceTime> <i>n</i> sec</ServiceTime> |
| Variance                     | <Variance> <i>variance</i> </Variance>   |
|                              | </TxnCallMinTime>                        |



| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
| IMS Txn CPU time             | <TxnCPUTime>                            |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Time                         | <CPUTime> <i>n</i> sec</CPUTime>        |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </TxnCPUTime>                           |
| IMS Txn max CPU              | <TxnCallMaxCPUTime>                     |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Time                         | <CPUTime> <i>n</i> sec</CPUTime>        |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </TxnCallMaxCPUTime>                    |
| IMS Txn min CPU              | <TxnCallMinCPUTime>                     |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Time                         | <CPUTime> <i>n</i> sec</CPUTime>        |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </TxnCallMinCPUTime>                    |
| DLI observations             | <DLIObservations>                       |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Count                        | <CallsSampled> <i>n</i> </CallsSampled> |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </DLIObservations>                      |
| DLI call count               | <DLICallsCounted>                       |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Count                        | <CallCount> <i>n</i> </CallCount>       |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </DLICallsCounted>                      |
| DLI call rate                | <DLICallRate>                           |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Rate                         | <CallRate> <i>n</i> per sec</CallRate>  |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </DLICallRate>                          |
| DLI call thruput             | <DLICallThroughput>                     |
| Ref                          | <Ref> <i>n</i> </Ref>                   |
| Rate                         | <CallRate> <i>n</i> per sec</CallRate>  |
| Variance                     | <Variance> <i>variance</i> </Variance>  |
|                              | </DLICallThroughput>                    |

| Field title in online report | XML element                      |
|------------------------------|----------------------------------|
| DLI svc time                 | <DLICallServiceTime>             |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallServiceTime>            |
| DLI max svc                  | <DLICallMaxTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallMaxTime>                |
| DLI min svc                  | <DLICallMinTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <ServiceTime>n sec</ServiceTime> |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallMinTime>                |
| DLI CPU time                 | <DLICallCPUTime>                 |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallCPUTime>                |
| DLI max CPU time             | <DLICallMaxCPUTime>              |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallMaxCPUTime>             |
| DLI min CPU time             | <DLICallMinCPUTime>              |
| Ref                          | <Ref>n</Ref>                     |
| Time                         | <CPUTime>n sec</CPUTime>         |
| Variance                     | <Variance>variance</Variance>    |
|                              | </DLICallMinCPUTime>             |

## CICS Performance analysis reports

### E01 CICS Session Statistics

| Field title in online report | XML element   |
|------------------------------|---------------|
|                              | <CICSSummary> |

| Field title in online report           | XML element                                                                 |
|----------------------------------------|-----------------------------------------------------------------------------|
| CICS Release                           | <CICSRelease> <i>CICS Release</i> </CICSRelease>                            |
| First Transaction TaskId               | <FirstTaskId> <i>n</i> </FirstTaskId>                                       |
| Last Transaction TaskId                | <LastTaskId> <i>n</i> </LastTaskId>                                         |
| Number of TaskId Increments            | <TaskIdIncrements> <i>n</i> </TaskIdIncrements>                             |
| Number of Observed Transactions        | <ObservedTransactions> <i>n</i> </ObservedTransactions>                     |
| Transaction Rate (per sec)             | <TransactionRate> <i>n</i> </TransactionRate>                               |
| Peak Active Txns (Observed)            | <PeakActiveTransactionsObserved> <i>n</i> </PeakActiveTransactionsObserved> |
| Peak Active Txns (Overall)             | <PeakActiveTransactionsOverall> <i>n</i> </PeakActiveTransactionsOverall>   |
| Max Task <MaxTask> <i>n</i> </MaxTask> | Execution Time <ExecutionTime> <i>n</i> </ExecutionTime>                    |
| Suspend Time                           | <SuspendTime> <i>n</i> </SuspendTime>                                       |
| CICS Dispatch Delay Time               | <CICSDispatchDelayTime> <i>n</i> </CICSDispatchDelayTime>                   |
| MVS Dispatch Delay Time                | <MVSDispatchDelayTime> <i>n</i> </MVSDispatchDelayTime>                     |
| Service Time                           | <ServiceTime> <i>n</i> </ServiceTime>                                       |
| Program Requests                       | <ProgramRequests> <i>n</i> </ProgramRequests>                               |
| Terminal Messages                      | <TerminalMessages> <i>n</i> </TerminalMessages>                             |
| Storage Getmains                       | <StorageGetmains> <i>n</i> </StorageGetmains>                               |
| Storage Freemains                      | <StorageFreemains> <i>n</i> </StorageFreemains>                             |
| File I/O Requests                      | <FileIORequests> <i>n</i> </FileIORequests>                                 |
| Temporary Storage Requests             | <TemporaryStorageRequests> <i>n</i> </TemporaryStorageRequests>             |
| Transient Data Requests                | <TransientDataRequests> <i>n</i> </TransientDataRequests>                   |
| Journal Write Requests                 | <JournalWriteRequests> <i>n</i> </JournalWriteRequests>                     |
| System Dumps                           | <SystemDumps> <i>n</i> </SystemDumps>                                       |
| System Dumps Suppressed                | <SystemDumpsSuppressed> <i>n</i> </SystemDumpsSuppressed>                   |
| Transaction Dumps                      | <TransactionDumps> <i>n</i> </TransactionDumps>                             |
| Transaction Dumps Suppressed           | <TransactionDumpsSuppressed> <i>n</i> </TransactionDumpsSuppressed>         |
| Storage Violations                     | <StorageViolations> <i>n</i> </StorageViolations>                           |
| Short on Storage occurrences           | <ShortOnStorageOccurrences> <i>n</i> </ShortOnStorageOccurrences>           |
| Times at MaxTask                       | <TimesAtMaxTask> <i>n</i> </TimesAtMaxTask>                                 |
| Times at Class MaxTask                 | <TimesAtClassMaxTask> <i>n</i> </TimesAtClassMaxTask>                       |
|                                        | <TransactionCounts>                                                         |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| TranId                       | <TransactionId> <i>tranid</i> </TransactionId>  |
| Count                        | <TransactionCount> <i>n</i> </TransactionCount> |
|                              | </TransactionCounts>                            |
|                              | </CICSSummary>                                  |

## E02 CICS CPU and Use Counts by Pgm

| Field title in online report    | XML element                             |
|---------------------------------|-----------------------------------------|
|                                 | <DetailLine>                            |
| Name                            | <Name> <i>name</i> </Name>              |
| Calls                           | <Description> <i>n</i> </Description>   |
|                                 | <Measurements> <i>n</i> </Measurements> |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>           |
|                                 | </DetailLine>                           |

## E03 CICS CPU Usage by Transaction

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report

| Field title in online report    | XML element                                     |
|---------------------------------|-------------------------------------------------|
|                                 | <CICSTranId>                                    |
| Name                            | <TransactionId> <i>tranid</i> </TransactionId>  |
| NTxns/Description               | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
|                                 | <Description> <i>description</i> </Description> |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSTranId>                                   |
|                                 | <CICSProgram>                                   |
| Name                            | <Program> <i>name</i> </Program>                |
| NTxns/Description               | <Description> <i>description</i> </Description> |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSProgram>                                  |
|                                 | <CICSCommand>                                   |
| Name                            | <CSECT> <i>name</i> </CSECT>                    |

| Field title in online report    | XML element                                     |
|---------------------------------|-------------------------------------------------|
| NTxns/Description               | <Offset> <i>offset</i> </Offset>                |
| NTxns/Description               | <Command> <i>command</i> </Command>             |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSCCommand>                                 |
|                                 | <CICSService>                                   |
| Name                            | <Program> <i>name</i> </Program>                |
| NTxns/Description               | <Description> <i>description</i> </Description> |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSService>                                  |
|                                 | <CICSSQL>                                       |
|                                 | <CSECT> <i>name</i> </CSECT>                    |
| Name                            | <Offset> <i>offset</i> </Offset>                |
| NTxns/Description               | <SQLVerb> <i>verb</i> </SQLVerb>                |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSSQL>                                      |
|                                 | <CICSDLI>                                       |
|                                 | <CSECT> <i>name</i> </CSECT>                    |
| Name                            | <Offset> <i>offset</i> </Offset>                |
| NTxns/Description               | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
|                                 | <Measurements> <i>n</i> </Measurements>         |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </CICSDLI>                                      |
|                                 | <ADABASCommand>                                 |
|                                 | <CSECT> <i>name</i> </CSECT>                    |
| Name                            | <Offset> <i>offset</i> </Offset>                |
| NTxns/Description               | <Command> <i>command</i> </Command>             |
|                                 | <Measurement> <i>n</i> </Measurement>           |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                 | </ADABASCommand>                                |

## E04 CICS Mean Service Time by Txn

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSTranId>                                    |
| Name                         | <TransactionId> <i>tranid</i> </TransactionId>  |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n%</i> </MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <SQL> <i>offset</i> </SQL>                      |
| Description                  | <Description> <i>sqlverb</i> </Description>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSDLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSDLI>                                      |
|                              | <ADABASCommand>                                 |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |

| Field title in online report | XML element                  |
|------------------------------|------------------------------|
| Delay                        | <DelayTime>n</DelayTime>     |
| Service                      | <ServiceTime>n</ServiceTime> |
|                              | </ADABASCommand>             |

## E05 CICS Total Service Time by Txn

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <CICSTranId>                           |
| Name                         | <TransactionId>tranid</TransactionId>  |
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>         |
| Description                  | <Description></Description>            |
| Error                        | <MarginofError>n%</MarginofErrors>     |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSTranId>                          |
|                              | <CICSProgram>                          |
| Name                         | <Program>name</Program>                |
| Description                  | <Description>description</Description> |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSProgram>                         |
|                              | <CICSCommand>                          |
| Name                         | <CSECT>name</CSECT>                    |
| Description                  | <Offset>offset</Offset>                |
| Description                  | <Command>command</Command>             |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSCommand>                         |



| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <SQL> <i>offset</i> </SQL>                      |
| Description                  | <Description> <i>sqlverb</i> </Description>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSDLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSDLI>                                      |
|                              | <ADABASCommand>                                 |

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
|                              | <CSECT> <i>name</i> </CSECT>          |
| Name                         | <Offset> <i>offset</i> </Offset>      |
| Description                  | <Command> <i>command</i> </Command>   |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>       |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime> |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>     |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime> |
|                              | </ADABASCommand>                      |

## E06 CICS Total Service Time by Task ID

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSTranId>                                    |
| Name                         | <TransactionId> <i>tranid</i> </TransactionId>  |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n%</i> </MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSTaskId>                                    |
| Name                         | <TaskId> <i>tasknumber</i> </TaskId>            |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTaskId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <SQLVerb> <i>sqlverb</i> </SQLVerb>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |

| Field title in online report | XML element                                  |
|------------------------------|----------------------------------------------|
| Delay                        | <DelayTime> <i>n</i> </DelayTime>            |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>        |
|                              | </CICSSQL>                                   |
|                              | <CICSCLI>                                    |
|                              | <CSECT> <i>name</i> </CSECT>                 |
| Name                         | <Offset> <i>offset</i> </Offset>             |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>              |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>        |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>            |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>        |
|                              | </CICSCLI>                                   |
|                              | <ADABASCommand>                              |
|                              | <CSECT> <i>name</i> </CSECT>                 |
| Name                         | <Offset> <i>offset</i> </Offset>             |
| Description                  | <Command> <i>command</i> </Command>          |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>              |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>        |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>            |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>        |
|                              | </ADABASCommand>                             |

## E07 CICS Wait by Txn

| Field title in online report     | XML element                                     |
|----------------------------------|-------------------------------------------------|
|                                  | <CICSTranId>                                    |
| Name                             | <TransactionId> <i>tranid</i> </TransactionId>  |
| NTxns/Description                | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
|                                  | <Description></Description>                     |
|                                  | <Measurements> <i>n</i> </Measurements>         |
| Percent of Wait Time *<br>10.00% | <Percent> <i>n</i> </Percent>                   |
|                                  | <CICSWait>                                      |
| Name                             | <WaitReason> <i>reason</i> </WaitReason>        |
| NTxns/Description                | <Description> <i>description</i> </Description> |
|                                  | <Measurements> <i>n</i> </Measurements>         |

| Field title in online report     | XML element                   |
|----------------------------------|-------------------------------|
| Percent of Wait Time *<br>10.00% | <Percent> <i>n</i> </Percent> |
|                                  | </CICSWait>                   |
|                                  | </CICSTranId>                 |

## E08 CICS Mean Service Time by Termid

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSTerminal>                                  |
| Name                         | <TerminalId> <i>termid</i> </TerminalId>        |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n</i> %</MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTerminal>                                 |
|                              | <CICSTranId>                                    |
| Name                         | <TransactionId> <i>transid</i> </TransactionId> |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n</i> %</MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSProgram>                         |
|                              | <CICSCommand>                          |
| Name                         | <CSECT>name</CSECT>                    |
| Description                  | <Offset>offset</Offset>                |
| Description                  | <Command>command</Command>             |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSCommand>                         |
|                              | <CICSWait>                             |
| Name                         | <WaitReason>reason</WaitReason>        |
| Description                  | <Description>description</Description> |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSWait>                            |
|                              | <CICSService>                          |
| Name                         | <Program>name</Program>                |
| Description                  | <Description>description</Description> |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSService>                         |
|                              | <CICSSQL>                              |
|                              | <CSECT>name</CSECT>                    |
| Name                         | <Offset>offset</Offset>                |
| Description                  | <SQLVerb>sqlverb</SQLVerb>             |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |

| Field title in online report | XML element                         |
|------------------------------|-------------------------------------|
|                              | </CICSSQL>                          |
|                              | <CICSCLI>                           |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <DLIRequest>dlirequest</DLIRequest> |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSCLI>                          |
|                              | <ADABASCommand>                     |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <Command>command</Command>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </ADABASCommand>                    |

## E09 CICS Total Service Time by Termid

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                        |
|------------------------------|------------------------------------|
|                              | <CICSTerminal>                     |
| Name                         | <TerminalId>termid</TerminalId>    |
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>     |
| Description                  | <Description></Description>        |
| Error                        | <MarginofError>n%</MarginofErrors> |
| Execution                    | <ExecTime>n</ExecTime>             |
| Suspend                      | <SuspendTime>n</SuspendTime>       |
| Delay                        | <DelayTime>n</DelayTime>           |
| Service                      | <ServiceTime>n</ServiceTime>       |
|                              | </CICSTerminal>                    |
|                              | <CICSTranId>                       |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Name                         | <TransactionId> <i>transid</i> </TransactionId> |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n%</i> </MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |



| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <SQLVerb> <i>sqlverb</i> </SQLVerb>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSCLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCLI>                                      |
|                              | <ADABASCommand>                                 |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </ADABASCommand>                                |

## E10 CICS Mean Service Time by User ID

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSUserid>                                    |
| Name                         | <Userid> <i>userid</i> </Userid>                |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n%</i> </MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSUserid>                                   |
|                              | <CICSTranId>                                    |
| Name                         | <TransactionId> <i>transid</i> </TransactionId> |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n%</i> </MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <SQLVerb> <i>sqlverb</i> </SQLVerb>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSDLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |

| Field title in online report | XML element                  |
|------------------------------|------------------------------|
| Suspend                      | <SuspendTime>n</SuspendTime> |
| Delay                        | <DelayTime>n</DelayTime>     |
| Service                      | <ServiceTime>n</ServiceTime> |
|                              | </CICSCLI>                   |
|                              | <ADABASCommand>              |
|                              | <CSECT>name</CSECT>          |
| Name                         | <Offset>offset</Offset>      |
| Description                  | <Command>command</Command>   |
| Execution                    | <ExecTime>n</ExecTime>       |
| Suspend                      | <SuspendTime>n</SuspendTime> |
| Delay                        | <DelayTime>n</DelayTime>     |
| Service                      | <ServiceTime>n</ServiceTime> |
|                              | </ADABASCommand>             |

## E11 CICS Total Service Time by User ID

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <CICSUserid>                           |
| Name                         | <Userid>userid</Userid>                |
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>         |
| Description                  | <Description></Description>            |
| Error                        | <MarginofError>n%</MarginofErrors>     |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSUserid>                          |
|                              | <CICSTranId>                           |
| Name                         | <TransactionId>transid</TransactionId> |
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>         |
| Description                  | <Description></Description>            |
| Error                        | <MarginofError>n%</MarginofErrors>     |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |

| Field title in online report | XML element                         |
|------------------------------|-------------------------------------|
|                              | </CICSService>                      |
|                              | <CICSSQL>                           |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <SQLVerb>sqlverb</SQLVerb>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSSQL>                          |
|                              | <CICSCLI>                           |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <DLIRequest>dlirequest</DLIRequest> |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSCLI>                          |
|                              | <ADABASCommand>                     |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <Command>command</Command>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </ADABASCommand>                    |

## E12 CICS CPU/Service Time by Transaction

| Field title in online report | XML element                     |
|------------------------------|---------------------------------|
|                              | <CPUTimeByTransaction>          |
| Name                         | <Transaction>name</Transaction> |
| NTxns                        | <NumberOfTxns>n</NumberOfTxns>  |
| % of CPU                     | <PctCPUTime>n%</PctCPUTime>     |

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
|                              | <CPUTimeByTransactionDetail>           |
| Name                         | <TaskNumber>n</TaskNumber>             |
| Description                  | <StartTime>hh.mm.ss.ss</StartTime>     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
|                              | </CPUTimeByTransactionDetail>          |
|                              | </CPUTimeByTransaction>                |

## IMS Performance analysis reports

### I01 IMS Measurement Profile

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
| IMS Environment              | <IMSEnvironment>                        |
| DFSRRRC00 parms              | <DFSRRRC00Parms>parms</DFSRRRC00Parms>  |
| IMS system id                | <SystemId>systemid</SystemId>           |
| IMS region name              | <RegionName>name</RegionName>           |
| IMS version                  | <Version>version</Version>              |
| IMS region type              | <RegionType>regiontype</RegionType>     |
|                              | </IMSEnvironment>                       |
| Most Active IMS PSBs         | <MostActiveIMSPSBs>                     |
| Samples                      | <Samples>n</Samples>                    |
|                              | <Percent>n%</Percent>                   |
| Reports                      | <Reports>I05 I08 I11</Reports>          |
|                              | <ActiveIMSPSBs>                         |
|                              | <PSBName>name</PSBName>                 |
|                              | <CPUActive>n</CPUActive>                |
|                              | <CPUActivePercent>n%</CPUActivePercent> |
|                              | </ActiveIMSPSBs>                        |
|                              | </MostActiveIMSPSBs>                    |

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
| Most Active IMS Transactions | <MostActiveIMSTransactions>                      |
| Samples                      | <Samples> <i>n</i> </Samples>                    |
|                              | <Percent> <i>n</i> %</Percent>                   |
| Reports                      | <Reports>I04 I06 I09 I12</Reports>               |
|                              | <ActiveIMSTransactions>                          |
|                              | <TransactionId> <i>tranid</i> </TransactionId>   |
|                              | <CPUActive> <i>n</i> </CPUActive>                |
|                              | <CPUActivePercent> <i>n</i> %</CPUActivePercent> |
|                              | </ActiveIMSTransactions>                         |
|                              | </MostActiveIMSTransactions>                     |
| Most Active IMS DLI Calls    | <MostActiveIMSDLICalls>                          |
| Samples                      | <Samples> <i>n</i> </Samples>                    |
|                              | <Percent> <i>n</i> %</Percent>                   |
| Reports                      | <Reports>I07 I10 I13</Reports>                   |
|                              | <ActiveIMSDLICalls>                              |
|                              | <IMSCall> <i>imscall</i> </IMSCall>              |
|                              | <CPUActive> <i>n</i> </CPUActive>                |
|                              | <CPUActivePercent> <i>n</i> %</CPUActivePercent> |
|                              | </ActiveIMSDLICalls>                             |
|                              | </MostActiveIMSDLICalls>                         |
| Most CPU consumptive DLI     | <MostCPUConsumptiveDLI>                          |
| Total DLI CPU time           | <CPUTime> <i>n</i> </CPUTime>                    |
|                              | <Percent> <i>n</i> %</Percent>                   |
| Reports                      | <Reports>I18 I19 I20 I21</Reports>               |
|                              | <CPUConsumptiveDLI>                              |
|                              | <IMSCall> <i>imscall</i> </IMSCall>              |
|                              | <CPUTime> <i>n</i> </CPUTime>                    |
|                              | <CPUTimePercent> <i>n</i> %</CPUTimePercent>     |
|                              | </CPUConsumptiveDLI>                             |
|                              | </MostCPUConsumptiveDLI>                         |
| Most Frequent Transactions   | <MostFrequentTransactions>                       |
| Total txns counted           | <Transactions> <i>n</i> </Transactions>          |
|                              | <Percent> <i>n</i> %</Percent>                   |



| Field title in online report | XML element                                                           |
|------------------------------|-----------------------------------------------------------------------|
| Reports                      | <Reports>I03 I04 I16 I17</Reports>                                    |
|                              | <FrequentTransactions>                                                |
|                              | <TransactionId> <i>tranid</i> </TransactionId>                        |
|                              | <TransactionsCounted> <i>n</i> </TransactionsCounted>                 |
|                              | <PercentOfTransactions> <i>n</i> %</PercentOfTransactions>            |
|                              | </FrequentTransactions>                                               |
|                              | </MostFrequentTransactions>                                           |
| Most Frequent DL/I Calls     | <MostFrequentDLICalls>                                                |
| Total DLI call count         | <Samples> <i>n</i> </Samples>                                         |
|                              | <Percent> <i>n</i> %</Percent>                                        |
|                              | Reports <Reports>I02 I17 I18</Reports>                                |
|                              | <FrequentDLICalls>                                                    |
|                              | <IMSCall> <i>imscall</i> </IMSCall>                                   |
|                              | <Samples> <i>n</i> </Samples>                                         |
|                              | <Percent> <i>n</i> %</Percent>                                        |
|                              | </FrequentDLICalls>                                                   |
|                              | </MostFrequentDLICalls>                                               |
| Transaction Statistics       | <TransactionStatistics>                                               |
| IMS Txns counted             | <TransactionsCounted> <i>n</i> </TransactionsCounted>                 |
| Transaction rate             | <TransactionRate> <i>n</i> per sec</TransactionRate>                  |
| Txn observations             | <TransactionObservations> <i>n</i> </TransactionObservations>         |
| Txn throughput               | <TransactionThroughput> <i>n</i> per sec</TransactionThroughput>      |
| IMS Txn svc time             | <TransactionServiceTime> <i>n</i> sec</TransactionServiceTime>        |
| IMS Txn CPU time             | <TransactionCPUTime> <i>n</i> sec</TransactionCPUTime>                |
| IMS txn max svc              | <TransactionMaximumService> <i>nssec</i> </TransactionMaximumService> |
| IMS Txn max CPU              | <TransactionMaximumCPU> <i>n</i> sec</TransactionMaximumCPU>          |
| IMS Txn min svc              | <TransactionMinimumService> <i>n</i> sec</TransactionMinimumService>  |
| IMS Txn min CPU              | <TransactionMinimumCPU> <i>n</i> sec</TransactionMinimumCPU>          |
|                              | </TransactionStatistics>                                              |

## I02 IMS DL/I Call Timeline

The DLICallTimeline tag pair and sub-elements are repeated for each DLI call.

| Field title in online report | XML element                   |
|------------------------------|-------------------------------|
|                              | <DLICallTimeline>             |
| CallSeq                      | <CallSeq> <i>n</i> </CallSeq> |

| Field title in online report | XML element                               |
|------------------------------|-------------------------------------------|
| Func                         | <Function> <i>function</i> </Function>    |
| PCB Name                     | <PCBName> <i>name</i> </PCBName>          |
| Id                           | <Id> <i>n</i> </Id>                       |
| Location                     | <Location> <i>location</i> </Location>    |
| Stat                         | <Status> <i>status</i> </Status>          |
| Call Time                    | <CallTime> <i>hh:mm:ss.ss</i> </CallTime> |
| Duration                     | <Duration> <i>n</i> </Duration>           |
|                              | </DLICallTimeline>                        |

## I03 IMS Transaction Timeline

The IMSTransactionTimeLine tag pair and sub-elements are repeated for each IMS transaction.

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
|                              | <IMSTransactionTimeLine>                                |
| TranCode                     | <TransactionCode> <i>tranid</i> </TransactionCode>      |
| PSB/PCB                      | <PSBName> <i>name</i> </PSBName>                        |
| Location                     | <LTERM> <i>lterm</i> </LTERM>                           |
| Txn Time                     | <TransactionTime> <i>hh:mm:ss.ss</i> </TransactionTime> |
| Duration                     | <Duration> <i>n</i> </Duration>                         |
|                              | <DLICallTimeLine>                                       |
| TranCode                     | <CallSeq> <i>n</i> </CallSeq>                           |
| PSB/PCB                      | <PCBName> <i>name</i> </PCBName>                        |
| Id                           | <Id> <i>n</i> </Id> Func                                |
|                              | <Function> <i>function</i> </Function>                  |
| Location                     | <Location> <i>location</i> </Location>                  |
| Stat                         | <Status> <i>status</i> </Status>                        |
| Txn Time                     | <CallTime> <i>hh:mm:ss.ss</i> </CallTime>               |
| Duration                     | <Duration> <i>n</i> </Duration>                         |
|                              | </DLICallTimeline>                                      |
|                              | </IMSTransactionTimeLine>                               |

## I04 IMS Transaction Activity Timeline

| Field title in online report | XML element                      |
|------------------------------|----------------------------------|
|                              | <IMSTransactionActivityTimeLine> |
| TranCode                     | <Samples> <i>n</i> </Samples>    |
| PSB/PCB                      | <Duration> <i>n</i> </Duration>  |
| Location                     | <Txn> <i>tranid</i> </Txn>       |

| Field title in online report | XML element                                        |
|------------------------------|----------------------------------------------------|
| Txn Time                     | <TransactionTime>hh:mm:ss.ss</TransactionTime>     |
| Duration                     | <PSB>name</PSB>                                    |
|                              | <Txns>n</Txns>                                     |
|                              | <Intervals>                                        |
|                              | <IntervalCount>n</IntervalCount> Repeated 50 times |
|                              | </Interval>                                        |
|                              | </IMSTransactionActivityTimeLine>                  |

## I05 to I13

This section describes the common tag pairs and elements of the XML detail lines shared by reports I05 through I13. The same information is categorized and displayed differently in each report. The report names covered by the following XML are:

- I05 IMS CPU Usage by PSB
- I06 IMS CPU Usage by Txn
- I07 IMS CPU Usage by DL/I Call
- I08 IMS WAIT Time by PSB
- I09 IMS WAIT Time by Txn
- I10 IMS WAIT Time by DL/I Call
- I11 IMS DL/I Activity by PSB
- I12 IMS DL/I Activity by Txn
- I13 IMS DL/I Activity by DL/I Call

The XML elements presented below may be repeated multiple times and appear under different parent elements. In the XML document, all elements are listed in hierarchical order as they appear in the online report.

| Field title in online report    | XML element                                             |
|---------------------------------|---------------------------------------------------------|
|                                 | <Category>                                              |
| Name                            | <CategoryName>name</CategoryName>                       |
| Description                     | <CategoryDescription>description</CategoryDescription > |
|                                 | <Measurements>n</Measurements>                          |
| Percent of xxx Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </Category>                                             |
|                                 | <CSECT>                                                 |
| Name                            | <CSECTName>name</CSECTName>                             |
| Description                     | <CSECTDescription>description</CSECTDescription>        |
|                                 | <Measurements>n</Measurements>                          |
| Percent of xxx Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </CSECT>                                                |

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
|                                 | <DLICall>                                                                        |
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <FunctionPCBProgramOffset> <i>FuncNameNameOffset</i> </FunctionPCBProgramOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DLICall>                                                                       |
|                                 | <DMRequest>                                                                      |
| Name                            | <MacroName> <i>name</i> </MacroName>                                             |
| Description                     | <MacroLocation> <i>location</i> </MacroLocation>                                 |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DMRequest>                                                                     |
|                                 | <DPAGroup>                                                                       |
| Name                            | <DPAGroupName> <i>name</i> </DPAGroupName>                                       |
| Description                     | <DPAGroupDescription> <i>description</i> </DPAGroupDescription>                  |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </DPAGroup>                                                                      |
|                                 | <File>                                                                           |
| Name                            | <DDName> <i>ddname</i> </DDName>                                                 |
| Description                     | <AccessMethod> <i>accessmethod</i> </AccessMethod>                               |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxxTime *<br>10.00%  | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </File>                                                                          |
|                                 | <LoadModule>                                                                     |
| Name                            | <LoadModuleName> <i>name</i> </LoadModuleName>                                   |
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>              |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </LoadModule>                                                                    |
|                                 | <NoSymAddressRange>                                                              |

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
| Name                            | <AddressRange> <i>address</i> </AddressRange>                                    |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription>            |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </NoSymAddressRange>                                                             |
|                                 | <PSB>                                                                            |
| Name                            | <PSBName> <i>name</i> </PSBName>                                                 |
| Description                     | <Description> <i>description</i> </Description>                                  |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </PSB>                                                                           |
|                                 | <SQLRequest>                                                                     |
| Name                            | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <ProgramStatementFunction> <i>name(stmt)function</i> </ProgramStatementFunction> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SQLRequest>                                                                    |
|                                 | <SVCRoutine>                                                                     |
| Name                            | <SVCIId> <i>svcid</i> </SVCIId>                                                  |
| Description                     | <SVCDescription> <i>description</i> </SVCDescription>                            |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of xxx Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SVCRoutine>                                                                    |

## I14 IMS PSB/PCB Attributes

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <IMSPSBAttributes>                              |
| PSB name                     | <PSBName> <i>name</i> </PSBName>                |
| IMS system                   | <IMSSystem> <i>imssystem</i> </IMSSystem>       |
| No.of PCBs                   | <NumberOfPCBs> <i>n</i> </NumberOfPCBs>         |
| LIST=NO PCBs                 | <LISTNOPCBs> <i>n</i> </LISTNOPCBs>             |
| Txn count                    | <TransactionCount> <i>n</i> </TransactionCount> |

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
| DL/I calls                   | <DLICalls> <i>n</i> </DLICalls>       |
| Sample count                 | <SampleCount> <i>n</i> </SampleCount> |
|                              | <IMSPCBs>                             |
| PCBNum                       | <PCBNumber> <i>n</i> </PCBNumber>     |
| Name                         | <PCBName> <i>name</i> </PCBName>      |
| Type                         | <PCBType> <i>type</i> </PCBType>      |
| DBD/LTRM                     | <DBDLterm> <i>name</i> </DBDLterm>    |
| PROCOPT                      | <PROCOPT> <i>procopt</i> </PROCOPT>   |
| LIST                         | <List> <i>yesno</i> </List>           |
|                              | </IMSPCBs>                            |
|                              | </IMSPSBAttributes>                   |

## I15 IMS DL/I Call Attributes

| Field title in online report | XML element                                         |
|------------------------------|-----------------------------------------------------|
|                              | <DLICallAttributes>                                 |
| DL/I Call Id                 | <DLICallId> <i>n</i> </DLICallId>                   |
| Function code                | <FunctionCode> <i>code</i> </FunctionCode>          |
| PSB Name                     | <PSBName> <i>name</i> </PSBName>                    |
| PCB Naame                    | <PCBName> <i>name</i> </PCBName>                    |
| IMS Id-Region                | <IMSIIdRegion> <i>imsid-region</i> </IMSIIdRegion>  |
| PCB Number                   | <PCBNumber> <i>n</i> </PCBNumber>                   |
| Call type                    | <CallType> <i>calltype</i> </CallType>              |
| CSECT/module                 | <CSECTModule> <i>csect in module</i> </CSECTModule> |
| Offset of call               | <OffsetOfCall> <i>n</i> </OffsetOfCall>             |
| Sample count                 | <SampleCount> <i>n</i> </SampleCount>               |
| Call count                   | <CallCount> <i>n</i> </CallCount>                   |
| DLI CPU time                 | <DLICPUTime> <i>n</i> </DLICPUTime>                 |
| Service time                 | <ServiceTime> <i>n</i> </ServiceTime>               |
|                              | <DLICall>                                           |
| SSA/FSA                      | <SSANum> <i>n</i> </SSANum>                         |
|                              | <SSA> <i>ssa</i> </SSA>                             |
|                              | </DLICall>                                          |
|                              | </DLICallAttributes>                                |

## I16 IMS Transaction Service Times

| Field title in online report | XML element                                                       |
|------------------------------|-------------------------------------------------------------------|
|                              | <IMSTransactionServiceTimes>                                      |
| TranCode                     | <TransactionCode> <i>tranid</i> </TransactionCode>                |
| PSB/PGM                      | <PSBProgram> <i>name</i> </PSBProgram>                            |
| Txns                         | <TransactionCount> <i>n</i> </TransactionCount>                   |
| Fetch                        | <FetchCount> <i>n</i> </FetchCount>                               |
| Sched                        | <ScheduleCount> <i>n</i> </ScheduleCount>                         |
| Total time                   | <TotalTime> <i>n</i> </TotalTime>                                 |
| Avg/Txn                      | <AverageTimePerTransaction> <i>n</i> </AverageTimePerTransaction> |
| CPU Time                     | <CPUTime> <i>n</i> </CPUTime>                                     |
|                              | </IMSTransactionServiceTimes>                                     |

## I17 IMS Transaction DL/I Call Counts

| Field title in online report | XML element                                        |
|------------------------------|----------------------------------------------------|
|                              | <IMSTransactionDLICallCounts>                      |
| Tran/PCB                     | <TransactionCode> <i>tranid</i> </TransactionCode> |
| PSB/DBD                      | <PSBname> <i>name</i> </PSBname>                   |
| Total                        | <DLITotalCount> <i>n</i> </DLITotalCount>          |
| Minimum                      | <DLIMinimumCount> <i>n</i> </DLIMinimumCount>      |
| Maximum                      | <DLIMaximumCount> <i>n</i> </DLIMaximumCount>      |
| Average                      | <DLIAverageCount> <i>n</i> </DLIAverageCount>      |
|                              | <IMSTransactionDLICallCountsByPCB>                 |
| Tran/PCB                     | <PCBName> <i>name</i> </PCBName>                   |
| PSB/DBD                      | <DBDName> <i>name</i> </DBDName>                   |
| PCBNum                       | <PCBNumber> <i>n</i> </PCBNumber>                  |
| Func                         | <Function> <i>function</i> </Function>             |
| Total                        | <DLITotalCount> <i>n</i> </DLITotalCount>          |
| Minimum                      | <DLIMinimumCount> <i>n</i> </DLIMinimumCount>      |
| Maximum                      | <DLIMaximumCount> <i>n</i> </DLIMaximumCount>      |
| Average                      | <DLIAverageCount> <i>n</i> </DLIAverageCount>      |
|                              | </IMSTransactionDLICallCountsByPCB>                |
|                              | </IMSTransactionServiceTimes>                      |

## I18 IMS CPU/Service Time by DL/I Call

| Field title in online report | XML element                                        |
|------------------------------|----------------------------------------------------|
|                              | <IMSCPUTimeByCall>                                 |
| Call                         | <CallNumber> <i>n</i> </CallNumber>                |
| Func                         | <Function> <i>function</i> </Function>             |
| PCB Name                     | <PCBName> <i>name</i> </PCBName>                   |
| Location                     | <Location> <i>location</i> </Location>             |
| Count                        | <CallCount> <i>n</i> </CallCount>                  |
| Svc time                     | <DLIServiceTime> <i>n</i> </DLIServiceTime>        |
| Prcnt                        | <DLIServicePercent> <i>n%</i> </DLIServicePercent> |
| CPU Time                     | <DLICPUTime> <i>n</i> </DLICPUTime>                |
| Prcnt                        | <DLICPUPercent> <i>n%</i> </DLICPUPercent>         |
|                              | </IMSCPUTimeByCall>                                |

## I19 IMS CPU/Service Time by PSB

| Field title in online report | XML element                                        |
|------------------------------|----------------------------------------------------|
|                              | <IMSCPUTimeByPSB>                                  |
| PSB Name                     | <PSBName> <i>name</i> </PSBName>                   |
| Txn Count                    | <TransactionCount> <i>n</i> </TransactionCount>    |
| DL/I Count                   | <CallCount> <i>n</i> </CallCount>                  |
| Svc time                     | <DLIServiceTime> <i>n</i> </DLIServiceTime>        |
| Prcnt                        | <DLIServicePercent> <i>n%</i> </DLIServicePercent> |
| CPU Time                     | <DLICPUTime> <i>n</i> </DLICPUTime>                |
| Prcnt                        | <DLICPUPercent> <i>n%</i> </DLICPUPercent>         |
|                              | </IMSCPUTimeByPSB>                                 |

## I20 IMS CPU/Service Time by Transaction

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <IMSCPUTimeByTransaction>                                   |
| TranCode                     | <TransactionCode> <i>transid</i> </TransactionCode>         |
| Txn Count                    | <TransactionCount> <i>n</i> </TransactionCount>             |
| Service                      | <TransactionServiceTime> <i>n</i> </TransactionServiceTime> |
| CPU Time                     | <TransactionCPUTime> <i>n</i> </TransactionCPUTime>         |
| Svc time                     | <DLIServiceTime> <i>n</i> </DLIServiceTime>                 |
| %of Txn                      | <DLIServicePercent> <i>n%</i> </DLIServicePercent>          |
| CPU Time                     | <DLICPUTime> <i>n</i> </DLICPUTime>                         |



| Field title in online report | XML element                       |
|------------------------------|-----------------------------------|
| %of Txn                      | <DLICPUPercent>n%</DLICPUPercent> |
|                              | </IMSCPUTimeByTransaction>        |

## I21 IMS CPU/Service Time by PCB

| Field title in online report | XML element                               |
|------------------------------|-------------------------------------------|
|                              | <IMSCPUTimeByPCB>                         |
| PSB Name                     | <PSBName>name</PSBName>                   |
| PCB Name                     | <PCBName>name</PCBName>                   |
| PCB Num                      | <PCBNumber>n</PCBNumber>                  |
| Count                        | <CallCount>n</CallCount>                  |
| Svc time                     | <DLIServiceTime>n</DLIServiceTime>        |
| Percent                      | <DLIServicePercent>n%</DLIServicePercent> |
| CPU Time                     | <DLICPUTime>n</DLICPUTime>                |
| Percent                      | <DLICPUPercent>n%</DLICPUPercent>         |
|                              | </IMSCPUTimeByPCB>                        |

## I22 IMS Region Transaction Summary

The IMSRegionTxns tag pair is repeated for each measured IMS transaction. The last tag pair represents the total for all lines of the report.

| Field title in online report | XML element               |
|------------------------------|---------------------------|
|                              | <IMSRegionTxns>           |
| TranCode                     | <TranCode>name</TranCode> |
| PSB Name                     | <PSBName>name</PSBName>   |
| Txn count                    | <TxnCount>n</TxnCount>    |
| Svc/Trn                      | <SvcPerTrn>n</SvcPerTrn>  |
| CPU/Trn                      | <CpuPerTrn>n</CpuPerTrn>  |
| DLI/Trn                      | <DLIPerTrn>n</DLIPerTrn>  |
| SQL/Trn                      | <SQLPerTrn>n</SQLPerTrn>  |
| MQ/Trn                       | <MQIPerTrn>n</MQIPerTrn>  |
|                              | </IMSRegionTxns>          |

## Db2 Performance analysis reports

### F01 Db2 Measurement profile

| Field title in online report | XML element          |
|------------------------------|----------------------|
| Most Active Db2 Plans        | <MostActiveDb2Plans> |

| Field title in online report  | XML element                                             |
|-------------------------------|---------------------------------------------------------|
| Samples                       | <Samples>n</Samples>                                    |
|                               | <Percent>n%</Percent>                                   |
| Reports                       | <Reports>F05</Reports>                                  |
|                               | <Plans>                                                 |
|                               | <PlanName>name</Planname>                               |
|                               | <CPUActive>n</CPUActive>                                |
|                               | <CPUActivePercent>n%</CPUActivePercent>                 |
|                               | </Plans>                                                |
|                               | </MostActiveDb2Plans>                                   |
| Most Active Package/<br>DBRM  | <MostActiveDBRMs>                                       |
| Samples                       | <Samples>n</Samples>                                    |
|                               | <Percent>n%</Percent>                                   |
| Reports                       | <Reports>F03</Reports>                                  |
|                               | <DBRMs>                                                 |
|                               | <DBRM>name</DBRM>                                       |
|                               | <CPUActive>n</CPUActive>                                |
|                               | <CPUActivePercent>n%</CPUActivePercent>                 |
|                               | </DBRMs>                                                |
|                               | </MostActiveDBRMs>                                      |
| Most Active SQL<br>Statements | <MostActiveSQL>                                         |
| Samples                       | <Samples>n</Samples>                                    |
|                               | <Percent>n%</Percent>                                   |
| Reports                       | <Reports>F04</Reports>                                  |
|                               | <SQLStatement>                                          |
|                               | <ProgramOffsetVerb>name:offset verb</ProgramOffsetVerb> |
|                               | <CPUActive>n</CPUActive>                                |
|                               | <CPUActivePercent>n%</CPUActivePercent>                 |
|                               | </SQLStatement>                                         |
|                               | </MostActiveSQL>                                        |
| Most CPU consumptive<br>SQL   | <MostCPUConsumptiveSQL>                                 |
| Total SQL CPU time            | <CPUTime>n</CPUTime>                                    |
|                               | <Percent>n%</Percent>                                   |
| Reports                       | <Reports>F10 F11 F12</Reports>                          |

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
|                              | <SQLStatement>                                          |
|                              | <ProgramOffsetVerb>name:offset verb</ProgramOffsetVerb> |
|                              | <CPUActive>n%</CPUActive>                               |
|                              | <CPUActivePercent>n%</CPUActivePercent>                 |
|                              | </SQLStatement>                                         |
|                              | </MostCPUConsumptiveSQL>                                |
| Most Frequent SQL Statements | <MostFrequentSQL>                                       |
| Total SQL call count         | <Samples>n</Samples>                                    |
|                              | <Percent>n%</Percent>                                   |
|                              | <SQLStatement>                                          |
|                              | <ProgramOffsetVerb>name:offset verb</ProgramOffsetVerb> |
|                              | <CPUActive>n%</CPUActive>                               |
|                              | <CPUActivePercent>n%</CPUActivePercent>                 |
|                              | </SQLStatement>                                         |
|                              | </MostFrequentSQL>                                      |
| Single SQL Call Service Time | <SingleSQLCallServiceTime>                              |
| Total SQL service count      | <Samples>n</Samples>                                    |
|                              | <Percent>n%</Percent>                                   |
|                              | <SQLStatement>                                          |
|                              | <ProgramOffsetVerb>name:offset verb</ProgramOffsetVerb> |
|                              | <CPUActive>n%</CPUActive>                               |
|                              | <CPUActivePercent>n%</CPUActivePercent>                 |
|                              | </SQLStatement>                                         |
|                              | </SingleSQLCallServiceTime>                             |
| Db2 Measurement Statistics   | <Db2MeasurementStatistics>                              |
| Db2 subsystem name           | <SubsystemName>name</SubsystemName>                     |
| Db2 Catalog Level            | <CatalogLevel>vv.r.mff</CatalogLevel>                   |
| Db2 Code Func Level          | <CodeFuncLevel>vv.r.mff</CodeFuncLevel>                 |
| Db2 Curr Func Level          | <CurrFuncLevel>vv.r.mff</CurrFuncLevel>                 |
| Db2 version                  | <Version>version</Version>                              |
| SQL calls sampled            | <CallsSampled>n</CallsSampled>                          |
| SQL observations             | <SQLObservations>n</SQLObservations>                    |
| SQL calls executed           | <CallsExecuted>n</CallsExecuted>                        |

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
| Avg SQL call rate            | <CallRate> <i>n</i> per sec</CallRate>           |
| SQL calls counted            | <CallsCounted> <i>n</i> </CallsCounted>          |
| SQL throughput               | <SQLThroughput> <i>n</i> per sec</SQLThroughput> |
| SQL service time             | <ServiceTime> <i>n</i> sec</ServiceTime>         |
| SQL CPU time                 | <CPUTime> <i>n</i> sec</CPUTime>                 |
| CQL call max time            | <CallMaxTime> <i>n</i> sec</CallMaxTime>         |
| SQL call max CPU             | <CallMaxCPU> <i>n</i> sec</CallMaxCPU>           |
| SQL call min time            | <CallMinTime> <i>n</i> sec</CallMinTime>         |
| SQL call min CPU             | <CallMinCPU> <i>n</i> sec</CallMinCPU>           |
|                              | </Db2MeasurementStatistics>                      |

## F02 Db2 SQL Activity Timeline

The SQLActivityTimeline tag pair and sub-elements are repeated for each SQL call.

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <SQLActivityTimeline>                                         |
| Thread                       | <Thread> <i>n</i> </Thread>                                   |
| REQCT                        | <REQCT> <i>n</i> </REQCT>                                     |
| Program                      | <Program>name</Program>                                       |
| Stmt#                        | <StatementNumber> <i>n</i> </StatementNumber>                 |
| SQL Function                 | <SQLFunction> <i>function</i> </SQLFunction>                  |
| Samps                        | <Samples> <i>n</i> </Samples>                                 |
| Call Time                    | <CallTime> <i>hh:mm:ss.ss</i> </CallTime>                     |
| Interval                     | <Interval> <i>n</i> </Interval>                               |
| CPU Time                     | <CPUTime> <i>n</i> </CPUTime>                                 |
|                              | <GetPagesIdx> <i>n</i> </GetPagesIdx>                         |
|                              | <GetPages> <i>n</i> </GetPages>                               |
|                              | <SyncReadIO> <i>n</i> </SyncReadIO>                           |
|                              | <PrefetchReq> <i>n</i> </PrefetchReq>                         |
|                              | <SyncWriteIO> <i>n</i> </SyncWriteIO>                         |
|                              | <SQLTextLines>                                                |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                           |
|                              | <PrepareInfo>                                                 |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |

| Field title in online report | XML element            |
|------------------------------|------------------------|
|                              | </SQLTextLines>        |
|                              | </SQLActivityTimeline> |

### F03 SQL Activity by DBRM

| Field title in online report | XML element                                                                 |
|------------------------------|-----------------------------------------------------------------------------|
|                              | <DetailLine>                                                                |
| Name                         | <Name> <i>name</i> </Name>                                                  |
|                              | <Description></Description>                                                 |
|                              | <Measurements> <i>n</i> </Measurements>                                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> %</Percent>                                              |
|                              | <SQLRequest>                                                                |
| Name                         | <SequenceNumber> <i>seqno</i> </SequenceNumber>                             |
| Stmt# SQL Function           | <ProgramStatementFunction> <i>stmt function</i> </ProgramStatementFunction> |
|                              | <Measurements> <i>n</i> </Measurements>                                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                               |
|                              | <SQLTextLines>                                                              |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                                         |
|                              | <PrepareInfo>                                                               |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>                 |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber>               |
|                              | </PrepareInfo>                                                              |
|                              | </SQLTextLines>                                                             |
|                              | </SQLRequest>                                                               |
|                              | </DetailLine>                                                               |

### F04 SQL Activity by Statement

| Field title in online report | XML element                                                                      |
|------------------------------|----------------------------------------------------------------------------------|
|                              | <SQLRequest>                                                                     |
| Seqno                        | <SequenceNumber> <i>seqno</i> </SequenceNumber>                                  |
| Program Stmt# SQL Function   | <ProgramStatementFunction> <i>name stmt function</i> </ProgramStatementFunction> |
|                              | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                                    |
|                              | <SQLTextLines>                                                                   |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                                              |
|                              | <PrepareInfo>                                                                    |

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |
|                              | </SQLTextLines>                                               |
|                              | </SQLRequest>                                                 |

## F05 SQL Activity by Plan

| Field title in online report | XML element                                                                      |
|------------------------------|----------------------------------------------------------------------------------|
|                              | <DetailLine>                                                                     |
| Seqno                        | <Name> <i>seqno</i> </Name>                                                      |
| Plan/Pgm                     | <Description> <i>name</i> </Description>                                         |
|                              | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> %</Percent>                                                   |
|                              | <SQLRequest>                                                                     |
| Seqno                        | <SequenceNumber> <i>seqno</i> </SequenceNumber>                                  |
| Plan/Pgm Stmt# SQL Function  | <ProgramStatementFunction> <i>name stmt function</i> </ProgramStatementFunction> |
|                              | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                                                    |
|                              | <SQLTextLines>                                                                   |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                                              |
|                              | <PrepareInfo>                                                                    |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>                      |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber>                    |
|                              | </PrepareInfo>                                                                   |
|                              | </SQLTextLines>                                                                  |
|                              | </SQLRequest>                                                                    |
|                              | </DetailLine>                                                                    |

## F06 Db2 SQL Statement Attributes

| Field title in online report | XML element                                  |
|------------------------------|----------------------------------------------|
|                              | <SQLStatementAttributes>                     |
| SQL Statement Id             | <StatementId> <i>n</i> </StatementId>        |
| Subsystem name               | <SubsystemName> <i>name</i> </SubsystemName> |
| Attach type                  | <AttachType> <i>attachtype</i> </AttachType> |
| Plan name                    | <PlanName> <i>name</i> </PlanName>           |

| Field title in online report | XML element                                                |
|------------------------------|------------------------------------------------------------|
| Plan bind time               | <PlanBindTime>Mon-dd-yy hh:mm:ss</PlanBindTime>            |
| DBRM name                    | <DBRMName>name</DBRMName>                                  |
| DBRM token                   | <DBRMToken>token</DBRMToken>                               |
| DBRM date/time               | <DBRMTime>Mon-dd-yy hh:mm:ss</DBRMTime>                    |
| Package ID                   | <PackageId>packageid</PackageId>                           |
| Location                     | <Location>location</Location>                              |
| Collectn name                | <CollectionName>name</CollectionName>                      |
| Pkg BIND time                | <PackageBindTime>Mon-dd-yy hh:mm:ss</PackageBindTime>      |
| SQL function                 | <SQLFunction>function</SQLFunction>                        |
| Static/dynamic               | <StaticDynamic>static or dynamic</StaticDynamic>           |
| Precmplr stmt#               | <PrecompilerStatementNumber>n</PrecompilerStatementNumber> |
| DBRM section#                | <DBRMSectionNumber>n</DBRMSectionNumber>                   |
| Prepare stmt#                | <PrepareStatementNumber>n</PrepareStatementNumber>         |
| CSECT/module                 | <CSECTModule>csect in module</CSECTModule>                 |
| Offset of call               | <OffsetOfCall>n</OffsetOfCall>                             |
| Sample count                 | <SampleCount>n</SampleCount>                               |
| SQL req count                | <SQLREQCT>n</SQLREQCT>                                     |
| SQL CPU time                 | <SQLCPUTime>n</SQLCPUTime>                                 |
| Service time                 | <ServiceTime>n</ServiceTime>                               |
|                              | <SQLTextLines>                                             |
| SQL Statement                | <SQLTEXT>sqltext</SQLTEXT>                                 |
|                              | </SQLTextLines>                                            |
|                              | </SQLStatementAttributes\t>                                |

## F07 SQL WAIT Time by DBRM

| Field title in online report | XML element                                                        |
|------------------------------|--------------------------------------------------------------------|
|                              | <DetailLine>                                                       |
| Name                         | <Name>name</Name>                                                  |
|                              | <Description></Description>                                        |
|                              | <Measurements>n</Measurements>                                     |
| Percent of Time * 10.00%     | <Percent>n %</Percent>                                             |
|                              | <SQLRequest>                                                       |
| Name                         | <SequenceNumber>seqno</SequenceNumber>                             |
| Stmt# SQL Function           | <ProgramStatementFunction>stmt function</ProgramStatementFunction> |
|                              | <Measurements>n</Measurements>                                     |

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| Percent of Time * 10.00%     | <Percent>n</Percent>                                 |
|                              | <SQLTextLines>                                       |
|                              | <SQLTEXT>sqltext</SQLTEXT>                           |
|                              | <PrepareInfo>                                        |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber> |
|                              | </PrepareInfo>                                       |
|                              | </SQLTextLines>                                      |
|                              | </SQLRequest>                                        |
|                              | </DetailLine>                                        |

## F08 SQL WAIT Time by Statement

| Field title in online report  | XML element                                                                 |
|-------------------------------|-----------------------------------------------------------------------------|
|                               | <SQLRequest>                                                                |
| Seqno                         | <SequenceNumber>seqno</SequenceNumber>                                      |
| Program Stmt# SQL<br>Function | <ProgramStatementFunction>name stmt function</<br>ProgramStatementFunction> |
|                               | <Measurements>n</Measurements>                                              |
| Percent of Time * 10.00%      | <Percent>n</Percent>                                                        |
|                               | <SQLTextLines>                                                              |
|                               | <SQLTEXT>sqltext</SQLTEXT>                                                  |
|                               | <PrepareInfo>                                                               |
|                               | <PrepareStatementNumber>n</PrepareStatementNumber>                          |
|                               | <PrepareSequenceNumber>seqno</PrepareSequenceNumber>                        |
|                               | </PrepareInfo>                                                              |
|                               | </SQLTextLines>                                                             |
|                               | </SQLRequest>                                                               |

## F09 SQL WAIT Time by Plan

| Field title in online report | XML element                     |
|------------------------------|---------------------------------|
|                              | <DetailLine>                    |
| Seqno                        | <Name>seqno</Name>              |
| Plan/Pgm                     | <Description>name</Description> |
|                              | <Measurements>n</Measurements>  |
| Percent of Time * 10.00%     | <Percent>n %</Percent>          |
|                              | <SQLRequest>                    |



| Field title in online report | XML element                                                             |
|------------------------------|-------------------------------------------------------------------------|
| Seqno                        | <SequenceNumber>seqno</SequenceNumber>                                  |
| Plan/Pgm Stmt# SQL Function  | <ProgramStatementFunction>name stmt function</ProgramStatementFunction> |
|                              | <Measurements>n</Measurements>                                          |
| Percent of Time * 10.00%     | <Percent>n</Percent>                                                    |
|                              | <SQLTextLines>                                                          |
|                              | <SQLTEXT>sqltext</SQLTEXT>                                              |
|                              | <PrepareInfo>                                                           |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>                      |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber>                    |
|                              | </PrepareInfo>                                                          |
|                              | </SQLTextLines>                                                         |
|                              | </SQLRequest>                                                           |
|                              | </DetailLine>                                                           |

## F10 SQL CPU/Service Time by DBRM

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <SQLCPUTimeByDBRM>                     |
| Name                         | <DBRMName>name</DBRMName>              |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>       |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>     |
|                              | <GetPagesIdx>n</GetPagesIdx>           |
|                              | <GetPages>n</GetPages>                 |
|                              | <SyncReadIO>n</SyncReadIO>             |
|                              | <PrefetchReq>n</PrefetchReq>           |
|                              | <SyncWriteIO>n</SyncWriteIO>           |
|                              | <SQLCPUTimeByDBRMDetail>               |
| Name                         | <SequenceNumber>seqno</SequenceNumber> |
| Stmt#                        | <StatementNumber>n</StatementNumber>   |
| SQL Function                 | <SQLFunction>function</SQLFunction>    |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>       |

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>                   |
|                              | <SQLTextLines>                                                |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                           |
|                              | <PrepareInfo>                                                 |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |
|                              | </SQLTextLines>                                               |
|                              | </SQLCPUTimeByDBRMDetail>                                     |
|                              | </SQLCPUTimeByDBRM>                                           |

## F11 SQL CPU/Service Time by Statement

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <SQLCPUTimeByStatement>                         |
| Seqno                        | <SequenceNumber> <i>seqno</i> </SequenceNumber> |
| Name                         | <ProgramName> <i>name</i> </ProgramName>        |
| Stmt#                        | <StatementNumber> <i>n</i> </StatementNumber>   |
| SQL Function                 | <SQLFunction> <i>function</i> </SQLFunction>    |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time -- Total          | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |
|                              | <GetPagesIdx> <i>n</i> </GetPagesIdx>           |
|                              | <GetPages> <i>n</i> </GetPages>                 |
|                              | <SyncReadIO> <i>n</i> </SyncReadIO>             |
|                              | <PrefetchReq> <i>n</i> </PrefetchReq>           |
|                              | <SyncWriteIO> <i>n</i> </SyncWriteIO>           |

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <SQLTextLines>                                                |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                           |
|                              | <PrepareInfo>                                                 |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |
|                              | </SQLTextLines>                                               |
|                              | </SQLCPUTimeByStatement>                                      |

## F12 SQL CPU/Service Time by Plan

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <SQLCPUTimeByPlan>                              |
| Seqno                        | <SequenceNumber> <i>seqno</i> </SequenceNumber> |
| Plan/Pgm                     | <PlanName> <i>name</i> </PlanName>              |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time -- Total          | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |
|                              | <GetPagesIdx> <i>n</i> </GetPagesIdx>           |
|                              | <GetPages> <i>n</i> </GetPages>                 |
|                              | <SyncReadIO> <i>n</i> </SyncReadIO>             |
|                              | <PrefetchReq> <i>n</i> </PrefetchReq>           |
|                              | <SyncWriteIO> <i>n</i> </SyncWriteIO>           |
|                              | </SQLCPUTimeByPlanDetail>                       |
| Seqno                        | <SequenceNumber> <i>seqno</i> </SequenceNumber> |
| Plan/Pgm                     | <ProgramName> <i>name</i> </ProgramName>        |
| Stmt#                        | <StatementNumber> <i>n</i> </StatementNumber>   |
| SQL Function                 | <SQLFunction> <i>function</i> </SQLFunction>    |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time -- Total          | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <SQLTextLines>                                       |
|                              | <SQLTEXT>sqltext</SQLTEXT>                           |
|                              | <PrepareInfo>                                        |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber> |
|                              | </PrepareInfo>                                       |
|                              | </SQLTextLines>                                      |
|                              | </SQLCPUTimeByPlanDetail>                            |
|                              | </SQLCPUTimeByPlan>                                  |

## F13 Db2 Threads Analysis

| Field title in online report | XML element                                |
|------------------------------|--------------------------------------------|
|                              | <Db2 Threads Analysis>                     |
| SeqNum                       | <SeqNum>n</SeqNum>                         |
| Thread Addr                  | <ThreadAddr>address</ThreadAddr>           |
| Attach                       | <Attach>type</Attach>                      |
| REQCT Range                  | <REQCTRange>n-n</REQCTRange>               |
| --- SQL Calls --- Executed   | <CallsExecuted>n</CallsExecuted>           |
| --- SQL Calls --- Sampled    | <CallsSampled>n</CallsSampled>             |
|                              | </Db2ThreadsAnalysis>                      |
|                              | <ThreadTotals>                             |
|                              | <TotalCallsExecuted>n</TotalCallsExecuted> |
|                              | <TotalCallsSampled>n</TotalCallsSampled>   |
|                              | </ThreadTotals>                            |

## F14 Db2 CPU by Plan/Stored Proc

| Field title in online report    | XML element                     |
|---------------------------------|---------------------------------|
|                                 | <DetailLine>                    |
| Seqno                           | <Name>seqno</Name>              |
| Description                     | <Description>name</Description> |
|                                 | <Measurements>n</Measurements>  |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>            |

| Field title in online report    | XML element                                             |
|---------------------------------|---------------------------------------------------------|
|                                 | <Category>                                              |
| Seqno                           | <CategoryName>name</CategoryName>                       |
| Description                     | <CategoryDescription>description</CategoryDescription > |
|                                 | <Measurements>n</Measurements>                          |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </Category>                                             |
|                                 | <CSECT>                                                 |
| Seqno                           | <CSECTName>name</CSECTName>                             |
| Description                     | <CSECTDescription>description</CSECTDescription>        |
|                                 | <Measurements>n</Measurements>                          |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </CSECT>                                                |
|                                 | <DMRequest>                                             |
| Seqno                           | <MacroName>name</MacroName>                             |
| Description                     | <MacroLocation>location</MacroLocation>                 |
|                                 | <Measurements>n</Measurements>                          |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </DMRequest>                                            |
|                                 | <DPAGroup>                                              |
| Seqno                           | <DPAGroupName>name</DPAGroupName>                       |
| Description                     | <DPAGroupDescription>description</DPAGroupDescription>  |
|                                 | <Measurements>n</Measurements>                          |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </DPAGroup>                                             |
|                                 | <File>                                                  |
| Seqno                           | <DDName>ddname</DDName>                                 |
| Description                     | <AccessMethod>accessmethod</AccessMethod>               |
|                                 | <Measurements>n</Measurements>                          |
| Percent of CPU Time *<br>10.00% | <Percent>n</Percent>                                    |
|                                 | </File>                                                 |
|                                 | <LoadModule>                                            |
| Seqno                           | <LoadModuleName>name</LoadModuleName>                   |

| Field title in online report    | XML element                                                                      |
|---------------------------------|----------------------------------------------------------------------------------|
| Description                     | <LoadModuleDescription> <i>description</i> </LoadModuleDescription>              |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </LoadModule>                                                                    |
|                                 | <NoSymAddressRange>                                                              |
| Seqno                           | <AddressRange> <i>address</i> </AddressRange>                                    |
| Description                     | <AddressRangeDescription>Unresolved Address</AddressRangeDescription>            |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </NoSymAddressRange>                                                             |
|                                 | <SQLRequest>                                                                     |
| Seqno                           | <SequenceNumber> <i>n</i> </SequenceNumber>                                      |
| Description                     | <ProgramStatementFunction> <i>name(stmt)function</i> </ProgramStatementFunction> |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SQLRequest>                                                                    |
|                                 | <SVCRoutine>                                                                     |
| Seqno                           | <SVCIId> <i>svcid</i> </SVCIId>                                                  |
| Description                     | <SVCDescription> <i>description</i> </SVCDescription>                            |
|                                 | <Measurements> <i>n</i> </Measurements>                                          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                                                    |
|                                 | </SVCRoutine>                                                                    |

## F15 Db2 SQL CPU/Svc Time by Rq Loc

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <SQLTimeByRequestLocation>                      |
| Name                         | <LocationName> <i>location</i> </LocationName>  |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>                   |
|                              | <GetPagesIdx> <i>n</i> </GetPagesIdx>                         |
|                              | <GetPages> <i>n</i> </GetPages>                               |
|                              | <SyncReadIO> <i>n</i> </SyncReadIO>                           |
|                              | <PrefetchReq> <i>n</i> </PrefetchReq>                         |
|                              | <SyncWriteIO> <i>n</i> </SyncWriteIO>                         |
|                              | <SQLTimeByStatement>                                          |
| Name                         | <SequenceNumber> <i>seqno</i> </SequenceNumber>               |
| Plan/Pgm                     | <PlanName> <i>name</i> </PlanName>                            |
| Stmt#                        | <StatementNumber> <i>n</i> </StatementNumber>                 |
| SQL Function                 | <SQLFunction> <i>function</i> </SQLFunction>                  |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>                   |
|                              | <SQLTextLines>                                                |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                           |
|                              | <PrepareInfo>                                                 |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |
|                              | </SQLTextLines>                                               |
|                              | </SQLTimeByStatement>                                         |
|                              | </SQLTimeByRequestLocation>                                   |

## F16 Db2 SQL CPU/Svc Time by Enclave

| Field title in online report | XML element                               |
|------------------------------|-------------------------------------------|
|                              | <SQLTimeByEnclave>                        |
| Token                        | <Token> <i>token</i> </Token>             |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls> |
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>   |

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <GetPagesIdx>n</GetPagesIdx>                         |
|                              | <GetPages>n</GetPages>                               |
|                              | <SyncReadIO>n</SyncReadIO>                           |
|                              | <PrefetchReq>n</PrefetchReq>                         |
|                              | <SyncWriteIO>n</SyncWriteIO>                         |
|                              | <SQLTimeByStatement>                                 |
| Token                        | <SequenceNumber>seqno</SequenceNumber>               |
| Stmt#                        | <StatementNumber>n</StatementNumber>                 |
| SQL Function                 | <SQLFunction>function</SQLFunction>                  |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <SQLTextLines>                                       |
|                              | <SQLTEXT>sqltext</SQLTEXT>                           |
|                              | <PrepareInfo>                                        |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber> |
|                              | </PrepareInfo>                                       |
|                              | </SQLTextLines>                                      |
|                              | </SQLTimeByStatement>                                |
|                              | </SQLTimeByEnclave>                                  |

## F17 Db2 SQL CPU/Svc Time by Corrid

| Field title in online report | XML element                       |
|------------------------------|-----------------------------------|
|                              | <SQLTimeByCorrelationId>          |
| CorrId                       | <CorrelationId>id</CorrelationId> |



| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <GetPagesIdx>n</GetPagesIdx>                         |
|                              | <GetPages>n</GetPages>                               |
|                              | <SyncReadIO>n</SyncReadIO>                           |
|                              | <PrefetchReq>n</PrefetchReq>                         |
|                              | <SyncWriteIO>n</SyncWriteIO>                         |
|                              | <SQLTimeByStatement>                                 |
| CorrId                       | <SequenceNumber>seqno</SequenceNumber>               |
| Stmt#                        | <StatementNumber>n</StatementNumber>                 |
| SQL Function                 | <SQLFunction>function</SQLFunction>                  |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <SQLTextLines>                                       |
|                              | <SQLTEXT>sqltext</SQLTEXT>                           |
|                              | <PrepareInfo>                                        |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber> |
|                              | </PrepareInfo>                                       |
|                              | </SQLTextLines>                                      |
|                              | </SQLTimeByStatement>                                |
|                              | </SQLTimeByCorrelationId>                            |

## F18 Db2 SQL CPU/Svc Time by Wkstn

| Field title in online report | XML element                                                   |
|------------------------------|---------------------------------------------------------------|
|                              | <SQLTimeByWorkstationId>                                      |
| Wkstn                        | <WorkstationId> <i>id</i> </WorkstationId>                    |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>                   |
|                              | <GetPagesIdx> <i>n</i> </GetPagesIdx>                         |
|                              | <GetPages> <i>n</i> </GetPages>                               |
|                              | <SyncReadIO> <i>n</i> </SyncReadIO>                           |
|                              | <PrefetchReq> <i>n</i> </PrefetchReq>                         |
|                              | <SyncWriteIO> <i>n</i> </SyncWriteIO>                         |
|                              | <SQLTimeByStatement>                                          |
| Wkstn                        | <SequenceNumber> <i>seqno</i> </SequenceNumber>               |
| Stmt#                        | <StatementNumber> <i>n</i> </StatementNumber>                 |
| SQL Function                 | <SQLFunction> <i>function</i> </SQLFunction>                  |
| Nbr of SQL Calls             | <NumberOfCalls> <i>n</i> </NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime> <i>n</i> </TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>                   |
|                              | <SQLTextLines>                                                |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                           |
|                              | <PrepareInfo>                                                 |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber> <i>seqno</i> </PrepareSequenceNumber> |
|                              | </PrepareInfo>                                                |
|                              | </SQLTextLines>                                               |
|                              | </SQLTimeByStatement>                                         |
|                              | </SQLTimeByWorkstationId>                                     |

## F19 Db2 SQL CPU/Svc Time by EndUsr

| Field title in online report | XML element                                          |
|------------------------------|------------------------------------------------------|
|                              | <SQLTimeByEndUser>                                   |
| EndUsr                       | <EndUser>user</EndUser>                              |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <SQLTimeByStatement>                                 |
| EndUsr                       | <SequenceNumber>seqno</SequenceNumber>               |
| Stmt#                        | <StatementNumber>n</StatementNumber>                 |
| SQL Function                 | <SQLFunction>function</SQLFunction>                  |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>                     |
| --CPU Time -- Total          | <TotalCPUTime>n</TotalCPUTime>                       |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>                         |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>                           |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime>               |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>                 |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>                   |
|                              | <GetPagesIdx>n</GetPagesIdx>                         |
|                              | <GetPages>n</GetPages>                               |
|                              | <SyncReadIO>n</SyncReadIO>                           |
|                              | <PrefetchReq>n</PrefetchReq>                         |
|                              | <SyncWriteIO>n</SyncWriteIO>                         |
|                              | <SQLTextLines>                                       |
|                              | <SQLTEXT>sqltext</SQLTEXT>                           |
|                              | <PrepareInfo>                                        |
|                              | <PrepareStatementNumber>n</PrepareStatementNumber>   |
|                              | <PrepareSequenceNumber>seqno</PrepareSequenceNumber> |
|                              | </PrepareInfo>                                       |
|                              | </SQLTextLines>                                      |
|                              | </SQLTimeByStatement>                                |
|                              | </SQLTimeByEndUser>                                  |

## F30 Db2 Class 3 Wait Times

The Db2Class3WaitTimesByPlan tag pair and sub-elements are repeated for each Db2 plan in the report.

| Field title in online report | XML element                                               |
|------------------------------|-----------------------------------------------------------|
|                              | <Db2Class3WaitTimesByPlan>                                |
| Plan Name                    | <PlanName> <i>name</i> </PlanName>                        |
|                              | <Class3WaitTimes>                                         |
| Database I/O                 | <DatabaseIO> <i>n</i> </DatabaseIO>                       |
| Read I/O other               | <ReadIOOther> <i>n</i> </ReadIOOther>                     |
| Write I/O other              | <WriteIOOther> <i>n</i> </WriteIOOther>                   |
| IRLM Lock/Latch              | <IRLMLockLatch> <i>n</i> </IRLMLockLatch>                 |
| Db2 Latch                    | <Db2Latch> <i>n</i> </Db2Latch>                           |
| Page Latch                   | <PageLatch> <i>n</i> </PageLatch>                         |
| Log Write I/O                | <LogWriteIO> <i>n</i> </LogWriteIO>                       |
| Log Read                     | <LogRead> <i>n</i> </LogRead>                             |
| ARC LOG QUIESCE              | <ArcLogQuiesce> <i>n</i> </ArcLogQuiesce>                 |
| Phase 1 Write                | <Phase1Write> <i>n</i> </Phase1Write>                     |
| TCP/IP LOB/XML               | <TcpiLobXml> <i>n</i> </TcpiLobXml>                       |
| Glbl Contention              | <GlblContention> <i>n</i> </GlblContention>               |
| Group Messages               | <GroupMessages> <i>n</i> </GroupMessages>                 |
| CF Requests                  | <CFRequests> <i>n</i> </CFRequests>                       |
| Drain Lock                   | <DrainLock> <i>n</i> </DrainLock>                         |
| Claim Release                | <ClaimRelease> <i>n</i> </ClaimRelease>                   |
| COMMIT                       | <TaskSwitchCOMMIT> <i>n</i> </TaskSwitchCOMMIT>           |
| OPEN/CLOSE                   | <TaskSwitchOPENCLOSE> <i>n</i> </TaskSwitchOPENCLOSE>     |
| SYSLGRNG                     | <TaskSwitchSYSLGRNG> <i>n</i> </TaskSwitchSYSLGRNG>       |
| Data Manager                 | <TaskSwitchDataManager> <i>n</i> </TaskSwitchDataManager> |
| Other                        | <TaskSwitchOther> <i>n</i> </TaskSwitchOther>             |
|                              | </Class3WaitTimes>                                        |
|                              | </Db2Class3WaitTimesByPlan>                               |

## Java/USS/HFS Performance analysis reports

### J01 Java Summary/Attributes

| Field title in online report | XML element                         |
|------------------------------|-------------------------------------|
|                              | <JavaSummary>                       |
| JVMId                        | <JVMId> <i>n</i> </JVMId>           |
| Identifier                   | <Identifier> <i>n</i> </Identifier> |

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
| Heap                         | <Heap>nM</Heap>                        |
| Max                          | <HeapMax>nM</HeapMax>                  |
| Description                  | <Description>description</Description> |
|                              | </JavaSummary>                         |
|                              | <ObservedJavaPackages>                 |
|                              | <JavaPackages>                         |
| PkgId                        | <PkgId>n</PkgId>                       |
| Package Name                 | <PackageName>name</PackageName>        |
|                              | </JavaPackages>                        |
|                              | </ObservedJavaPackages>                |
|                              | <ObservedJavaClasses>                  |
|                              | <JavaClasses>                          |
| ClsId                        | <ClsId>n</ClsId>                       |
| PkgId                        | <PkgId>n</PkgId>                       |
| Class Name                   | <ClassName>name</ClassName>            |
|                              | </JavaClasses>                         |
|                              | </ObservedJavaClasses>                 |
|                              | <ObservedJavaMethods>                  |
|                              | <JavaMethods>                          |
| MthId                        | <MthId>n</MthId>                       |
| ClsId                        | <ClsId>n</ClsId>                       |
| Method Name                  | <MethodName>name</MethodName>          |
|                              | </JavaMethods>                         |
|                              | </ObservedJavaMethods>                 |

## J02 Java Heap Usage Timeline

| Field title in online report | XML element                        |
|------------------------------|------------------------------------|
|                              | <UsageTimeline>                    |
| SEQN                         | <SequenceNumber>n</SequenceNumber> |
| Storage                      | <StorageUsed>nK</Storage Used>     |
| Total                        | <StorageTotal>nK</StorageTotal>    |
|                              | </UsageTimeline>                   |

## J03 Java CPU Usage by Thread

| Field title in online report | XML element       |
|------------------------------|-------------------|
|                              | <JavaCPUbyThread> |

| Field title in online report    | XML element                            |
|---------------------------------|----------------------------------------|
| JavaId                          | <JavaId> <i>n</i> </JavaId>            |
| Thread Name                     | <ThreadName> <i>name</i> </ThreadName> |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>          |
|                                 | </JavaCPUbyThread>                     |

## J04 Java CPU Usage by Package

| Field title in online report    | XML element                                      |
|---------------------------------|--------------------------------------------------|
|                                 | <JavaPackage>                                    |
| JavaId                          | <JavaPackageId> <i>n</i> </JavaPackageId>        |
| Pkg/Cls/Mthd                    | <JavaPackageName> <i>name</i> </JavaPackageName> |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaClass>                                      |
| JavaId                          | <JavaClassId> <i>n</i> </JavaClassId>            |
| Pkg/Cls/Mthd                    | <JavaClassName> <i>name</i> </JavaClassName>     |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaMethod>                                     |
| JavaId                          | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Pkg/Cls/Mthd                    | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaLine>                                       |
| JavaId                          | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Pkg/Cls/Mthd                    | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | </JavaLine>                                      |
|                                 | </JavaMethod>                                    |
|                                 | </JavaClass>                                     |
|                                 | </JavaPackage>                                   |

## J05 Java CPU Usage by Class

| Field title in online report    | XML element                                      |
|---------------------------------|--------------------------------------------------|
|                                 | <JavaClass>                                      |
| JavaId                          | <JavaClassId> <i>n</i> </JavaClassId>            |
| Class/Method                    | <JavaClassName> <i>name</i> </JavaClassName>     |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaMethod>                                     |
| JavaId                          | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Class/Method                    | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaLine>                                       |
| JavaId                          | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Class/Method                    | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | </JavaLine>                                      |
|                                 | </JavaMethod>                                    |
|                                 | </JavaClass>                                     |

## J06 Java CPU Usage by Method

| Field title in online report    | XML element                                      |
|---------------------------------|--------------------------------------------------|
|                                 | <JavaMethod>                                     |
| MthId                           | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Method                          | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |
|                                 | <JavaLine>                                       |
| MthId                           | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Method                          | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                                 | <Measurements> <i>n</i> </Measurements>          |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                    |

| Field title in online report | XML element   |
|------------------------------|---------------|
|                              | </JavaLine>   |
|                              | </JavaMethod> |

## J07 Java CPU Usage by Call Path

| Field title in online report | XML element                                    |
|------------------------------|------------------------------------------------|
|                              | <JavaMethod>                                   |
| MthId                        | <JavaMethodId> <i>n</i> </JavaMethodId>        |
| Method                       | <JavaMethodName> <i>name</i> </JavaMethodName> |
|                              | <Measurements> <i>n</i> </Measurements>        |
| Percent of CPU Time * 10.00% | <Percent> <i>n</i> </Percent>                  |
|                              | </JavaMethod>                                  |

## J09 Java Service Time by Package

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
|                              | <JavaPackage>                                    |
| JavaId                       | <JavaPackageId> <i>n</i> </JavaPackageId>        |
| Pkg/Cls/Mthd                 | <JavaPackageName> <i>name</i> </JavaPackageName> |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaClass>                                      |
| JavaId                       | <JavaClassId> <i>n</i> </JavaClassId>            |
| Pkg/Cls/Mthd                 | <JavaClassName> <i>name</i> </JavaClassName>     |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaMethod>                                     |
| JavaId                       | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Pkg/Cls/Mthd                 | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaLine>                                       |
| JavaId                       | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Pkg/Cls/Mthd                 | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | </JavaLine>                                      |



| Field title in online report | XML element    |
|------------------------------|----------------|
|                              | </JavaMethod>  |
|                              | </JavaClass>   |
|                              | </JavaPackage> |

## J10 Java Service Time by Class

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
|                              | <JavaClass>                                      |
| JavaId                       | <JavaClassId> <i>n</i> </JavaClassId>            |
| Class/Method                 | <JavaClassName> <i>name</i> </JavaClassName>     |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaMethod>                                     |
| JavaId                       | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Class/Method                 | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaLine>                                       |
| JavaId                       | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Class/Method                 | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | </JavaLine>                                      |
|                              | </JavaMethod>                                    |
|                              | </JavaClass>                                     |

## J11 Java Service Time by Method

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
|                              | <JavaMethod>                                     |
| MthId                        | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Method                       | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaLine>                                       |
| MthId                        | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Method                       | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                              | <Measurements> <i>n</i> </Measurements>          |

| Field title in online report | XML element          |
|------------------------------|----------------------|
| Percent of Time * 10.00%     | <Percent>n</Percent> |
|                              | </JavaLine>          |
|                              | </JavaMethod>        |

## J12 Java Service Time by Call Path

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
|                              | <JavaMethod>                          |
| MthId                        | <JavaMethodId>n</JavaMethodId>        |
| Method                       | <JavaMethodName>name</JavaMethodName> |
|                              | <Measurements>n</Measurements>        |
| Percent of Time * 10.00%     | <Percent>n</Percent>                  |
|                              | </JavaMethod>                         |

## J14 Java Wait Time by Package

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <JavaPackage>                           |
| JavaId                       | <JavaPackageId>n</JavaPackageId>        |
| Pkg/Cls/Mthd                 | <JavaPackageName>name</JavaPackageName> |
|                              | <Measurements>n</Measurements>          |
| Percent of Time * 10.00%     | <Percent>n</Percent>                    |
|                              | <JavaClass>                             |
| JavaId                       | <JavaClassId>n</JavaClassId>            |
| Pkg/Cls/Mthd                 | <JavaClassName>name</JavaClassName>     |
|                              | <Measurements>n</Measurements>          |
| Percent of Time * 10.00%     | <Percent>n</Percent>                    |
|                              | <JavaMethod>                            |
| JavaId                       | <JavaMethodId>n</JavaMethodId>          |
| Pkg/Cls/Mthd                 | <JavaMethodName>name</JavaMethodName>   |
|                              | <Measurements>n</Measurements>          |
| Percent of Time * 10.00%     | <Percent>n</Percent>                    |
|                              | <JavaLine>                              |
| JavaId                       | <JavaLineNumberId>n</JavaLineNumberId>  |
| Pkg/Cls/Mthd                 | <JavaLineNumber>lineno</JavaLineNumber> |
|                              | <Measurements>n</Measurements>          |
| Percent of Time * 10.00%     | <Percent>n</Percent>                    |
|                              | </JavaLine>                             |

| Field title in online report | XML element    |
|------------------------------|----------------|
|                              | </JavaMethod>  |
|                              | </JavaClass>   |
|                              | </JavaPackage> |

## J15 Java Wait Time by Class

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
|                              | <JavaClass>                                      |
| JavaId                       | <JavaClassId> <i>n</i> </JavaClassId>            |
| Class/Method                 | <JavaClassName> <i>name</i> </JavaClassName>     |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaMethod>                                     |
| JavaId                       | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Class/Method                 | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaLine>                                       |
| JavaId                       | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Class/Method                 | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | </JavaLine>                                      |
|                              | </JavaMethod>                                    |
|                              | </JavaClass>                                     |

## J16 Java Wait Time by Method

| Field title in online report | XML element                                      |
|------------------------------|--------------------------------------------------|
|                              | <JavaMethod>                                     |
| MthId                        | <JavaMethodId> <i>n</i> </JavaMethodId>          |
| Method                       | <JavaMethodName> <i>name</i> </JavaMethodName>   |
|                              | <Measurements> <i>n</i> </Measurements>          |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                    |
|                              | <JavaLine>                                       |
| MthId                        | <JavaLineNumberId> <i>n</i> </JavaLineNumberId>  |
| Method                       | <JavaLineNumber> <i>lineno</i> </JavaLineNumber> |
|                              | <Measurements> <i>n</i> </Measurements>          |

| Field title in online report | XML element          |
|------------------------------|----------------------|
| Percent of Time * 10.00%     | <Percent>n</Percent> |
|                              | </JavaLine>          |
|                              | </JavaMethod>        |

## J17 Java Wait Time by Call Path

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
|                              | <JavaMethod>                          |
| MthId                        | <JavaMethodId>n</JavaMethodId>        |
| Method                       | <JavaMethodName>name</JavaMethodName> |
|                              | <Measurements>n</Measurements>        |
| Percent of Time * 10.00%     | <Percent>n</Percent>                  |
|                              | </JavaMethod>                         |

## J18 - Java Garbage Collection Report

| Field Title in Online Report | XML Element                                      |
|------------------------------|--------------------------------------------------|
|                              | <GarbageCollectionSummary>                       |
| Number of GC Events          | <NumberOfGCEvents>n</NumberOfGCEvents>           |
| Total GC Time                | <TotalGCtime>seconds</TotalGCtime>               |
| Average GC Time              | <AverageGCtime>seconds</AverageGCtime>           |
| Total JVM Sample Time        | <TotalJVMsampleTime>seconds</TotalJVMsampleTime> |
| Percent Time Elapsed in GC   | <PercentTimeGC>percent</PercentTimeGC>           |
|                              | <GarbageCollectionDetails>                       |
|                              | <HeapSnapshot>                                   |
| Sequence Number              | <SequenceNumber>n</SequenceNumber>               |
| Heap Bytes                   | <HeapBytes>bytes</HeapBytes>                     |
| Heap Object Count            | <HeapObjectCount>count</HeapObjectCount>         |
|                              | <GCevent>                                        |
| Sequence Number              | <SequenceNumber>n </SequenceNumber>              |
| GC Duration                  | <GCduration>seconds</GCduration>                 |

## J19 - Java Heap Object Report

| Field Title in Online Report | XML Element         |
|------------------------------|---------------------|
|                              | <HeapObjectDetails> |
|                              | <HeapClassOrArray>  |

|                            |                                                |
|----------------------------|------------------------------------------------|
| Class Name                 | <ClassName>name</ClassName>                    |
| Class Type                 | <ClassType>type</ClassType>                    |
| Object Instance Count      | <ObjectInstanceCount>n</ObjectInstanceCount>   |
| Average Object Size        | <AverageObjectSize>bytes</AverageObjectSize>   |
| Object Total Bytes         | <ObjectTotalBytes>bytes</ObjectTotalBytes>     |
| Object Total Bytes Ranking | <ObjectTotalBytesRank>n</ObjectTotalBytesRank> |
| Percentage of Heap Used    | <HeapUsePercentage>percent</HeapUsePercentage> |

## H01 HFS Service Time by Path Name

| Field title in online report | XML element                    |
|------------------------------|--------------------------------|
|                              | <HFSTimeByPathName>            |
| FileId                       | <FileId>n</FileId>             |
| Path Name                    | <PathName>name</PathName>      |
|                              | <Measurements>n</Measurements> |
| Percent of Time * 10.00%     | <Percent>n</Percent>           |
|                              | </HFSTimeByPathName>           |

## H02 HFS Service Time by Device

| Field title in online report | XML element                    |
|------------------------------|--------------------------------|
|                              | <HFSTimeByDevice>              |
| DevId                        | <DeviceId>n</DeviceId>         |
| Device#>PathName             | <DeviceNumber>n</DeviceNumber> |
|                              | <Measurements>n</Measurements> |
| Percent of Time * 10.00%     | <Percent>n</Percent>           |
|                              | <HFSTimeByPathName>            |
| DevId                        | <FileId>n</FileId>             |
| Device#>PathName             | <PathName>name</PathName>      |
|                              | <Measurements>n</Measurements> |
| Percent of Time * 10.00%     | <Percent>n</Percent>           |
|                              | </HFSTimeByPathName>           |
|                              | </HFSTimeByDevice>             |

## H03 HFS File Activity

| Field title in online report | XML element               |
|------------------------------|---------------------------|
|                              | <HFSFileActivity>         |
| FileId                       | <FileId>n</FileId>        |
| PathName                     | <PathName>name</PathName> |

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
| File Type                    | <FileType> <i>filetype</i> </FileType> |
| Reads/Writes                 | <ReadsWrites> <i>n</i> </ReadsWrites>  |
|                              | </HFSFileActivity>                     |

## H04 HFS File Attributes

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <HFSFileAttributes>                                         |
| FileId                       | <FileId> <i>n</i> </FileId>                                 |
| Path name                    | <PathName> <i>name</i> </PathName>                          |
| File type                    | <FileType> <i>filetype</i> </FileType>                      |
| Major                        | <FileTypeMajor> <i>n</i> </FileTypeMajor>                   |
| Minor                        | <FileTypeMinor> <i>n</i> </FileTypeMinor>                   |
| Opened                       | <OpenTime> <i>hh:mm:ss.ss</i> </OpenTime>                   |
| Opened                       | <OpenDate> <i>Day Mon dd yyyy</i> </OpenDate>               |
| Device#                      | <DeviceNumber> <i>n</i> </DeviceNumber>                     |
| Serial#                      | <SerialNumber> <i>n</i> </SerialNumber>                     |
| Open Flags                   | <OpenFlags> <i>flags</i> </OpenFlags>                       |
| File type                    | <ModeFlagsFileType> <i>type</i> </ModeFlagsFileType>        |
| Permissions: Owner           | <PermissionOwner> <i>permission</i> </PermissionOwner>      |
| Permissions: Group           | <PermissionGroup> <i>permission</i> </PermissionGroup>      |
| Permissions: Other           | <PermissionOther> <i>permission</i> </PermissionOther>      |
|                              | <SetIdFlags> <i>setid</i> </SetIdFlags>                     |
| Read Requests Initial        | <ReadRequestsFirst> <i>n</i> </ReadRequestsFirst>           |
| Last                         | <ReadRequestsLast> <i>n</i> </ReadRequestsLast>             |
| Delta                        | <ReadRequestsDelta> <i>n</i> </ReadRequestsDelta>           |
| Write Requests Initial       | <WriteRequestsFirst> <i>n</i> </WriteRequestsFirst>         |
| Last                         | <WriteRequestsLast> <i>n</i> </WriteRequestsLast>           |
| Delta                        | <WriteRequestsDelta> <i>n</i> </WriteRequestsDelta>         |
| DIR I/O Blocks Initial       | <DirectoryRequestsFirst> <i>n</i> </DirectoryRequestsFirst> |
| Last                         | <DirectoryRequestsLast> <i>n</i> </DirectoryRequestsLast>   |
| Delta                        | <DirectoryRequestsDelta> <i>n</i> </DirectoryRequestsDelta> |
| Blocks Read Initial          | <BlocksReadFirst> <i>n</i> </BlocksReadFirst>               |
| Last                         | <BlocksReadLast> <i>n</i> </BlocksReadLast>                 |
| Delta                        | <BlocksReadDelta> <i>n</i> </BlocksReadDelta>               |
| Blocks Written Initial       | <BlocksWrittenFirst> <i>n</i> </BlocksWrittenFirst>         |

| Field title in online report | XML element                                         |
|------------------------------|-----------------------------------------------------|
| Last                         | <BlocksWrittenLast> <i>n</i> </BlocksWrittenLast>   |
| Delta                        | <BlocksWrittenDelta> <i>n</i> </BlocksWrittenDelta> |
| Bytes Read Initial           | <BytesReadFirst> <i>n</i> </BytesReadFirst>         |
| Last                         | <BytesReadLast> <i>n</i> </BytesReadLast>           |
| Delta                        | <BytesReadDelta> <i>n</i> </BytesReadDelta>         |
| Bytes Written Initial        | <BytesWrittenFirst> <i>n</i> </BytesWrittenFirst>   |
| Last                         | <BytesWrittenLast> <i>n</i> </BytesWrittenLast>     |
| Delta                        | <BytesWrittenDelta> <i>n</i> </BytesWrittenDelta>   |
|                              | </HFSFileAttributes>                                |

## H05 HFS Device Activity

| Field title in online report | XML element                                  |
|------------------------------|----------------------------------------------|
|                              | <HFSDeviceActivity>                          |
| DevId                        | <DeviceId> <i>n</i> </DeviceId>              |
| Device#                      | <DeviceNumber> <i>n</i> </DeviceNumber>      |
| Mount Point                  | <MountPoint> <i>mountpoint</i> </MountPoint> |
| Reads/Writes                 | <ReadsWrites> <i>n</i> </ReadsWrites>        |
|                              | </HFSDeviceActivity>                         |

## H06 HFS Device Attributes

| Field title in online report | XML element                                                  |
|------------------------------|--------------------------------------------------------------|
|                              | <HFSDeviceAttributes>                                        |
| DevId                        | <DeviceId> <i>n</i> </DeviceId>                              |
| Device#                      | <DeviceNumber> <i>n</i> </DeviceNumber>                      |
| Dataset name                 | <DatasetName> <i>dsn</i> </DatasetName>                      |
| DD name                      | <DDName> <i>ddname</i> </DDName>                             |
| Physical file system         | <PhysicalFileSystem> <i>filesystem</i> </PhysicalFileSystem> |
| Mount point                  | <MountPoint> <i>mountpoint</i> </MountPoint>                 |
| Mounted                      | <MountTime> <i>hh:mm:ss.ss</i> </MountTime>                  |
| Mounted                      | <MountDate> <i>Day Mon dd yyyy</i> </MountDate>              |
| Read Requests Initial        | <ReadRequestsFirst> <i>n</i> </ReadRequestsFirst>            |
| Last                         | <ReadRequestsLast> <i>n</i> </ReadRequestsLast>              |
| Delta                        | <ReadRequestsDelta> <i>n</i> </ReadRequestsDelta>            |
| Write Requests Initial       | <WriteRequestsFirst> <i>n</i> </WriteRequestsFirst>          |
| Last                         | <WriteRequestsLast> <i>n</i> </WriteRequestsLast>            |
| Delta                        | <WriteRequestsDelta> <i>n</i> </WriteRequestsDelta>          |

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
| DIR I/O Blocks Initial       | <DirectoryRequestsFirst> <i>n</i> </DirectoryRequestsFirst> |
| Last                         | <DirectoryRequestsLast> <i>n</i> </DirectoryRequestsLast>   |
| Delta                        | <DirectoryRequestsDelta> <i>n</i> </DirectoryRequestsDelta> |
| Blocks Read Initial          | <BlocksReadFirst> <i>n</i> </BlocksReadFirst>               |
| Last                         | <BlocksReadLast> <i>n</i> </BlocksReadLast>                 |
| Delta                        | <BlocksReadDelta> <i>n</i> </BlocksReadDelta>               |
| Blocks Written Initial       | <BlocksWrittenFirst> <i>n</i> </BlocksWrittenFirst>         |
| Last                         | <BlocksWrittenLast> <i>n</i> </BlocksWrittenLast>           |
| Delta                        | <BlocksWrittenDelta> <i>n</i> </BlocksWrittenDelta>         |
| Bytes Read Initial           | <BytesReadFirst> <i>n</i> </BytesReadFirst>                 |
| Last                         | <BytesReadLast> <i>n</i> </BytesReadLast>                   |
| Delta                        | <BytesReadDelta> <i>n</i> </BytesReadDelta>                 |
| Bytes Written Initial        | <BytesWrittenFirst> <i>n</i> </BytesWrittenFirst>           |
| Last                         | <BytesWrittenLast> <i>n</i> </BytesWrittenLast>             |
| Delta                        | <BytesWrittenDelta> <i>n</i> </BytesWrittenDelta>           |
|                              | </HFSDeviceAttributes>                                      |

## H07 HFS Activity Timeline

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
|                              | <HFSActivityTimeline>                                   |
| File Information Samples     | <Samples> <i>n</i> </Samples>                           |
| Duration                     | <Duration> <i>n</i> </Duration>                         |
| Path Name                    | <PathName> <i>name</i> </PathName>                      |
| FileId                       | <FileId> <i>n</i> </FileId>                             |
| File Type                    | <FileType> <i>filetype</i> </FileType>                  |
| Open for                     | <OpenFor> <i>mode</i> </OpenFor>                        |
|                              | <Intervals>                                             |
|                              | <IntervalPct> <i>n</i> </IntervalPct> Repeated 50 times |
|                              | </Interval>                                             |
|                              | </HFSActivityTimeline>                                  |

## H08 HFS Wait Time by Path Name

| Field title in online report | XML element                        |
|------------------------------|------------------------------------|
|                              | <HFSTimeByPathName>                |
| FileId                       | <FileId> <i>n</i> </FileId>        |
| Path Name                    | <PathName> <i>name</i> </PathName> |



| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | </HFSTimeByPathName>                    |

## H09 HFS Wait Time by Device

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <HFSTimeByDevice>                       |
| DevId                        | <DeviceId> <i>n</i> </DeviceId>         |
| Device#>PathName             | <DeviceNumber> <i>n</i> </DeviceNumber> |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | <HFSTimeByPathName>                     |
| DevId                        | <FileId> <i>n</i> </FileId>             |
| Device#>PathName             | <PathName> <i>name</i> </PathName>      |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | </HFSTimeByPathName>                    |
|                              | </HFSTimeByDevice>                      |

## H10 HFS Service Time by Request

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <HFSTimeByRequest>                      |
| ReqId                        | <RequestId> <i>n</i> </RequestId>       |
| Request>PathName             | <Request> <i>request</i> </Request>     |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | <HFSTimeByPathName>                     |
| ReqId                        | <FileId> <i>n</i> </FileId>             |
| Request>PathName             | <PathName> <i>name</i> </PathName>      |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | </HFSTimeByPathName>                    |
|                              | </HFSTimeByRequest>                     |

## H11 HFS Wait Time by Request

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <HFSTimeByRequest>                      |
| ReqId                        | <RequestId> <i>n</i> </RequestId>       |
| Request>PathName             | <Request> <i>request</i> </Request>     |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | <HFSTimeByPathName>                     |
| ReqId                        | <FileId> <i>n</i> </FileId>             |
| Request>PathName             | <PathName> <i>name</i> </PathName>      |
|                              | <Measurements> <i>n</i> </Measurements> |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>           |
|                              | </HFSTimeByPathName>                    |
|                              | </HFSTimeByRequest>                     |

## MQ Performance analysis reports

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### Q01 MQ Activity Summary

| Field title in online report | XML element                                              |
|------------------------------|----------------------------------------------------------|
|                              | <MQObjectsObserved>                                      |
| Object Sequence Number       | <ObjectSequenceNumber> <i>n</i> </ObjectSequenceNumber > |
| Object Manager Name          | <QueueManagerName> <i>name</i> </QueueManagerName>       |
| Object Name                  | <ObjectName> <i>name</i> </ObjectName>                   |
| Object Type                  | <ObjectType> <i>type</i> </ObjectType>                   |
|                              | </MQObjectsObserved>                                     |
|                              | <MQCallsObserved>                                        |
| Module                       | <Module> <i>name</i> </Module>                           |
| CSECT                        | <CSECT> <i>name</i> </CSECT>                             |
| Offset                       | <Offset> <i>n</i> </Offset>                              |
| Function                     | <Function> <i>function</i> </Function>                   |
| Queue Mgr                    | <QueueManager> <i>name</i> </QueueManager>               |
| Object Name                  | <ObjectName> <i>name</i> </ObjectName>                   |
|                              | </MQCallsObserved>                                       |

### Q02 MQ CPU Usage by Queue

| Field title in online report | XML element |
|------------------------------|-------------|
|                              | <MQQueue>   |

| Field title in online report    | XML element                                                 |
|---------------------------------|-------------------------------------------------------------|
| Name                            | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                     | <QueueName> <i>name</i> </QueueName>                        |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | <MQRequest>                                                 |
| Name                            | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                     | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | </MQRequest>                                                |
|                                 | </MQQueue>                                                  |

### Q03 MQ CPU Usage by Request

| Field title in online report    | XML element                                                 |
|---------------------------------|-------------------------------------------------------------|
|                                 | <MQRequest>                                                 |
| Name                            | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                     | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | <MQQueue>                                                   |
| Name                            | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                     | <QueueName> <i>name</i> </QueueName>                        |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | </MQQueue>                                                  |
|                                 | </MQRequest>                                                |

### Q04 MQ CPU Usage by Txn/Queue

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
|                              | <Transaction>                                           |
| Name                         | <TranName> <i>name</i> </TranName>                      |
| Description                  | <TranDescription> <i>description</i> </TranDescription> |
|                              | <Measurements> <i>n</i> </Measurements>                 |

| Field title in online report    | XML element                                                 |
|---------------------------------|-------------------------------------------------------------|
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | <MQQueue>                                                   |
| Name                            | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                     | <QueueName> <i>name</i> </QueueName>                        |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | <MQRequest>                                                 |
| Name                            | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                     | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                                 | <Measurements> <i>n</i> </Measurements>                     |
| Percent of CPU Time *<br>10.00% | <Percent> <i>n</i> </Percent>                               |
|                                 | </MQRequest>                                                |
|                                 | </MQQueue>                                                  |
|                                 | </Transaction>                                              |

## Q05 MQ Service Time by Queue

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <MQQueue>                                                   |
| Name                         | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                  | <QueueName> <i>name</i> </QueueName>                        |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQRequest>                                                 |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQRequest>                                                |
|                              | </MQQueue>                                                  |

## Q06 MQ Service Time by Request

| Field title in online report | XML element                                              |
|------------------------------|----------------------------------------------------------|
|                              | <MQRequest>                                              |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction> |

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQQueue>                                                   |
| Name                         | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                  | <QueueName> <i>name</i> </QueueName>                        |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQQueue>                                                  |
|                              | </MQRequest>                                                |

## Q07 MQ Service Time by Txn/Queue

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <Transaction>                                               |
| Name                         | <TranName> <i>name</i> </TranName>                          |
| Description                  | <TranDescription> <i>description</i> </TranDescription>     |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQQueue>                                                   |
| Name                         | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                  | <QueueName> <i>name</i> </QueueName>                        |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQRequest>                                                 |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQRequest>                                                |
|                              | </MQQueue>                                                  |
|                              | </Transaction>                                              |

## Q08 MQ Wait Time by Queue

| Field title in online report | XML element                                |
|------------------------------|--------------------------------------------|
|                              | <MQQueue>                                  |
| Name                         | <QueueManager> <i>name</i> </QueueManager> |

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
| Description                  | <QueueName> <i>name</i> </QueueName>                        |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQRequest>                                                 |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQRequest>                                                |
|                              | </MQQueue>                                                  |

## Q09 MQ Wait Time by Request

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <MQRequest>                                                 |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQQueue>                                                   |
| Name                         | <QueueManager> <i>name</i> </QueueManager>                  |
| Description                  | <QueueName> <i>name</i> </QueueName>                        |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQQueue>                                                  |
|                              | </MQRequest>                                                |

## Q10 MQ Wait Time by Txn/Queue

| Field title in online report | XML element                                             |
|------------------------------|---------------------------------------------------------|
|                              | <Transaction>                                           |
| Name                         | <TranName> <i>name</i> </TranName>                      |
| Description                  | <TranDescription> <i>description</i> </TranDescription> |
|                              | <Measurements> <i>n</i> </Measurements>                 |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                           |
|                              | <MQQueue>                                               |
| Name                         | <QueueManager> <i>name</i> </QueueManager>              |
| Description                  | <QueueName> <i>name</i> </QueueName>                    |

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | <MQRequest>                                                 |
| Name                         | <MQRequestFunction> <i>function</i> </MQRequestFunction>    |
| Description                  | <ProgramNameOffset> <i>name+offset</i> </ProgramNameOffset> |
|                              | <Measurements> <i>n</i> </Measurements>                     |
| Percent of Time * 10.00%     | <Percent> <i>n</i> </Percent>                               |
|                              | </MQRequest>                                                |
|                              | </MQQueue>                                                  |
|                              | </Transaction>                                              |

## Q11 MQ+ Activity Timeline

The MQ+ ActivityTimeline tag pair is repeated nested for each MQ call and MQ Queue Manager detail line.

| Field title in online report | XML element                                  |
|------------------------------|----------------------------------------------|
|                              | <MQActivityTimeline>                         |
| Seqno                        | <Seqno> <i>n</i> </Seqno>                    |
| Call                         | <Call> <i>call type</i> </Call>              |
| Location                     | <Location> <i>location</i> </Location>       |
| Msg Len                      | <MsgLen> <i>n</i> </Msglen>                  |
| Call Time                    | <CallTime> <i>hh:mm:ss.ss</i> </CallTime>    |
| Svc Time                     | <ServiceTime> <i>n</i> </ServiceTime>        |
| CPU Time                     | <CPUTime> <i>n</i> </CPUTime>                |
|                              | <MQActivityTimeLine>                         |
| Seqno                        | <QMgr> <i>queue manager</i> </QMgr>          |
| Call                         | <ObjectName> <i>queue name</i> </ObjectName> |
|                              | </MQActivityTimeline>                        |
|                              | </MQActivityTimeline>                        |

## Q12 MQ+ CPU/SVC Time by Queue

The MQ+ CPU Time by Queue tag pair is repeated nested for each MQ Queue Manager and MQ call detail line.

| Field title in online report | XML element                                    |
|------------------------------|------------------------------------------------|
|                              | <MQCPUTimebyQueue>                             |
| Name                         | <Name> <i>queue manager</i> </Name>            |
| Description                  | <Description> <i>queue name</i> </Description> |
| Nbr of Calls                 | <NumberOfCalls> <i>n</i> </NumberOfCalls>      |

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
| --CPU Time-- Total           | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>     |
|                              | <MQCPUTimebyQueue>                     |
| Name                         | <Name> call type</Name>                |
| Description                  | <Description>location</Description>    |
| Nbr of Calls                 | <NumberOfCalls>n</NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>     |
|                              | </MQCPUTimebyQueue>                    |
|                              | </MQCPUTimebyQueue>                    |

### Q13 MQ+ CPU/SVC Time by Request

The MQ+ CPU Time by Request tag pair is repeated nested for each MQ call and MQ Queue Manager detail line.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <MQCPUTimebyRequest>                   |
| Name                         | <Name>call type</Name>                 |
| Description                  | <Description>location</Description>    |
| Nbr of Calls                 | <NumberOfCalls>n</NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime>n</PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime>n</MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime>n</PctServiceTime>     |
|                              | <MQCPUTimebyRequest>                   |
| Name                         | <Name>queue manager</Name>             |



| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Description                  | <Description> <i>queue name</i> </Description>  |
| Nbr of Calls                 | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime> <i>n</i> </TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |
|                              | </MQCPUTimebyRequest>                           |
|                              | </MQCPUTimebyRequest>                           |

## Q14 MQ+ CPU/SVC Time by Txn

The MQ+ CPU Time by Transaction tag pair is repeated nested for each transaction, MQ Queue Manager, and MQ call detail line.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <MQCPUTimebyTransaction>                        |
| Name                         | <Name> <i>tran</i> </Name>                      |
| Description                  | <Description> <i>descr</i> </Description>       |
| Nbr of Calls                 | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime> <i>n</i> </TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |
|                              | <MQCPUTimebyTransaction>                        |
| Name                         | <Name> <i>queue manager</i> </Name>             |
| Description                  | <Description> <i>queue name</i> </Description>  |
| Nbr of Calls                 | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime> <i>n</i> </TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <MQCPUTimebyTransaction>                        |
| Name                         | <Name> <i>call type</i> </Name>                 |
| Description                  | <Description> <i>location</i> </Description>    |
| Nbr of Calls                 | <NumberOfCalls> <i>n</i> </NumberOfCalls>       |
| --CPU Time-- Total           | <TotalCPUTime> <i>n</i> </TotalCPUTime>         |
| --CPU Time-- Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>           |
| --CPU Time-- Pct             | <PctCPUTime> <i>n</i> </PctCPUTime>             |
| --Svc Time-- Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime> |
| --Svc Time-- Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>   |
| --Svc Time-- Pct             | <PctServiceTime> <i>n</i> </PctServiceTime>     |
|                              | </MQCPUTimebyTransaction>                       |
|                              | </MQCPUTimebyTransaction>                       |
|                              | </MQCPUTimebyTransaction>                       |

## WebSphere performance analysis reports

### B01 WAS Summary

| Field title in online report | XML element                                       |
|------------------------------|---------------------------------------------------|
|                              | <WASSummary>                                      |
| System name                  | <SystemName> <i>name</i> </SystemName>            |
| Sysplex                      | <SysplexName> <i>name</i> </SysplexName>          |
| Job name                     | <JobName> <i>name</i> </JobName>                  |
| Job id                       | <JobId> <i>id</i> </JobId>                        |
| ASID                         | <ASID> <i>asid</i> </ASID>                        |
| Cell                         | <Cell> <i>name</i> </Cell>                        |
| Node                         | <Node> <i>name</i> </Node>                        |
| Cluster                      | <Cluster> <i>name</i> </Cluster>                  |
| Server                       | <Server> <i>name</i> </Server>                    |
| WAS version                  | <WASVersion> <i>version</i> </WASVersion>         |
| Service level                | <ServiceLevel> <i>level</i> </ServiceLevel>       |
| Total requests               | <RequestedObserved> <i>n</i> </RequestedObserved> |
| IIOP requests                | <IIOPRequests> <i>n</i> </IIOPRequests>           |
| HTTP requests                | <HTTPRequests> <i>n</i> </HTTPRequests>           |
| HTTPS requests               | <HTTPSRequests> <i>n</i> </HTTPSRequests>         |
| MDB Plan A requests          | <MDBPlanARequests> <i>n</i> </MDBPlanARequests>   |

| Field title in online report | XML element                                           |
|------------------------------|-------------------------------------------------------|
| MDB Plan B requests          | <MDBPlanBRequests>n</MDBPlanBRequests>                |
| MDB Plan C requests          | <MDBPlanCRequests>n</MDBPlanCRequests>                |
| SIP requests                 | <SIPRequests>n</SIPRequests>                          |
| SIPS requests                | <SIPSRequests>n</SIPSRequests>                        |
| MBean requests               | <MBeanRequests>n</MBeanRequests>                      |
| OTS requests                 | <OTSRequests>n</OTSRequests>                          |
| Internal requests            | <InternalRequests>n</InternalRequests>                |
| Inbound WOLA                 | <InboundWOLAResponses>n</InboundWOLAResponses>        |
| Unknown requests             | <UnknownRequests>n</UnknownRequests>                  |
| Asynchronous requests        | <AsynchronousRequests>n</AsynchronousRequests>        |
| Timed out requests           | <TimedOutRequests>n</TimedOutRequests>                |
| Outbound WOLA requests       | <OutboundWOLA>n</OutboundWOLA>                        |
| Outbound unknown             | <OutboundUnknown>n</OutboundUnknown>                  |
| Total service time           | <TotalServiceTime>hh:mm:ss.sss</TotalServiceTime>     |
| WLM queued time              | <WLMQueuedTime>hh:mm:ss.sss</WLMQueuedTime>           |
| Dispatched time              | <DispatchedTime>hh:mm:ss.sss</DispatchedTime>         |
| Controller time              | <ControllerTime>hh:mm:ss.sss</ControllerTime>         |
| Asynchronous time            | <AsynchronousTime>hh:mm:ss.sss</AsynchronousTime>     |
| Enclave CPU time             | <EnclaveCPUTime>hh:mm:ss.sss</EnclaveCPUTime>         |
| Encl zIIP CPU time           | <EnclavezIIPCPUTime>hh:mm:ss.sss</EnclavezIIPCPUTime> |
| Encl zAAP CPU time           | <EnclavezAAPCPUTime>hh:mm:ss.sss</EnclavezAAPCPUTime> |
| Encl CPU s/units             | <EnclaveCPUServiceUnits>n</EnclaveCPUServiceUnits>    |
| Encl zIIP s/units            | <EnclavezIIPServiceUnits>n</EnclavezIIPServiceUnits>  |
| Encl zAAP s/units            | <EnclavezAAPServiceUnits>n</EnclavezAAPServiceUnits>  |
| Async Encl CPU time          | <AsyncEnclCPUTime> hh:mm:ss.sss </AsyncEnclCPUTime>   |
| Async Encl zIIP CPU          | <AsyncEnclzIIPCPU> hh:mm:ss.sss</AsyncEnclzIIPCPU>    |
| Async Encl zAAP CPU          | <AsyncEnclzAAPCPU> hh:mm:ss.sss</AsyncEnclzAAPCPU>    |
|                              | </WASSummary>                                         |

## B02 WAS Activity

| Field title in online report             | XML element             |
|------------------------------------------|-------------------------|
|                                          | <WASActivitybyRequest > |
| Seqno                                    | <Seqno>n</Seqno>        |
| Request, EJB/Webapp, Method/Servlet Name | <Name>name</Name>       |
|                                          | <Type>type</Type>       |

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
| Request Count                | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total           | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean            | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time-- Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WASActivitybyRequest>                 |

### B03 WAS Activity by Origin

| Field title in online report               | XML element                             |
|--------------------------------------------|-----------------------------------------|
|                                            | <WASActivitybyOrigin >                  |
| Seqno                                      | <Seqno> <i>n</i> </Seqno>               |
| Origin, EJB/Webapp,<br>Method/Servlet Name | <Name> <i>name</i> </Name>              |
|                                            | <Type> <i>type</i> </Type>              |
| Request Count                              | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total                         | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean                          | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total                         | <TotalService> <i>n</i> </TotalService> |
| --Svc Time-- Mean                          | <MeanService> <i>n</i> </MeanService>   |
|                                            | </WASActivitybyOrigin>                  |

### B04 WAS Activity by Servant

| Field title in online report                | XML element                             |
|---------------------------------------------|-----------------------------------------|
|                                             | <WASActivitybyServant >                 |
| Seqno                                       | <Seqno> <i>n</i> </Seqno>               |
| Servant,Req,EJB/Web,<br>Method/Servlet Name | <Name> <i>name</i> </Name>              |
|                                             | <Type> <i>type</i> </Type>              |
| Request Count                               | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total                          | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean                           | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total                          | <TotalService> <i>n</i> </TotalService> |
| --Svc Time-- Mean                           | <MeanService> <i>n</i> </MeanService>   |
|                                             | </WASActivitybyServant>                 |

## B05 WAS EJB Activity

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WASEJBActivitybyRequest >              |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| EJB, Method Name             | <Name> <i>name</i> </Name>              |
|                              | <Type> <i>type</i> </Type>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total           | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean            | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time-- Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WASEJBActivitybyRequest>              |

## B06 WAS EJB Activity by Origin

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WASEJBActivitybyOrigin >               |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Origin, EJB, Method Name     | <Name> <i>name</i> </Name>              |
|                              | <Type> <i>type</i> </Type>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total           | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean            | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time-- Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WASEJBActivitybyOrigin>               |

## B07 WAS EJB Activity by Servant

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WASEJBActivitybyServant >              |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Servant, EJB, Method Name    | <Name> <i>name</i> </Name>              |
|                              | <Type> <i>type</i> </Type>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --CPU Time-- Total           | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time-- Mean            | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time-- Total           | <TotalService> <i>n</i> </TotalService> |

| Field title in online report | XML element                  |
|------------------------------|------------------------------|
| --Svc Time-- Mean            | <MeanService>n</MeanService> |
|                              | </WASEJBActivitybyServant>   |

## B08 WAS Servlet/JSP Activity

| Field title in online report | XML element                       |
|------------------------------|-----------------------------------|
|                              | <WASServletJSPActivitybyRequest > |
| Seqno                        | <Seqno>n</Seqno>                  |
| Web App, Servlet/JSP Name    | <Name>name</Name>                 |
|                              | <Type>type</Type>                 |
| Request Count                | <Count>n</Count>                  |
| --CPU Time-- Total           | <TotalCPU>n</TotalCPU>            |
| --CPU Time-- Mean            | <MeanCPU>n</MeanCPU>              |
| --Svc Time-- Total           | <TotalService>n</TotalService>    |
| --Svc Time-- Mean            | <MeanService>n</MeanService>      |
|                              | </WASServletJSPActivitybyRequest> |

## B09 WAS Servlet/JSP Activity by Origin

| Field title in online report      | XML element                      |
|-----------------------------------|----------------------------------|
|                                   | <WASServletJSPActivitybyOrigin>  |
| Seqno                             | <Seqno>n</Seqno>                 |
| Origin, Web App, Servlet/JSP Name | <Name>name</Name>                |
|                                   | <Type>type</Type>                |
| Request Count                     | <Count>n</Count>                 |
| --CPU Time-- Total                | <TotalCPU>n</TotalCPU>           |
| --CPU Time-- Mean                 | <MeanCPU>n</MeanCPU>             |
| --Svc Time-- Total                | <TotalService>n</TotalService>   |
| --Svc Time-- Mean                 | <MeanService>n</MeanService>     |
|                                   | </WASServletJSPActivitybyOrigin> |

## B10 WAS Servlet/JSP by Activity by Servant

| Field title in online report       | XML element                      |
|------------------------------------|----------------------------------|
|                                    | <WASServletJSPActivitybyServant> |
| Seqno                              | <Seqno>n</Seqno>                 |
| Servant, Web App, Servlet/JSP Name | <Name>name</Name>                |

| Field title in online report | XML element                       |
|------------------------------|-----------------------------------|
|                              | <Type>type</Type>                 |
| Request Count                | <Count>n</Count>                  |
| --CPU Time-- Total           | <TotalCPU>n</TotalCPU>            |
| --CPU Time-- Mean            | <MeanCPU>n</MeanCPU>              |
| --Svc Time-- Total           | <TotalService>n</TotalService>    |
| --Svc Time-- Mean            | <MeanService>n</MeanService>      |
|                              | </WASServletJSPActivitybyServant> |

## B11 WAS/CICS Calls

| Field title in online report | XML element                    |
|------------------------------|--------------------------------|
|                              | <WASCICSCalls>                 |
| Name                         | <Name>Name</Name>              |
| Count                        | <Count>n</Count>               |
| --Svc Time – Total           | <TotalService>n</TotalService> |
| --Svc Time – Mean            | <MeanService>n</MeanService>   |
|                              | </WASCICSCalls>                |

## B12 WAS/Db2 Calls

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <WASDB2Activity>                       |
| Seqno                        | <SequenceNumber>n</SequenceNumber>     |
| WAS Request                  | <WASRequest>name</WASRequest>          |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>       |
| --CPU Time – Total           | <TotalCPUTime>n</TotalCPUTime>         |
| --CPU Time – Mean            | <MeanCPUTime>n</MeanCPUTime>           |
| --CPU Time – Mean            | <PctCPUTime>n</PctCPUTime>             |
| --Svc Time – Total           | <TotalServiceTime>n</TotalServiceTime> |
| --Svc Time – Mean            | <MeanServiceTime>n</MeanServiceTime>   |
| --Svc Time – Mean            | <PctServiceTime>n</PctServiceTime>     |
|                              | </WASDB2Activity>                      |
|                              | <SQLCPUTimeByStatement>                |
| Seqno                        | <SequenceNumber>n</SequenceNumber>     |
| Db2 Call                     | <ProgramName>name</ProgramName>        |
|                              | <StatementNumber>n</StatementNumber>   |
|                              | <SQLFunction>name</SQLFunction>        |
| Nbr of SQL Calls             | <NumberOfCalls>n</NumberOfCalls>       |

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
| --CPU Time – Total           | <TotalCPUTime> <i>n</i> </TotalCPUTime>                     |
| --CPU Time – Mean            | <MeanCPUTime> <i>n</i> </MeanCPUTime>                       |
| --CPU Time – Mean            | <PctCPUTime> <i>n</i> </PctCPUTime>                         |
| --Svc Time – Total           | <TotalServiceTime> <i>n</i> </TotalServiceTime>             |
| --Svc Time – Mean            | <MeanServiceTime> <i>n</i> </MeanServiceTime>               |
| --Svc Time – Mean            | <PctServiceTime> <i>n</i> </PctServiceTime>                 |
|                              | </SQLCPUTimeByStatement>                                    |
|                              | <SQLTextLines>                                              |
|                              | <SQLTEXT> <i>text</i> </SQLTEXT>                            |
|                              | <PrepareInfo>                                               |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber> |
|                              | <PrepareSequenceNumber> <i>n</i> </PrepareSequenceNumber>   |
|                              | </PrepareInfo>                                              |
|                              | </SQLTextLines>                                             |

## B13 Async Work Requests

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <AsyncWorkRequest>                      |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Pkg/Class, Work Mgr          | <Name> <i>name</i> </Name>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --CPU Time – Total           | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time – Mean            | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time – Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </AsyncWorkRequest>                     |

## B14 Async Work by Manager

| Field title in online report | XML element                     |
|------------------------------|---------------------------------|
|                              | <AsyncWorkbyWorkMgr>            |
| Seqno                        | <Seqno> <i>n</i> </Seqno>       |
| Work Mgr , Pkg/Class         | <Name> <i>name</i> </Name>      |
| Request Count                | <Count> <i>n</i> </Count>       |
| --CPU Time – Total           | <TotalCPU> <i>n</i> </TotalCPU> |
| --CPU Time – Mean            | <MeanCPU> <i>n</i> </MeanCPU>   |



| Field title in online report | XML element                    |
|------------------------------|--------------------------------|
| --Svc Time – Total           | <TotalService>n</TotalService> |
| --Svc Time – Mean            | <MeanService>n</MeanService>   |
|                              | </AsyncWorkbyWorkMgr>          |

## B15 Async Work by Servant

| Field title in online report | XML element                    |
|------------------------------|--------------------------------|
|                              | <AsyncWorkbyServant>           |
| Seqno                        | <Seqno>n</Seqno>               |
| Servant, Pkg/Class, Work Mgr | <Name>name</Name>              |
| Request Count                | <Count>n</Count>               |
| --CPU Time – Total           | <TotalCPU>n</TotalCPU>         |
| --CPU Time – Mean            | <MeanCPU>n</MeanCPU>           |
| --Svc Time – Total           | <TotalService>n</TotalService> |
| --Svc Time – Mean            | <MeanService>n</MeanService>   |
|                              | </AsyncWorkbyServant>          |

## B16 WOLA Inbound Requests

| Field title in online report             | XML element                    |
|------------------------------------------|--------------------------------|
|                                          | <WOLAINboundbyRequest>         |
| Seqno                                    | <Seqno>n</Seqno>               |
| Request, EJB/Webapp, Method/Servlet Name | <Name>name</Name>              |
|                                          | <Type>type</Type>              |
| Request Count                            | <Count>n</Count>               |
| --CPU Time – Total                       | <TotalCPU>n</TotalCPU>         |
| --CPU Time – Mean                        | <MeanCPU>n</MeanCPU>           |
| --Svc Time – Total                       | <TotalService>n</TotalService> |
| --Svc Time – Mean                        | <MeanService>n</MeanService>   |
|                                          | </WOLAINboundbyRequest >       |

## B17 WOLA Inbound by Origin

| Field title in online report | XML element            |
|------------------------------|------------------------|
|                              | <WOLAINboundbyRequest> |
| Seqno                        | <Seqno>n</Seqno>       |

| Field title in online report                            | XML element                             |
|---------------------------------------------------------|-----------------------------------------|
| Origin, Request, EJB/<br>Webapp, Method/Servlet<br>Name | <Name> <i>name</i> </Name>              |
|                                                         | <Type> <i>type</i> </Type>              |
| Request Count                                           | <Count> <i>n</i> </Count>               |
| --CPU Time – Total                                      | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time – Mean                                       | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time – Total                                      | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean                                       | <MeanService> <i>n</i> </MeanService>   |
|                                                         | </WOLAINboundbyOrigin>                  |

## B18 WOLA Inbound by Servant

| Field title in online report                             | XML element                             |
|----------------------------------------------------------|-----------------------------------------|
|                                                          | <WOLAINboundbyServant>                  |
| Seqno                                                    | <Seqno> <i>n</i> </Seqno>               |
| Servant, Request, EJB/<br>Webapp, Method/Servlet<br>Name | <Name> <i>name</i> </Name>              |
|                                                          | <Type> <i>type</i> </Type>              |
| Request Count                                            | <Count> <i>n</i> </Count>               |
| --CPU Time – Total                                       | <TotalCPU> <i>n</i> </TotalCPU>         |
| --CPU Time – Mean                                        | <MeanCPU> <i>n</i> </MeanCPU>           |
| --Svc Time – Total                                       | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean                                        | <MeanService> <i>n</i> </MeanService>   |
|                                                          | </WOLAINboundbyServant >                |

## B19 WOLA Outbound Requests

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WOLAOutboundbyRequest>                 |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Request, Register, Service   | <Name> <i>name</i> </Name>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --Bytes-- Sent               | <BytesSent> <i>n</i> </BytesSent>       |
| --Bytes-- Rcvd               | <BytesRcvd> <i>n</i> </BytesRcvd>       |
| --Svc Time – Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WOLAOutboundbyRequest>                |

## B20 WOLA Outbound by Register

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WOLAOutboundbyRegister>                |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Register, Service            | <Name> <i>name</i> </Name>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --Bytes-- Sent               | <BytesSent> <i>n</i> </BytesSent>       |
| --Bytes-- Rcvd               | <BytesRcvd> <i>n</i> </BytesRcvd>       |
| --Svc Time – Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WOLAOutboundbyRequest>                |

## B21 WOLA Outbound by Servant

| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
|                              | <WOLAOutboundbyServant>                 |
| Seqno                        | <Seqno> <i>n</i> </Seqno>               |
| Servant, Register, Service   | <Name> <i>name</i> </Name>              |
| Request Count                | <Count> <i>n</i> </Count>               |
| --Bytes-- Sent               | <BytesSent> <i>n</i> </BytesSent>       |
| --Bytes-- Rcvd               | <BytesRcvd> <i>n</i> </BytesRcvd>       |
| --Svc Time – Total           | <TotalService> <i>n</i> </TotalService> |
| --Svc Time – Mean            | <MeanService> <i>n</i> </MeanService>   |
|                              | </WOLAOutboundbyServant>                |

## Multiple address space reports

### X01 CICS Mean Service Time by Txn

This report is generated for multiple CICS address space reporting.

The XML elements presented below can be repeated multiple times and occur under different parent elements. In the XML document, all elements are listed in hierarchical order as they are displayed in the online report.

| Field title in online report | XML element                                    |
|------------------------------|------------------------------------------------|
|                              | <CICSTranId>                                   |
| Name                         | <TransactionId> <i>tranid</i> </TransactionId> |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>        |
| Description                  | <Description></Description>                    |
| Error                        | <MarginofError> <i>n</i> %</MarginofErrors>    |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSAppId>                                     |
| Name                         | <AppId> <i>name</i> </AppId>                    |
| Description                  | <Description>Region AppId</Description>         |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSAppId>                                    |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |
|                              | <CICSCommand>                                   |
| Name                         | <CSECT> <i>name</i> </CSECT>                    |
| Description                  | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSCommand>                                  |
|                              | <CICSWait>                                      |
| Name                         | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <SQL> <i>offset</i> </SQL>                      |
| Description                  | <Description> <i>sqlverb</i> </Description>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSDLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSDLI>                                      |
|                              | <ADABASCommand>                                 |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <Command> <i>command</i> </Command>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
| Delay                        | <DelayTime> <i>n</i> </DelayTime>     |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime> |
|                              | </ADABASCommand>                      |

## X02 CICS Total Service Time by Txn

This report is generated for multiple CICS address space reporting.

The XML elements presented below can be repeated multiple times and occur under different parent elements. In the XML document, all elements are listed in hierarchical order as they are displayed in the online report.

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
|                              | <CICSTranId>                                    |
| Name                         | <TransactionId> <i>tranid</i> </TransactionId>  |
| NTxns                        | <CICSTxnCount> <i>n</i> </CICSTxnCount>         |
| Description                  | <Description></Description>                     |
| Error                        | <MarginofError> <i>n</i> %</MarginofErrors>     |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSTranId>                                   |
|                              | <CICSAppId>                                     |
| Name                         | <AppId> <i>name</i> </AppId>                    |
| Description                  | <Description>Region AppId</Description>         |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSAppId>                                    |
|                              | <CICSProgram>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSProgram>                                  |

| Field title in online report                  | XML element                                     |
|-----------------------------------------------|-------------------------------------------------|
|                                               | <CICSCommand>                                   |
| Name                                          | <CSECT> <i>name</i> </CSECT>                    |
| Description                                   | <Offset> <i>offset</i> </Offset>                |
| Description                                   | <Command> <i>command</i> </Command>             |
| Execution                                     | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                                       | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                                         | <DelayTime> <i>n</i> </DelayTime>               |
| Service                                       | <ServiceTime> <i>n</i> </ServiceTime>           |
|                                               | </CICSCommand>                                  |
|                                               | <CICSWait>                                      |
| Name                                          | <WaitReason> <i>reason</i> </WaitReason>        |
| Description                                   | <Description> <i>description</i> </Description> |
| Execution                                     | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                                       | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                                         | <DelayTime> <i>n</i> </DelayTime>               |
| Service <ServiceTime> <i>n</i> </ServiceTime> |                                                 |
|                                               | </CICSWait>                                     |
|                                               | <CICSService>                                   |
| Name                                          | <Program> <i>name</i> </Program>                |
| Description                                   | <Description> <i>description</i> </Description> |
| Execution                                     | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                                       | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                                         | <DelayTime> <i>n</i> </DelayTime>               |
| Service                                       | <ServiceTime> <i>n</i> </ServiceTime>           |
|                                               | </CICSService>                                  |
|                                               | <CICSSQL>                                       |
|                                               | <CSECT> <i>name</i> </CSECT>                    |
| Name                                          | <SQL> <i>offset</i> </SQL>                      |
| Description                                   | <Description> <i>sqlverb</i> </Description>     |
| Execution                                     | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                                       | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                                         | <DelayTime> <i>n</i> </DelayTime>               |
| Service                                       | <ServiceTime> <i>n</i> </ServiceTime>           |
|                                               | </CICSSQL>                                      |
|                                               | <CICSCLI>                                       |

| Field title in online report | XML element                         |
|------------------------------|-------------------------------------|
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <DLIRequest>dlirequest</DLIRequest> |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSCLI>                          |
|                              | <ADABASCommand>                     |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <Command>command</Command>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </ADABASCommand>                    |

### X03 CICS Mean Service Time by Term

This report is generated for multiple CICS address space reporting.

The XML elements presented below can be repeated multiple times and occur under different parent elements. In the XML document, all elements are listed in hierarchical order as they are displayed in the online report.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <CICSTerminal>                         |
| Name                         | <TerminalId>termid</TerminalId>        |
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>         |
| Description                  | <Description></Description>            |
| Error                        | <MarginofError>n%</MarginofErrors>     |
| Execution                    | <ExecTime>n</ExecTime>                 |
| Suspend                      | <SuspendTime>n</SuspendTime>           |
| Delay                        | <DelayTime>n</DelayTime>               |
| Service                      | <ServiceTime>n</ServiceTime>           |
|                              | </CICSTerminal>                        |
|                              | <CICSTranId>                           |
| Name                         | <TransactionId>transid</TransactionId> |



| Field title in online report | XML element                             |
|------------------------------|-----------------------------------------|
| NTxns                        | <CICSTxnCount>n</CICSTxnCount>          |
| Description                  | <Description></Description>             |
| Error                        | <MarginofError>n%</MarginofErrors>      |
| Execution                    | <ExecTime>n</ExecTime>                  |
| Suspend                      | <SuspendTime>n</SuspendTime>            |
| Delay                        | <DelayTime>n</DelayTime>                |
| Service                      | <ServiceTime>n</ServiceTime>            |
|                              | </CICSTranId>                           |
|                              | <CICSAppId>                             |
| Name                         | <AppId>name</AppId>                     |
| Description                  | <Description>Region AppId</Description> |
| Execution                    | <ExecTime>n</ExecTime>                  |
| Suspend                      | <SuspendTime>n</SuspendTime>            |
| Delay                        | <DelayTime>n</DelayTime>                |
| Service                      | <ServiceTime>n</ServiceTime>            |
|                              | </CICSAppId>                            |
|                              | <CICSProgram>                           |
| Name                         | <Program>name</Program>                 |
| Description                  | <Description>description</Description>  |
| Execution                    | <ExecTime>n</ExecTime>                  |
| Suspend                      | <SuspendTime>n</SuspendTime>            |
| Delay                        | <DelayTime>n</DelayTime>                |
| Service                      | <ServiceTime>n</ServiceTime>            |
|                              | </CICSProgram>                          |
|                              | <CICSCommand>                           |
| Name                         | <CSECT>name</CSECT>                     |
| Description                  | <Offset>offset</Offset>                 |
| Description                  | <Command>command</Command>              |
| Execution                    | <ExecTime>n</ExecTime>                  |
| Suspend                      | <SuspendTime>n</SuspendTime>            |
| Delay                        | <DelayTime>n</DelayTime>                |
| Service                      | <ServiceTime>n</ServiceTime>            |
|                              | </CICSCommand>                          |
|                              | <CICSWait>                              |
| Name                         | <WaitReason>reason</WaitReason>         |

| Field title in online report | XML element                                     |
|------------------------------|-------------------------------------------------|
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSWait>                                     |
|                              | <CICSService>                                   |
| Name                         | <Program> <i>name</i> </Program>                |
| Description                  | <Description> <i>description</i> </Description> |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSService>                                  |
|                              | <CICSSQL>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <SQLVerb> <i>sqlverb</i> </SQLVerb>             |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSSQL>                                      |
|                              | <CICSDLI>                                       |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |
| Description                  | <DLIRequest> <i>dlirequest</i> </DLIRequest>    |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>                 |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime>           |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>               |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime>           |
|                              | </CICSDLI>                                      |
|                              | <ADABASCommand>                                 |
|                              | <CSECT> <i>name</i> </CSECT>                    |
| Name                         | <Offset> <i>offset</i> </Offset>                |

| Field title in online report | XML element                           |
|------------------------------|---------------------------------------|
| Description                  | <Command> <i>command</i> </Command>   |
| Execution                    | <ExecTime> <i>n</i> </ExecTime>       |
| Suspend                      | <SuspendTime> <i>n</i> </SuspendTime> |
| Delay                        | <DelayTime> <i>n</i> </DelayTime>     |
| Service                      | <ServiceTime> <i>n</i> </ServiceTime> |
|                              | </ADABASCommand>                      |

## X04 CICS Total Service Time by Term

This report is generated for multiple CICS address space reporting.

The XML elements presented below can be repeated multiple times and occur under different parent elements. In the XML document, all elements are listed in hierarchical order as they are displayed in the online report.

| Table 15. XML Elements for X04 Report Field Titles |                                                |
|----------------------------------------------------|------------------------------------------------|
| Field title in online report                       | XML element                                    |
|                                                    | <CICSTerminal>                                 |
| Name                                               | <TerminalId> <i>termid</i> </TerminalId>       |
| NTxns                                              | <CICSTxnCount> <i>n</i> </CICSTxnCount>        |
| Description                                        | <Description></Description>                    |
| Error                                              | <MarginofError> <i>n%</i> </MarginofErrors>    |
| Execution                                          | <ExecTime> <i>n</i> </ExecTime>                |
| Suspend                                            | <SuspendTime> <i>n</i> </SuspendTime>          |
| Delay                                              | <DelayTime> <i>n</i> </DelayTime>              |
| Service                                            | <ServiceTime> <i>n</i> </ServiceTime>          |
|                                                    | </CICSTerminal>                                |
|                                                    | <CICSTranId>                                   |
| Name                                               | <TransactionId> <i>tranid</i> </TransactionId> |
| NTxns                                              | <CICSTxnCount> <i>n</i> </CICSTxnCount>        |
| Description                                        | <Description></Description>                    |
| Error                                              | <MarginofError> <i>n%</i> </MarginofErrors>    |
| Execution                                          | <ExecTime> <i>n</i> </ExecTime>                |
| Suspend                                            | <SuspendTime> <i>n</i> </SuspendTime>          |
| Delay                                              | <DelayTime> <i>n</i> </DelayTime>              |
| Service                                            | <ServiceTime> <i>n</i> </ServiceTime>          |
|                                                    | </CICSTranId>                                  |
|                                                    | <CICSApplid>                                   |
| Name                                               | <Applid> <i>name</i> </Applid>                 |

Table 15. XML Elements for X04 Report Field Titles (continued)

| Field title in online report | XML element                              |
|------------------------------|------------------------------------------|
| Description                  | <Description>Region Applid</Description> |
| Execution                    | <ExecTime>n</ExecTime>                   |
| Suspend                      | <SuspendTime>n</SuspendTime>             |
| Delay                        | <DelayTime>n</DelayTime>                 |
| Service                      | <ServiceTime>n</ServiceTime>             |
|                              | </CICSAppid>                             |
|                              | <CICSProgram>                            |
| Name                         | <Program>name</Program>                  |
| Description                  | <Description>description</Description>   |
| Execution                    | <ExecTime>n</ExecTime>                   |
| Suspend                      | <SuspendTime>n</SuspendTime>             |
| Delay                        | <DelayTime>n</DelayTime>                 |
| Service                      | <ServiceTime>n</ServiceTime>             |
|                              | </CICSProgram>                           |
|                              | <CICSCommand>                            |
| Name                         | <CSECT>name</CSECT>                      |
| Description                  | <Offset>offset</Offset>                  |
| Description                  | <Command>command</Command>               |
| Execution                    | <ExecTime>n</ExecTime>                   |
| Suspend                      | <SuspendTime>n</SuspendTime>             |
| Delay                        | <DelayTime>n</DelayTime>                 |
| Service                      | <ServiceTime>n</ServiceTime>             |
|                              | </CICSCommand>                           |
|                              | <CICSWait>                               |
| Name                         | <WaitReason>reason</WaitReason>          |
| Description                  | <Description>description</Description>   |
| Execution                    | <ExecTime>n</ExecTime>                   |
| Suspend                      | <SuspendTime>n</SuspendTime>             |
| Delay                        | <DelayTime>n</DelayTime>                 |
| Service                      | <ServiceTime>n</ServiceTime>             |
|                              | </CICSWait>                              |
|                              | <CICSService>                            |
| Name                         | <Program>name</Program>                  |
| Description                  | <Description>description</Description>   |

Table 15. XML Elements for X04 Report Field Titles (continued)

| Field title in online report | XML element                         |
|------------------------------|-------------------------------------|
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSService>                      |
|                              | <CICSSQL>                           |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <SQLVerb>sqlverb</SQLVerb>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSSQL>                          |
|                              | <CICSDLI>                           |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <DLIRequest>dlirequest</DLIRequest> |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </CICSDLI>                          |
|                              | <ADABASCommand>                     |
|                              | <CSECT>name</CSECT>                 |
| Name                         | <Offset>offset</Offset>             |
| Description                  | <Command>command</Command>          |
| Execution                    | <ExecTime>n</ExecTime>              |
| Suspend                      | <SuspendTime>n</SuspendTime>        |
| Delay                        | <DelayTime>n</DelayTime>            |
| Service                      | <ServiceTime>n</ServiceTime>        |
|                              | </ADABASCommand>                    |

## X05 Combined Db2 IMS MQ Timeline

The CombinedTimeline tag pair is repeated for each Db2, IMS, and MQ call. When an expanded report is requested, SQL text lines, Prepare lines, and MQ Queue Manager lines may also be generated in the XML.

| Field title in online report | XML element                                                 |
|------------------------------|-------------------------------------------------------------|
|                              | <CombinedTimeline>                                          |
| Seqno                        | <SeqNum> <i>n</i> </SeqNum>                                 |
| System                       | <System>Db2, IMS or MQ</System>                             |
| Function                     | <Function> <i>function</i> </Function>                      |
| Object                       | <Object> <i>object</i> </Object>                            |
| Status                       | <Status> <i>status</i> </Status>                            |
| Call Time                    | <CallTime> <i>hh:mm:ss.ss</i> </CallTime>                   |
| Svc Time                     | <SvcTime> <i>n</i> </SvcTime>                               |
| CPU Time                     | <CPUTime> <i>n</i> </CPUTime>                               |
|                              | <SQLTextLines>                                              |
|                              | <SQLTEXT> <i>sqltext</i> </SQLTEXT>                         |
|                              | <PrepareInfo>                                               |
|                              | <PrepareStatementNumber> <i>n</i> </PrepareStatementNumber> |
|                              | <PrepareSequenceNumber> <i>n</i> </PrepareSequenceNumber>   |
|                              | </PrepareInfo>                                              |
|                              | </SQLTextLines>                                             |
|                              | <CombinedTimelineMQ>                                        |
|                              | <QueueManager> <i>queue manager</i> </QueueManager>         |
|                              | <ObjectName> <i>queue name</i> </ObjectName>                |
|                              | </CombinedTimelineMQ>                                       |
|                              | </CombinedTimeline>                                         |

## X06 IMS MASS Region Summary

The IMSMassRegion tag pair is repeated for each measured IMS region. The last tag pair represents the total for all lines of the report.

| Field title in online report | XML element                            |
|------------------------------|----------------------------------------|
|                              | <IMSMassRegion>                        |
| Region                       | <RegionName> <i>name</i> </RegionName> |
| IMS                          | <IMSID> <i>name</i> </IMSID>           |
| ReqNum                       | <ReqNum> <i>n</i> </ReqNum>            |
| Txn Count                    | <TxnCount> <i>n</i> </TxnCount>        |
| Svc/Trn                      | <SvcPerTrn> <i>n</i> </SvcPerTrn>      |

| Field title in online report | XML element              |
|------------------------------|--------------------------|
| CPU/Trn                      | <CpuPerTrn>n</CpuPerTrn> |
| SQL/Trn                      | <DLIPerTrn>n</DLIPerTrn> |
| CPU Time                     | <SQLPerTrn>n</SQLPerTrn> |
| MQ/Trn                       | <MQIPerTrn>n</MQIPerTrn> |

## X07 Db2 Stored Procedures Summary

The Db2SP tag pair is repeated for each measured Db2 Stored Procedure name.

| Field title in online report | XML element                |
|------------------------------|----------------------------|
|                              | < Db2SP>                   |
| Name                         | <DBRMName>name</DBRMName>  |
| Db2 Sysid                    | <Db2Sysid>name</Db2Sysid>  |
| ReqNum                       | <ReqNum>n</ReqNum>         |
| Nbr of Invocations           | <InvCount>n</InvCount>     |
| SQL Calls/Total              | <SQLTotal>29</SQLTotal>    |
| SQL Calls/Average            | <SQLAvg>524.15</SQLAvg>    |
| Mean CPU Time                | <MeanCPU>0.10413</MeanCPU> |
| Mean SVC Time                | <MeanSvc>0.10413</MeanSvc> |

## Source Program Attribution

### P01 Source Program Attribution

| Field title in online report | XML element                                    |
|------------------------------|------------------------------------------------|
|                              | <LoadModuleInformation>                        |
| Load Module                  | <LoadModuleName>name</LoadModuleName>          |
| LIB                          | <LoadLibrary>library</LoadLibrary>             |
| CSECT                        | <CSECTName>name</CSECTName>                    |
| Mapped by                    | <SourceMappingFile>file</SourceMappingFile>    |
|                              | <SourceLanguage>language</SourceLanguage>      |
| Compiler                     | <Compiler>compiler</Compiler>                  |
| Compile Time                 | <CompileTime>yyyy/mm/dd hh:mm:ss</CompileTime> |
|                              | </LoadModuleInformation>                       |
|                              | <SourceStatement>                              |
| LineNo                       | <LineNumber>n</LineNumber>                     |
| Offset                       | <Offset>n</Offset>                             |
| Prct or Count                | <Percent>n</Percent> or <Count>n</Count>       |

| Field title in online report | XML element                                                |
|------------------------------|------------------------------------------------------------|
| Source Statement             | <Statement> <i>stmt</i> </Statement>                       |
|                              | <Attribution>                                              |
|                              | <Percent> <i>n</i> </Percent> or <Count> <i>n</i> </Count> |
|                              | </Attribution>                                             |
|                              | </SourceStatement>                                         |



---

## Appendix D. Automatic Report Generation Samples

This appendix describes the supplied Automatic Report Generation (ARG) samples that are included in *hlq.SCAZSAMP*.

With the Automatic Report Generation Feature (ARG), you can request the automatic generation of observation reports immediately upon the completion of a successful observation session. Specify a dataset name and optional member name that contain JCL and PRINT control statements that will be used to submit the batch job to generate the reports. For more information on this feature, see [Automatic Report Generation \(ARG\)](#).

The JCL can be enhanced to perform other functions as well, which is tailored to your installation. The following three samples are provided as examples of how the Automatic Report Generation feature may be used.

### **Member CAZARG**

CAZARG is a basic sample. When this sample is customized for your installation, it creates sampling reports in both SYSOUT and PDF format.

```

//RP&SAMP. JOB <job parameters>
//*
//* Member: CAZARG
//* Function: Model JCL for creating sampling reports via the
//* Automatic Report Generation Feature.
//*
//* Before using this job, you must add the job parameters to
//* meet your system requirements.
//*
//* Notes:
//*
//* This JCL contains substitutable variables that enable the job to
//* be reusable without user intervention. These variables will be
//* substituted by APA prior to the JCL being submitted. The
//* variables included here are:
//* 1. &JOB. - Contains the sampled job's JOBNAME.
//* 2. &SAMP. - Contains the sample request number. E.g. Rnnnnn.
//* 3. &SAMPDSN. - Contains the sample file dataset name.
//* 4. &STEPLIB. - Contains the name of the load library containing
//* all APA components.
//* 5. &USERID. - Contains the user ID of the requestor.
//*
//* The user may also specify System symbols wherever appropriate.
//*
//* Documentation on how to use ARG may be found in the
//* Application Performance Analyzer User's Guide.
//*
//-----
//* Ensure that the PDF flat file is deleted as we will be
//* allocating a new one in the next step.
//-----
//STEP1 EXEC PGM=IEFBR14
//DD1 DD DISP=(MOD,DELETE),DSN=&USERID..&JOB..&SAMP..PDF,
// SPACE=(CYL,(1,1))
//
//-----
//* Create the reports.
//* This step will create reports to both SYSOUT and to a PDF file.
//-----
//STEP2 EXEC PGM=CAZPRINT
//STEPLIB DD DISP=SHR,DSN=&STEPLIB.
//SFIN DD DISP=SHR,DSN=&SAMPDSN.
//RPT1 DD SYSOUT=*
//PDF1 DD DISP=(NEW,CATLG),SPACE=(CYL,(1,1)),UNIT=SYSDA,
// DCB=(LRECL=80,RECFM=FB,DSORG=PS),
// DSN=&USERID..&JOB..&SAMP..PDF
//CAZLOG DD SYSOUT=*
//CAZCTL DD *
//PROFILE 01 INPUT=SFIN
//SECTION S01
//SECTION S02 Sequence=NAME
// OmitESD=N
// OmitNUC=N
// OmitPLPA=N
// Omitdup=Y
//SECTION S03 Sequence=NAME
// Omitdup=N
//SECTION S04
//SECTION S05 Intervals=45
//SECTION S06 Intervals=45
//SECTION S10 Levels=4
// MsgE=Y
// MsgW=Y
// MsgI=Y
// MsgD=Y
//PRINT DDNAME=RPT1 LANG=ENU
//CONVERT DDNAME=PDF1 FORMAT=PDF LANG=ENU
//

```

The control statements can be customized to your requirements depending on which reports are required. In the example above, only the “Statistics/Storage” (Sxx) reports are to be printed. For detailed descriptions of the available control statements (ddname CAZCTL), see [“Specifying control statements” on page 673](#).

## Member CAZARGRP

When the sample CAZARGRP is customized for your installation, it demonstrates how a user may choose to create sampling reports and email them in printed (plain text) format as an attachment using the Communications Server Simple Mail Transfer Protocol (CSSMTP).

**Note:** In addition to customization of the included sample, additional configuration might be required, including setup of CSSMTP. For more information, refer to the *"IBM z/OS Communications Server: IP User's Guide and Commands"*. The following sample is meant for only illustration purposes.

```
//RP&SAMP. JOB <job parameters>
//*
//* Member: CAZARGRP
//* Function: Model JCL for creating sampling reports via the
//* Automatic Report Generation Feature. If CSSMTP is
//* configured, reports can be e-mailed (plain text) in
//* STEP3.
//*
//* Before using this procedure, you must make the following
//* modifications:
//*
//* 1) Add the job parameters to meet your system requirements.
//*
//* 2) Change '#cssmtp'. If the ExtWrtName statement is specified in
//* the CSSMTP application configuration, change '#cssmtp' to the
//* external writer name; otherwise, change '#cssmtp' to the CSSMTP
//* application address space name.
//* * Refer to the "IBM z/OS Communications Server: IP User's
//* Guide and Commands" for more information.
//*
//* 3) Change '#mycssmtp.lrecl121' to the name of your
//* SMTP commands dataset. This dataset must have a DCB of
//* RECFM=FBA,LRECL=121,BLKSIZE=27951. An example of the contents
//* of this dataset can be found in the Application Performance
//* Analyzer User's Guide.
//*
//* Notes:
//*
//* This JCL contains substitutable variables that enable the job to
//* be reusable without user intervention. These variables will be
//* substituted by APA prior to the JCL being submitted. The
//* variables included here are:
//* 1. &JOB. - Contains the sampled job's JOBNAME.
//* 2. &SAMP. - Contains the sample request number. E.g. Rnnnnn.
//* 3. &SAMPDSN. - Contains the sample file dataset name.
//* 4. &STEPLIB. - Contains the name of the load library containing
//* all APA components.
//* 5. &USERID. - Contains the user ID of the requestor.
//*
//* The user may also specify System symbols wherever appropriate.
//*
//* Documentation on how to use ARG may be found in the
//* Application Performance Analyzer User's Guide.
//*
//-----
//-----
//* Ensure that the PDF flat file is deleted as we will be
//* allocating a new one in the next step.
```

(Sample CAZARGRP - Continued )

```

/*-----
//STEP1 EXEC PGM=IEFBR14
//DD1 DD DISP=(MOD,DELETE),DSN=&USERID..&JOB..&SAMP..RPT,
// SPACE=(CYL,(1,1))
//*
/*-----
/* Create the reports.
/* This step will create reports to both SYSOUT and to a PDF file.
/*-----
//STEP2 EXEC PGM=CAZPRINT
//STEPLIB DD DISP=SHR,DSN=&STEPLIB.
//SFIN DD DISP=SHR,DSN=&SAMPDSN.
//RPT1 DD DISP=(NEW,CATLG),SPACE=(CYL,(100,50),RLSE),UNIT=SYSDA,
// DCB=(RECFM=FBA,LRECL=121,BLKSIZE=0),
// DSN=&USERID..&JOB..&SAMP..RPT
//CAZLOG DD SYSOUT=*
//CAZCTL DD *
//PROFILE 01 INPUT=SFIN
//SECTION S01
//SECTION S02 Sequence=NAME
// OmitESD=Y
// OmitNUC=N
// OmitPLPA=N
// Omitdup=N
//SECTION S03 Sequence=NAME
// Omitdup=N
//SECTION S04
//SECTION S05 Intervals=45
//SECTION S06 Intervals=45
//SECTION S07
//SECTION S08
//SECTION S09
//PRINT DDNAME=RPT1 LANG=ENU
//*
//STEP3 EXEC PGM=IEBGGENER
//SYSIN DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSUT2 DD SYSOUT=(B,#cssmtp),
// DCB=(RECFM=FBA,LRECL=121,BLKSIZE=27951)
//SYSUT1 DD DSN=#mycssmtp.1rec121,DISP=SHR
// DD DSN=&USERID..&JOB..&SAMP..RPT,DISP=SHR
//

```

The control statements can be customized to your requirements depending on which reports are required. In the example above, only the “Statistics/Storage” (S01-S09) reports are to be printed. For detailed descriptions of the available control statements (ddname CAZCTL) see [“Specifying control statements” on page 673](#).

**Note:** You might want to carefully consider which reports to include when you e-mail them as an attachment. Large measurements can produce exceptionally large reports.

Additionally, you must provide an SMTP commands dataset. This dataset must have a data control block parameter of RECFM=FBA, LRECL=121, BLKSIZE=27951. An example of the content of this dataset is as follows:

```
HELO youimvs
MAIL FROM:<user1@company.com>
RCPT TO:<user1@company.com>
RCPT TO:<user2@company.com>
DATA
FROM: user@youimvs
TO: user1@company.com
TO: user2@company.com
SUBJECT: APA report auto-sent using ARG
MIME-VERSION: 1.0
CONTENT-TYPE: MULTIPART/MIXED; BOUNDARY="SIMPLE BOUNDARY"

--SIMPLE BOUNDARY
CONTENT-TYPE: TEXT/PLAIN

Please review the attached APA report.

--SIMPLE BOUNDARY
CONTENT-TYPE: TEXT/PLAIN
CONTENT-DISPOSITION: ATTACHMENT; FILENAME=REPORT.TXT
```

For more information about SMTP commands, refer to "*IBM z/OS Communications Server: IP User's Guide and Commands*". The sample above is meant for only illustration purposes.

## Member CAZARGXM

When the sample CAZARGXM is customized for your installation, it demonstrates how a user might choose to create sampling reports and email them in XML format as an attachment by using the Communications Server Simple Mail Transfer Protocol (CSSMTP).

**Note:** In addition to the customization of the included sample, additional configuration might be required, including setup of CSSMTP. For more information, see the "*IBM z/OS Communications Server: IP User's Guide and Commands*". The following sample is meant for only illustration purposes.

```

//RP&SAMP. JOB <job parameters>
//*
//* Member: CAZARGXM
//* Function: Model JCL for creating sampling reports via the
//* Automatic Report Generation Feature. If CSSMTP is
//* configured, reports can be e-mailed (XML format) in
//* STEP3.
//*
//* Before using this procedure, you must make the following
//* modifications:
//*
//* 1) Add the job parameters to meet your system requirements.
//*
//* 2) Change '#cssmtp'. If the ExtWrtName statement is specified in
//* the CSSMTP application configuration, change '#cssmtp' to the
//* external writer name; otherwise, change '#cssmtp' to the CSSMTP
//* application address space name.
//* * Refer to the "IBM z/OS Communications Server: IP User's
//* Guide and Commands" for more information.
//*
//* 3) Change '#mycssmtp.vb.lrecl255' to the name of your
//* SMTP commands dataset. This dataset must have a DCB of
//* RECFM=VB,LRECL=255,BLKSIZE=27795. An example of the contents
//* of this dataset can be found in the Application Performance
//* Analyzer User's Guide.
//*
//* Notes:
//*
//* This JCL contains substitutable variables that enable the job to
//* be reusable without user intervention. These variables will be
//* substituted by APA prior to the JCL being submitted. The
//* variables included here are:
//* 1. &JOB. - Contains the sampled job's JOBNAME.
//* 2. &SAMP. - Contains the sample request number. E.g. Rnnnnn.
//* 3. &SAMPDSN. - Contains the sample file dataset name.
//* 4. &STEPLIB. - Contains the name of the load library containing
//* all APA components.
//* 5. &USERID. - Contains the user ID of the requestor.
//*
//* The user may also specify System symbols wherever appropriate.
//*
//* Documentation on how to use ARG may be found in the
//* Application Performance Analyzer User's Guide.
//*
//-----
//-----
//* Ensure that the PDF flat file is deleted as we will be
//* allocating a new one in the next step.

```

(Sample CAZARGXM - Continued)

```

/*-----
//STEP1 EXEC PGM=IEFBR14
//DD1 DD DISP=(MOD,DELETE),DSN=&USERID..&JOB..&SAMP..XML,
// SPACE=(CYL,(1,1))
//*
/*-----
/* Create the reports.
/* This step will create reports to both SYSOUT and to a PDF file.
/*-----
//STEP2 EXEC PGM=CAZPRINT
//STEPLIB DD DISP=SHR,DSN=&STEPLIB.
//SFIN DD DISP=SHR,DSN=&SAMPDSN.
//XML1 DD DISP=(NEW,CATLG),SPACE=(CYL,(100,50),RLSE),UNIT=SYSDA,
// DCB=(RECFM=VB,LRECL=255,BLKSIZE=0),
// DSN=&USERID..&JOB..&SAMP..XML
//CAZLOG DD SYSOUT=*
//CAZCTL DD *
//PROFILE 01 INPUT=SFIN
//SECTION S01
//SECTION S02 Sequence=NAME
// OmitESD=Y
// OmitNUC=N
// OmitPLPA=N
// Omitdup=N
//SECTION S03 Sequence=NAME
// Omitdup=N
//SECTION S04
//SECTION S05 Intervals=45
//SECTION S06 Intervals=45
//SECTION S07
//SECTION S08
//SECTION S09
//CONVERT DDNAME=XML1 FORMAT=XML
//*
//STEP3 EXEC PGM=IEBGENER
//SYSIN DD DUMMY
//SYSPRINT DD SYSOUT=*
//SYSUT2 DD SYSOUT=(B,#cssmtp),
// DCB=(RECFM=VB,LRECL=255,BLKSIZE=0)
//SYSUT1 DD DSN=#mycssmtp.vb.lrec1255,DISP=SHR
// DD DSN=&USERID..&JOB..&SAMP..XML,DISP=SHR
//

```

The control statements can be customized to your requirements depending on which reports are required. In the example above, only the “Statistics/Storage” (S01-S09) reports are to be printed. For detailed descriptions of the available control statements (ddname CAZCTL), see [“Specifying control statements” on page 673](#).

**Note:** You might want to carefully consider which reports to include when you email them as an attachment. Large measurements can produce exceptionally large reports.

Additionally, you must provide an SMTP commands dataset. This dataset must have a data control block parameter of RECFM=VB , LRECL=255 , BLKSIZE=27795. An example of the content of this dataset is as follows:

```
HELO yourmvs
MAIL FROM:<user1@company.com>
RCPT TO:<user2@company.com>
RCPT TO:<user3@company.com>
DATA
FROM: user1@yourmvs
TO: user2@company.com
TO: user3@company.com
SUBJECT: APA XML report auto-sent using ARG
MIME-VERSION: 1.0
CONTENT-TYPE: MULTIPART/MIXED; BOUNDARY="SIMPLE BOUNDARY"

--SIMPLE BOUNDARY
CONTENT-TYPE: TEXT/PLAIN

Please review the attached APA report.

--SIMPLE BOUNDARY
CONTENT-TYPE: TEXT/PLAIN
CONTENT-DISPOSITION: ATTACHMENT; FILENAME=REPORT.XML
```

For more information about SMTP commands, refer to the *"IBM z/OS Communications Server: IP User's Guide and Commands"*. The sample above is meant for only illustration purposes.



---

## Appendix E. Checkpoint File Merge Utility

This appendix describes the supplied Checkpoint File Merge Utility sample included in *hlq.SCAZSAMP*. The Checkpoint File Merge Utility allows the user to merge a source checkpoint file to a live target STC checkpoint file.

## Member CAZSTCMR

```
//CAZSTCMR JOB <job parameters>
//*
//*****
//* Licensed Materials - Property of IBM *
//* 5755-A04 *
//* (C) Copyright IBM Corp. 2005, 2023. *
//* *
//* All Rights Reserved *
//* US Government Users Restricted Rights - Use, duplication *
//* or disclosure restricted by GSA ADP Schedule Contract *
//* with IBM Corp. *
//*****
//*-----
//* Copyright (c) 2023 by BankNet Technologies Inc.
//* All Rights Reserved. No part of the contents of this
//* source program may be reproduced or transmitted in any
//* form or by any means without the written permission of
//* the publisher.
//*-----
//*****
//* IBM Application Performance Analyzer for z/OS */
//* Version 15 Release 1 Modification 0 */
//* */
//* This JCL merges an existing (source) Checkpoint file into a */
//* Checkpoint file currently allocated in a live APA STC (target). */
//* */
//* This JCL consists of the following Steps: */
//* */
//* CAZBKUP */
//* ----- */
//* - Backup Target Checkpoint file currently allocated in APA STC */
//* */
//* CAZMRGE */
//* ----- */
//* - Merges the Source Checkpoint file into the STC Target */
//* Checkpoint file */
//* */
//* CAZDLTE (It is recommended that this step is run Standalone) */
//* ----- */
//* - Deletes the Sample Files from the Source Checkpoint file that */
//* were merged successfully into the Target APA STC Checkpoint */
//* file. */
//* */
//* CAUTION: This is neither a JCL procedure nor a complete */
//* job. Before using this job, you will have to make the */
//* following modifications: */
//* */
//* 1) Add the job parameters to meet your system requirements. */
//* */
//* 2) Change all references of '#hlq' to the high-level qualifier */
//* of your Application Performance Analyzer libraries. */
//* */
//* 3) Change all references of "#chkphlq" to the high-level */
//* qualifier of your checkpoint data set name. */
//* */
//* 4) Change all references of "checkpointTgtDSN" to a valid */
//* data set name. This is the checkpoint DSN name currently */
//* defined in the CONFIG file of the Target APA STC */
//* See section "CONFIG BASIC statement" in the Customization */
//* Customization Guide for the rules on how to specify this */
//* checkpoint data set name in the APA STC. */
//* */
//* 5) Change all references of "checkpointTgtDSN.BACKUP" to a valid */
//* data set name. */
//* */
//* 6) Change all references of "checkpointSrcDSN" to a valid */
//* data set name. This is the checkpoint source DSN name that */
//* will be merged into the checkpoint file of the Target APA */
//* STC. */
//* */
//*****
```

```

/*
/*
/*****
/* BACKUP - Backup STC Checkpoint File (TARGET) before the merge */
/*****
//CAZBKUP EXEC PGM=IEBGGENER,REGION=0M,COND=(0,LT)
/*****
/* Target STC Checkpoint File Name */
//SYSUT1 DD DISP=SHR,
// DSN=#chkphlq.checkpointTgtDSN
/*****
/* Target STC Checkpoint BACKUP File Name */
/*****
//SYSUT2 DD DSN=#chkphlq.checkpointTgtDSN.BACKUP,DISP=(NEW,CATLG),
// UNIT=SYSALLDA,SPACE=(4096,(30010,0)),
// DCB=(DSORG=PS,RECFM=F,LRECL=4096,BLKSIZE=4096)
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
/*****
/* MERGE - Merge Source Checkpoint File into Target STC Checkpoint */
/* File */
/*****
//CAZMRGE EXEC PGM=CAZCHKMR,REGION=0M,COND=(0,LT),PARM='STCID=CAZ0'
//STEPLIB DD DSN=#hlq.SCAZAUTH,DISP=SHR
//SYSPRINT DD SYSOUT=*,RECFM=FBA,LRECL=133
/* Source Checkpoint File Name
//CHKPTSRC DD DSN=#chkphlq.checkpointSrcDSN,DISP=SHR
/*****
/* The file below contains the sample file names from the Source */
/* Checkpoint File that were merged into the Target Checkpoint File */
/* This file can be used in the optional idcams step included below */
/* to delete the sample files after the merge has been successfully */
/* executed */
/*****
//FLS2DLTE DD DSN=#hlq.DELETE.FILES,
// DISP=(NEW,CATLG,CATLG),
// RECFM=FB,LRECL=80,
// SPACE=(80,(20,10)),AVGREC=K
//SYSUDUMP DD SYSOUT=*
//
/*****
/*>>C A U T I O N<< >>C A U T I O N<< >>C A U T I O N<< */
/*
/* This Step should be run in a standalone Job after the merge is */
/* successfully executed to Delete the sample files that were in */
/* the Source (old) Checkpoint File */
/*****
/* DELETE - Delete the Source (old) Checkpoint sample files */
/*****
//CAZDLTE EXEC PGM=IDCAMS,REGION=500K,COND=(0,LT)
/*SYSPRINT DD SYSOUT=*
/*****
/* This file contains the sample file names from the Source (old) */
/* Checkpoint File to be Deleted */
/*****
/*SYSIN DD DSN=#hlq.DELETE.FILES,DISP=SHR

```

The sample JCL consists of the following steps::

**CAZBKUP** – this step backs up the target checkpoint file

**CAZMRGE** – this step merges the source checkpoint file into the target checkpoint file

**CAZDLTE** – this step deletes the samples files from the source checkpoint file that were merged successfully into the target checkpoint file.

**Note:** It is highly recommended that this step be run standalone to ensure there is no unwanted deletion of sample files from the source checkpoint.

## Usage

1) Add the job parameters to meet your system requirements.

- 2) Change all references of '#hlq' to the high-level qualifier of your Application Performance Analyzer libraries.
- 3) Change all references of "#chkphlq" to the high-level qualifier of your checkpoint data set name.
- 4) Change all references of "checkpointTgtDSN" to a valid data set name. This is the checkpoint DSN name currently defined in the CONFIG file of the target APA STC. See the section "CONFIG BASIC statement" in the *Customization Guide* for the rules on how to specify this checkpoint data set name in the APA STC.
- 5) Change all references of "checkpointTgtDSN.BACKUP" to a valid data set name. This will be the backup of the target checkpoint file.
- 6) Change all references of "checkpointSrcDSN" to a valid data set name. This is the checkpoint source DSN name that will be merged into the checkpoint file of the target APA STC.

**Note:** When merging an existing (source) checkpoint file into a brand new (target) checkpoint file, it is highly recommended that a new HLQ is used for the new checkpoint file. This will minimize the chances of errors occurring in the event duplicate sample file names are created while the checkpoint file merge is running.

The HLQ can be changed by editing the HLQ parameter in the CONFIG file for the Application Performance Analyzer STC.

## Checkpoint Merge Detail Report

A Checkpoint Merge Detail Report is generated after running the utility to show the result of each observation selected for merge into the target checkpoint file.

This report displays 3 types of messages:

- If the observation is successfully merged, a message prefixed by an I- (Information) and information about the source request number as well as the target request number is displayed.
- If the sample dataset associated with an observation is missing, a message prefixed by a W- (Warning) is displayed showing the source request number and the missing dataset name.
- There are also CAZnnnnn type error messages that show Information, Warning, and Error messages associated with the execution of the Checkpoint Merge process.
  - CAZnnnnnI - Information
  - CAZnnnnnW - Warning
  - CAZnnnnnE - Error

Sample report Output:

```
=====
2022/04/02 12.10.18 Application Performance Analyzer -CHKPT Merge- V15.1.0
=====

I-Source ReqNum: 00001 Successfully Merged into STCID=CAZ1 =>Target ReqNum: 0070
I-Source ReqNum: 00006 Successfully Merged into STCID=CAZ1 =>Target ReqNum: 0071
I-Source ReqNum: 00010 Successfully Merged into STCID=CAZ1 =>Target ReqNum: 0071
I-Source ReqNum: 00015 Successfully Merged into STCID=CAZ1 =>Target ReqNum: 0072
I-Source ReqNum: 00019 Successfully Merged into STCID=CAZ1 =>Target ReqNum: 0072
" " " "
" " " "
E-Source ReqNum: 04416>Sample File not found=>BCAZ.FFFP01.AFP01.R04416.D.SF<=Req
E-Source ReqNum: 04417>Sample File not found=>BCAZ.FFFP01.AFP01.R04417.D.SF<=Req
E-Source ReqNum: 04418>Sample File not found=>BCAZ.FFFP01.AFP01.R04418.D.SF<=Req
E-Source ReqNum: 04419>Sample File not found=>BCAZ.FFFP01.AFP01.R04419.D.SF<=Req
E-Source ReqNum: 04420>Sample File not found=>BCAZ.FFFP01.AFP01.R04420.D.SF<=Req
```

A Summary Report is produced at the end of the Detail Report that shows the number of records and observations processed.

```
=====
2022/03/31 13.39.22 Application Performance Analyzer -CHKPT Merge- V15.1.0
=====
```

```

Source Checkpoint Dataset Name: AFP01.FFFP01.CHKP
Target Checkpoint Dataset Name: AFP01.FFFP01.CHKP.NEW

Number of Checkpoint File Records Read: 01424

Number of Observations with Deleted Status: 00003
Number of Observations Selected for Merge: 01421

Number of Merged Observations: 00710
Number of Observations Ineligible for Merge: 00711

CAZ3925I IBM APA for z/OS CHKPT Merge terminating, highest Return code is: 0000
```

## Sample uses

### Merge one or more existing checkpoint files into a new checkpoint file

Use this procedure to merge one or more existing checkpoint files into a new checkpoint file in a newly created or existing Application Performance Analyzer STC:

1. Change the HLQ parameter in the CONFIG file to a new unique HLQ that is not currently in use:

```
HLQ=New unique HLQ
```

2. Change the CheckpointDSN parameter in the CONFIG file to a new checkpoint file name:

```
CheckpointDSN=New Checkpoint file name
```

3. Stop and restart target Application Performance Analyzer STC.
4. Customize *hlq.SCAZSAMP(CAZSTCMR)* with your installation requirements.

The DSN parameter of DDName CHKPTSRC should contain the source checkpoint file name to be merged into the new checkpoint file of the target Application Performance Analyzer STC.

5. Run *hlq.SCAZSAMP(CAZSTCMR)* to execute Checkpoint File merge.
6. Repeat steps 4 and 5 for each checkpoint file to be merged.

### Merge one or more existing Checkpoint files into a checkpoint file currently allocated to an existing Application Performance Analyzer STC

Use this procedure to merge one or more existing checkpoint files into a target checkpoint file that is currently in use in an Application Performance Analyzer STC. The target checkpoint file already contains one or more measurements.

1. Change the HLQ parameter in the CONFIG file to a new unique HLQ that is not currently in use:

```
HLQ=New unique HLQ
```

2. Stop and restart target Application Performance Analyzer STC.
3. Customize *hlq.SCAZSAMP(CAZSTCMR)* with your installation requirements.

The DSN parameter of DDName CHKPTSRC should contain the source checkpoint file name to be merged into the new checkpoint file of the target Application Performance Analyzer STC.

4. Run *hlq.SCAZSAMP(CAZSTCMR)* to execute Checkpoint File merge.
5. Repeat steps 3 and 4 for each checkpoint file to be merged.

### Merge one or more existing checkpoint files into a checkpoint file currently allocated to an existing Application Performance Analyzer STC.

**Note:** This procedure does not change the current HLQ parameter in the CONFIG file.

Use this procedure to merge one or more existing checkpoint files into a target checkpoint file that is currently in use in an Application Performance Analyzer STC. This procedure does not change the HLQ parameter in the CONFIG file. This is the least recommended procedure, as there is a possibility that there will be conflicts in the new file names for the measurements being merged. These conflicts may result in error conditions that will result in some measurements not being merged.

1. Customize *hlq.SCAZSAMP(CAZSTCMR)* with your installation requirements.

The DSN parameter of DDName CHKPTSRC should contain the source checkpoint file name to be merged into the new checkpoint file of the target Application Performance Analyzer STC.

2. Run *hlq.SCAZSAMP(CAZSTCMR)* to execute Checkpoint File merge.
3. Repeat steps 1 and 2 for each Checkpoint file to be merged.

---

## Appendix F. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The accessibility features in z/OS provide accessibility for IBM Application Performance Analyzer.

The major accessibility features in z/OS enable users to:

- Use assistive technology products such as screen readers and screen magnifier software
- Operate specific or equivalent features by using only the keyboard
- Customize display attributes such as color, contrast, and font size

### Using assistive technologies

---

Assistive technology products work with the user interfaces that are found in z/OS. For specific guidance information, consult the documentation for the assistive technology product that you use to access z/OS interfaces.

### Keyboard navigation of the user interface

---

Users can access z/OS user interfaces by using TSO/E or ISPF. Refer to the following publications:

- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*
- *z/OS ISPF User's Guide Volume 1*

These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

### Accessibility of this document

---

The XHTML format of this document that will be provided in the IBM Application Performance Analyzer Knowledge Center at <https://www.ibm.com/support/knowledgecenter/SSFMHB/product.html>, which is accessible to visually impaired individuals who use a screen reader.

To enable your screen reader to accurately read syntax diagrams, source code examples, and text that contains the period or comma picture symbols, you must set the screen reader to speak all punctuation.

When you use JAWS for Windows, the links to accessible syntax diagrams might not work. Use IBM Home Page Reader to read the accessible syntax diagrams.





---

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*Customization Guide*, SC27-8401  
*Messages Guide*, SC27-8402  
*Program Directory*, GI13-4303  
*User's Guide*, SC27-8403

## Documents for related products

### z/OS

*ISPF Planning and Customizing*, GC34-4814  
*MVS JCL Reference*, SA22-7597  
*MVS JCL User's Guide*, SA22-7598  
*MVS System Commands*, SA22-7627  
*Security Server RACF® Command Language Reference*, SA22-7687  
*Security Server RACF Security Administrator's Guide*, SA22-7683  
*TSO/E Command Reference*, SA22-7782  
*TSO/E Programming Guide*, SA22-7788  
*TSO/E System Programming Command Reference*, SA22-7793  
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*ISPF Planning and Customizing*, SC28-1298  
*MVS JCL Reference*, GC28-1757  
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*z/OS Communications Server: IP Configuration Guide*, SC31-8775-15  
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*Db2 9 for z/OS: Configuring SSL for Secure Client-Server Communications*, REDP-4630-00

### CICS

*Application Programming Guide*, SC34-5993  
*Application Programming Primer*, SC33-0674  
*Application Programming Reference*, SC34-5994  
*CICS Supplied Transactions*, SC34-5992  
*CICS Transaction Server for z/OS Release Guide*, GC34-6218

### Db2 UDB for OS/390 and z/OS

*Administration Guide*, SC26-9931  
*Application Programming and SQL Guide*, SC26-9933  
*Command Reference*, SC26-9934  
*Data Sharing: Planning and Administration*, SC26-9935

*Installation Guide*, GC26-9936  
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*Reference for Remote DRDA\* Requesters and Servers*, SC26-9942  
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*SQL Reference*, SC26-9944  
*Utility Guide and Reference*, SC26-9945

## **IMS**

*IMS Version 8 Installation Volume 1: Installation Verification*, GC27-1297  
*IMS Version 7 Installation Volume 1: Installation Verification*, GC26-9429

## **WebSphere MQ**

*WebSphere MQ for z/OS Concepts and Planning Guide*, GC34-6926  
*WebSphere MQ for z/OS System Administration Guide*, GC34-6929  
*WebSphere MQ for z/OS System Setup Guide*, GC34-6927

# Glossary

---

## A

### **abend**

Abnormal end of a task. The termination of a task before its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing.

### **access plan**

The set of access paths that are selected by the optimizer to evaluate a particular SQL statement.

## **APF**

Authorized program facility. A facility that permits the identification of programs that are authorized to use restricted functions.

### **authorized program**

A system program or user program that is allowed to use restricted functions.

## B

### **batch**

A processing mode in which a predefined series of actions are performed with little or no interaction between the user and the system.

### **bind**

To convert the output from the SQL compiler to a usable control structure.

## C

### **checkpoint**

A place in a program at which a check is made, or at which data is recorded, to provide real-time monitoring.

### **checkpoint data set**

A data set that contains checkpoint records.

### **connection authorization exit**

An exit that approves or disapproves requests for a connection to another program.

## D

### **data set**

The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

### **dynamic**

Pertaining to events that occur at run time or during processing.

## E

### **explain**

To capture detailed information about the access plan that was chosen by the SQL compiler to resolve an SQL statement.

## I

## **ISPF**

Interactive system productivity facility. An IBM licensed program that serves as a full-screen editor and dialog manager.

## J

## **JCL**

Job control language. A control language that is used to identify a job to an operating system and to describe the job's requirements.

## M

### **monitor**

To collect data about an application from the running agents that are associated with the application.

**P****panel**

An area of the screen that displays formatted information and that can include entry fields.



---

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