

CICS Transaction Server for z/OS



Migration from CICS TS Version 2.2

Version 3 Release 2

CICS Transaction Server for z/OS



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Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 279.

This edition applies to Version 3 Release 2 of CICS Transaction Server for z/OS, program number 5655-M15, and to all subsequent versions, releases, and modifications until otherwise indicated in new editions.

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Preface

This book is about migration to CICS® Transaction Server for z/OS®, Version 3 Release 2.

This book provides the relevant information for users who plan to migrate from CICS Transaction Server for z/OS, Version 2 Release 2. For the purposes of this book, “migration” is generally taken to mean running existing applications at the equivalent level of function provided by the existing release.

If you are migrating from an older release, select the Migration Guide for the release from which you are migrating. The Migration Guides for older releases include additional information about changes that took place in the intervening releases.

Note: The oldest release for which migration information is provided with CICS Transaction Server for z/OS, Version 3 Release 2 is CICS Transaction Server for OS/390®, Version 1 Release 3. If you are migrating from a release of CICS earlier than this, you are recommended to read the *Release Guide* and the *Migration Guide* (where applicable) for any additional intervening releases.

This book describes external interfaces, such as system definitions, resource definitions, and programming interfaces, that have changed or are new, and which may require you to make changes to your existing CICS and CICSplex® SM setup.

This book assumes that you are familiar with CICS and CICSplex System Manager, either as a systems administrator, or as a system or application programmer.

You should also have read about the new function in this release of CICS Transaction Server as described in the *CICS Transaction Server for z/OS Release Guide*.

Notes on terminology

CICS refers to the CICS element of CICS Transaction Server for z/OS.

CICS TS, unless stated otherwise, refers to the release of CICS Transaction Server for z/OS to which you are migrating.

CICSplex SM refers to the CICSplex System Manager element of CICS Transaction Server for z/OS.

MVS™ is sometimes used for the operating system, the Base Control Program (BCP) element of z/OS.

Part 1. Changes to CICS externals

Chapter 1. Changes to installation

When you migrate to CICS Transaction Server for z/OS, Version 3 Release 2, note these changes to the installation process and important new requirements.

You can install this release of CICS Transaction Server using the SMP/E RECEIVE, APPLY, and ACCEPT commands. Use the SMP/E dialogs to accomplish the SMP/E installation steps. The process meets IBM® Corporate Standards and might be familiar to you if you have installed other z/OS products.

The DFHISTAR process for installing CICS Transaction Server is still available if you prefer it.

The *CICS Transaction Server for z/OS Installation Guide* has information about all the processes for installing CICS Transaction Server.

CICS region user ID access to VSAM catalogs

You must grant the CICS region user ID read access to each VSAM catalog for files for which CICS has file definitions installed and are to be either opened during CICS startup or at any time after.

Include the VSAM catalog for the DFHCSD file for the CICS system definition data set (CSD).

SCEERUN2 and SCEERUN libraries

There are changes to the way that the SCEERUN and SCEERUN2 libraries must be defined:

- The library SCEERUN2 must be defined in both the STEPLIB and DFHRPL concatenations, in addition to SCEERUN.
- Both the libraries, SCEERUN and SCEERUN2, must be APF-authorized.

Authorization routines

In z/OS, do not install SVCs or PC routines that return control to their caller in any authorized mode: that is, in supervisor state, system PSW key, or APF-authorized. Doing so is contrary to the z/OS Statement of Integrity (http://www.ibm.com/systems/z/os/zos/features/racf/zos_integrity_statement.html).

If you invoke such services from CICS, you might compromise your system integrity, and any resultant problems will not be resolved by IBM Service.

Integration of CICSplex SM and CICS installation

You can now edit the DFHISTAR job to modify both the CICS and CICSplex SM installation parameters for your environment. EYUISTAR is no longer available as a job to modify CICSplex SM installation parameters.

DFHISTAR produces customized JCL for CICS and CICSplex SM. It now includes a combination of parameters that apply only for CICSplex SM, parameters that apply only for CICS, and parameters that are common to CICS and CICSplex SM.

For CICSplex SM, DFHISTAR generates sample JCL procedures to:

- Create CMAS data sets
- Start a CMAS
- Create Web User Interface (WUI) data sets
- Start a WUI
- Create MAS data sets
- Run a MAS
- Move MAS modules to the link pack area (LPA)

These procedures enable you to create a CICSplex SM configuration that consists of a CMAS, a WUI, and a managed CICS system (MAS). The CICSplex SM Starter Set, which contained samples of JCL for this purpose, is no longer provided.

Requirement for unique CICS region applid

If your CICS regions are part of a z/OS sysplex, you must ensure that their applids (as specified on the APPLID system initialization parameter) are unique within the sysplex. If CICS is an XRF partner, its specific applid must be unique within the sysplex.

In CICS TS for z/OS, Version 3.2, if an applid is not unique (that is, it duplicates the specific or only applid of any other CICS region currently active in the sysplex), on startup CICS issues a message and fails to initialize.

This requirement supports IPIC connections, but it is required whether or not you plan to use that type of connection. It also allows multiple XCF groups to contain CICS regions.

Requirement for MEMLIMIT value

To use storage above the 2 GB boundary (above the bar) when migrating to CICS TS for z/OS, Version 3.2, set your MEMLIMIT value equal to or greater than 2 GB.

Set the MEMLIMIT value using any of these methods:

1. JCL. You can set MEMLIMIT either to a specific value in JCL or as NOLIMIT, if REGION=0M is specified.
2. SMFPRM PARMLIB member. Set a MEMLIMIT value in SYS1.PARMLIB(SMFPRMxx).
3. IEFUSI z/OS global user exit.

System usage and workload remain the same as they were before you altered the MEMLIMIT value. You cannot alter the MEMLIMIT value on a running system.

If you set MEMLIMIT lower than 2 GB, but higher than the EDSALIM value, a warning message is displayed. If you set MEMLIMIT lower than the EDSALIM value, an error message is displayed and CICS does not start up.

Release levels on INQUIRE SYSTEM command

You use the EXEC CICS INQUIRE SYSTEM CICSTSLEVEL command to determine the version and release number of CICS. Use the EXEC CICS INQUIRE SYSTEM OSLEVEL command to determine the level of z/OS.

To ensure compatibility with previous releases, the CICS base element maintains its own level (identification) number. Each time new function is added to CICS and shipped with the CICS Transaction Server product, the CICS level number is incremented.

The CICS level number in CICS TS 3.2 is 030200. This number is returned in the **RELEASE** parameter of the **INQUIRE SYSTEM** command.

The level number also appears in the alternative decimal form 6.5 in output from offline utilities such as statistics and dump formatters to identify the level of utility being used, and as the suffix in module names such as DFHPD650.

Installing IPIC support

IP interconnectivity (IPIC) enables you to make CICS TS-to-CICS TS distributed program link (DPL) calls over TCP/IP connections. To enable support for this function, you need to activate CICS TCP/IP services, and define and install some resource definitions.

System initialization parameter for IPIC

To activate IPIC at CICS startup, specify **TCPIP=YES** and **ISC=YES** as system initialization parameters. The default value of the **TCPIP** and **ISC** parameters is **NO**. For reference information about the **TCPIP** and **ISC** system initialization parameters, see the *CICS System Definition Guide*.

Resource definitions for IPIC

To enable IPIC:

- Define and install IPCONNs with attributes appropriate to your CICS environment. For guidance information about defining IPCONNs, see the *CICS Intercommunication Guide*. For reference information about IPCONN definitions, see the *CICS Resource Definition Guide*. IPIC connections can be autoinstalled; see the *CICS Customization Guide*.
- Define and install a TCPIPSERVICE definition with the **PROTOCOL** attribute set to **IPIC**. See the *CICS Resource Definition Guide* for reference information about TCPIPSERVICE definitions.

Chapter 2. Changes to system initialization parameters

In CICS Transaction Server for z/OS, Version 3 Release 2, new system initialization parameters are available, and you might find that some system initialization parameters that you used previously are now obsolete. Also, the scope, default, or range of possible values for some existing system initialization parameters has changed. You might need to make changes to your system initialization table or your CICS startup JCL because of these changes.

To migrate with the changes to CICS system initialization parameters described in this section, follow these instructions.

Use the default system initialization table

The unsuffixed default system initialization table (DFHSIT) is supplied in the CICS SDFHAUTH library. You can use the default table to start a CICS region using the default values. CICS loads DFHSIT by default if your JCL does not contain a SIT parameter.

Override defaults using the SYSIN data set

To override default values, specify system initialization parameters in a permanent member of a SYSIN data set. You can vary these during testing by changing the data set member, avoiding the need to reassemble suffixed system initialization tables. Nearly all system initialization parameters entered at run time are used even on a warm start. The main exceptions are the FCT and CSD parameters.

Obsolete system initialization parameters

Remove these obsolete parameters from your system initialization table or from your CICS startup JCL (for example, the SYSIN data set) before migrating.

System initialization parameters made obsolete in CICS Transaction Server for z/OS, Version 3 Release 2

MNSUBSYS

This parameter, used in earlier releases to specify the subsystem identification in monitoring SYSEVENT class records, is obsolete. If specified, it is rejected and a message is issued.

System initialization parameters made obsolete in earlier CICS releases

Table 1. System initialization parameters made obsolete in earlier CICS releases

Obsolete keywords	Explanation
MAXHPTCBS	Run-time support for Java program objects and hot-pooling (HPJ) has been removed. The system initialization parameter MAXHPTCBS is not required, and is removed. The open TCB mode H8, which was used for hot-pooling Java program objects and was controlled by MAXHPTCBS, no longer exists.
SSLTCBS	This parameter is now obsolete and is only kept for compatibility. If it is specified, it is rejected with a message and MAXSSLTCBS is assumed.

Table 1. System initialization parameters made obsolete in earlier CICS releases (continued)

Obsolete keywords	Explanation
TCAM	<p>This parameter is now obsolete and is only kept for compatibility. If it is specified, it is rejected with a message and TCAM=NO is assumed.</p> <p>In CICS Transaction Server for z/OS, Version 3 Release 1, support for the TCAM/ACB interface was removed. The TCAM/DCB interface is supported only indirectly.</p>

Changed system initialization parameters

For some system initialization parameters, the default has changed, or the values that you can specify have changed, or the scope of the system initialization parameter has changed. You might need to modify your system initialization table or CICS startup JCL because of these changes.

System initialization parameters changed in CICS Transaction Server for z/OS, Version 3 Release 2

APPLID={DBDCCICS|applid}

If CICS is running in a sysplex, its applid must be unique within the sysplex. Note that, if the CICS extended recovery facility (XRF) is used by any of the regions in the sysplex, the specified applid must not duplicate the *specific* applid of any XRF CICS region. If, on CICS startup, the specified applid is found to duplicate the (specific or only) applid of any other CICS region currently active in the sysplex, CICS issues message DFHPA1946 and fails to initialize.

This parameter can be used also as the application identifier of this CICS region on IPIC connections.

When you define this CICS region to another CICS region, in an MRO or ISC over SNA CONNECTION definition you specify the applid as the NETNAME; in an IPIC IPCONN definition you specify the applid as the APPLID.

CONFDATA={SHOW|HIDETC}

CONFDATA now applies to initial input data received on IPIC connections (IS data), as well as to initial input data received on VTAM® RECEIVE ANY operations, MRO connections, and FEPI screens and RPLAREAs. When you specify CONFDATA=HIDETC, IS data is handled as follows:

IS data with CONFDATA=HIDETC

- **IPIC:** Trace points SO 0201 and SO 0202 suppress buffer data with the message "Trace data suppressed because it may contain sensitive data". Subsequent trace point SO 029D (buffer continuation) and buffer data from trace points WB 0700 and WB 0701 is suppressed.

If the transaction definition specifies CONFDATA(NO), IS trace entries are created with the user data, as normal.

If the transaction definition specifies CONFDATA(YES), user data from IS trace points IS 0602, IS 0702, and IS 0906 is replaced with "SUPPRESSED DUE TO CONFDATA=HIDETC IN SIT". Data from IS trace points IS 0603 and IS 0703 is not shown.

EDSALIM={34M|number}

The default EDSA limit is now 34 MB. If you created your SIT using previously supplied defaults, update the table to use the new CICS-supplied defaults.

MSGCASE={MIXED|UPPER}

In previous releases, this parameter applied only to messages displayed by the CICS message domain. It now also applies to messages displayed by the CPSM message domain.

MIXED

MIXED is the default in the SIT. All messages displayed by the CICS message domain or the CPSM message domain remain in mixed case.

UPPER

The message domain displays all mixed case messages in uppercase only.

Mixed case output is not displayed correctly on Katakana display terminals and printers. Uppercase English characters appear correctly as uppercase English characters, but lowercase appears as Katakana symbols. If you have any Katakana terminals connected to your CICS region, specify MSGCASE=UPPER.

If you want to use uppercase English for your CICS WebSphere® MQ components, set MSGCASE=UPPER and ensure that ASSIGN NATLANGINUSE returns E (US English).

UOWNETQL=user_defined_value

On VTAM=NO regions, UOWNETQL, or its default value, is now used as the default NETWORKID of this CICS region on the IPCONN definitions that define IPIC connections.

System initialization parameters changed in earlier CICS releases

Table 2. Changed system initialization parameters in earlier CICS releases

Keywords	Operands	Explanation
ENCRYPTION	{ <u>STRONG</u> WEAK MEDIUM}	Specifies the cipher suites that CICS uses for secure TCP/IP connections. For compatibility with previous releases, ENCRYPTION=NORMAL is accepted as an equivalent to ENCRYPTION=MEDIUM.
MAXJVMTCBS	{5 number}	J9-mode TCBs are now used in addition to J8-mode TCBs. This parameter now specifies the maximum number of open TCBs that CICS can create in the pool of J8- and J9-mode TCBs for use by Java programs that run in a JVM (the JVM pool). Within this limit, there are no constraints on how many of the TCBs in the JVM pool are J9 TCBs, and how many are J8 TCBs.

Table 2. Changed system initialization parameters in earlier CICS releases (continued)

Keywords	Operands	Explanation
STNTR, STNTRxx, SPCTR and SPCTRxx	{level numbers}	The SJ component (JVM domain) now has trace levels 29–32, that are reserved to indicate the JVM trace levels 0, 1, and 2, plus a user-definable JVM trace level. You are recommended to use only the SPCTRSJ system initialization parameter to activate JVM tracing, so that it is only activated for <i>special</i> transactions. Selecting tracing levels 29, 30, 31, 32 or ALL for <i>standard</i> tracing for the JVM domain (SJ) component (using the STNTR or STNTRSJ system initialization parameters) is not recommended, because JVM trace can produce a large amount of output.

New system initialization parameters

The default values for these parameters have minimal impact when you are migrating from an earlier release of CICS.

For information about the new function relating to these new system initialization parameters, see What's new.

New system initialization parameters added in CICS Transaction Server for z/OS, Version 3 Release 2

FCQRONLY={NO|YES}

Specifies whether you want CICS to force all user application programs that are specified as threadsafe to run file control requests under the CICS QR TCB, as if they were specified as quasi-reentrant programs.

NO CICS honors the CONCURRENCY(THREADSAFE) attribute on program resource definitions, and allows user application programs to run applicable file control request on an open TCB to avoid unnecessary TCB switching.

YES CICS forces all file control requests to run under the CICS QR TCB, as if they were non-threadsafe EXEC CICS commands. With all file requests on the QR TCB, CICS is able to minimise the amount of locking required at the expense of additional TCB switches if requests were issued from applications running on OPEN TCBs.

The **FCQRONLY=YES** setting can improve the performance of file-owning regions.

APAR PK45354 changes the default from NO to YES.

Local VSAM threadsafety requires CICS APAR PK45354, z/OS 1.9 with APARs OA20352 and OA24071. If run on z/OS 1.7 or z/OS 1.8, these commands are not threadsafe for local VSAM files.

NONRLSRECOV={VSAMCAT|FILEDEF}

Specifies whether CICS uses the recovery options of the VSAM catalog or the FILE resource for non-RLS files, including the CSD.

Recovery options do not apply to read-only files.

VSAMCAT

By default, CICS uses the recovery options that are specified on the VSAM catalog for non-RLS files. These recovery options include the LOG, LOGSTREAMID, and BWO options. If no recovery options are set, CICS uses the attributes on the FILE resource.

FILEDEF

For non-RLS files, including the CSD, CICS ignores any recovery options on the catalog and uses the values specified in the FILE resource instead. The recovery attributes for the CSD are set by the appropriate system initialization parameters.

XCFGROUP={DFHIR000|name}

specifies the name of the cross-system coupling facility (XCF) group to be joined by this region.

The group name must be eight characters long, padded on the right with blanks if necessary. The valid characters are A-Z 0-9 and the national characters \$ # and @. To avoid using the names IBM uses for its XCF groups, do not begin group names with the letters A through C, E through I, or the character string "SYS". Also, do not use the name "UNDESIG", which is reserved for use by the system programmer in your installation.

It is recommended that you use a group name beginning with the letters "DFHIR".

You can specify **XCFGROUP** on the SIT macro or as a SYSIN override. You cannot specify it as a console override.

Each CICS region can join only one XCF group, which happens when it signs on to CICS interregion communication (IRC). The default XCF group is DFHIR000.

XCF groups allow CICS regions in different MVS images within the same sysplex to communicate with each other across multi-region operation (MRO) connections.

Note: Regions in the same MVS image too, can communicate with each other using MRO, but this does not require a coupling facility. The only situation in which CICS regions in the same MVS image cannot communicate via MRO is when they are members of different XCF groups.

For introductory information about XCF/MRO, and instructions on how to set up XCF groups, see the *CICS Intercommunication Guide*.

XHFS={YES|NO}

specifies whether CICS is to check the transaction user's ability to access files in the z/OS UNIX System Services file system. At present, this checking applies only to the user ID of the Web client when CICS Web support is returning z/OS UNIX file data as the static content identified by a URIMAP definition.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter. However, the RESSEC option on the transaction resource definition does **not** affect this security checking.

YES CICS is to check whether the user identified as the Web client is authorized to access the file identified by the URIMAP that matches the incoming URL. This check is in addition to the check performed by z/OS UNIX System Services against the CICS region user ID. If access to the file is denied for either of these user IDs, the HTTP request is rejected with a 403 (Forbidden) response.

NO CICS is not to check the client user's access to z/OS UNIX files. Note that the CICS region user ID's access to these files is still checked by z/OS UNIX System Services.

Restrictions You can specify the XHFS parameter in the SIT, PARM, or SYSIN only.

XRES={YES|name|NO}

specifies whether you want CICS to perform resource security checking for DOCTEMPLATE (CICS document template) resources, and optionally specifies the general resource class name in which you have defined the resource security profiles. If you specify YES, or a general resource class name, CICS calls the external security manager to verify that the userid associated with a transaction is authorized to use the resource. This checking is performed every time a transaction tries to access a CICS document template.

The actual profile name passed to the external security manager is the name of the DOCTEMPLATE resource definition for the CICS document template to be checked, prefixed by its resource type, DOCTEMPLATE. For example, for a document template whose resource definition is named "WELCOME", the profile name passed to the external security manager is DOCTEMPLATE.WELCOME. Even if a command references the document template using its 48-character template name, the shorter name (up to 8 characters) of the DOCTEMPLATE resource definition is always used for security checking.

Note: The checking is performed only if you have specified YES for the SEC system initialization parameter and specified the RESSEC(YES) option on the transaction resource definition.

YES CICS calls the external security manager, using the default CICS resource class name of RCICSRES, to check whether the userid associated with a transaction is authorized to use the resource it is trying to access. The resource class name is RCICSRES and the grouping class name is WCICSRES.

name CICS calls the external security manager, using the specified resource class name prefixed by the letter R, to check whether the userid associated with a transaction is authorized to use the resource it is trying to access. The resource class name is *Rname* and the grouping class name is *Wname*. The resource class name specified must be 1 through 7 characters.

NO CICS does not perform any security checks for DOCTEMPLATE resources, allowing any user to access any CICS document template.

Restrictions You can specify the XRES parameter in the SIT, PARM, or SYSIN only.

New system initialization parameters added in earlier CICS releases

Table 3. New system initialization parameters added in earlier releases

Keywords	Operands	Explanation
CLINTCP	{ 437 codepage}	Specifies the default client code page to be used by the DFHCNV data conversion table but only if the CLINTCP parameter in the DFHCNV macro is set to SYSDEF.
CRLPROFILE	<i>profilename</i>	Specifies the name of the profile that authorizes CICS to access the LDAP server that contains the certification revocation lists (CRLs). Specifying this parameter means that CICS checks each client certificate during the SSL negotiation for a revoked status. If the certificate is revoked, CICS closes the connection immediately.
DEBUGTOOL	{ NO YES}	Specifies whether debugging profiles are used to select programs that run under the control of a debugging tool.
INFOCENTER	{infocenter_url }	Specifies the Universal Resource Locator (URL) of the root of the CICS Information Center directory structure.
JVMCCPROFILE	{ DFHJVMCC <i>profile</i> }	Specifies the JVM profile to be used for the master JVM that initializes a Version 1.4.2 shared class cache.
JVMCCSIZE	{ 24M number}	Specifies the size of the shared class cache on an initial or cold start of CICS.
JVMCCSTART	{ AUTO YES NO}	Sets the status of autostart for the shared class cache.
JVMLEVEL0TRACE, JVMLEVEL1TRACE, JVMLEVEL2TRACE, JVMUSERTRACE	{ <i>option</i> }	Specify the default options for the JVM trace levels.
JVMPROFILEDIR	{/usr/lpp/cicsts/cicsts32 / JVMProfiles directory} (Take note that the previous operand is entered without spaces, or line breaks.)	Specifies the name of an z/OS UNIX directory that contains the JVM profiles for CICS.

Table 3. New system initialization parameters added in earlier releases (continued)

Keywords	Operands	Explanation
LOCALCCSID	{ <u>037</u> CCSID}	Specifies the default CCSID for the local region. The CCSID is a value of up to 8 characters. If CCSID value is not specified, the default LOCALCCSID is set to 037.
MAXSSLTCBS	{ <u>8</u> number}	Specifies the maximum number of S8 TCBs that can run in the SSL pool. The default is 8, but you can specify up to 1024 TCBs.
MAXXPTCBS	{ <u>5</u> number}	Specifies the maximum number, in the range 1 through 999, of open X8 and X9 TCBs that can exist concurrently in the CICS region.
MNRES	{ <u>OFF</u> ON}	Specifies whether transaction resource monitoring is to be made active during CICS initialization.
SRVERCP	{ <u>037</u> codepage}	Specifies the default server code page to be used by the DFHCNV data conversion table but only if the SRVERCP parameter in the DFHCNV macro is set to SYSDEF.
SSLCACHE	{ <u>CICS</u> SYSPLEX}	Specifies whether SSL is to use the local or sysplex caching of session ids.

Chapter 3. Changes to CICS-supplied transactions

The commands available in the CEMT transaction have been modified to reflect changes to resource definitions. Some other CICS-supplied transactions are new or have changed. Also, you might need to define any new CICS internal system transactions listed here to your external security manager, if CICS is running with security enabled.

Obsolete options on CEMT commands

Obsolete options on CEMT commands in CICS Transaction Server for z/OS, Version 3 Release 2

INQUIRE CLASSCACHE: The value Reset is no longer displayed for the REUSEST option. If the shared class cache is not started, the value Unknown is displayed. In this situation, CICS cannot identify the reuse status, but, when the shared class cache is started, the status always becomes Reuse.

INQUIRE JVM: The value Reset is no longer displayed for the REUSEST option.

INQUIRE MONITOR: The SUBSYSTEMID option is obsolete and has been removed.

SET JVMPOOL: The TERMINATE function on the SET JVMPOOL command is now deprecated. Use the improved function on the PERFORM JVMPOOL command instead.

Obsolete options on CEMT commands in earlier CICS releases

Table 4. Obsolete options on CEMT commands in earlier CICS releases

CEMT command	Option	Comment
INQUIRE CORBASERVER	PORT SSLPORT SSLTYPE	These port-related options, introduced with the new CORBASERVER command in CICS TS 2.1, are no longer required, because CICS now obtains TCP/IP port information from the TCIPSERVICE resource definition used by the CorbaServer.
INQUIRE DISPATCHER	ACTHPTCBS MAXHPTCBS	ACTHPTCBS displayed the number of H8 mode open TCBs that were active, and MAXHPTCBS displayed the number that CICS was allowed to attach. H8 mode open TCBs no longer exist.
INQUIRE PROGRAM	HOTPOOLING HOTPOOL NOTHOTPOOL	The values Hotpool and Nothotpool were used to show whether or not the Java program object was to be run in a preinitialized Language Environment® enclave.

Table 4. Obsolete options on CEMT commands in earlier CICS releases (continued)

CEMT command	Option	Comment
INQUIRE REQUESTMODEL	OMGINTERFACE OMGMODULE OMGOPERATION	These options, which returned 31-character, 58-character, and 31-character values respectively, are obsolete and replaced by INTERFACE, MODULE, and OPERATION, each of which returns 255-character values. See Table 7 on page 32 for details of all the changes to the REQUESTMODEL resource definition.
INQUIRE SYSTEM	ACTOPENTCBS MAXOPENTCBS	These options are now included in the new INQUIRE DISPATCHER command, together with the other open TCB options.
SET DISPATCHER	MAXHPTCBS	This option used to specify the maximum number of H8 mode open TCBs that CICS was allowed to attach. H8 mode open TCBs no longer exist.
SET PROGRAM	HOTPOOL NOTHOTPOOL	The values Hotpool and Nothotpool were used to show whether or not the Java program object was to be run in a preinitialized Language Environment enclave.

Changed CEMT commands

Changed CEMT commands in CICS Transaction Server for z/OS, Version 3 Release 2

DISCARD: new IPCONN resource type

Ipconn(*value*)

specifies the name of the IPCONN to be removed. The name can be up to 8 characters long. You cannot discard an IPCONN unless it is in OUTSERVICE status.

DISCARD: new LIBRARY resource type

LIBRARY(*name*)

specifies the name of a LIBRARY resource that you want to remove. The name can be up to 8 characters long. The LIBRARY must be disabled. The **DISCARD LIBRARY** command removes an installed resource definition and its corresponding catalog entry from an active CICS system.

Note: Specifying a LIBRARY name of DFHRPL is invalid, and will result in the message 'NOT VALID FOR RPL' being displayed.

INQUIRE DOCTEMPLATE: new SIZE option

Size

returns the amount of storage, in bytes, used by the cached copy of the document template. A value of zero is returned if there is no cached copy of the template at the time of the enquiry.

INQUIRE DSAS: removal of SOSSTATUS option, new MEMLIMIT, SOSABOVEBAR, SOSABOVELINE and SOSBELOWLINE options

Memlimit(*value*)

displays the amount of storage available above the 2GB boundary (above the bar), for use by the CICS region. A value of NOLIMIT indicates that no limit has been imposed on the amount of storage that the region can attempt to use.

Sosabovebar(*value*)

displays whether CICS is short-on-storage in the dynamic storage areas above the 2GB boundary (above the bar).

Notsos

CICS is not short-on-storage in any of the dynamic storage areas above the 2GB boundary.

Sos CICS is short-on-storage in at least one of the dynamic storage areas above the 2GB boundary.

Sosaboveline(*value*)

displays whether CICS is short-on-storage in the dynamic storage areas above the 16MB line, but below the 2GB boundary.

Notsos

CICS is not short-on-storage in any of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

Sos CICS is short-on-storage in at least one of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

Sosbelowline(*value*)

displays whether CICS is short-on-storage in the dynamic storage areas below the 16MB line.

Notsos

CICS is not short-on-storage in any of the dynamic storage areas below the 16MB line.

Sos CICS is short-on-storage in at least one of the dynamic storage areas below the 16MB line.

INQUIRE FILE: new RBATYPE option**Rbatype**

displays whether, for VSAM files, the data set uses extended addressing. The values are:

Extended

This VSAM data set uses extended relative byte addressing and therefore can hold more than 4 gigabytes of data.

Notapplic

One of the following is true:

- The data set is BDAM.
- The file is remote.
- The file is not open.

Notextended

This VSAM data set does not use extended relative byte addressing and therefore cannot hold more than 4 gigabytes of data.

You cannot modify the contents of this field.

INQUIRE IRC: new XCFGROUP option**Xcfgroup**

displays the name of the cross-system coupling facility (XCF) group of which this region is a member.

If this region is not a member of an XCF group, because it has not signed on to IRC, XCFGROUP displays the relevant XCF group for the region if XCF was open.

For introductory information about XCF and MRO, see Cross-system multiregion operation (XCF/MRO) in the *CICS Intercommunication Guide*.

INQUIRE MONITOR: new COMPRESSST option

COMpressst

displays whether data compression is performed for monitoring records. The values are:

Compress

Data compression is performed.

Nocompress

Data compression is not performed.

Note: You can reset this value by overtyping it with a different value.

INQUIRE PROGRAM: The USECOUNT option now displays a use count for Java programs. In earlier CICS releases, this count was not available.

INQUIRE PIPELINE: new options

Ciddomain(value)

Displays the name of the domain that is used to generate MIME content-ID values that identify binary attachments.

Mode(value)

Displays the operating mode of the pipeline.

PROVIDER

CICS is using the pipeline as a service provider of Web services.

REQUESTER

CICS is using the pipeline as a service requester of Web services.

UNKNOWN

The operating mode of the pipeline cannot be determined.

Mtomnoxopst(value)

Displays the status of the pipeline for sending outbound messages in MIME format when binary attachments are not present.

MTOMNOXOP

Outbound messages are sent in MIME format, even when there are no binary attachments present.

NOMTOMNOXOP

Outbound messages are only sent in MIME format when there are binary attachments present.

Mtomst(value)

Displays the status of the MTOM handler in the pipeline.

MTOM

The MTOM handler is enabled in the pipeline.

NOMTOM

The MTOM handler is not enabled in the pipeline.

Respwait (number)

Displays the number of seconds that an application program waits for an

optional message from a remote Web service. If no value is displayed, the default timeout value of the transport protocol is being used.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for WebSphere MQ is 60 seconds.

Sendmtomst(*value*)

Displays the status of the pipeline for sending outbound messages in MIME format.

NOSENDMTOM

Outbound messages are never sent in MIME format.

SAMESENDMTOM

Outbound messages are only sent in MIME format when the inbound message is in MIME format.

SENDMTOM

Outbound messages are always sent in MIME format.

SOAPlevel(*value*)

Displays the level of SOAP that is supported in the pipeline. The SOAP level can be 1.1 or 1.2. If the pipeline is not being used for SOAP messages, a value of NOTSOAP is displayed.

Xopdirectst(*value*)

Displays the status of the pipeline for handling XOP documents and binary attachments in direct or compatibility mode.

XOPDIRECT

The pipeline is processing XOP documents and binary attachments in direct mode.

NOXOPDIRECT

The pipeline is processing XOP documents and binary attachments in compatibility mode.

Xopsupportst(*value*)

Displays the status of the application handler for processing XOP documents and binary attachments directly.

XOPSUPPORT

The application handler supports the direct handling of XOP documents and binary attachments.

NOXOPSUPPORT

The application handler does not support the direct handling of XOP documents and binary attachments.

INQUIRE SYSTEM: removal of SOSSTATUS option, new SOSABOVEBAR, SOSABOVELINE and SOSBELOWLINE options

Sosabovebar(*value*)

displays whether CICS is short on storage in the dynamic storage areas above the 2GB boundary (above the bar).

Notsos

CICS is not short on storage in any of the dynamic storage areas above the 2GB boundary.

Sos

CICS is short on storage in at least one of the dynamic storage areas above the 2GB boundary.

Sosaboveline(*value*)

displays whether CICS is short on storage in the dynamic storage areas above the 16MB line, but below the 2GB boundary.

Notsos

CICS is not short on storage in any of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

Sos CICS is short on storage in at least one of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

Sosbelowline(*value*)

displays whether CICS is short on storage in the dynamic storage areas below the 16MB line.

Notsos

CICS is not short on storage in any of the dynamic storage areas below the 16MB line.

Sos CICS is short on storage in at least one of the dynamic storage areas below the 16MB line.

INQUIRE TCPIP SERVICE: A new value of Identify can be returned on the ATTACHSEC option.

Attachsec

indicates the level of attach-time security used by the connection. Values are:

Local

CICS does not require a userid or password from clients.

Notapplic

This option has no meaning for Web interface or IIOP TCP/IP services.

Verify

Incoming attach requests must specify a user identifier and a user password.

Realm (*value*)

returns the 56-character realm that is used during the process of HTTP basic authentication.

The PROTOCOL option also has a new value:

IPic

IP interconnectivity.

INQUIRE WEBSERVICE: new options**CCSID(*value*)**

Displays the CCSID that is used to encode data between the application program and the Web service binding file at run time. This value is set using the optional **CCSID** parameter in the Web services assistant when the Web service binding file was generated. If the *value* is 0, the default CCSID for the CICS region that is specified by the **LOCALCCSID** system initialization parameter is used.

Mappinglevel(*value*)

Displays the mapping level that is used to convert data between language structures and Web service description (WSDL) documents. The value of the mapping level is 1.0, 1.1, 1.2, 2.0 or 2.1. The default is to use a mapping level of 1.0.

Minrunlevel(*value*)

Displays the minimum runtime level that is required to run the Web service in CICS. The value of the runtime level is 1.0, 1.1, 1.2, 2.0 or 2.1.

Xopdirectst(*value*)

Indicates whether the Web service is capable of handling XOP documents and binary attachments in direct mode.

NOXOPDIRECT

The Web service cannot handle XOP documents and binary attachments in direct mode. This is either because validation is switched on for the Web service, or because the Web service implementation does not support the handling of XOP documents and binary attachments. Compatibility mode is used instead.

XOPDIRECT

The Web service can handle XOP documents and binary attachments in direct mode.

Xopsupportst(*value*)

Indicates whether the Web service implementation is capable of handling XOP documents and binary attachments.

NOXOPSUPPORT

The Web service implementation is not capable of handling XOP documents and binary attachments.

XOPSUPPORT

The Web service implementation is capable of handling XOP documents and binary attachments. This is true for any CICS-generated web service created by a level of CICS that supports MTOM/XOP.

PERFORM STATISTICS: new LIBRARY option**LIBRARY**

LIBRARY statistics are to be written immediately to the SMF data set.

SET MONITOR: new options**COMPRESS**

Data compression is to be performed for monitoring records.

NOCOMPRESS

Data compression is not to be performed for monitoring records.

SET PIPELINE: new RESPWAIT option**Reswait**(*value*)

Specifies the time in seconds that an application program should wait for a response message from a remote Web service. The value can range from 0 to 9999 seconds.

If you do not specify a value, the default timeout value of the transport protocol is used.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for MQ is 60 seconds.

PERFORM STATISTICS: Statistics can be written for the new resource types DOCTEMPLATE, IPCONN, and MQCONN.

DISCARD DOCTEMPLATE, INQUIRE DOCTEMPLATE, SET DOCTEMPLATE: If resource security for document templates is active in the CICS region, with the XRES system initialization parameter set on (which is the default), and assuming RESSEC(YES) is specified for CEMT, these commands are subject to resource security checking.

Changed CEMT commands in earlier CICS releases

Table 5. Changed CEMT commands in earlier CICS releases

CEMT command	Option	Explanation
INQUIRE CORBASERVER	ENABLESTATUS	These options display: <ul style="list-style-type: none"> ENABLESTATUS displays a value indicating the current state of the CorbaServer (DISABLED, DISABLING, DISCARDING, ENABLED, or ENABLING). ENABLESTATUS replaces the STATE option, which is now obsolete.
INQUIRE DISPATCHER	ACTSSLTCBS ACTXPTCBS MAXSSLTCBS MAXXPTCBS	ACTSSLTCBS displays the number of S8 mode open TCBs that are active, and MAXSSLTCBS displays the number that CICS is allowed to attach. ACTXPTCBS displays the number of X8 and X9 mode open TCBs that are active, and MAXXPTCBS displays the number that CICS is allowed to attach.
INQUIRE DOCTEMPLATE	HFSFILE	Returns the fully-qualified name of the z/OS UNIX System Services file where the template resides.
INQUIRE PROGRAM	APIST RUNTIME has a new value	APIST displays the API attribute of the installed program definition. The values are: CICSAPI OPENAPI The XPLINK value for the RUNTIME option means that the program is a C or C++ program which has been compiled using the XPLINK option.
INQUIRE SYSTEM	DEBUGTOOL	Displays a value (DEBUG or NODEBUG) indicating whether debugging profiles will be used to select programs that will run under the control of a debugging tool.
INQUIRE SYSTEM	FORCEQR has a revised description	The description of FORCEQR, and its value FORCE are altered to limit its relevance to CICSAPI programs, because it does not apply to OPENAPI programs.
INQUIRE TCPIP	CRLPROFILE SSLCACHE	CRLPROFILE displays the name of the profile that authorizes CICS to access an LDAP server that stores certificate revocation lists for SSL connections. SSLCACHE displays whether CICS is using local (CICS) or sysplex caching of session ids.
INQUIRE TCPIP SERVICE	MAXDATALEN	Displays the maximum length of data that may be received by CICS as an HTTP server.
INQUIRE WORKREQUEST	SOAP	Specifies that any action you request is limited to Web service work requests.
PERFORM STATISTICS	BEAN, JVMPROFILE, JVMPROGRAM	New resource types for which statistics can be recorded.

Table 5. Changed CEMT commands in earlier CICS releases (continued)

CEMT command	Option	Explanation
PERFORM STATISTICS	PIPELINE WEBSERVICE	New resource types for which statistics can be recorded.
SET CORBASERVER	DISABLED ENABLED	Specifies whether to enable or disable the CorbaServer.
SET DISPATCHER	MAXSSLTCBS MAXXPTCBS	MAXSSLTCBS displays the maximum number of S8 mode open TCBs that CICS is allowed to attach. MAXXPTCBS specifies the maximum number of X8 and X9 mode open TCBs that CICS is allowed to attach.
SET PROGRAM	JVMPROFILE	For Java programs, this option specifies the 8-character name of a JVM profile that is to be used for the JVM in which the program runs. Any instances of this program that are currently running in a JVM with the old JVM profile are unaffected, and are allowed to finish running.
SET SYSTEM	DEBUG NODEBUG	Specifies whether debugging profiles will be used to select programs that will run under the control of a debugging tool.
SET SYSTEM	FORCEQR has a revised description	The description of FORCEQR, and its value FORCE are altered to limit its relevance to CICSAPI programs, because it does not apply to OPENAPI programs.
SET TCIPSERVICE	MAXDATALEN	Specifies the maximum length of data that may be received by CICS as an HTTP server.
SET WORKREQUEST	SOAP	Specifies that any action you request is limited to Web service work requests.

New CEMT commands

For detailed information on all the new and changed CEMT transactions and options, see in the *CICS Supplied Transactions*.

New CEMT commands in CICS Transaction Server for z/OS, Version 3 Release 2

INQUIRE IPCONN

Retrieve information about IPCONNs.

INQUIRE LIBRARY

Retrieve information about LIBRARY resources.

PERFORM JVMPOOL

Start and terminate JVMs in the JVM pool.

SET IPCONN

Change the attributes of an IPCONN or cancel outstanding AIDs.

SET LIBRARY

Change the attributes of LIBRARY resource.

SET DOCTEMPLATE

Refresh the cached copy of a document template installed in your CICS region, or phase in a new copy of a CICS program or exit program that is defined as a document template.

New CEMT commands in earlier CICS releases

Table 6. New CEMT commands in earlier CICS releases

CEMT command	Function
DISCARD PIPELINE	Use the command to remove a PIPELINE from the CICS system and the CICS catalog.
DISCARD URIMAP	Remove a URIMAP from the CICS system and the CICS catalog.
DISCARD WEBSERVICE	Remove a WEBSERVICE from the CICS system and the CICS catalog.
INQUIRE CLASSCACHE	Obtain information about the active shared class cache in the CICS region, and report the presence of any old shared class caches that are awaiting deletion.
INQUIRE HOST	Retrieve information about virtual hosts in the local CICS region.
INQUIRE JVM	Identify JVMs in a CICS region and get information about their status.
INQUIRE PIPELINE	Retrieve information about an installed PIPELINE.
INQUIRE URIMAP	Retrieve information about URIMAP resource definitions.
INQUIRE WEBSERVICE	Retrieve information about an installed WEBSERVICE.
INQUIRE WORKREQUEST	Track work requests in the local CICS region.
PERFORM CLASSCACHE	Start and reload the shared class cache, or phase out, purge or forcepurge the shared class cache and the JVMs that are using it.
PERFORM PIPELINE	Initiate a scan of the Web service binding directory that is specified in the WSBIND attribute of the PIPELINE definition.
SET CLASSCACHE	Enable you to set the status of autostart for the shared class cache.
SET HOST	Enable or disable a virtual host.
SET PIPELINE	Enable or disable a PIPELINE.
SET URIMAP	Enable or disable a URIMAP definition, and apply or remove redirection for a URIMAP definition.
SET WEBSERVICE	Set the validation status of a WEBSERVICE.
SET WORKREQUEST	Purge or forcepurge a specific work request task.

Changes to CEBR

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, the CEBR transaction is changed to permit the entry of lower case and mixed case queue names.

This applies equally to the queue name used on the CEBR command, and to overtyping a queue name on the displayed CEBR panel. To enter a queue name which includes lower case characters, first ensure that upper case translation is suppressed for the terminal you are using, and then enter the case-sensitive queue name.

Changes to CETR

The CETR transaction is enhanced to enable you to set special tracing for the following new components:

DP	Debug Tool Interface domain
IS	Intersystems communication and MRO
PI	Pipeline Manager domain
RA	Resource manager adapters

Controlling tracing for JVMs

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, CETR has new option screens to display and update trace settings for JVMs.

Press PF6 on the main screen to access the JVM trace options screens. (Although the JVM trace options are part of the SJ component, they are controlled using the JVM trace options screens, rather than the component trace options screen.) You can use these screens to specify the JVM trace options, using the “free-form” 240-character field, and to specify trace settings for JVMs using the Standard and Special flags. You can then use the Transaction and Terminal Trace screen to switch on these flags for particular transactions. JVM trace can produce a large amount of output, so you should normally activate JVM tracing for special transactions, rather than turning it on globally for all transactions.

The default JVM trace options that are provided in CICS use the JVM trace point level specifications. The default settings for JVM Level 0 trace, JVM Level 1 trace, and JVM Level 2 trace specify LEVEL0, LEVEL1, and LEVEL2 respectively, so they map to the Level 0, Level 1 and Level 2 trace point levels for JVMs. A Level 0 trace point is very important, and this classification is reserved for extraordinary events and errors. Note that unlike CICS exception trace, which cannot be switched off, the JVM Level 0 trace is normally switched off unless JVM tracing is required. The Level 1 trace points and Level 2 trace points provide deeper levels of tracing. The JVM trace point levels go up to Level 9, which provide in-depth component detail. It is suggested that you keep the CICS-supplied level specifications, but if you find that another JVM trace point level is more useful for your purposes than one of the default levels, you could change the level specification to map to your preferred JVM trace point level (for example, you could specify LEVEL5 instead of LEVEL2 for the JVMLEVEL2TRACE option). The default values for JVM trace options can be overridden using the CICS system initialization parameters JVMLEVEL0TRACE, JVMLEVEL1TRACE, JVMLEVEL2TRACE and JVMUSERTRACE.

You can add further parameters to the basic level specifications for JVM Level 0 trace, JVM Level 1 trace, and JVM Level 2 trace, if you want to include or exclude particular items at the selected trace levels. If you want to create more complex specifications for JVM tracing which use multiple trace point levels, or if you do not want to use trace point levels at all in your specification, use the JVMUSERTRACE option to create a trace option string that includes the parameters of your choice. Defining and activating tracing for JVMs in the *CICS Problem Determination Guide* has information about the JVM trace options that you can set using the JVM Level 0 trace, JVM Level 1 trace, JVM Level 2 trace, and JVM User trace levels. There is further information about JVM trace and about problem determination for JVMs in the *IBM Developer Kit and Runtime Environment, Java 2 Technology Edition Diagnostics Guide*, which is available to download from www.ibm.com/developerworks/java/jdk/diagnosis/.

Changes to CWXN

If you are migrating from a CICS release earlier than CICS Transaction Server for z/OS, Version 3 Release 1, there are several changes to the processing carried out by the CICS-supplied transaction CWXN, the Web attach transaction.

The most significant of the changes are:

- If a matching URIMAP definition is found for an HTTP request, CWXN now invokes the analyzer program only if instructed to do so by the URIMAP definition.
- Where the HTTP version of the request is HTTP/1.1, CWXN carries out some of the responsibilities of an HTTP server by performing some basic acceptance checks on the request. In response to these checks, CWXN might take action to return a response to the request without involving a user-written application program.
- CWXN pre-processes chunked and pipelined messages received from a Web client, so that user-written applications do not have to perform this processing.
 - Chunked messages are single messages split up and sent as a series of smaller messages (chunks). CWXN receives and assembles the chunks of the message to create a single HTTP request. CWXN checks that the message is complete before passing it to the user application. The user application can then process the request like any other HTTP request.
 - Pipelined messages are multiple messages sent in sequence, where the sender does not wait for a response after each message sent. A server must respond to these messages in the order that they are received. To ensure this, CWXN holds pipelined requests and releases them one at a time to the user application. The user application must send a response to the first request before receiving the next request from CWXN.
- Persistent connections are now the default behavior. The connection is only closed if the Web client requests closure, or if the timeout period is reached, or if the Web client is an HTTP/1.0 client that does not send a Keep-Alive header.
- Before CICS Transaction Server for z/OS, Version 3 Release 1, if a Web client and CICS had a persistent connection, the CWXN transaction would remain in the system for the duration of the persistent connection. Now, the CWXN transaction terminates after each request from the Web client has been passed to the alias transaction (CWBA or another transaction), or after the static response has been delivered. The Sockets listener task monitors the socket and initiates a new instance of CWXN for each request on the persistent connection. This behavior, known as an asynchronous receive, avoids the possibility of a deadlock in a situation where the maximum task specification (MXT) has been reached, when a CWXN transaction remaining in the system would not be able to attach alias transactions to process further requests. It also means that the maximum number of concurrent connections between CICS and Web clients is no longer limited by the MXT value, but can in theory be up to 64000. In terms of system activity, if you used persistent connections before CICS Transaction Server for z/OS, Version 3 Release 1, you should now see an increased transaction rate, but a decrease in the number of concurrent tasks.

New transaction CCRL

CCRL, the certificate revocation lists transaction, was introduced in CICS Transaction Server for z/OS, Version 3 Release 1. Use CCRL to create and update the certificate revocation lists (CRLs) that are stored in an LDAP server. You only need to use CCRL if you are implementing SSL in your CICS regions and want each connection checked for a revoked certificate during the SSL handshake.

The CCRL transaction specifies the location of CRL repositories on the world wide web. CICS downloads the lists from the CRL repository at the specified URL and stores it in the LDAP server. You can specify more than one URL if you need to access multiple CRL repositories.

Before you run the CCRL transaction, you must have the following set up in CICS:

- An LDAP server that is set up and configured to store the certificate revocation lists.
- The **CRLPROFILE** system initialization parameter is defined with the name of the profile that authorizes CICS to access the LDAP server.

You can run the CCRL transaction from a terminal or from a START command. If you want to schedule regular updates, use the START command option.

To run the transaction from a terminal, enter the following command: `CCRL url-list` where *url-list* is a space-delimited list of URLs that contain the certificate revocation lists that you want to download.

To run the transaction from a START command, using the following syntax:

```
EXEC CICS START TRANSID(CCRL) FROM (url-list)
LENGTH (url-list-length) [INTERVAL(hhmmss)|TIME(hhmmss)]
```

where *url-list* is a space-delimited list of URLs that contain the certificate revocation lists that you want to download, *url-list-length* is the length of the URL list, and *hhmmss* is the interval or expiration time at which the CCRL transaction is scheduled to run.

If you enter an invalid URL, you will receive an error message.

New transaction CEMN

CEMN, the CICS monitoring facility transaction, was introduced in CICS Transaction Server for z/OS, Version 3 Release 2.

CEMN gives you an alternative to the INQUIRE MONITOR and SET MONITOR system programming commands and the equivalent CEMT commands. You can use the transaction to inquire on the settings for the CICS monitoring facility, and to change some of the settings without needing to restart CICS.

Note that if you use the Frequency option in CEMN to set the interval at which CICS produces performance class records for long-running tasks, CICS can only produce a performance class monitoring record in this way when the long-running transaction is running on the QR or CO TCBs.

CEMN is a Category 2 transaction.

New transaction CJGC

CJGC, the CICS JVM garbage collection transaction, was introduced in CICS Transaction Server for z/OS, Version 3 Release 2.

When CICS initiates garbage collection in a JVM, this transaction is used for the process, so that the time spent in garbage collection is assigned to CJGC rather than to one of the user transactions that used the JVM.

If garbage collection is caused by an allocation failure in the JVM, rather than being scheduled by CICS, garbage collection takes place while the user application is running, and the CJGC transaction is not used.

The GC_HEAP_THRESHOLD option in the JVM profile specifies the heap utilization limit at which CICS initiates garbage collection. The default is 85%. If GC_HEAP_THRESHOLD is set to 100, CICS never initiates garbage collection, and so the CJGC transaction is not used.

CJGC is a Category 1 transaction.

New transaction CJPI

CJPI was introduced in CICS Transaction Server for z/OS, Version 3 Release 2. It starts up new JVMs as a result of a PERFORM JVMPOOL command.

CJPI is a Category 1 transaction.

New transaction CWXU

CWXU, the CICS Web user-defined protocol attach transaction, was introduced in CICS Transaction Server for z/OS, Version 3 Release 1.

From CICS Transaction Server for z/OS, Version 3 Release 1, processing for HTTP requests and processing for non-HTTP requests are kept separate. This ensures that CICS can perform basic acceptance checks on HTTP requests and responses, and that non-HTTP requests are not subjected to these checks. Processing for non-HTTP requests must now be carried out under the user-defined (USER) protocol, which is specified on the TCPIPSERVICE definition for the port that receives the requests.

CWXU is the default when the protocol is defined as USER. CWXU executes the CICS program DFHWBXN. The DFHCURDI sample includes a sample definition for CWXU. An alternative transaction that executes DFHWBXN may be used, with the exception of the other default transactions that are defined for protocols on the TCPIPSERVICE resource definition.

CWXU is a RACF® Category 1 transaction.

Additions to CICS RACF category 1 transactions

New CICS internal system transactions are added to the list of category 1 transactions. These transactions must be defined to your external security manager, and the CICS region user ID must be authorized to use them, so that CICS can initialize successfully when it is running with security enabled (SEC=YES).

For a full list of all the CICS category 1 transactions, see in the *CICS RACF Security Guide*. Also see the DFH\$CAT1 CLIST, supplied in the SDFHSAMP library.

The new category 1 transactions are:

- CISC
- CISD
- CISE
- CISR
- CISS
- CIST
- CISX
- CJGC
- CJMJ
- CJPI
- CPIR
- CPIS
- CRTP
- CWXU

Chapter 4. Changes to resource definition

Changes to the resource definitions available in CICS relate to new, changed or obsolete CICS functions. The changes might involve complete resource definitions or individual attributes. The pre-made resource definitions supplied by CICS have corresponding changes, which you can implement by running the UPGRADE function of the CSD utility program (DFHCSDUP).

For more information about all the new and changed resource definitions, see the *CICS Resource Definition Guide*.

Obsolete CICS-supplied resource definitions

Some CICS-supplied resource definition groups are now obsolete, and they have been removed from the CICS-supplied default startup group list, DFHLIST. If you use customized startup group lists, you must remove any obsolete definition groups from them.

DFH\$JAVA

CICS-supplied sample application program group DFH\$JAVA is removed. This group contained the resource definitions needed for the sample applications for Java support using VisualAge® for Java, Enterprise Edition for OS/390. The same sample applications are defined for use with a JVM by the DFH\$JVM group.

DFHAUGRP

CICS-supplied group DFHAUGRP is removed. This group contained the resource definitions for the CICS transaction affinities utility.

DFH\$AFFY

CICS-supplied sample group DFH\$AFFY is removed. This group contained sample resource definitions for the CICS transaction affinities utility that you could modify to suit your requirements.

Changed resource definition attributes

For some individual attributes of existing resource definitions, the values that you can specify have changed, or the scope of the attribute has changed. If you have resource definitions that use these attributes, check that the value you are using is still the best for your situation.

Resource definition attributes changed in CICS Transaction Server for z/OS, Version 3 Release 2

TCPIPSERVICE resource definition: new values

- On the PROTOCOL option, a value of IPIC is added:
 - IPIC** IPIC protocol is used. Specify IPIC for a TCP/IP service that is to be used for distributed program link (DPL) over IP interconnectivity connections, which are also known as *IPCONNs*.
- On the URM option, a value of NO is added, and a new user-replaceable program can be specified:

NO Autoinstall is not permitted on this TCP/IP service. This option only applies for PROTOCOL(IPIC).

program_name

For those protocols for which URM is a required attribute, the default program name depends on the value of the PROTOCOL attribute:

- For the IPIC protocol, specify the name of the autoinstall user program for IPCONNs, if required. For PROTOCOL(IPIC), if you do not specify this attribute, CICS uses the CICS-supplied, default IPCONNs autoinstall user program, DFHISAIP.

Resource definition attributes changed in earlier CICS releases

Table 7. Changed resource definition attributes in earlier CICS releases

Resource type	Affected attributes	Explanation
PROFILE	RTIMOUT	Now, in addition to specifying the terminal read time-out feature as in earlier releases, this also specifies the time-out value for IIOp request processor tasks that are waiting for method requests.
PROGRAM	EXECKEY JVMPROFILE	<ul style="list-style-type: none">• The EXECKEY attribute now applies to programs that run in a JVM. You can use the same JVM profile to invoke a JVM in either of the keys.• The JVM profiles that you specify using the JVMPROFILE attribute are now files in the z/OS UNIX directory that is specified by the system initialization parameter JVMPROFILEDIR, and you need to specify the name using the same combination of upper and lower case characters that is present in the HFS file name.
TCIPSERVICE	PORTNUMBER TRANSACTION	<p>The description of the PORTNUMBER attribute has been extended, with information regarding the use of well-known IIOp port numbers and port sharing within an MVSimage.</p> <p>CIEP, for an ECI over TCP/IP TCIPSERVICE definition, is added to the CICS transactions you can specify on the TRANSACTION attribute.</p>
TRANSACTION	SHUTDOWN	The meaning of this parameter is changed. It now applies to ALL transactions whether the transaction is associated with a terminal or not. Therefore, SHUTDOWN(ENABLED) should be specified on all TRANSACTIONS that you want to run during shutdown. Alternatively, specify them on the XLT used at shutdown.

Changes to CICS-supplied resource definitions

Some CICS-supplied resource definitions are changed or obsolete, and are moved to new compatibility groups. Following the upgrade of your CSD, the resource definitions listed here no longer exist in their old groups, which are removed from DFHLIST. If you plan to share the upgraded CSD with earlier releases of CICS,

remove the obsolete group names from the group lists you use on the earlier releases and add the appropriate DFHCOMP compatibility groups in their place.

Resource definitions moved to group DFHCOMPA

Group DFHJIIRP became obsolete in CICS Transaction Server for z/OS, Version 3 Release 1. The definition that was in this group is now in the compatibility group DFHCOMPA.

When you upgrade the CSD using DFHCSDUP, DFHCOMPA is locked.

New resource definitions and new attributes

Some new resource definitions are available in CICS Transaction Server for z/OS, Version 3 Release 2, and some new individual attributes are added to existing resource definitions. You can use these new resource definitions and attributes to define support for new CICS functions.

New resource definitions and attributes added in CICS Transaction Server for z/OS, Version 3 Release 2

New IPCONN resource definition

Support for IPIC introduces a new CICS resource, the IPIC connection, or IPCONN. An IPIC connection is a TCP/IP communication link to a remote system. An IPCONN definition specifies the *outbound* attributes of the TCP/IP connection. The *inbound* attributes of the connection are specified by the TCPIPSERVICE definition named on the TCPIPSERVICE option of the IPCONN definition. For more information about this new resource definition type, see IPCONN resource definitions, in the *CICS Resource Definition Guide*.

New LIBRARY resource definition

Support for dynamic program library management introduces a new CICS resource, the LIBRARY. A LIBRARY represents a partitioned data set or sequence of concatenated, partitioned data sets containing program entities that make up an application or group of applications, defined by the System Programmer. A LIBRARY definition specifies the name of the LIBRARY, the data sets belonging to that LIBRARY, whether or not it is critical to the running of CICS, and its ranking in the overall LIBRARY search order. For more information about this new resource definition type, see LIBRARY resource definitions, in the *CICS Resource Definition Guide*.

PIPELINE resource definition: new RESPWAIT attribute

RESPWAIT(*value*)

Specifies the number of seconds that an application program should wait for a response message from a remote Web service. The value can range from 0 to 9999 seconds.

If you want to use the default timeout value of the transport protocol, specify DEFT.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for WebSphere MQ is 60 seconds.

TCIPSERVICE resource definition: new attributes

REALM(*string*)

specifies the realm that is used for HTTP basic authentication. You can specify this attribute only for the HTTP protocol.

CICS provides the realm in the WWW-Authenticate header. The end user sees the realm during the process of basic authentication. The realm identifies the set of resources to which the authentication information requested (that is, the user ID and password) will apply.

If you do not specify a realm, the default used by CICS is CICS application *aaaaaaaa*, where *aaaaaaaa* is the applid of the CICS region.

The realm can be up to 56 characters long, and can include embedded blanks. You specify it in mixed case and the case is preserved. Do not specify opening and closing double quotes, because CICS provides these when assembling the WWW-Authenticate header.

Acceptable characters:

A-Z a-z 0-9 \$ @ # . - _ % & ? ! : | ' = ~ + * , ; < > ()

Space characters are also permitted. If parentheses ("(" and ")") are used, you must use them as pairs of opening and closing parentheses.

New resource definitions and attributes added in earlier CICS releases

Table 8. New resource definitions and attributes added in earlier releases

Resource definition	New keywords	Explanation
CORBASERVER	STATUS({ Enabled Disabled})	Specifies whether the CorbaServer is to be installed in enabled or disabled state. The default is enabled.
PIPELINE		For information about this new resource definition type, see PIPELINE resource definitions the <i>CICS Resource Definition Guide</i> .
URIMAP		For information about this new resource definition type, see URIMAP resource definitions in the <i>CICS Resource Definition Guide</i> .
WEBSERVICE		For information about this new resource definition type, see WEBSERVICE resource definitions in the <i>CICS Resource Definition Guide</i> .

New CICS-supplied resource definitions

New groups of CICS-supplied resource definitions are added to your CSD when you run the UPGRADE command.

DFHDP

The CICS-supplied group DFHDP, introduced in CICS Transaction Server for z/OS, Version 3 Release 1, contains the resource definitions for the application debugging profile manager 3270 interface (the CADP transaction), and for the inactivate debugging profiles utility.

The group contains:

PROGRAM definitions

DFHDPLU, DFHDPIN and DFHDPCP

TRANSACTION definitions

CADP and CIDP

MAPSET definitions

DFHDPMS

DFHDPWB

The CICS-supplied group DFHDPWB, introduced in CICS Transaction Server for z/OS, Version 3 Release 1, contains the resource definitions for the application debugging profile manager web interface.

The group contains:

PROGRAM definitions

DFHDPWB, DFHDPWM0, DFHDPWM1, DFHDPWM2, DFHDPWM3, DFHDPWM4, DFHDPWM5, DFHDPWM6, DFHDPWT0, and DFHDPWF0

DFHISCIP

The CICS-supplied group DFHISCIP, introduced in CICS Transaction Server for z/OS, Version 3 Release 2, contains the default autoinstall user program for IPIC connections, DFHISAIP.

DFHISCIP is included in the default CICS startup grouplist DFHLIST. If you use a different CICS startup grouplist, ensure that you append the DFHISCIP group to it.

DFHMQ

The CICS-supplied group DFHMQ, introduced in CICS Transaction Server for z/OS, Version 3 Release 2, contains CSD definitions for the CICS-MQ adapter.

When the CICS-MQ adapter was shipped with the WebSphere MQ product, WebSphere MQ supplied the CSQCAT1 and CSQKB CSD groups. The CSQCAT1 and CSQCKB groups should not be installed on CICS TS 3.2 systems or higher and you should ensure that they are removed from GROUPLISTS.

DFHSO

The CICS-supplied group DFHSO, introduced in CICS Transaction Server for z/OS, Version 3 Release 1, contains the resource definitions for external sockets support.

The group contains:

PROGRAM definitions

DFHSOCI and DFHSOLI

DFH\$WEB

The CICS-supplied group DFH\$WEB, introduced in CICS Transaction Server for z/OS, Version 3 Release 2, contains most of the samples for CICS Web support. The exception is the assembler language sample program DFH\$WB1A, which is provided in the existing DFHWEB resource definition group.

DFH\$WEB contains these definitions:

- PROGRAM resource definitions for:
 - DFH\$WB1C, sample C program for verifying the operation of CICS Web support

- DFH\$WBCA, sample assembler language program for sending client requests in chunks and receiving a chunked response
- DFH\$WBCC, sample C program for sending client requests in chunks and receiving a chunked response
- DFH0WBCO, sample COBOL program for sending client requests in chunks and receiving a chunked response
- DFH\$WBHA, sample assembler language program for a server to receive chunked requests and send a chunked response
- DFH\$WBHC, sample C program for a server to receive chunked requests and send a chunked response
- DFH0WBHO, sample COBOL program for a server to receive chunked requests and send a chunked response
- DFH\$WBPA, sample assembler language program for pipelining client requests
- DFH\$WBPC, sample C program for pipelining client requests
- DFH0WBPO, sample COBOL program for pipelining client requests
- Sample URIMAP definitions:
 - DFH\$URI1, for accessing DFH\$WB1C
 - DFH\$URI2, used by the sample programs for pipelining client requests
 - DFH\$URI3, used by the sample programs for chunking
 - DFH\$URI4, used by the sample programs for chunking

Changes to control tables (macro resource definition)

When migrating to CICS Transaction Server for z/OS, Version 3 Release 2, reassemble all CICS control tables using the CICS TS 3.2 macro libraries, even if there are no changes to the macro externals. This applies also to tables that you are reassembling only to migrate them to the CSD. You must also reassemble any DFHCNV data conversion tables that you use, because CICS initialization fails if you try to load DFHCNV tables assembled using macros from an earlier release.

DFHMCT monitoring control table

The performance class data fields added for CICS Transaction Server for z/OS, Version 3 Release 2, have corresponding new values, which can be defined on the INCLUDE and EXCLUDE operands of the DFHMCT TYPE=RECORD macro. These values allow you to include or exclude specific fields from performance class monitoring records. Control data recording-DFHMCT TYPE=RECORD in the *CICS Resource Definition Guide* lists all the fields that can now be included or excluded using the macro.

Because of the removal of run-time support for Java program objects and hot-pooling (HPJ), DFHTASK field 278, CICS MAXHPTCBS delay time, is no longer relevant, and is removed.

A new option COMPRESS is available on the DFHMCT TYPE=INITIAL macro. Use this option to activate data compression for monitoring records. The default is NO, meaning that data compression is not performed. YES specifies that you do want monitoring record data compression to be performed.

Changes to the DFHFCT control table

Access to information in the FCT is available using the **INQUIRE FILE SPI** command. There is no interface to access the addresses of FCT entries or any other file control blocks.

Changes to DFHTCT control table

CICS no longer supports local TCAM terminals. The TYPE=SDSCI, TYPE=LINE and TYPE=TERMINAL resource definition macros can no longer be used to define local TCAM terminals.

It is still possible to define remote TCAM terminals. You can do this using either of the following methods:

1. A single DFHTCT TYPE=REMOTE macro.
2. A DFHTCT TYPE=REGION macro, followed by a DFHTCT TYPE=LINE and a DFHTCT TYPE=TERMINAL macro. CICS uses only the "remote" attributes of the DFHTCT TYPE=LINE and DFHTCT TYPE=TERMINAL macros.

CICS no longer supports BTAM terminals, even indirectly. You can no longer define BTAM terminals, even as remote resources.

Chapter 5. Changes to the application programming interface (API)

CICS Transaction Server for z/OS, Version 3 Release 2 includes some new API commands in support of new CICS functions, and there are changes to the options and error conditions available for some existing commands. New sample programs are also provided.

Program compatibility

CICS provides API compatibility from release to release. However, functional changes to some CICS components can affect some of the CICS API commands.

Except for the specific cases described in this section, CICS Transaction Server provides compatibility with future releases, at source and object level, for all CICS application programs that are written to the CICS application programming interface and which execute correctly under the previous release.

For information about CICS support for application programming languages, see High level language support in the *CICS Transaction Server for z/OS Release Guide*.

Obsolete API commands and options

Some API commands are now obsolete in CICS Transaction Server for z/OS, Version 3 Release 2, and some commands that are still current have individual options or RESP2 values that are obsolete.

Table 9. Obsolete API commands and options

Commands	Changes
<ul style="list-style-type: none">• CONVERSE (SYSTEM/3)• CONVERSE (SYSTEM/7)• CONVERSE (2741)• CONVERSE (2770)• CONVERSE (2780)• CONVERSE (3600 BTAM)• CONVERSE (3735)• CONVERSE (3740)• ISSUE COPY (3270 display)• RECEIVE (SYSTEM/3)• RECEIVE (SYSTEM/7)• RECEIVE (2741)• RECEIVE (3600 BTAM)• RECEIVE (3735)• RECEIVE (3740)• SEND (SYSTEM/3)• SEND (SYSTEM/7)• SEND (2741)• SEND (3600 BTAM)• SEND (3735)• SEND (3740)	All these BTAM-related EXEC CICS API commands are obsolete.
EXEC CICS LINK	The RESP2 value 41 for the INVREQ response is removed, because it is now possible to link to more than one JVM program in the same CICS task.

Changed API commands

Some API commands are extended with new options or RESP2 values. Also, the usage of certain options on existing API commands has changed; check the new descriptions to ensure that you are using these options in the best way.

Changes to API commands in CICS Transaction Server for z/OS, Version 3 Release 2

DOCUMENT CREATE and DOCUMENT SET: A new error condition, NOTAUTH, might be received if resource security for document templates is active in the CICS region.

GET CONTAINER CHANNEL: new INTOCODEPAGE option and other changes

INTOCODEPAGE(data-value)

specifies an IANA-registered alphanumeric charset name or a Coded Character Set Identifier (CCSID) for the code page into which the character data in the container is to be converted, using up to 40 alphanumeric characters, including appropriate punctuation. Use this option instead of the CCSID option if you prefer to use an IANA-registered charset name, as specified in the Content-Type header for an HTTP request. CICS converts the IANA name into a CCSID, and the subsequent data conversion process is identical. Also use this option if you prefer to specify the CCSID in alphanumeric characters, rather than as a fullword binary number.

Where an IANA name exists for a code page and CICS supports its use, the name is listed with the CCSID in the *CICS Family: Communicating from CICS on zSeries*.

The description of the INTOCCSID option on the GET CONTAINER CHANNEL command has changed, and a new error condition CODEPAGEERR contains new RESP2 values.

PUT CONTAINER CHANNEL: new FROMCODEPAGE option and other changes

FROMCODEPAGE(data-value)

specifies an IANA-registered alphanumeric charset name or a Coded Character Set Identifier (CCSID) for the current code page of the character data to be put into the container, using up to 40 alphanumeric characters, including appropriate punctuation. Use this option instead of the CCSID option if you prefer to use an IANA-registered charset name, as specified in the Content-Type header for an HTTP request. CICS converts the IANA name into a CCSID, and the subsequent data conversion process is identical. Also use this option if you prefer to specify the CCSID in alphanumeric characters, rather than as a fullword binary number.

FROMCCSID and FROMCODEPAGE are effective only on the PUT CONTAINER command that creates the container. This is because, for CHAR containers, the data is stored in the CCSID specified on the original PUT CONTAINER command that created the container. If you want to use a different CCSID, the application program should delete the existing container before issuing the new PUT CONTAINER command, thus recreating the container.

Where an IANA name exists for a code page and CICS supports its use, the name is listed with the CCSID in the *CICS Family: Communicating from CICS on zSeries*.

If FROMCODEPAGE is specified, DATATYPE(DFHVALUE(CHAR)) is implied.

If FROMCCSID and FROMCODEPAGE are not specified, but a DATATYPE of CHAR is specified, the value for conversion defaults to the CCSID of the region (or, for CICS-created channels, the CCSID of the channel). The default CCSID of the region is specified on the LOCALCCSID system initialization parameter.

The description of the FROMCCSID option on the PUT CONTAINER CHANNEL command has changed, and a new error condition CODEPAGEERR contains new RESP2 values.

QUERY SECURITY: You can now use the QUERY SECURITY command to determine whether the user has access to the resource definitions for CICS document templates (DOCTEMPLATE).

READ, READNEXT, READPREV, RESETBR, STARTBR, and WRITE: new XRBA option

XRBA

specifies that the record identification field specified in the RIDFLD option contains an extended relative byte address. Use this option when reading, browsing, or writing records in an extended ESDS.

If you specify XRBA on a STARTBR command, all other commands within the same browse must also specify XRBA.

The READ and STARTBR commands have a new RESP2 value of 59 for the INVREQ response. The READ, READNEXT, READPREV, RESETBR, and STARTBR commands have a new RESP2 value of 81 for the NOTFND response.

WEB EXTRACT: new options and other changes

REALM(*data-area*)

specifies the realm or security environment that contains the data you are requesting. If you are issuing a WEB EXTRACT command in response to a HTTP 401 message, REALM is the realm value in the most recently received WWW-Authenticate header.

REALMLEN(*data-area*)

specifies the buffer length supplied for the REALM option, as a fullword binary variable. If you are issuing a WEB EXTRACT command in response to a HTTP 401 message, REALMLEN is the length of the realm name in the most recently received WWW-Authenticate header.

The description of the HTTPVERSION option has changed.

WEB SEND (Client): new options for specifying authentication credentials

AUTHENTICATE(*cvda*)

This option allows you to specify user authentication details (credentials), to control access to restricted data. The CVDA values that apply for CICS as an HTTP client are:

NONE specifies that there are no restrictions on accessing this data, therefore no credentials are required. This is the default value for AUTHENTICATE.

BASICAUTH

specifies that HTTP Basic Authentication credentials are required for this session. These details can be supplied within the command or by using the XWBAUTH global user exit.

PASSWORDLEN(*data-value*)

specifies the buffer length supplied for the PASSWORD option as a fullword binary variable.

PASSWORD(*data-value*)

specifies the password associated with the USERNAME that is allowed access to this data. The PASSWORD option is only required if the USERNAME option is used.

USERNAME(*data-value*)

specifies the user ID or logon name that is allowed access to this data. If the USERNAME is specified, you also need to use the PASSWORD option.

USERNAMELEN(*data-value*)

specifies the buffer length supplied for the USERNAME option as a fullword binary variable.

WEB SEND (Server and Client) and WEB CONVERSE: new DOCSTATUS option

DOCSTATUS(*cvda*)

indicates whether the document should be deleted or not deleted during processing of the WEB SEND command. The CVDA values are:

DOCDELETE

CICS deletes the document after the document contents are saved for sending. Storage allocated for the document is released immediately. If you make subsequent requests for the document, these generate a TOKENERR response.

NODOCDELETE

CICS does not delete the document during processing of the WEB SEND command. This is the default value for DOCSTATUS.

WEB OPEN: The descriptions of the HTTPRNUM and HTTPVNUM options have changed.

WEB RETRIEVE: If a WEB SEND command specifies the option DOCSTATUS(DOCDELETE), the WEB RETRIEVE command cannot retrieve the document and a NOTFND response with a RESP2 value of 1 is returned.

Changes to API commands in earlier CICS releases

Table 10. Changed API commands in earlier CICS releases

Commands	Changes
<ul style="list-style-type: none">• WEB WRITE HTTPHEADER• WEB READ HTTPHEADER• WEB STARTBROWSE HTTPHEADER• WEB READNEXT HTTPHEADER• WEB ENDBROWSE HTTPHEADER• WEB EXTRACT• FORMATTIME• EXTRACT TCPIP	A number of new options are available on these commands.
<ul style="list-style-type: none">• VERIFY PASSWORD	When the command EXEC CICS VERIFY PASSWORD is issued, CICS now enforces the revoked status of a user ID or a user's group connection. "Changes to EXEC CICS VERIFY PASSWORD" on page 44 explains the consequences for your application programs.
<ul style="list-style-type: none">• LINK	There is a new RESP2 value 49, relating to the availability of the shared class cache, for the INVREQ response.

New API commands

CICS Transaction Server for z/OS, Version 3 Release 2 includes some new API commands that you can use to create application programs that use new CICS functions.

New API commands added in CICS Transaction Server for z/OS, Version 3 Release 2

EXEC CICS DOCUMENT DELETE

DOCUMENT DELETE

►►—DOCUMENT—DELETE—DOCTOKEN(*data-area*)—————◄◄

Conditions: NOTFND

This command is threadsafe.

New API commands added in earlier CICS releases

Table 11. New API commands added in earlier CICS releases

Commands	Function
<ul style="list-style-type: none">• EXEC CICS DELETE CONTAINER (CHANNEL)• EXEC CICS GET CONTAINER (CHANNEL)• EXEC CICS MOVE CONTAINER (CHANNEL)• EXEC CICS PUT CONTAINER (CHANNEL)• EXEC CICS START TRANSID CHANNEL	Commands for channels and containers.
<ul style="list-style-type: none">• EXEC CICS INVOKE WEBSERVICE• EXEC CICS SOAPFAULT ADD• EXEC CICS SOAPFAULT CREATE• EXEC CICS SOAPFAULT DELETE	Commands for Web services.

Table 11. New API commands added in earlier CICS releases (continued)

Commands	Function
<ul style="list-style-type: none"> • EXEC CICS CONVERTTIME • EXEC CICS WEB OPEN • EXEC CICS WEB CONVERSE • EXEC CICS WEB CLOSE • EXEC CICS WEB PARSE URL • EXEC CICS WEB SEND (CLIENT) • EXEC CICS WEB RECEIVE (CLIENT) 	Commands for CICS as an HTTP client. Some also apply to CICS as an HTTP server.

Member DFHEILID has moved

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, member DFHEILID has moved from the SDFHC370 library to the SDFHSAMP library. The change affects the COPYLINK step of the sample jobs supplied by CICS and CICSplex SM to translate, compile, link-edit and install application programs.

The sample jobs supplied by CICS have names in the format DFHxxTxL (for example, DFHYITDL, DFHZITCL) and are supplied in the SDFHPROC library. The sample job supplied by CICSplex SM is supplied in member EYUEITDL of the SEYUPROC library.

If you are using an older version of these supplied sample jobs, or if you have created your own job based on the supplied samples, ensure that you apply the change for DFHEILID to the COPYLINK step in the job.

Changes to EXEC CICS VERIFY PASSWORD

When you issue the EXEC CICS VERIFY PASSWORD command, CICS now enforces the revoked status of a user ID or a user's group connection. The new method CICS uses to verify the password is more efficient, but you might notice changes to the output that is produced when verification takes place.

CICS now attempts to verify a password using a RACROUTE REQUEST=EXTRACT request to the external security manager. If the password cannot be verified using this method, CICS uses a RACROUTE REQUEST=VERIFYX call. Before CICS Transaction Server for z/OS, Version 3 Release 1, CICS always used the RACROUTE REQUEST=VERIFYX call, which is more expensive.

The output produced by the external security manager is different for the old and new methods of verifying a password. If your application programs relied on the output produced by the old method, you need to change them so that they do not depend on this output. The differences are:

- ESMRESP and ESMREASON codes are not supplied by the external security manager for the new method of verifying a password using a RACROUTE REQUEST=EXTRACT call. These codes are produced only if CICS needs to use the old method with a RACROUTE REQUEST=VERIFYX call. Your application programs must always check the EIBRESP and EIBRESP2 values returned by the EXEC CICS VERIFY PASSWORD command and not rely on the ESMRESP and ESMREASON codes.
- Message ICH70002I is not produced by the external security manager for the new method of verifying a password. The message is produced only if CICS

needs to use the old method with a RACROUTE REQUEST=VERIFYX call. The SETR PASSWORD(WARN(nn)) option must also be active in the external security manager for the message to be produced. Your application programs must therefore not rely on receiving this message.

Changes to sample programs

CICS Transaction Server for z/OS, Version 3 Release 2 has a number of changes to the samples provided to demonstrate the use of the EXEC CICS API commands. Unless otherwise stated, sample programs are supplied in the SDFHSAMP library.

Verification samples: DFH\$WB1A and DFH\$WB1C

The sample programs for verifying the operation of CICS Web support, DFH\$WB1A (assembler language) and DFH\$WB1C (C), are updated to use the EXEC CICS WEB commands. In addition, a new sample URIMAP definition DFH\$URI1 can be used to access DFH\$WB1C. The CICS-supplied sample analyzer, DFH\$WBADX, can be used to access both DFH\$WB1A and DFH\$WB1C.

The PROGRAM resource definition for DFH\$WB1C, and the URIMAP definition DFH\$URI1, are in the new DFH\$WEB resource definition group. DFH\$WB1A is provided in the DFH\$WEB resource definition group, which is installed as part of DFH\$LIST.

Pipelining samples: DFH\$WBPA (assembler language), DFH\$WBPC (C), and DFH0WBPO (COBOL)

New sample programs are provided to demonstrate how CICS can pipeline client requests to an HTTP server. The sample programs use the sample client URIMAP definition, DFH\$URI2, to pipeline requests to a CICS region that has been set up as an HTTP server, to be handled there by the verification sample program DFH\$WB1C.

The PROGRAM resource definitions for the pipelining sample programs, and the URIMAP definition DFH\$URI2, are in the new DFH\$WEB resource definition group.

Chunking samples: DFH\$WBHA and DFH\$WBHA (Assembler), DFH\$WBHC and DFH\$WBCC (C), DFH0WBHO and DFH0WBHO (COBOL)

New sample programs DFH\$WBHA (assembler language), DFH\$WBCC (C), and DFH0WBHO (COBOL) demonstrate how CICS, as an HTTP client, can send a request in sections or chunks to an HTTP server and receive a chunked message in response. New sample programs DFH\$WBHA (assembler language), DFH\$WBHC (C), and DFH0WBHO (COBOL) demonstrate how CICS, as an HTTP server, can receive a request in chunks from an HTTP client and send a chunked response.

The sample programs send and receive requests between CICS regions in which CICS Web support is running. The client chunking samples, DFH\$WBHA, DFH\$WBCC, and DFH0WBHO, are handled by DFH\$WBHA, the assembler language server chunking sample. You can update the server URIMAP to point at a different server program if required. The PROGRAM resource definitions for the chunking sample programs, and the URIMAP definitions DFH\$URI3 and DFH\$URI4, are provided in the DFH\$WEB resource definition group.

Chapter 6. Changes to the system programming interface (SPI)

CICS Transaction Server for z/OS, Version 3 Release 2 has some new SPI commands to control new system resources, and some existing commands have new options or new values for existing options. Some system programming commands, options or values are now obsolete because they relate to obsolete CICS functions.

Program compatibility

The system programming commands operate on CICS system resources, such as control blocks and tables of resource definitions, and not on user resources, such as data, on which the API operates.

The SPI is also sensitive to the underlying environment in which it is implemented and, as a consequence, compatibility with future releases of CICS cannot be guaranteed.

This section describes the effect on the SPI of the functional changes in CICS, explaining where incompatibilities exist, to enable you to make programming changes where necessary.

Except for the instances given in this section, CICS continues to provide compatibility with future releases, at source and object level, for application programs that use the unaffected SPI commands.

Obsolete options or values on SPI commands

These system programming interface command options or values are obsolete. Remove these options from your applications, because they represent functions that are no longer available, so the behavior of applications that use these options will change.

Obsolete options or values on SPI commands in CICS Transaction Server for z/OS, Version 3 Release 2

INQUIRE CLASSCACHE: The value RESET is no longer returned for the REUSEST option. If the shared class cache is not started, the value UNKNOWN is displayed. In this situation, CICS cannot identify the reuse status, but when the shared class cache is started the status always becomes REUSE.

INQUIRE JVM: The value RESET is no longer returned for the REUSEST option.

INQUIRE JVMPROFILE: The value RESET is no longer returned for the REUSEST option.

INQUIRE MONITOR: The SUBSYSTEMID option is obsolete.

SET JVMPOOL: The TERMINATE function on the SET JVMPOOL command is now deprecated. Use the improved function on the PERFORM JVMPOOL command instead.

Obsolete options on system programming commands in earlier CICS releases

Table 12. Obsolete options on system programming commands in earlier CICS releases

Command	Obsolete options	Explanation
CREATE PROGRAM	HOTPOOL	The CVDA values YES and NO were used with this option to specify whether or not the Java program object was to be run in a preinitialized Language Environment enclave.
INQUIRE CORBASERVER	STATE	The option STATE is replaced by ENABLESTATUS.
INQUIRE DISPATCHER	ACTHPTCBS MAXHPTCBS	ACTHPTCBS displayed the number of H8 mode open TCBs that were active, and MAXHPTCBS displayed the number that CICS was allowed to attach. H8 mode open TCBs no longer exist.
INQUIRE PROGRAM	HOTPOOLING HOTPOOL NOTHOTPOOL	The values Hotpool and Nothotpool were used to show whether or not the Java program object was to be run in a preinitialized Language Environment enclave.
SET DISPATCHER	MAXHPTCBS	This option used to specify the maximum number of H8 mode open TCBs that CICS was allowed to attach. H8 mode open TCBs no longer exist.
SET PROGRAM	HOTPOOL NOTHOTPOOL	The values Hotpool and Nothotpool were used to show whether or not the Java program object was to be run in a preinitialized Language Environment enclave.

Obsolete CVDA values

These CVDA values are obsolete. Remove them from your applications, because they represent functions that are no longer available, so the behavior of applications that use these CVDA values will change.

Table 13. Obsolete CVDA values

CVDA	value
HOTPOOL	1065
NOTHOTPOOL	1066

New options or values on SPI commands

These system programming interface commands have new options or new values for options.

New options or values on SPI commands in CICS Transaction Server for z/OS, Version 3 Release 2

CREATE PIPELINE: new RESPWAIT option

RESPWAIT(*value*)

Specifies the number of seconds that an application program should wait for a response message from a remote Web service. The value can range from 0 to 9999 seconds.

If you want to use the default timeout value of the transport protocol, specify DEFT.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for WebSphere MQ is 60 seconds.

CREATE TCIPSERVICE: new options and values

REALM(*data-area*)

returns the 56-character realm that is used during the process of HTTP basic authentication. This value is returned only when PROTOCOL has a value of HTTP. If no realm is specified for this service, the default realm used by CICS is returned, which is CICS application *aaaaaaaa*, where *aaaaaaaa* is the applid of the CICS region.

New value on the PROTOCOL option:

IPIC IPIC protocol is used. Specify IPIC for a TCP/IP service that is to be used for distributed program link (DPL) over IP interconnectivity connections, which are also known as *IPCONNs*.

ENABLE PROGRAM: The QUASIRENT and THREADSAFE options now apply to global user exit programs, as well as to task-related user exit programs. The meaning of value *X'802000'*, which can be returned on the INVEXITREQ condition of the EXEC CICS ENABLE command, has changed.

EXTRACT STATISTICS: new values on the RESTYPE option

DOCTEMPLATE

Requests statistics for a document template; RESID identifies the particular DOCTEMPLATE resource definition.

IPCONN

Requests statistics for an IPCONN.

LIBRARY

Requests statistics for a LIBRARY resource

MQCONN

Requests statistics for a WebSphere MQ Connection.

INQUIRE DOCTEMPLATE: new CACHESIZE option

CACHESIZE(*data-area*)

returns a fullword binary field giving the amount of storage, in bytes, used by the cached copy of the document template. A value of zero is returned if there is no cached copy of the template at the time of the inquiry.

INQUIRE FILE: new RBATYPE option

RBATYPE(*cvda*)

returns a CVDA value identifying whether, for VSAM files, the data set uses extended addressing. CVDA values are:

EXTENDED

This VSAM data set uses extended relative byte addressing and therefore can hold more than 4 gigabytes of data.

NOTAPPLIC

One of the following is true:

- The data set is BDAM.
- The file is remote.

- The file is not open.

NOTEXTENDED

This VSAM data set does not use extended relative byte addressing and therefore cannot hold more than 4 gigabytes of data.

INQUIRE IRC: new XCFGROUP option

XCFGROUP (*data-area*)

returns the 8-character name of the cross-system coupling facility (XCF) group of which this region is a member.

If this region is not a member of an XCF group (because it has not signed on to IRC), XCFGROUP contains the XCF group the region would be in if XCF were opened.

For introductory information about XCF/MRO, see Cross-system multiregion operation (XCF/MRO) in the *CICS Intercommunication Guide*.

INQUIRE MONITOR: new COMPRESSST option

COMPRESSST (*cvda*)

returns a CVDA value indicating whether data compression is active for the CICS SMF 110 monitoring records output by the CICS monitoring facility. CVDA values are:

COMPRESS

Data compression is being performed for the monitoring records.

NOCOMPRESS

Data compression is not being performed for the monitoring records.

INQUIRE MVSTCB: new syntax

The INQUIRE MVSTCB command has a new syntax, which uses the new option SET and the existing option NUMELEMENTS to provide a list of descriptors for individual storage elements owned by the TCB that you are browsing. The descriptors contain the new information about the storage key and storage in use for each storage element, as well as the information that was formerly provided about addresses, lengths, and MVS subpools for each element.

The options ELEMENTLIST, LENGTHLIST, and SUBPOOLLIST are now obsolete, but are supported for compatibility with applications developed in releases before CICS Transaction Server for z/OS, Version 3 Release 2. These options do not provide the new information about the storage key and storage in use for each element. You cannot use these options in combination with the new SET option. For all new applications, use the new syntax with the SET option.

INQUIRE NETNAME: new options

AIDCOUNT (*data-area*)

Returns a fullword binary field giving the number of automatic initiate descriptors (AIDs) queued for the specified terminal. If there are no AIDs, then an AIDCOUNT value of 0 is returned.

INQUIRE PIPELINE: new options

CIDDOMAIN(*data-area*)

Returns the domain name that is used to generate MIME content-ID values to identify binary attachments in containers. The name can be up to 255 characters long.

MODE(*cvda*)

Returns the operating mode of the pipeline. CVDA values are:

PROVIDER

CICS is using the pipeline as a service provider.

REQUESTER

CICS is using the pipeline as a service requester.

UNKNOWN

The operating mode of the pipeline cannot be determined.

MTOMNOXOPST(*cvda*)

Returns a value that indicates whether MTOM should be used for outbound SOAP messages when there are no binary attachments present. The values are:

MTOMNOXOP

Use MTOM, even when there are no binary attachments present.

NOMTOMNOXOP

Do not use MTOM unless there are binary attachments present.

MTOMST(*cvda*)

Returns a value that indicates whether support for MTOM has been enabled in the pipeline. The values are:

MTOM

MTOM support has been enabled in the pipeline.

NOMTOM

MTOM support has not been enabled in the pipeline.

RESPWAIT(*data-area*)

Returns the number of seconds that an application program waits for an optional response message from a remote Web service. If the returned value is -1, no value has been set for the pipeline and the default timeout value of the transport protocol is being used.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for WebSphere MQ is 60 seconds.

SENDMTOMST(*cvda*)

Returns a value that indicates when MTOM should be used for outbound SOAP messages. The values are:

NOSENDMTOM

Do not use MTOM for outbound SOAP messages.

SAMESENDMTOM

Use MTOM for outbound SOAP message responses when the inbound message is received in MTOM format.

SENDMTOM

Always use MTOM for outbound SOAP messages.

SOAPLEVEL(*data-area*)

Returns an eight byte character string of the SOAP level that is used in the

PIPELINE. The value of the SOAP level is 1.1 or 1.2. If the pipeline is not being used for SOAP messages, a value of NOTSOAP is returned.

SOAPRNUM(*data-area*)

Returns a fullword binary value of the release number for the SOAP level that is used in the PIPELINE. The value of the release number is 1 or 2.

SOAPVNUM(*data-area*)

Returns a fullword binary value of the version number for the SOAP level that is used in the PIPELINE. The value of the version number is 1.

XOPDIRECTST(*cvda*)

Returns a value that indicates whether the pipeline can currently handle XOP documents in direct mode. The values are:

XOPDIRECT

The pipeline supports the direct processing of XOP documents and binary attachments.

NOXOPDIRECT

The pipeline does not support the direct processing of XOP documents and binary attachments. Compatibility mode is in operation.

XOPSUPPORTST(*cvda*)

Returns a value that indicates whether the application handler for the pipeline supports the processing of XOP documents and binary attachments. The values are:

XOPSUPPORT

The application handler supports XOP documents.

NOXOPSUPPORT

The application handler does not support XOP documents.

INQUIRE PROGRAM: new LIBRARY and LIBRARYDSN options

LIBRARY(*data-area*)

returns the 8-character name of the LIBRARY resource from which this program was loaded. This is blank if the program has not been loaded, or if the LPASTATUS is LPA (indicating that the program has been loaded from the LPA).

Note:

- If the program was loaded from an installed LIBRARY, the LIBRARY and LIBRARYDSN names will be returned.
- If the program was loaded from a LIBRARY that has been disabled, the LIBRARY name will be returned but the LIBRARYDSN will be blank.
- If the program was loaded from a LIBRARY that has been discarded, both LIBRARY and LIBRARYDSN will be blank.

LIBRARYDSN(*data-area*)

Returns the 44-character name of the data set from which the program was loaded. This data-area is blank if the program has not been loaded or if the LPASTATUS is LPA (indicating that the program has been loaded from the LPA).

INQUIRE PROGRAM: new scope for USECOUNT and CONCURRENTST options

- The USECOUNT option now displays a use count for Java programs. In earlier CICS releases, this count was not available and a value of -1 was returned.
- The CONCURRENTST option now applies to global user exit programs, as well as to task-related user exit programs.

INQUIRE SYSTEM: new options

MEMLIMIT(*data-area*)

returns a doubleword binary field giving the maximum amount, in bytes, of storage available above the 2GB boundary (above the bar), for use by the CICS region. A value of -1 indicates that no limit has been imposed on the amount of storage that the region can attempt to use (also known as NOLIMIT). The MEMLIMIT value can be set as a PARMLIB member, by JCL or through the IEFUSI global user exit.

SOSABOVEBAR(*cvda*)

returns a CVDA value indicating whether CICS is short on storage in the dynamic storage areas above the 2GB boundary (above the bar).

NOTSOS

CICS is not short on storage in any of the dynamic storage areas above the 2GB boundary.

SOS CICS is short on storage in at least one of the dynamic storage areas above the 2GB boundary.

SOSABOVELINE(*cvda*)

returns a CVDA value indicating whether CICS is short on storage in the dynamic storage areas above the 16MB line, but below the 2GB boundary.

NOTSOS

CICS is not short on storage in any of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

SOS CICS is short on storage in at least one of the dynamic storage areas above the 16MB line (but below the 2GB boundary).

SOSBELOWLINE(*cvda*)

returns a CVDA value indicating whether CICS is short on storage in the dynamic storage areas below the 16MB line.

NOTSOS

CICS is not short on storage in any of the dynamic storage areas below the 16MB line.

SOS CICS is short on storage in at least one of the dynamic storage areas below the 16MB line.

INQUIRE SUBPOOL: The new DSA name GCDSA (above the bar CICS dynamic storage area) is added to the values returned by the DSANAME option.

INQUIRE TASK: new options

IPFACILITIES(*ptr-ref*)

returns the address of a list of 4-byte binary tokens, each of which identifies an IPCONN session that the task is using to communicate with another system. If there are no such IP facilities for this task, the IPFACILITIES pointer contains a null value.

CICS obtains the storage for the list and frees it when the inquiring task issues another INQUIRE TASK command or ends; the task cannot free the storage itself.

IPFLISTSIZE(*data-area*)

returns a fullword binary field giving the number of IP facilities associated with this task. (That is, it returns the number of items in the list addressed by the IPFACILITIES option.)

If this task has no IP facilities, IPFLISTSIZE contains zero.

INQUIRE TCPIPSERVICE: new options and values**REALM**(*data-area*)

returns the 56-character realm that is used during the process of HTTP basic authentication. This value is returned only when PROTOCOL has a value of HTTP. If no realm is specified for this service, the default realm used by CICS is returned, which is CICS application *aaaaaaaa*, where *aaaaaaaa* is the applid of the CICS region.

- New value on the PROTOCOL option:

IPIC IP interconnectivity (IPIC).

INQUIRE TERMINAL: new options**AIDCOUNT**(*data-area*)

Returns a fullword binary field giving the number of automatic initiate descriptors (AIDs) queued for the specified terminal. If there are no AIDs, then an AIDCOUNT value of 0 is returned.

INQUIRE WEBSERVICE: new options**CCSID**(*data-area*)

Returns the CCSID that is used to encode the character data in the application data structure at run time. This value is set using the optional **CCSID** parameter in the Web services assistant when the Web serving binding file was generated. If the *data-area* is 0, the default CCSID for the CICS region that is specified by the **LOCALCCSID** system initialization parameter is used.

MAPPINGLEVEL(*data-area*)

Returns an eight byte character string of the mapping level that is used to convert data between language structures and Web service description (WSDL) documents. The value of the mapping level is 1.0, 1.1, 1.2, 2.0 or 2.1.

MAPPINGNUM(*data-area*)

Returns a fullword binary value of the release number for the mapping level that is used to convert data between language structures and Web service description (WSDL) documents. The value of the release number is 0, 1, or 2.

MAPPINGNUM(*data-area*)

Returns a fullword binary value of the version number for the mapping level that is used to convert data between language structures and Web service description (WSDL) documents. The value of the version number is 1 or 2.

MINRUNLEVEL(*data-area*)

Returns an eight byte character string of the minimum runtime level that is required to run the Web service in CICS. The value of the runtime level is 1.0, 1.1, 1.2, 2.0 or 2.1

MINRUNNUM(*data-area*)

Returns a fullword binary value of the release number for the minimum runtime level that is required to run the Web service in CICS. The value of the release number is 0, 1, or 2.

MINRUNVNUM(*data-area*)

Returns a fullword binary value of the version number for the minimum runtime level that is required to run the Web service in CICS. The value of the version number is 1 or 2.

XOPDIRECTST(*cvda*)

Returns a value that indicates whether the web service is currently able to handle XOP documents in direct mode. The values are:

NOXOPDIRECT

The web service cannot currently handle XOP documents and binary attachments directly. This is true when the web service implementation does not support the direct handling of XOP documents and binary attachments, or Web service validation is switched on.

XOPDIRECT

The web service can currently handle XOP documents and binary attachments directly. This is true when the web service implementation supports the direct handling of XOP documents and Web service validation is not switched on.

XOPSUPPORTST(*cvda*)

Returns a value that indicates whether the web service implementation is capable of handling XOP documents and binary attachments in direct mode. The values are:

NOXOPSUPPORT

The web service implementation does not support the direct handling of XOP documents and binary attachments.

XOPSUPPORT

The web service implementation supports the direct handling of XOP documents and binary attachments. This is true for any web services that are generated and deployed using the Web services assistant.

PERFORM STATISTICS RECORD: new statistics types**DOCTEMPLATE**

records specific statistics for each document template installed in the CICS region.

IPCONN

records specific statistics for all IPIC connections installed in the CICS region.

LIBRARY

records specific statistics for all LIBRARY resources.

MQCONN

records global statistics for the WebSphere MQ connection.

SET MONITOR: new COMPRESSST option**COMPRESSST(*cvda*)**

specifies whether you want data compression to be performed for the CICS SMF 110 monitoring records output by the CICS monitoring facility. If you change the setting for the data compression option, the new setting applies to all monitoring records written from that point on, even if they are for a task being processed at the time the change is made. The new setting also applies to any records which are in the buffer waiting to be written to SMF at the time the change is made. The change only applies until a CICS restart.

COMPRESS

CICS is to perform data compression for the monitoring records. (In some situations, some of the records might not be compressed.)

NOCOMPRESS

CICS is not to perform data compression for the monitoring records.

SET PIPELINE: new RESPWAIT option

RESPWAIT (*data-area*)

Specifies the number of seconds that an application program should wait for an optional response message from a remote Web service. The value can range from 0 to 9999 seconds. If you do not specify a value, the default timeout value of the transport protocol is used.

- The default timeout value for HTTP is 10 seconds.
- The default timeout value for WebSphere MQ is 60 seconds.

New options or values on SPI commands in earlier CICS releases

See System commands in the *CICS System Programming Reference* for information on these new options.

Table 14. New options or values on SPI commands in earlier CICS releases

Command	Option	Explanation
COLLECT STATISTICS	BEAN JVMPROFILE JVMPROGRAM	Retrieve statistics for these new resource types.
CREATE CORBASERVER	STATUS	Specifies whether the CorbaServer is to be installed in enabled or disabled state. The default is enabled.
INQUIRE CORBASERVER	ENABLESTATUS	Returns a CVDA value indicating the current state of the CorbaServer (DISABLED, DISABLING, DISCARDING, ENABLED, or ENABLING). ENABLESTATUS replaces the STATE option, which is now obsolete.
INQUIRE JVMPOOL	JVMLEVEL0TRACE, JVMLEVEL1TRACE, JVMLEVEL2TRACE, JVMUSERTRACE	Return a 240-character data value giving the current options for JVM tracing, which are used when the associated level of tracing has been activated using the CICS-supplied transaction CETR, the SET TRACETYPE command, or the system initialization parameter SPCTRSJ.
INQUIRE SYSTEM	DEBUGTOOL	Returns a CVDA value (DEBUG or NODEBUG) indicating whether debugging profiles will be used to select programs that will run under the control of a debugging tool.
INQUIRE WORKREQUEST	WORKTYPE	A new value, SOAP, is added.

Table 14. New options or values on SPI commands in earlier CICS releases (continued)

Command	Option	Explanation
PERFORM STATISTICS RECORD	BEAN JVMPROFILE JVMPROGRAM PIPELINE	Write statistics for these new resource types.
SET PROGRAM	JVMPROFILE	Specifies the 8-character name of a JVM profile that is to be used for the JVM in which the program runs. Any instances of this program that are currently running in a JVM with the old JVM profile are unaffected, and are allowed to finish running.
SET SYSTEM	DEBUGTOOL	Specifies whether debugging profiles will be used to select programs that will run under the control of a debugging tool.
SET WORKREQUEST	WORKTYPE	A new value, SOAP, is added

New SPI commands

CICS Transaction Server for z/OS, Version 3 Release 2 includes some new SPI commands that you can use to control new system resources or to do new things with existing resources.

New system programming commands added in CICS Transaction Server for z/OS, Version 3 Release 2

CREATE IPCONN

Define and install an IPCONN in the local CICS region.

CREATE LIBRARY

Create a LIBRARY resource in the local CICS region.

DISCARD IPCONN

Remove an IPCONN definition.

DISCARD LIBRARY

Remove a specified LIBRARY from the running CICS system.

INQUIRE ASSOCIATION

Retrieve association information for a specified task from its associated data control block (ADCB).

INQUIRE ASSOCIATIONLIST

Retrieve a list of tasks, based on user correlation data contained in the tasks' association information.

INQUIRE IPCONN

Retrieve information about an IPCONN.

INQUIRE LIBRARY

Retrieve information about a LIBRARY.

SET IPCONN

Change the attributes of an IPCONN or cancel outstanding AIDs.

SET LIBRARY

Change the attributes of a LIBRARY resource.

PERFORM JVMPOOL

Start and terminate JVMs in the JVM pool.

SET DOCTEMPLATE

Refresh the cached copy of a document template installed in your CICS region, or phase in a new copy of a CICS program or exit program that is defined as a document template.

New system programming commands added in earlier CICS releases

Table 15. New system programming commands added in earlier CICS releases

Command	Description
CREATE PIPELINE	Define a PIPELINE in the local CICS region.
CREATE URIMAP	Define a URIMAP in the local CICS region.
CREATE WEBSERVICE	Define a WEBSERVICE in the local CICS region.
DISCARD PIPELINE	Remove a PIPELINE from the CICS system and the CICS catalog.
DISCARD URIMAP	Remove a URIMAP from the CICS system and the CICS catalog.
DISCARD WEBSERVICE	Remove a WEBSERVICE from the CICS system and the CICS catalog.
EXTRACT STATISTICS	The EXTRACT STATISTICS command is added to provide statistics about new resource types, because the design of COLLECT STATISTICS prevented its further expansion. The syntax of EXTRACT STATISTICS is not like COLLECT STATISTICS, but the results of using EXTRACT STATISTICS are equivalent to those produced by COLLECT STATISTICS.
INQUIRE CLASSCACHE	Return information about the active shared class cache in the CICS region, and report the presence of any old shared class caches that are awaiting deletion.
INQUIRE JVM	Identify JVMs in a CICS region and get information about their status.
INQUIRE JVMPROFILE	Retrieve the full path name of the z/OS UNIX file for a JVM profile, and find whether or not a JVM with this profile uses the shared class cache.
INQUIRE PIPELINE	Retrieve information about an installed PIPELINE.

Table 15. New system programming commands added in earlier CICS releases (continued)

Command	Description
INQUIRE URIMAP	Retrieve information about URIMAP resource definitions.
INQUIRE WEBSERVICE	Retrieve information about an installed WEBSERVICE.
INQUIRE WORKREQUEST	Retrieve information about work requests in the local CICS region.
PERFORM PIPELINE	Initiate a scan of the Web service binding directory that is specified in the WSBIND attribute of the PIPELINE definition.
SET HOST	Enable or disable a virtual host.
SET PIPELINE	Enable or disable a PIPELINE.
SET URIMAP	Enable or disable a URIMAP definition, and apply or remove redirection for a URIMAP definition.
SET WEBSERVICE	Set the validation status of a WEBSERVICE.

Changes to DOCTEMPLATE SPI commands

If resource security for document templates is active in the CICS region, with the XRES system initialization parameter set on (which is the default), the system programming commands for CICS document templates can be affected.

The following commands can be affected:

- EXEC CICS CREATE DOCTEMPLATE
- EXEC CICS DISCARD DOCTEMPLATE
- EXEC CICS INQUIRE DOCTEMPLATE
- EXEC CICS SET DOCTEMPLATE

Document templates specified by these commands are subject to resource security checking if RESSEC(YES) is specified in the transaction resource definition for the transaction that issues the command.

If resource security checking is in place, the user ID for the transaction must have an appropriate level of access to the DOCTEMPLATE resource definition involved:

Table 16. Access required for system programming commands involving document templates

Action	Access required
CREATE	ALTER
DISCARD	ALTER
INQUIRE	READ
SET	UPDATE

For all these commands, there is a new RESP2 value of 101 for the condition NOTAUTH:

NOTAUTH

- 101** The user associated with the issuing task is not authorized to access this DOCTEMPLATE resource definition in the way required by this command.

The XHFS system initialization parameter, which specifies access control for z/OS UNIX files, does not affect any system programming commands. z/OS UNIX files are referenced by EXEC CICS commands only when they are defined as CICS document templates. In this situation, resource security for CICS document templates, specified by the XRES system initialization parameter, controls access to them for users.

Chapter 7. Changes to CICS-supplied utility programs

CICS Transaction Server for z/OS, Version 3 Release 2 supplies some new utility programs. Also, as with every release, the existing utility programs DFHCSDUP, DFHSTUP and DFH0STAT support new resources, and the trace formatting utility program (DFHTUxxx) and IPCS dump exit routine (DFHPDxxx) support new resources and are renamed for the release.

CSD utility program, DFHCSDUP

The CSD utility program supports all the new and changed resource types and attributes. See Chapter 4, “Changes to resource definition,” on page 31 for details of all the changes to CSD resource definitions that are supported by DFHCSDUP.

If you are sharing the CSD with earlier releases of CICS and want to alter definitions that are used only on earlier releases, you must use the latest DFHCSDUP, even if some attributes are obsolete in the latest releases of CICS. To use the latest DFHCSDUP to update obsolete options on resource definitions, specify the COMPAT option in the PARM string to indicate that you want DFHCSDUP to operate in compatibility mode.

Statistics formatting utility program, DFHSTUP

The statistics formatting utility program formats additional statistics reports for the new resource types. See Chapter 12, “Changes to CICS statistics,” on page 89 for information about the new keywords available on the SELECT TYPE and IGNORE TYPE parameters.

Sample statistics utility program, DFH0STAT

DFH0STAT, the sample statistics utility program, produces additional statistics reports.

DFH0STAT now displays a 4-digit count for the hours in time fields instead of a 2-digit count, and also displays the time to six decimal places (down to one microsecond) instead of five decimal places. The new format for the time fields is hhhh:mm:ss.000000. The new format is used in the Dispatcher TCB Modes Report.

DFH0STAT now provides a new report for LIBRARY resources, which will provide details about the data sets in the concatenation as well as the LIBRARY statistics. The DFHRPL Analysis provided by DFH0STAT is revised to provide a DFHRPL and LIBRARY analysis showing the programs from the DFHRPL concatenation and those from LIBRARY resources.

Trace formatting utility program, DFHTU650

The trace formatting utility program is renamed to DFHTU650. Always ensure that you use the trace program with the correct level number for the release of CICS TS that created the trace data set that you are formatting.

The program formats trace entries written by the new domains and functions. The new identifiers that you can specify to DFHTU650 on the **TYPETR** parameter for these functional areas are the same as the CETR trace component codes.

IPCS dump exit routine, DFHPD650

The dump formatting utility program is renamed to DFHPD650. Always ensure that you use the dump formatting program with the correct level number for the release of CICS TS that created the dump data set that you are formatting.

The dump exit routine for formatting CICS system dumps formats the control blocks for the new domains. To select or ignore dump data for any domains, specify the dump component keywords for those domains. The dump component keywords for use with the CICS IPCS dump exit routine are the same as the CETR trace component codes.

New CICS JVM Application Isolation Utility

The CICS JVM Application Isolation Utility helps system administrators and application programmers to discover static variables in Java applications that they use or plan to use in their CICS regions. Application developers then review the findings of the utility and determine whether or not the application might exhibit unintended behavior when it runs in a continuous JVM. You can use the utility when migrating Java workloads from resettable to continuous JVMs.

The CICS JVM Application Isolation Utility is a code analyzer tool that inspects Java bytecodes in Java Archive (JAR) files and class files. It does not alter any Java bytecodes. It helps identify potential issues before they arise in a continuous JVM under CICS. The Java application does not need to be running in a CICS region when it is inspected.

The CICS JVM Application Isolation Utility is shipped with CICS Transaction Server for z/OS, Version 3 Release 2 as a JAR file named `dfhjaiu.jar`. It runs under z/OS UNIX System Services as a standalone utility. You do not need to have a CICS Transaction Server for z/OS, Version 3 Release 2 region or any other CICS region running when you use the utility.

New utility sample programs for connection factories

CICS supplies three new utility programs to publish, retract and look up a connection factory in a JNDI namespace.

The programs illustrate how to:

1. Publish a connection factory to a JNDI namespace (the `CICSConnectionFactoryPublish` sample). You can use the sample to create a **ConnectionFactory** object suitable for use with the CCI Connector for CICS TS, and to publish it to the JNDI namespace used by the local CICS region. An enterprise bean or Java program, running on CICS, can then perform a JNDI lookup to obtain a reference to the connection factory.
2. Retract a previously-published connection factory from the JNDI namespace (the `CICSConnectionFactoryRetract` sample).
3. Look up a connection factory in the JNDI namespace (the CCI Connector sample). This sample also shows you how to use the CCI Connector for CICS TS, to call a CICS server program.

The `CICSConnectionFactoryPublish`, `CICSConnectionFactoryRetract`, and CCI Connector samples are described in *Java Applications in CICS*.

Chapter 8. Changes to global user exits, task-related user exits, and the exit programming interface

CICS Transaction Server for z/OS, Version 3 Release 2 has changes to some existing global user exit programs and task-related user exit programs, and there are some new global user exit points. Check your existing global user exit programs against the changes summarized here.

Reassembling global user exit programs

The CICS global user exit programming interface is product-sensitive, and depends on the facilities that you have set up in your CICS system. Global user exit programs must be reassembled for each CICS release.

Check the changes summarized in this section, and modify your global user exit programs to take account of changes to relevant parameters. When you have completed your program changes, you must reassemble *all* your global user exit programs against the CICS Transaction Server for z/OS, Version 3 Release 2 libraries.

Obsolete global user exit points

These global user exit points are no longer called in CICS Transaction Server for z/OS, Version 3 Release 2.

Table 17. Obsolete global user exit points

Exit name	Module or domain	Reason
XTCTIN	Terminal control program	This exit was invoked on TCAM input events. It is no longer called because CICS Transaction Server for z/OS, Version 3 Release 2 does not support the TCAM/ACB interface, and it only supports the TCAM/DCB interface indirectly.
XTCTOUT	Terminal control program	This exit was invoked on TCAM output events. It is no longer called because CICS Transaction Server for z/OS, Version 3 Release 2 does not support the TCAM/ACB interface, and it only supports the TCAM/DCB interface indirectly.

Changes to the DFHUEPAR standard parameter list

The DFHUEPAR standard parameter list of TCB two-character codes and symbolic values addressed by the global user exit task indicator field, UEPGIND, is extended. TCB modes are represented in DFHUEPAR as both a two-character code and a symbolic value.

Table 18. TCB indicators changed in DFHUEPAR. Description

Symbolic value	2-byte code	Change	Description
UEPTH8	H8	Deletion	A Java hotpooling mode TCB
UEPTL9	L9	Addition	An L9 open TCB, used for OPENAPI programs that are in user key
UEPTX8	X8	Addition	An X8 open TCB, used for C and C++ programs, compiled with the XPLINK option, that are in CICS key
UEPTX9	X9	Addition	An X9 open TCB, used for C and C++ programs, compiled with the XPLINK option, that are in user key

Changes to global user exits

CICS Transaction Server for z/OS, Version 3 Release 2 has changes to some existing global user exits, including new parameters, values or return codes, or changes to the way in which the exits are used.

Threadsafe PLT-enabled global user exit programs

You can now define as threadsafe global user exit programs that are enabled from first-phase PLT programs. In previous CICS releases, this technique was available to task-related user exit programs but not to global user exit programs. To define a first-phase PLT global user exit program as threadsafe, specify the THREADSAFE keyword on the EXEC CICS ENABLE command. THREADSAFE overrides the CONCURRENCY(QUASIRENT) setting on the system-autoinstalled program definition.

Changes to resource management install and discard exit XRSINDI

The range of values in the 1-byte field addressed by the UEPIDTYP parameter now covers the install and discard of the following new resource types:

UEIDLBY

A LIBRARY resource

UEIDIPCO

An IPIC connection ("IPCONN")

UEIDPIPE

A pipeline (PIPELINE)

UEIDURIM

A URI map (URIMAP)

UEIDWEBS

A Web service (WEBSERVICE)

Changes to global user exits in CICS Transaction Server for z/OS, Version 3 Release 2

XEIIN, XEIOUT, XEISPIN, and XEISPOUT, EXEC interface program exits

A new parameter, UEP_EI_PBTOK, is added to the exit-specific parameter lists of these exits:

UEP_EI_PBTOK

Address of a 4-byte field containing the z/OS Workload Manager (WLM) Performance Block Token. An exit program can use this token to access information (such as the service class token, SERVCLS) in the WLM Performance Block. To do so, it must use the WLM EXTRACT macro, IWMMEXTR, passing the Performance Block Token as the MONTKN input parameter. For more information about the IWMMEXTR macro, see *z/OS MVS Programming: Workload Management Services*.

An exit program must not attempt to modify the Performance Block: if it does so, the results are unpredictable.

XFCFRIN and XFCFROUT, file control domain exits

- A new value of UEP_FC_XRBA may be returned in the UEP_FC_RECORD_ID_TYPE exit-specific parameter.

UEP_FC_XRBA

VSAM extended ESDS access

- The following new return codes may be returned in UEP_FC_REASON:

UEP_FC_REASON_KSDS_AND_XRBA

Extended relative byte addressing (XRBA) was specified with a KSDS, CMT, or UMT data set.

UEP_FC_REASON_NOT_EXTENDED

Extended relative byte addressing was specified, with an XRBA number greater than 4 GB, but the data set uses standard relative byte addressing (RBA).

XFCREQ and XFCREQC, file control EXEC interface API exits

A new value of X'08' (XRBA) may be returned in the FC_EIDOPT8 field of the EXEC interface descriptor (EID), which is pointed to by the first address in the command-level parameter structure:

FC_EIDOPT8

Indicates whether certain keywords that do not take values were specified on the request.

X'80' DEBKEY specified.

X'40' DEBREC specified.

X'20' TOKEN specified.

X'08' XRBA specified. If the XRBA bit is on, FC_RIDFLD (described in DSECT DFHFCEDS) points to an 8-byte extended relative byte address (XRBA).

XFCLDEL, XFCBFAIL, XFCBOVER, and XFCBOUT, file control exits

If you have exit programs that run at these exit points, you might have to re-code them to cope with the format of the new log records that are issued for extended addressing ESDS data sets.

XMEOUT, message domain exit

New parameters are added for CICSplex SM messages:

UEPCPID

Address of a 3-byte product ID. The possible values are:

DFH CICS messages.

EYU CICSplex SM messages.

UEPCPDOM

Address of a 2-byte field containing the domain identifier of the message.

UEPCPNUM

Address of a 4-byte field containing the message number.

UEPCPSEV

Address of the message severity code.

XPCREQ, XPCREQC, and XPCERES program control program exits

A new parameter, UEP_PC_PBTOK, is added to the exit-specific parameter lists of these exits:

UEP_PC_PBTOK

Address of a 4-byte field containing the z/OS Workload Manager (WLM) Performance Block Token. An exit program can use this token to access information (such as the service class token, SERVCLS) in the WLM Performance Block. To do so, it must use the WLM EXTRACT macro, IWMMEXTR, passing the Performance Block Token as the MONTKN input parameter. For more information about the IWMMEXTR macro, see *z/OS MVS Programming: Workload Management Services*.

An exit program must not attempt to modify the Performance Block: if it does so, the results are unpredictable.

XRMIIN and XRMIOU, resource manager interface program exits

A new parameter, UEP_RM_PBTOK, is added to the exit-specific parameter lists of these exits:

UEP_RM_PBTOK

Address of a 4-byte field containing the z/OS Workload Manager (WLM) Performance Block Token. An exit program can use this token to access information (such as the service class token, SERVCLS) in the WLM Performance Block. To do so, it must use the WLM EXTRACT macro, IWMMEXTR, passing the Performance Block Token as the MONTKN input parameter. For more information about the IWMMEXTR macro, see *z/OS MVS Programming: Workload Management Services*.

An exit program must not attempt to modify the Performance Block: if it does so, the results are unpredictable.

Changes to global user exits in earlier CICS releases

Table 19. Changed global user exits in earlier CICS releases

Exit name	Description of changes
XPCFTCH	When the exit XPCFTCH is invoked from a C or C++ programs that was compiled with the XPLINK option, a flag is set indicating that any modified entry point address, if specified by the exit, will be ignored.

Table 19. Changed global user exits in earlier CICS releases (continued)

Exit name	Description of changes
XPCTA	When the exit XPCTA is invoked from a C or C++ programs that was compiled with the XPLINK option, a flag is set indicating that a resume address, if specified by the exit, will be ignored.

Changes to global user exit points because of channels

Global user exit programs cannot access containers created by application programs. They can, however, create their own channels and pass them to programs which they call.

Minor changes to the following exits are described in in the *CICS Customization Guide*:

- XFCAREQ
- XFCAREQC
- XFCREQ
- XFCREQC
- XICEREQ
- XICEREQC
- XNQEREQ
- XNQEREQC
- XPCREQ
- XPCREQC
- XTDEREQ
- XTDEREQC
- XTSEREQ
- XTSEREQC

New global user exit points

CICS Transaction Server for z/OS, Version 3 Release 2 includes some new global user exit points to help you customize new or existing CICS functions.

New global user exit points added in CICS Transaction Server for z/OS, Version 3 Release 2

Application Associated Data exit XAPADMGR

Use the XAPADMGR exit for distributed transactions. It allows you to add user information to a task's Associated Data Origin Descriptor, at the point of origin of the distributed transaction. This information could later be used as, for example, search keys for processing carried out through CICSplex SM.

CICS provides a sample global user exit program, DFH\$APAD, for use at the XAPADMGR exit point. The exit program is invoked, if enabled, when non-system tasks for which no input Origin Descriptor Record is provided are attached.

HTTP client send exit XWBAUTH

XWBAUTH enables you to specify basic authentication credentials (username and password) for a target server. XWBAUTH passes these to CICS on request, to create an Authorization header. XWBAUTH is called during processing of an **EXEC CICS WEB SEND (Client)** or **EXEC CICS WEB CONVERSE** command. The host name and path information are passed to the user exit, with an optional qualifying realm.

Intersystem queues on IPIC connections exit XISQUE

You can use the XISQUE exit to control the number of queued distributed program link (DPL) requests for sessions on IP interconnectivity (IPIC) connections.

The XISQUE exit enables you to detect queuing problems (bottlenecks) early. It is invoked only for DPL requests across IPCONNn.

XISQUE enables allocate requests to be queued or rejected, depending on the length of the queue. It also allows an IPCONN on which there is a bottleneck to be terminated and then re-established.

Pipeline processing exit XWSPRROO

Use the XWSPRROO exit to access containers on the current channel after the Web services provider application issues the Web service response message and before CICS creates the body of the response message.

New global user exit points added in earlier CICS releases

Table 20. New global user exit points added in earlier CICS releases

Module or domain	Exit name	When invoked
HTTP client open exit	XWBOPEN	XWBOPEN is invoked during processing of an EXEC CICS WEB OPEN or EXEC CICS INVOKE WEBSERVICE command. It enables systems administrators to specify proxy servers that should be used for HTTP requests by CICS as an HTTP client, and to apply a security policy to the host name specified for those requests.
HTTP client send exit	XWBSNDO	XWBSNDO is invoked during processing of an EXEC CICS WEB SEND or EXEC CICS WEB CONVERSE command for an HTTP request by CICS as an HTTP client. It enables systems administrators to specify a security policy for HTTP requests by CICS as an HTTP client.
EXEC interface program	XPCERES	XPCERES is invoked by the EXEC interface program, on the target region, before CICS processes either of the following kinds of dynamically-routed link request: <ul style="list-style-type: none">• A distributed program link (DPL) call• A Link3270 bridge request
Interval control program	XICERES	XICERES is invoked by the interval control program, before CICS processes a non-terminal-related EXEC CICS START request that has been dynamically routed to this region.

Changes to the exit programming interface

These changes to the exit programming interface (XPI) mean that you might have to change global user exit programs that contain XPI calls. Check whether or not your global user exit programs are affected by these changes to the XPI and modify your programs accordingly.

The INQUIRE_SHORT_ON_STORAGE call

A new output parameter, `SOS_ABOVE_THE_BAR`, has been added to the `INQUIRE_SHORT_ON_STORAGE` storage control call.

`SOS_ABOVE_THE_BAR(NO|YES)`,
returns YES if CICS is currently short-on-storage above the 2GB boundary, and NO if not.

Changes to task-related user exits

In CICS Transaction Server for z/OS, Version 3 Release 2, task-related user exit programs can now be invoked at an additional invocation point.

Invocation by CICS context management

You can now invoke task-related user exit programs at an additional invocation point. Currently, you can invoke a task-related user exit program from:

- An application program
- CICS SPI manager
- CICS syncpoint manager
- CICS task manager
- CICS termination manager
- The Execution Diagnostic Facility (EDF)

You can now also invoke a task-related user exit program from CICS context management.

A task-related user exit program signals that it wants to be invoked by CICS context management by setting a bit in the schedule flag word: see The schedule flag word, in the *CICS Customization Guide*. It can set this bit when it is invoked by an application program or by the CICS task manager at start-of-task.

The only way to cause the exit program to be invoked by CICS context management is for the exit program itself, on a preliminary invocation, to set the bit in the schedule flag word. You can schedule calls by the CICS termination manager, for instance, can be scheduled by specifying the SHUTDOWN option on the EXEC CICS ENABLE command that enables the exit program. The EXEC CICS ENABLE command has no equivalent option to cause the exit program to be invoked by CICS context management. How to use options of the EXEC CICS ENABLE command to cause a task-related user exit program to be invoked for specific types of call is described in Enabling for specific invocation-types, in the *CICS Customization Guide*.

On invocation, the exit program is passed a context-related parameter list: see CICS context management parameters, in the *CICS Customization Guide*.

At the attach of the transaction started by the EXEC CICS START command, if a valid correlator is present, the monitoring domain passes it to the z/OS Workload Manager (WLM). The WLM does one of the following:

- Accepts the correlator as valid. In this case, the WLM returns a new correlator that is known as a *child correlator*.
- Rejects the correlator as invalid or unrecognized. In this case, the WLM treats this as an edge transaction, and generates a new edge correlator.

CICS uses it to identify the piece of work in any further WLM calls.

Chapter 9. Changes to the external CICS interface (EXCI)

The external CICS interface (EXCI) is an application programming interface that enables a non-CICS program (a client program) running in MVS to call a program (a server program) running in a CICS region and to pass and receive data by means of a communications area. The EXCI options table has some changes.

Changes to the EXCI options table

The EXCI options table, generated by the DFHXCOPT macro, enables you to specify a number of parameters that are required by the external CICS interface. A new option, XCFGROUP, is added to the EXCI options table.

XCFGROUP={DFHIR000|name}

Specifies the name of the cross-system coupling facility (XCF) group to be joined by this client program.

Note: XCF groups allow CICS regions in different MVS images in the same sysplex to communicate with each other across multiregion operation (MRO) connections. For introductory information about XCF/MRO, and instructions on how to set up XCF groups, see [../com.ibm.cics.ts.intercommunication.doc/topics/dfht17e.dita#dfht17e](#) in the *CICS Intercommunication Guide*.

Each client program can join a maximum of one XCF group.

DFHIR000

The default XCF group name.

name

The group name must be eight characters long, padded on the right with blanks if necessary. The valid characters are A-Z, 0-9, and the national characters \$, #, and @. To avoid using the names IBM uses for its XCF groups, do not begin group names with the letters A through C, E through I, or the character string "SYS". Also, do not use the name "UNDESIG", which is reserved for use by the system programmer in your installation.

You are recommended to use a group name beginning with the letters "DFHIR".

Chapter 10. Changes to user-replaceable programs

For each CICS release, you must reassemble all user-replaceable programs, whether or not you make any changes to them. Before reassembling the programs, check whether these changes to the user-replaceable program interface affect your own customized programs, and make any necessary changes. For example, there might be changes to the parameters passed to the programs or there might be new actions that the programs need to take. To help you to identify any code changes that are required, compare your customized programs with the sample code in the user-replaceable sample programs provided with this CICS release.

See General notes about user-replaceable programs in the *CICS Customization Guide* for programming information about user-replaceable programs.

Obsolete user-replaceable program DFHSJJ80

DFHSJJ80 is replaced by DFHJVMRO.

Changes to the IOP security program, DFHXOPUS

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, there are changes to the sample IOP security program, DFHXOPUS.

DFHXOPUS has been changed to handle GIOP 1.2 request headers. The actions taken by the sample program have not changed. However, versions of GIOP from 1.2 onwards do not support the IOP Principal field in request headers. In some circumstances (where SSL(YES) or SSL(NO) is specified on the TCPIP SERVICE definition and there is no RACF user ID associated with the SSL client certificate), DFHXOPUS uses the first eight characters of the IOP Principal, if there is one, to derive the user ID that it returns. For GIOP 1.2 requests, the IOP Principal is not present and so DFHXOPUS will never return it as the user ID.

For information about how to write an IOP security program, and for details of the DFHXOPUS sample program, see Writing a security exit program for IOP in the *CICS Customization Guide*.

Changes to DFHCNV

When migrating to CICS Transaction Server for z/OS, Version 3 Release 2, you need to reassemble any DFHCNV data conversion tables that you use, because CICS initialization fails if you try to load DFHCNV tables assembled using macros from an earlier release. There is a new DFHCNV macro parameter operand SYSDEF.

The new operand SYSDEF has been added to the TYPE=INITIAL and TYPE=ENTRY macro parameters CLINTCP and SRVERCP. These macros define the user-replaceable data conversion table DFHCNV. The DFHCNV TYPE=INITIAL macro defines the beginning of the conversion table. It gives a list of valid code pages. The DFHCNV TYPE=ENTRY macro specifies a name and type to uniquely identify a data resource. There must be one for each resource for which conversion is required.

For information about the format of the changed parameters, see Defining the conversion table in *CICS Family: Communicating from CICS on zSeries*.

New user-replaceable programs

CICS Transaction Server for z/OS, Version 3 Release 2 includes user-replaceable programs to support new CICS functions.

DFHJVMRO (formerly DFHSJJ80)

DFHJVMRO defines Language Environment run-time options for the Language Environment enclave in which the JVM runs. It replaces the user-replaceable program DFHSJJ80, which was used in CICS Transaction Server for z/OS, Version 2 Release 1 and CICS Transaction Server for z/OS, Version 2 Release 2 to construct the Language Environment enclave for the JVM. DFHJVMRO performs the same functions as DFHSJJ80.

DFHJVMRO defines storage allocation parameters for heap and stack and a number of other options. For CICS, the storage settings that are supplied in DFHJVMRO are more efficient than the default Language Environment storage settings. You can also modify these settings to match more closely with the storage usage of your JVMs. The source for DFHJVMRO is supplied in the CICSTS32.CICS.SDFHSAMP library.

For information on how you can tailor this user-replaceable program to your own requirements, see Using DFHJVMRO to modify the Language Environment enclave for a JVM in the *CICS Customization Guide*.

DFHAPXPO

DFHAPXPO was introduced in CICS Transaction Server for z/OS, Version 3 Release 1. It is loaded during the PIPI preinitialization phase of each Language Environment enclave where C or C++ programs compiled with the XPLINK option are to be run. It allows you to alter the default Language Environment run-time options.

See the *z/OS Language Environment Programming Guide*, SA22-7561, for details of the Language Environment options that can be reset. The program must be written in Assembler language.

The source for DFHAPXPO is supplied in the CICSTS32.CICS.SDFHSAMP library.

For information on how you can tailor this user-replaceable program to your own requirements, see DFHAPXPO in the *CICS Customization Guide*.

DFHISAIP

DFHISAIP was introduced in CICS Transaction Server for z/OS, Version 3 Release 2. It manages the autoinstall of IP interconnectivity (IPIC) connections.

The IPCONN autoinstall user program is similar to the APPC autoinstall user program. Like the APPC autoinstall user program, the IPIC autoinstall user program can choose an installed connection to use as a template for the new connection. The main differences are that the template is an IPCONN rather than a CONNECTION definition and that the use of the template is optional.

If IPCONN autoinstall is active, CICS installs the new IPCONN resource using the following information:

- The information in the connect flow
- The IPCONN template, optionally selected by the IPCONN autoinstall user program
- Values returned by the user program in its communications area
- CICS-supplied values

DFHISAIP, the assembler language version, is the default user program for autoinstall of IPIC connections. Sample COBOL, PL/I, and C versions are also supplied. The source for all the versions of the sample program is in the CICSTS32.CICS.SDFHSAMP library.

For more information about this program, see Writing a program to control autoinstall of IPIC connections, in the *CICS Customization Guide*.

Chapter 11. Changes to CICS monitoring

Changes to CICS monitoring data could affect user-written and vendor-written utilities that analyze and print CICS SMF 110 monitoring records.

The length of a standard performance class monitoring record, as output to SMF, has increased to 2352 bytes. The length does not take into account any user data that you add or any system-defined data fields that you exclude by using a monitoring control table (MCT). CICS Transaction Server for z/OS, Version 3 Release 2 introduces a data compression facility for SMF 110 monitoring records, which can provide a significant reduction in the volume of data written to SMF.

The offsets have changed for a number of the default CICS dictionary entries in the dictionary data sections of CICS monitoring SMF 110 records.

The length of a monitoring clock for performance class data, such as USRCPUT, has increased from 8 bytes to 12 bytes. For detailed information about the new format, see the Technote Interpreting new 12 byte format of USRCPUT in SMF110 records. This change affects all performance class data fields defined as TYPE-S and also affects any user-defined event-monitoring points (EMPs) that involve clocks. User clocks are defined in the monitoring control table (MCT) using DFHMCT TYPE=EMP macros. The monitoring clocks for transaction resource class data are *not* changed, and they remain at 8 bytes.

Check your utility programs that process CICS SMF records to ensure that they can still process SMF 110 records correctly. If you have utility programs provided by independent software vendors, you must ensure that they are able to handle the SMF 110 records correctly. If you want to activate data compression for monitoring records, these programs must handle data compression correctly. You must make sure that the product can identify compressed CICS SMF 110 monitoring records, and expand the data section using the z/OS Data Compression and Expansion Services, so that the monitoring records can be processed correctly. If the reporting tool cannot work in this way, consider using the CICS-supplied monitoring sample program DFH\$MOLS, with the EXPAND control statement, to produce an output data set containing the SMF 110 monitoring records in their expanded format, with which the tool can work.

You can identify SMF 110 records from different releases by using the record-version field in the SMF product section.

New and changed monitoring data fields

A number of new performance data fields are added to performance class data records. Some existing performance class and exception class data fields are changed.

New performance data fields added in CICS Transaction Server for z/OS, Version 3 Release 2

Group DFHCICS

360 (TYPE-C, '0APPLID', 8 BYTES)

The applid of the CICS region in which this work request (transaction) originated; (for example, the region in which the CWXN task ran).

- 361 (TYPE-T, 'OSTART', 8 BYTES)**
The time at which the originating task (for example, the CWXN task) was started.
- 362 (TYPE-P, 'OTRANNUM', 4 BYTES)**
The number of the originating task (for example, the CWXN task).
- 363 (TYPE-C, 'OTRAN', 4 BYTES)**
The transaction ID (TRANSID) of the originating task (for example, the CWXN task).
- 364 (TYPE-C, 'OUSERID', 8 BYTES)**
The originating Userid-2 or Userid-1 (for example, from CWBA), depending on the originating task.
- 365 (TYPE-C, 'OUSERCOR', 64 BYTES)**
The originating user correlator.
- 366 (TYPE-C, 'OTCPSVCE', 8 BYTES)**
The name of the originating TCPIP SERVICE.
- 367 (TYPE-A, 'OPORTNUM', 4 BYTES)**
The port number used by the originating TCPIP SERVICE.
- 368 (TYPE-C, 'OCLIPADR', 16 BYTES)**
The IP address of the originating client (or Telnet client).
- 369 (TYPE-A, 'OCLIPORT', 4 BYTES)**
The TCP/IP port number of the originating client (or Telnet client).
- 370 (TYPE-A, 'OTRANFLG', 8 BYTES)**
Originating transaction flags, a string of 64 bits used for signaling transaction definition and status information:

Byte 0

The facility-type of the originating transaction:

- Bit 0** None (X'80')
- Bit 1** Terminal (X'40')
- Bit 2** Surrogate (X'20')
- Bit 3** Destination (X'10')
- Bit 4** 3270 bridge (X'08')
- Bit 5** Reserved
- Bit 6** Reserved
- Bit 7** Reserved

Byte 1

Transaction identification information:

- Bit 0** System transaction (x'80')
- Bit 1** Mirror transaction (x'40')
- Bit 2** DPL mirror transaction (x'20')
- Bit 3** ONC/RPC Alias transaction (x'10')
- Bit 4** WEB Alias transaction (x'08')
- Bit 5** 3270 Bridge transaction (x'04')
- Bit 6** Reserved (x'02')

Bit 7 CICS BTS Run transaction

Byte 2

Reserved.

Byte 3

Transaction definition information:

Bit 0 Taskdataloc = below (x'80')

Bit 1 Taskdatakey = cics (x'40')

Bit 2 Isolate = no (x'20')

Bit 3 Dynamic = yes (x'10')

Bits 4–7

Reserved

Byte 4

The type of the originating transaction:

X'01' None

X'02' Terminal

X'03' Transient data

X'04' START

X'05' Terminal-related START

X'06' CICS business transaction services (BTS) scheduler

X'07' Transaction manager domain (XM)-run transaction

X'08' 3270 bridge

X'09' Socket domain

X'0A' CICS Web support (CWS)

X'0B' Internet Inter-ORB Protocol (IIOP)

X'0C' Resource Recovery Services (RRS)

X'0D' LU 6.1 session

X'0E' LU 6.2 (APPC) session

X'0F' MRO session

X'10' External Call Interface (ECI) session

X'11' IIOP domain request receiver

X'12' Request stream (RZ) instore transport

X'13' IP interconnectivity session

Byte 5

Reserved.

Byte 6

Reserved.

Byte 7

Recovery manager information:

Bit 0 Indoubt wait = no

Bit 1 Indoubt action = commit

Bit 2 Recovery manager - UOW resolved with indoubt action

Bit 3 Recovery manager - Shunt

Bit 4 Recovery manager - Unshunt

Bit 5 Recovery manager - Indoubt failure

Bit 6 Recovery manager - Resource owner failure

Bit 7 Reserved

371 (TYPE-C, 'OFCTYNME', 4 BYTES)

The facility name of the originating transaction. If the originating transaction is not associated with a facility, this field is null. The transaction facility type, if any, can be identified using byte 0 of the transaction flags, OTRANFLG (370), field.

Group DFHDOCH

223 (TYPE-A, 'DHDELCT', 4 BYTES)

The number of document handler DELETE requests issued by the user task.

Group DFHSOCK

288 (TYPE-A, 'ISALLOCT', 4 BYTES)

The number of allocate session requests issued by the user task for sessions using IPIC

300 (TYPE--S, 'ISIWTT', 12 BYTES)

The elapsed time for which a user task waited for control at this end of an (IPIC) connection.

305 (TYPE--C, 'ISIPICNM', 8 BYTES)

The name of the IPIC connection whose TCP/IP service attached the user task.

330 (TYPE--A, 'CLIPPORT', 4 BYTES)

The port number of the client or Telnet client.

Performance data fields changed in CICS Transaction Server for z/OS, Version 3 Release 2

Group DFHSOCK

244 (TYPE-C, 'CLIPADDR', 16 BYTES)

The client IP address (in the form *nnn.nnn.nnn.nnn*) or Telnet client IP address.

Group DFHTASK

164 (TYPE-A, 'TRANFLAG', 8 BYTES)

Transaction flags, a string of 64 bits used for signaling transaction definition and status information:

Byte 0

Transaction facility identification

Bit 0 Transaction facility name = none (x'80')

Bit 1 Transaction facility name = terminal (x'40')

If this Bit is set, FCTYNAME and TERM contain the same terminal id.

Bit 2 Transaction facility name = surrogate (x'20')

Bit 3 Transaction facility name = destination (x'10')

Bit 4 Transaction facility name = 3270 bridge (x'08')

Bits 5–7

Reserved

Byte 1

Transaction identification information

Bit 0 System transaction (x'80')

Bit 1 Mirror transaction (x'40')

- Bit 2** DPL mirror transaction (x'20')
- Bit 3** ONC/RPC Alias transaction (x'10')
- Bit 4** WEB Alias transaction (x'08')
- Bit 5** 3270 Bridge transaction (x'04')
- Bit 6** Reserved (x'02')
- Bit 7** CICS BTS Run transaction

Byte 2

z/OS workload manager request (transaction) completion information

- Bit 0** Report the total response time (begin-to-end phase) for completed work request (transaction)
- Bit 1** Notify that the entire execution phase of the work request is complete
- Bit 2** Notify that a subset of the execution phase of the work request is complete
- Bit 3** This transaction has been reported to the z/OS workload manager as completing abnormally because it has tried to access DB2® and a “connection unavailable” response has been returned. This occurs when all the following are true:
 1. Bit 0 is set.
 2. CICS is not connected to DB2.
 3. The CICS-DB2 adapter is in standby mode (STANDBYMODE(RECONNECT) or STANDBYMODE(CONNECT)).
 4. CONNECTERROR(SQLCODE) is specified, causing the application to receive a -923 SQL code.

Bits 4-7

Reserved

Byte 3

Transaction definition information

- Bit 0** Taskdataloc = below (x'80')
- Bit 1** Taskdatakey = cics (x'40')
- Bit 2** Isolate = no (x'20')
- Bit 3** Dynamic = yes (x'10')

Bits 4-7

Reserved

Byte 4

Transaction origin type:

- X'01'** None
- X'02'** Terminal
- X'03'** Transient data
- X'04'** START
- X'05'** Terminal-related START
- X'06'** CICS business transaction services (BTS) scheduler

X'07' Transaction manager domain (XM)-run transaction
X'08' 3270 bridge
X'09' Sockets domain
X'0A' CICS Web support (CWS)
X'0B' Internet Inter-ORB Protocol (IIOP)
X'0C' Resource Recovery Services (RRS)
X'0D' LU 6.1 session
X'0E' LU 6.2 (APPC) session
X'0F' MRO session
X'10' External Call Interface (ECI) session
X'11' IIOP domain request receiver
X'12' Request stream (RZ) instore transport
X'13' IPIC session

Byte 5

Transaction status information

Bits 0–5

Reserved

Bit 6 Task purged on an open TCB

Bit 7 Task abnormally terminated

Note: If bit 6 is set, the task has been purged while running on an open TCB, and its transaction timing clocks have been left in an unreliable state. Because of this, the clocks will be set to zero when the record is written by the CICS Monitoring Facility (CMF).

Byte 6

Reserved

Byte 7

Recovery manager information

Bit 0 Indoubt wait = no

Bit 1 Indoubt action = commit

Bit 2 Recovery manager - UOW resolved with indoubt action

Bit 3 Recovery manager - Shunt

Bit 4 Recovery manager - Unshunt

Bit 5 Recovery manager - Indoubt failure

Bit 6 Recovery manager - Resource owner failure

Bit 7 Reserved

Note: Bits 2 through 6 will be reset on a SYNCPOINT request when the MNSYNC=YES option is specified.

275 (TYPE-S, 'JVMRTIME', 12 BYTES)

Before CICS Transaction Server for z/OS, Version 3 Release 2, the JVMRTIME field (group name: DFHTASK, field id: 275) recorded the time spent resetting the JVM environment to its initial state between uses of the JVM. This time was only measurable for resettable JVMs, and usually registered as zero for continuous JVMs. The resettable mode is now withdrawn, but the precision of the CICS monitoring clocks has been increased, so the JVMRTIME field is now able to measure the time spent in JVM cleanup between uses of a continuous JVM. This time includes deleting local references for each task and handling any exception raised. It also includes the time taken to destroy the JVM when CICS ceases to require it.

Before CICS Transaction Server for z/OS, Version 3 Release 2, the JVMRTIME field also recorded the time spent on garbage collections scheduled by CICS. This type of garbage collection was included in the activity measurements for the transaction immediately before the garbage collection took place. Garbage collections scheduled by CICS now take place under a separate transaction, CJGC, and are not recorded in the JVMRTIME field for user transactions.

Exception records changed in CICS Transaction Server for z/OS, Version 3 Release 2

EXCMNTRF (TYPE-C, 8 BYTES)

EXCMNTRF has changed to match the changes for field 164 (TRANFLAG) in performance data group DFHTASK.

Effects of monitoring clock changes on performance data

The monitoring clocks for performance class data now record dispatch time and CPU time much more precisely and over a longer period. When you migrate to CICS Transaction Server for z/OS, Version 3 Release 2, you might see differences in the times reported in your performance class data.

The changes to the monitoring clock format should *not* themselves have any measurable impact on the performance of your transactions. However, because of the increased precision and capacity of the clocks, you might see some times for individual transactions being reported differently in your CICS performance class data.

Because the monitoring clocks are more precise, you might see a higher dispatch time or CPU time being reported for any transactions that suffered from under-reporting in previous CICS releases. This is caused because, when the monitoring clocks used units of 16 microseconds, the time recorded was rounded *down* to a multiple of 16 microseconds; that is, only completed 16-microsecond units were recorded. If a transaction was dispatched on a CICS TCB for 24 microseconds, 16 microseconds were added to the time on the clock, but the other 8 microseconds would go unreported. However, in CICS Transaction Server for z/OS, Version 3 Release 2, with the monitoring clocks recording every microsecond, the 24-microsecond dispatch for the same transaction is reported in full. You are most likely to notice an increase in the amount of dispatch time or CPU time reported when you have a transaction with a high level of TCB switching, such as a nonthreadsafe transaction that makes a number of DB2 requests.

Because the monitoring clocks have a greater capacity, you should see more useful reporting of times for long-running transactions. In previous CICS releases, transactions that ran for longer than the clock capacity of around 19 hours were not

reported correctly in the performance class data, because the timer component and period count wrapped around after that time. In CICS Transaction Server for z/OS, Version 3 Release 2, the clock components are still not protected against wraparound, but, because of the increased clock capacity, it is unlikely to occur. Therefore the time used by long-running transactions can be presented accurately.

Changes to the format of CICS SMF 110 monitoring records

CICS SMF 110 monitoring records are divided into three parts: an SMF header, an SMF product section, and a CICS data section. If data compression is active, the CICS data section is compressed before the record is written to SMF and must be expanded before use. A new field in the SMF product section identifies a compressed monitoring record and gives its length after compression.

Effect of data compression

When data compression is active, CICS uses the standard z/OS Data Compression and Expansion Services, CSRCEsrv, to compress the CICS data section of each monitoring record before writing it to SMF. The SMF header and SMF product section of records are not compressed.

When CICS SMF 110 monitoring records have been compressed, they must be identified, and the data section must be expanded using the z/OS Data Compression and Expansion Services, before the records can be processed by SMF 110 reporting tools.

Data compression applies only to SMF 110 records written by CICS monitoring, with subtype X'0001' in the record subtype field in the SMF header. It does not apply to the other types of SMF 110 records created by CICS; that is, records written by CICS journaling, CICS statistics, the TS data sharing server, the coupling facility data table (CFDT) server, and the named counter sequence number server.

New product header field SMFMNCRL

The new field SMFMNCRL in the SMF product section of monitoring records identifies where data compression has been used for a monitoring record and gives the compressed length of the CICS data section:

SMFMNCRL	DS	XL2	COMPRESSED RECORD LENGTH
----------	----	-----	--------------------------

A zero value in this field indicates that the CICS data section in the record does not contain compressed data. A nonzero value in this field indicates that the CICS data section in the record does contain compressed data, and that the z/OS Data Compression and Expansion Services must be used to expand the data section before processing.

The value of the field shows the length of the CICS data section after compression. The maximum expanded length of the data section is 32598 bytes.

Changes to the monitoring sample program DFH\$MOLS

DFH\$MOLS is a sample program that you can modify or adapt to your own purposes. It shows you how you can code your own monitoring utility program to produce reports from the data collected by the CICS monitoring domain (MN) and written to SMF data sets. From CICS Transaction Server for z/OS, Version 3 Release 2, DFH\$MOLS can identify any SMF 110 monitoring records that have

been compressed and expand them using the z/OS Data Compression and Expansion Services, CSRCEsrv, before printing reports.

New monitoring clock field format

DFH\$MOLS now reports clock fields in the format ddd hh:mm:ss.000000, showing a count for days, hours, minutes, and seconds, followed by six decimal places (down to one microsecond).

New EXPAND control statement

Use this option if some or all of the input monitoring records were compressed, and you want to create an output data set with these records in their expanded format, and the records that were never compressed.

EXPAND

specifies that the monitoring data is to be written to an output data set, including any compressed SMF 110 monitoring records in their expanded format, along with the records that were never compressed. The output data set of SMF 110 monitoring records can be used by reporting tools which are not able to use the z/OS Data Compression and Expansion Services (CSRCEsrv) to expand compressed records.

A monitoring record with a compressed data section is identified by the compressed record length in the SMFMNCRL field in the SMF product section, which is only present for a compressed record.

If you just want to print reports, or to unload the records into a fixed length format, you do not need to specify the EXPAND option. DFH\$MOLS identifies and expands any compressed monitoring records automatically before working with them. You only need to specify the EXPAND option if you want to create an output data set of SMF 110 monitoring records.

DDNAME=name

specifies the ddname for the output data set to hold the SMF 110 monitoring records. If you do not code this keyword, the default ddname SYSUT2 is used, and your job stream must include a SYSUT2 DD statement. If you code this keyword to specify a different ddname, your job stream must include the corresponding DD statement.

NEWDCB

To ignore the DCB information from the original data set, specify NEWDCB. Supply the new DCB information on the JCL for the output data set.

Note:

1. When the EXPAND control statement is specified, the only parameter for IGNORE and SELECT statements that operates during creation of the output data set is the APPLID option. The PRCSTYPE, TASKNO, TERMID, TRANID, and USERID parameters are ignored while the output data set is being produced. You can also select records for the output data set by date, using the DATE parameter, or by time, using the TIME parameter.
2. Monitoring data is not automatically printed when the EXPAND control statement is specified. If this statement is specified, and you also want to print monitoring data, you need to specify the PRINT control statement explicitly. When you specify the PRINT statement

to print monitoring records, all of the selection parameters on your IGNORE and SELECT statements now operate for the selection of the monitoring records for printing.

New messages

The following new messages are produced by DFH\$MOLS if problems are encountered in expanding compressed monitoring data records.

118: UNABLE TO EXPAND A COMPRESSED RECORD, RC='nn'; REPORT IS TERMINATED

The DFH\$MOLS program was unable to expand the compressed data section for an SMF 110 monitoring record. This abend is issued when the z/OS Data Compression and Expansion service CSRCESTRV FUNCTION=EXPAND was unable to expand the data section in the SMF record. For more information on the return codes issued by the CSRCESTRV service, see the *z/OS MVS Assembler Services Reference ABE-HSP*.

This message is followed by an MVS abend U118 with a dump.

119: UNABLE TO OPEN DDNAME 'xxxxxxx'; REPORT IS TERMINATED

The DFH\$MOLS program was unable to open the data set specified on the DD statement used for the EXPAND control statement. 'xxxxxxx' is either SYSUT2, which is the default, or the ddname specified by the DDNAME= parameter on the EXPAND control statement. Ensure that the JCL for the job was correct.

This message is followed by an MVS abend U119 without a dump.

120: UNEXPECTED CSRCESTRV QUERY ERROR, RC='nn'; REPORT IS TERMINATED

The DFH\$MOLS program received an unexpected (non-zero) return code from the z/OS Data Compression and Expansion service CSRCESTRV FUNCTION=QUERY. For more information on the return codes issued by the CSRCESTRV service, see the *z/OS MVS Assembler Services Reference ABE-HSP*.

This message is followed by an MVS abend U118 with a dump.

DFH\$MOLS support for data for earlier CICS releases

The CICS Transaction Server for z/OS, Version 3 Release 2 release of DFH\$MOLS no longer processes monitoring data for CICS/ESA Version 4 or CICS/ESA Version 3, or for the oldest CICS Transaction Server releases. The UNLOAD control statement has additional restrictions.

In CICS Transaction Server for z/OS, Version 3 Release 2, DFH\$MOLS can process SMF 110 monitoring data records for the following releases:

- CICS Transaction Server for z/OS, Version 3 Release 2
- CICS Transaction Server for z/OS, Version 3 Release 1
- CICS Transaction Server for z/OS, Version 2 Release 3
- CICS Transaction Server for z/OS, Version 2 Release 2

However, the UNLOAD control statement (which unloads performance class monitoring data into a fixed length record format) can only be used with monitoring data for CICS Transaction Server for z/OS, Version 3 Release 2, and not with

monitoring data for any earlier CICS releases. Any version or release of DFH\$MOLS cannot process monitoring data for a version or release *later* than itself, so you should always use the DFH\$MOLS from the highest version or release available to you.

Calculating CICS and DB2 processor times for DB2 Version 6 or later

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, you must change the way in which you calculate processor time for transactions that use CICS and DB2.

When CICS is connected to DB2 Version 6 or later, and is exploiting the open transaction environment, the CICS DB2 attachment facility uses CICS-managed open TCBs rather than CICS DB2 subtask TCBs. This means the CICS monitoring facility can measure activity that was previously only reported in the DB2 accounting record (the SMF type 101 record). For example, CICS can now measure the processor time consumed on the DB2 thread and the processor time consumed in DB2 (the CLASS 1 and CLASS 2 CPU time). When CICS is using L8 open TCBs, the CPU time reported for these TCBs by the CICS monitoring facility includes the DB2 CLASS 1 processor time.

When CICS is connected to DB2 Version 6 or later, **do not** add together the processor time from the CICS records (SMF type 110 records) and the DB2 accounting records (SMF type 101 records) when calculating the total processor time for a single transaction, because the DB2 processor time would then be included twice. The total processor time for a single transaction is recorded in the USRCPUT field in the CICS records (performance class data field 008 from group DFHTASK). This field includes all processor time used by the transaction when it was executing on any TCB managed by the CICS dispatcher. “Important changes to accounting for processor time in the open transaction environment” on page 170 has more detailed information about this.

Chapter 12. Changes to CICS statistics

CICS statistics records are changed because of new domains or as a result of enhancements to CICS. There are some new statistics DSECTs, and a number of statistics DSECTs have new or changed fields. You might have to recompile application programs using the changed DSECTs.

New statistics DSECTs

Copybook

For functional area

DFHDDHDS

Document template statistics

DFHISRDS

IPCONN resource statistics

DFHLDBDS

LIBRARY resource statistics

DFHMQGDS

WebSphere MQ Connection statistics

DFHPGRDS

JVM programs

DFHPIPDS

Pipeline resource statistics

DFHPIWDS

Webservice resource statistics

DFHWBRDS

URIMAP resource statistics

DFHWBDS

URIMAP global statistics

Changed statistics DSECTs

Copybook

For functional area

DFHA17DS

File resource statistics

DFHDSGDS

Dispatcher global statistics

DFHDSRDS

MVS TCB resource statistics

DFHDSTDS

MVS TCB global statistics

DFHEJBDS

Enterprise beans

DFHEJRDS

Enterprise Java CorbaServer resource statistics

DFHLDGDS

Loader statistics

DFHLDRDS

Loader statistics for programs

DFHMNGDS

Monitoring domain statistics

DFHMNTDS

Transaction performance monitoring resource statistics. Data is not written to SMF by DFHMNTDS. It is relevant only when used through the COLLECT STATISTICS interface.

DFHSJGDS

The JVM pool

DFHSJRDS

JVM profiles

DFHMSDS

Storage above 16MB

DFHSORDS

TCP/IP service resource statistics

Existing application programs are unaffected by the changes if they use the old versions of the following changed DSECTS:

DFHDSTDS
DFHDSRDS
DFHMNGDS
DFHSORDS

They are unaffected because the new fields are added to the end and do not affect the offsets of the unchanged fields. Not all of these DSECTS existed at all earlier releases of CICS, but if you were using one or more of them, your application will not see the new fields.

The changes to the other changed DSECTS listed are such that the old DSECTS are not compatible with the new DSECT, and you must recompile application programs using these DSECTS.

New values in DFHSTIDS (statistics record identifiers)

The new DSECTS added for CICS Transaction Server for z/OS, Version 3 Release 2 have corresponding values in the common statistics record copybook, DFHSTIDS. The revised list of the statistics record identifiers is shown in CICS statistics data section in the *CICS Customization Guide*.

The values in that list that are new for CICS Transaction Server for z/OS, Version 3 Release 2 are as follows:

STILDB	31	DFHLDBDS	LIBRARY (resource) id
STIMQG	74	DFHMQGDS	MQ connection stats (global) id
STIISR	109	DFHISRDS	IPCONN (resource) id
STIDHD	112	DFHDHDDS	DOCTEMPLATE (resource) id

The statistics formatting utility program, DFHSTUP

The statistics formatting utility program now formats additional statistics reports for the new statistics. You can code new resource types on the SELECT TYPE and IGNORE TYPE parameters using these keywords:

- BEAN
- CORBASERVER

- DOCTEMPLATE
- IPCONN
- JVMPOOL
- JVMPROFILE
- JVMPROGRAM
- LIBRARY
- MQCONN
- PIPELINE
- REQUESTMODEL
- URIMAP
- WEBSERVICE

Collecting statistics for Java programs that run in a JVM

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, and you have an application that uses the INQUIRE PROGRAM command to produce a list of programs for statistics collection, the application now needs to check whether or not each program is a Java program that runs in a JVM.

Statistics for Java programs that run in a JVM are collected separately from statistics for other programs, because the JVM programs are not loaded by CICS. CICS does not collect statistics for JVM programs when a COLLECT or PERFORM STATISTICS PROGRAM command is issued; to see them, you need to use the COLLECT or PERFORM STATISTICS JVMPROGRAM command instead.

However, when you browse program names using the INQUIRE PROGRAM command, JVM programs *are* found. If you have an application that collects statistics for programs by browsing with the INQUIRE PROGRAM command, and then issuing the COLLECT STATISTICS PROGRAM command for the program names that it finds, the application will now receive a “not found” response when it attempts to collect statistics for any JVM programs. (Previously, zeros would have been returned as statistics values for these programs.)

To avoid receiving this response, make the application check the RUNTIME value for each program name that it finds. If the RUNTIME value is JVM, the application should not issue the COLLECT STATISTICS PROGRAM command for that program name. If you want to see the statistics for programs with a RUNTIME value of JVM, you can make the application issue the COLLECT STATISTICS JVMPROGRAM command for those programs. Note that the statistics information that is collected for JVM programs is not the same as that collected for other programs.

Chapter 13. Changes to problem determination for CICS-MQ, CICS-DBCTL and CICS-DB2

CICS-MQ components are now shipped with CICS. As a result, tracing has changed for CICS-MQ, CICS-DBCTL, and CICS-DB2.

- All trace entries produced by the CICS-MQ components use the CICS trace domain. If you have user tracing enabled for WebSphere MQ tracing only, you can turn off user tracing, saving the overhead of application trace.
- The CICS-DBCTL Attach and CICS-DB2 Attach change to use RA (Resource Manager Adapter) Level 1 and Level 2 tracing, instead of FC (File Control) Level 1 and Level 2 tracing.

CICS-MQ messages are changed from CSQCxxx to DFHMQ0xxx. Ensure that your message retrieval applications cope with this change.

Part 2. Migration tasks for CICS Transaction Server

Chapter 14. Migration procedures for all CICS regions

Complete these tasks when you migrate any CICS Transaction Server region to CICS Transaction Server for z/OS, Version 3 Release 2.

Redefining and initializing the local and global catalogs

When you migrate to a new CICS release, delete, redefine, and initialize the CICS local catalog (LCD) and global catalog (GCD).

1. Delete your existing local catalog and global catalog.
2. Define and initialize new local and global catalogs, following the instructions in Setting up the catalog data sets in the *CICS System Definition Guide*. When you initialize the catalogs, make sure that you use the CICS Transaction Server for z/OS, Version 3 Release 2 versions of the DFHRMUTL and DFHCCUTL utility programs and the sample jobs.
3. When you start the CICS region for the first time after migration, make sure that it is an initial start with the START=INITIAL parameter.

Enabling z/OS conversion services

To obtain the benefits of z/OS conversion services for data conversion, perhaps because your system requires support for the conversion of UTF-8 or UTF-16 data to EBCDIC, you must enable the z/OS conversion services and install a conversion image that specifies the conversions that you want CICS to perform.

Refer to the instructions in *z/OS Support for Unicode: Using Conversion Services*, SA22-7649, to find out how to set up and configure conversions supported through the operating system services.

If z/OS conversion services are not enabled, CICS issues a message to indicate this. You can suppress that message if you do not need these services. If the message is encountered when starting a CICS region that is expected to make use of these services, an IPL is necessary to enable the z/OS conversion services.

To discover the status of z/OS conversion services after an IPL, use one of these commands from an MVS console:

/D UNI

To show whether z/OS conversion services were enabled.

/D UNI,ALL

To show whether z/OS conversion services were enabled and which conversions are supported by the system.

Upgrading the CSD for CICS-supplied and other IBM-supplied resource definitions

Upgrade the CICS-supplied resource definitions using the UPGRADE function of the CSD utility program (DFHCSDUP). (If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3, you also need to change the CSD average and maximum record size.) If you have resource definitions in your CSD that support other IBM products (such as z/OS), you might need to upgrade these also.

If you need to share your upgraded CSD with different CICS releases, see “CSD compatibility between different CICS releases” on page 100.

1. If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3, redefine the CSD to VSAM with an increased average and maximum record size, RECORDSIZE(200 2000). Use any of these methods to do this:
 - a. Take a backup, then delete the data set, define a new one with the correct record size, and REPRO the backup into the new data set.
 - b. Rename the old data set as a backup, then create a new data set and REPRO the renamed data set into the new one. “Sample jobs for additional CSD modifications” implements this method.
 - c. Define a new data set with the correct record size and other attributes, and then REPRO the old data set into the new one.
2. Run the DFHCSDUP utility program, specifying the UPGRADE command, to upgrade the CICS-supplied definitions in your CSD to the latest CICS TS level. You can create a new CSD using the DFHCSDUP INITIALIZE command. For information about running DFHCSDUP with the UPGRADE command, see The DFHCSDUP UPGRADE command in the *CICS Operations and Utilities Guide*.
3. If you have resource definitions in your CSD that support other IBM products, upgrade these as required. For example, if your Language Environment resource definitions are not at the correct z/OS level, you should delete and replace the CSD group containing these. The Language Environment resource definitions are in the SCEESAMP library in member CEECCSD. “Sample jobs for additional CSD modifications” has an example job to delete and replace the CSD group containing these.

Sample jobs for additional CSD modifications

If you need to upgrade the Language Environment resource definitions in your CSD, you can use a job like this.

```
//CSDUPGRD JOB 1,WALSH,MSGCLASS=A,MSGLEVEL=(1,1),
//          CLASS=A,NOTIFY=BELL
/*JOBPARM SYSAFF=MV26
/* Remove Old Language Environment group
//CSDUP1 EXEC PGM=DFHCSDUP,REGION=2M,PARM='CSD(READWRITE)'
//STEPLIB DD DSN=CICSTS32.CICS.SDFHLOAD,DISP=SHR
//DFHCSD DD DSN=CICSTS32.CICSHURS.DFHCSD,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN DD *
DELETE GROUP(CEE)
/*
/*
//CSDUP2 EXEC PGM=DFHCSDUP,REGION=2M,PARM='CSD(READWRITE)'
//STEPLIB DD DSN=CICSTS32.CICS.SDFHLOAD,DISP=SHR
//DFHCSD DD DSN=CICSTS32.CICSHURS.DFHCSD,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN DD DSN=SYS1.ZOS170.SCEESAMP(CEECCSD),DISP=SHR
/*
//
```

Figure 1. Upgrading Language Environment resource definitions

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3, you can use a job like this to increase the record size for the CSD.

```
//BAKUPCSD JOB (1,BELL),CLASS=A
//ALTERDEF EXEC PGM=IDCAMS,REGION=0M
//SYSPRINT DD SYSOUT=A
//AMSDUMP DD SYSOUT=A
//SYSIN DD *
  ALTER CICSTS32.CICSH.DFHCS*. * -
    NEWNAME(CICSTS32.CICSH.DFHCS*.BACKUP)
  ALTER CICSTS32.CICSH.DFHCS* -
    NEWNAME(CICSTS32.CICSH.DFHCS*.BACKUP)
  IF LASTCC = 0 THEN -
    DEFINE CLUSTER (
      NAME( CICSTS32.CICSH.DFHCS* ) -
      REC(10000) -
      VOLUME(SYSDA) -
      KEYS( 22 0 ) -
      INDEXED -
      RECORDSIZE( 200 2000 ) -
      FREESPACE( 5 5 ) -
      SHAREOPTIONS( 2 ) -
    )
    INDEX (
      NAME( CICSTS32.CICSH.DFHCS*.INDEX ) -
    )
    DATA (
      NAME( CICSTS32.CICSH.DFHCS*.DATA ) -
    )
  )
/*
//REPROCSD EXEC PGM=IDCAMS,REGION=0M,COND=(5,LT,ALTERDEF)
//SYSPRINT DD SYSOUT=A
//AMSDUMP DD SYSOUT=A
//SYSIN DD *
  REPRO INDATASET(CICSTS32.CICSH.DFHCS*.BACKUP) -
    OUTDATASET(CICSTS32.CICSH.DFHCS*)
/*
//
```

Figure 2. Sample job to rename and redefine the CSD

Migrating user-modified CICS-supplied resource definitions

When you run the UPGRADE function of the CSD utility program DFHCSDUP, ensure that you manually upgrade any CICS-supplied definitions that you have modified on earlier releases. The safest way to do this is to copy the upgraded CICS-supplied definitions and reapply your modifications. This action is necessary because the UPGRADE command does not operate on your own groups or on CICS groups that you have copied.

It is important to upgrade these modified definitions to ensure that they are defined correctly with nondefault values for attributes that are new. If you fail to upgrade modified definitions, CICS assigns default values to any new attributes, and these might be inappropriate for CICS-supplied resource definitions.

If you are not sure whether your CSD contains any modified CICS-supplied definitions, use the DFHCSDUP SCAN command to compare the CICS-supplied resource definitions with any user-modified versions.

The DFHCSDUP SCAN command searches for the CICS-supplied version of a specified resource name of a specific resource type and compares it with any other resource definition of the same name and type. DFHCSDUP reports any differences

it finds between the CICS-supplied definition and a user-modified version. If you have copied and changed the name of a CICS-supplied definition, the SCAN command enables you to specify the changed name as an alias.

See The DFHCSDUP SCAN command in the *CICS Operations and Utilities Guide* for details of the DFHCSDUP SCAN command.

Migrating copies of CICS-supplied resource definitions

If you have made copies of CICS-supplied resource definitions, you might need to change your copies to match the changes that have been made to the supplied definitions for this release. To help you, member DFH\$CSDU in library SDFHSAMP contains ALTER commands that you can apply using the CSD utility program DFHCSDUP.

1. Review your resource definitions to determine if you have copied any CICS-supplied definitions.
2. Review DFH\$CSDU to determine if the changes that it contains should apply to your resource definitions.
3. Make any necessary changes to DFH\$CSDU. It is advisable to make a copy of DFH\$CSDU and apply any changes to the copy.
4. Run DFHCSDUP using your modified version of DFH\$CSDU as input. As supplied, the ALTER commands in DFH\$CSDU specify GROUP(*), which means that DFHCSDUP attempts to change resources in the CICS-supplied groups. This action is not permitted and results in message DFH5151. You can ignore this message.

Example

JVMPROFILE(DFHJVMCD) is added to the definition of program DFHADJR. Therefore, DFH\$CSDU contains the following command:

```
ALTER PROGRAM(DFHADJR) GROUP(*) JVMPROFILE(DFHJVMCD)
```

When you run DFHCSDUP, the attribute is added to the definitions of program DFHADJR in all groups. Other attributes are unchanged.

CSD compatibility between different CICS releases

Most releases of CICS make changes to the CICS-supplied groups of resource definitions that are included in the DFHLIST group list. The old versions of the CICS resource definitions are retained in compatibility groups, which are needed to support earlier releases if you share the CSD between different levels of CICS.

When you have upgraded a CSD, if you plan to share the CSD with earlier releases of CICS, include the appropriate DFHCOMPx compatibility groups in your startup group list to provide the required support for earlier releases. Table 21 on page 101 shows you which DFHCOMPx groups you need to include for the earlier releases. Do not attempt to share a CSD with a CICS region running at a higher level than the CSD.

You must install the compatibility groups in the correct order, as shown in the table. For example, to run a CICS TS 2.3 region, with the CSD upgraded to CICS TS 3.2, append the compatibility group DFHCOMPc followed by DFHCOMPb at the end of your group list.

Table 21. Required compatibility groups for earlier releases of CICS

	CICS TS 3.2 CSD	CICS TS 3.1 CSD	CICS TS 2.3 CSD	CICS TS 2.2 CSD	CICS TS 1.3 CSD
Shared with CICS TS 3.1	DFHCOMPC	None	Do not share	Do not share	Do not share
Shared with CICS TS 2.3	DFHCOMPC DFHCOMPB	DFHCOMPB	None	Do not share	Do not share
Shared with CICS TS 2.2	DFHCOMPC DFHCOMPB DFHCOMPA	DFHCOMPB DFHCOMPA	DFHCOMPA	None	Do not share
Shared with CICS TS 1.3	DFHCOMPC DFHCOMPB DFHCOMPA DFHCOMP9 DFHCOMP8	DFHCOMPB DFHCOMPA DFHCOMP9 DFHCOMP8	DFHCOMPA DFHCOMP9 DFHCOMP8	DFHCOMP9 DFHCOMP8	None

Chapter 15. Migration for application programs

CICS translator support for pre-Language Environment compilers is withdrawn. Runtime support is usually provided for your existing application programs that were developed using these old compilers, with the exception of OS/VS COBOL and OO COBOL programs, which do not have runtime support.

Withdrawal of support for pre-Language Environment compilers

The compilers for which translator support is withdrawn are:

- OS/VS COBOL (5740-CB1, 5740-LM1, and 5734-CB4)
- VS COBOL II (5668-958 and 5688-023)
- OS PL/I Version 1 (5734-PL1)
- OS PL/I Version 2 (5668-910 and 5668-909)
- SAA AD/Cycle[®] C/370[™] (5688-216)

For details of the compilers that are supported by CICS, see High-level language support in the *CICS Transaction Server for z/OS Release Guide*.

The following JCL procedures that were supplied in earlier releases for translating, compiling, and link-editing using the unsupported compilers are also withdrawn:

COBOL

The DFHEITVL, DFHEXTVL, DFHEBTVL, DFHEITCL, and DFHEXTCL procedures.

PL/I The DFHEITPL, DFHEXTPL, and DFHEBTPL procedures.

C The DFHEITDL and DFHEXTDL procedures.

CICS now supplies the following procedures only, for use with Language Environment-conforming compilers:

Language	CICS-online	EXCI	Integrated translator
C	DFHYITDL	DFHYXTDL	DFHZITDL (without XPLINK) DFHZITFL (with XPLINK)
C++	DFHYITEL	DFHYXTEL	DFHZITEL (without XPLINK) DFHZITGL (with XPLINK)
COBOL	DFHYITVL	DFHYXTVL	DFHZITCL
PL/I	DFHYITPL	DFHYXTPL	DFHZITPL

The following CICS translator options, which all relate to the unsupported compilers, are obsolete:

- ANSI85
- LANTLR
- FE

The CICS translators ignore these and issue a return code 4 warning message.

Runtime support for programs developed using pre-Language Environment compilers

Although application program development support for old, obsolete compilers is withdrawn, CICS usually continues to provide runtime support for your existing application programs that were developed using these old compilers. However, to apply maintenance to these application programs, use one of the supported Language Environment-conforming compilers.

Applications compiled and linked with pre-Language Environment compilers usually execute successfully using the runtime support provided by Language Environment. They do not usually have to be recompiled or re-link-edited. In some circumstances, you might need to adjust Language Environment runtime options to enable these applications to execute correctly. Refer to the *z/OS Language Environment Run-Time Application Migration Guide*, and the *Compiler and Run-Time Migration Guide* for the language in use, for further information. Because pre-Language Environment compilers are not Language Environment-conforming, programs compiled by these compilers cannot take advantage of all Language Environment facilities in a CICS region.

The runtime libraries provided by Language Environment replace the native runtime libraries that were provided with older compilers such as VS COBOL II, OS PL/I, and C/370. The native runtime libraries provided with pre-Language Environment compilers are not supported. Language libraries, other than the Language Environment libraries, should not be present in your CICS startup JCL. If, perhaps for commonality with other CICS systems, the JCL for your CICS startup job includes other language libraries, the Language Environment libraries must be above all the other language libraries in the JCL concatenations of the CICS startup job for both STEPLIB and DFHRPL. This order ensures that the programs are processed by Language Environment.

Withdrawal of runtime support for OS/VS COBOL

Runtime support for OS/VS COBOL programs is withdrawn. If you try to use an OS/VS COBOL program, CICS issues the abend code ALIK, abnormally terminates the task, and disables the program.

You must upgrade OS/VS COBOL programs to Language Environment-conforming COBOL, and recompile them against a level of COBOL compiler supported by CICS. Enterprise COBOL for z/OS Version 3 is the recommended compiler.

See the *CICS Application Programming Guide* for notes about converting OS/VS COBOL programs to Enterprise COBOL. The *Enterprise COBOL for z/OS: Compiler and Run-Time Migration Guide* has more detailed information about language differences and describes facilities to help with conversion.

Withdrawal of runtime support for OO COBOL

In this CICS release, you cannot use COBOL class definitions and methods (object-oriented COBOL). This restriction includes both Java classes and COBOL classes.

Modules using OO features and compiled in earlier CICS releases with the OOCOBOL translator option cannot execute in this CICS release. The OOCOBOL translator option was used for the older SOM-based (System Object Manager-based) OO COBOL, and runtime support for this form of OO COBOL was

withdrawn in z/OS V1.2. The newer Java-based OO COBOL, which is used in Enterprise COBOL, is not supported by the CICS translator.

If you have existing SOM-based OO COBOL programs, you must rewrite your OO COBOL into procedural (non-OO) COBOL in order to use the Enterprise COBOL compiler. Note that the newer Java-based OO COBOL is not compatible with SOM-based OO COBOL programs and is not a migration path for SOM-based OO COBOL programs.

Migration to the integrated translator

Newer COBOL, PL/I, C and C++ Language Environment-conforming compilers include the CICS language translator as an integral part. If you use any other compiler, including Assembler, you must translate your program in the traditional way.

The releases of the COBOL, PL/I, C and C++ compilers that support the CICS integrated translator are listed in *CICS Transaction Server for z/OS Release Guide*.

To install application programs into CICS libraries, you can use one of the CICS-supplied procedures for use with the integrated translator. Note that these procedures, DFHZITCL (for COBOL), DFHZITPL (for PL/I), and DFHZITDL, DFHZITEL, DFHZITFL, and DFHZITGL (for XL C/C++), include the CICS load library SDFHLOAD in STEPLIB, which is necessary for the compilers to load the translation tables. Also, if you are using the PL/I procedure or XL C/C++ procedures, the SYSLMOD DD statement in the binder step must refer to a PDSE (not a PDS as for the older compilers).

To use the CICS-supplied procedures to invoke the integrated translator, add the required language options to indicate that you want the compiler to invoke the translator:

- To invoke the PL/I compiler and the integrated translator, specify the PL/I compiler preprocessing option (PP); for example,
`PP(CICS('opt1 opt2 optn ...'))`
- To invoke the COBOL compiler and the integrated translator, specify CICS as a COBOL compiler option; for example, in the PARM string, as follows:
`PARM='NODYNAM,LIB,OBJECT,RENT,MAP,XREF,CICS(''COBOL3,SP'')'`
- To invoke the XL C/C++ compiler and the integrated translator, specify CICS as a compiler option; for example, in the PARM string, as follows:
`PARM=('RENT SOURCE CICS(SP,DEBUG)')`

Note:

1. If you specify CICS translator options for the integrated translator in the PARM string, you need double apostrophes as shown in this example. If, however, you specify the options in your source program, you need single apostrophes (for example, you might have `CBL CICS('COBOL3,SP') AP0ST` as the CBL statement in your source program).
2. The COBOL compiler recognizes only the keyword CICS for defining translator options, not the alternative options XOPT or XOPTS as in the case of the stand-alone translator supplied with CICS TS.
3. If the CICS TS 1.3 translator is set up to run with a CICS TS 3.2 LPALIB, Error Return Code 16 will be produced.
CICS TS 3.2 uses AMODE(31) settings, while CICS TS 1.3 uses AMODE(24). If you intend to run a CICS TS 1.3 translator, you must add

to your STEPLIB, an SDFHLOAD that contains the modules DFHEITAB and DFHEITBS from CICS TS 1.3. This addition must be placed prior to the CICS TS 3.2 SDFHLOAD. This will allow the CICS TS 1.3 translator to operate in a CICS TS 3.2 region.

Nested COBOL programs

If you are compiling a COBOL application program that contains nested programs, the rules regarding the use of DFHEIBLK and DFHCOMMAREA, described in the *CICS Application Programming Guide*, apply only when you are using the CICS stand-alone translator.

When you use the integrated translator to compile nested programs, observe the following rules:

- You no longer need to code explicitly DFHEIBLK and DFHCOMMAREA on the USING phrase when calling a nested program, or on the PROCEDURE DIVISION USING phrase in the nested program, and they must be omitted.
- Because DFHCOMMAREA is not generated in a nested program, it cannot be REDEFINED as with the stand-alone translator. DFHCOMMAREA can be redefined with the global attribute in the outer-most (containing) program, and accessed from nested (contained) programs.

If you are unable to apply these rules for existing programs that you are modifying (including using COPY members to redefine DFHCOMMAREA in nested programs), continue using the stand-alone translator.

Chapter 16. Migration for Business Transaction Services (BTS)

When you migrate your BTS environment to CICS Transaction Server for z/OS, Version 3 Release 2, you might need to migrate the DFHLRQ data set. Be aware that even if you are not explicitly making use of BTS services in your applications, it is possible that they are being exploited by vendor code or IBM-supplied products executing within your CICS environment.

Migrating the DFHLRQ data set

The local request queue data set stores pending BTS requests, such as timer requests, or requests to run activities. It is recoverable and is used to ensure that, if CICS fails, no pending requests are lost.

Requests that CICS can execute immediately, such as requests to run activities, are stored on the data set only briefly. Requests that CICS cannot execute immediately, such as timer or unserviceable requests, might be stored for longer periods. When CICS has processed a request, the request is deleted from the data set.

If you have outstanding BTS activities for BTS processes in CICS, you must migrate the contents of your DFHLRQ data set as part of the migration. You can use a utility such as IDCAMS COPY to update the CICS TS for z/OS, Version 3.2 DFHLRQ data set with the contents of the DFHLRQ data set from your previous CICS release.

Be aware that even if you are not explicitly making use of BTS services in your applications, it is possible that they are being exploited by vendor code or IBM-supplied products executing within your CICS environment.

PTFs for earlier CICS releases modified the dynamic routing DSECT used for dynamic DPL and dynamic start requests. This modification caused the structure of DFHLRQ records to change. The PTF numbers are:

CICS TS 1.3

PTF UQ82768 (APAR PQ75814)

CICS TS 2.2

PTF UQ82632 (APAR PQ75834)

CICS TS 2.3

PTF UQ85555 (APAR PQ81378)

If you have one of these PTFs applied to your existing CICS system, or if your existing CICS system is a later release than those listed here, the DFHLRQ records match the format of DFHLRQ records used in CICS TS for z/OS, Version 3.2, and so can be migrated using a utility such as IDCAMS COPY. However, if your existing CICS system is listed here and you do not have one of these PTFs applied, the DFHLRQ record format is *not* compatible with that used in CICS TS for z/OS, Version 3.2. In this case, you must complete your BTS workload before you migrate to CICS TS for z/OS, Version 3.2, and start with an empty DFHLRQ at that release.

Repository data sets

When a process is not executing under the control of the CICS business transaction services domain, its state and the states of its constituent activities are preserved by being written to a VSAM data set known as a repository.

To use BTS, you must define at least one BTS repository data set to MVS. You may decide to define more than one, assigning a different set of process-types to each. One reason for doing this might be storage efficiency, for example, if some of your process-types tend to produce longer records than others.

If you operate BTS in a sysplex, several CICS regions may share access to one or more repository data sets. This sharing enables requests for the processes and activities stored on the data sets to be routed across the participating regions. As you migrate your CICS releases, you may therefore still share older versions of repository data sets. The expectation is that you define and use different repository data sets whenever you want to assign different sets of process-types, rather than because a CICS migration has occurred.

Chapter 17. Migration for BTAM and TCAM networks

Transactions cannot be routed to a CICS Transaction Server for z/OS, Version 3 Release 2 application-owning region (AOR) from a network of BTAM terminals, or from a network of terminals connected by the ACB interface of TCAM. You are recommended to migrate your connections to use ACF/VTAM.

BTAM networks

If you have a network of BTAM terminals connected to a back-level CICS terminal-owning region (TOR), you will not be able (as you were in older CICS releases) to route transactions from them to a CICS Transaction Server for z/OS, Version 3 Release 2 application-owning region (AOR). You must either upgrade your terminals or route to an AOR at CICS Transaction Server for z/OS, Version 2 Release 3 or an earlier release.

TCAM networks

If you have a network of terminals connected by the ACB interface of TCAM to a back-level CICS TOR, you will not be able (as you were in older CICS releases) to route transactions from them to a CICS Transaction Server for z/OS, Version 3 Release 2 AOR. You must migrate your connections to use TCAM/DCB or (preferably) ACF/VTAM, or route to an AOR at CICS Transaction Server for z/OS, Version 2 Release 3 or an earlier release. (All terminals that support TCAM/ACB also support ACF/VTAM.)

If you have a network of terminals connected by the DCB interface of TCAM to, for example, a CICS TS 2.3 TOR, you will not be able to migrate the TOR to CICS Transaction Server for z/OS, Version 3 Release 2. To do so, you must migrate your connections to use ACF/VTAM.

If you have a network of terminals connected by the DCB interface of TCAM to a back-level CICS TOR, you will (as in previous CICS releases) be able to route transactions from them to a CICS Transaction Server for z/OS, Version 3 Release 2. However, you are recommended to migrate your connections to use ACF/VTAM.

Using dummy consoles instead of dummy TCAM terminals

The EXEC CICS SIGNON command does not work in transactions that have no principal facility: that is, non-terminal transactions. One unofficial technique to solve this problem was suggested in early Marketing Question and Answer forums. This technique involved creating dummy TCAM terminals in the terminal control table (TCT) defined by the DFHTCT macros, and specifying these as the principal facility for tasks that needed to use the SIGNON command. Now that local TCAM support is removed from CICS, it is no longer possible to use TCAM terminals for this purpose.

If you have been using this technique in the past, it may be possible for you to use dummy consoles instead of dummy TCAM terminals. You can create a dummy console using the EXEC CICS CREATE command:

```
EXEC CICS CREATE TERMINAL(tttt) ATTRLEN(47) ATTRIBUTES(attrs)
```

where *attrs* is a character data area that contains the string
'CONSNAME(*nnnnnnnn*) TYPETERM(DFHCONS) NATLANG(E)'

tttt and *nnnnnnnn* are a unique terminal ID and console name that you have chosen for this purpose. The terminal ID must be unique in the CICS region. The console name does not need to correspond to a real console, assuming that the transaction does not attempt any terminal I/O. DFHCONS is the CICS-supplied TYPETERM definition for console devices, provided in the CICS-supplied CSD group DFHTYPE.

This dummy console with a TERMINAL resource definition could now be used where you previously used a dummy TCAM terminal. You need to set the terminal ID as available for automatic transaction initiation (ATI) before START commands can be issued against it. You can set a terminal to ATI using the command EXEC CICS SET TERMINAL(*tttt*) ATI. The CICS-supplied TYPETERM definition DFHCONS does not specify the ATI attribute, so the default setting ATI(NO) applies until you issue the SET TERMINAL command. When the terminal ID is available for ATI, you can schedule transactions against it. These transactions have the dummy console as their principal facility, and so can use the EXEC CICS SIGNOFF and EXEC CICS SIGNON commands. Each transaction requires one dummy console.

It must be emphasized that the use of dummy TCAM terminals or dummy consoles to enable a non-terminal transaction to issue the EXEC CICS SIGNON command is **not recommended**, and has never previously been suggested in the CICS product manuals. These techniques are described here only for migration purposes, and you should redesign affected applications as soon as possible to eliminate the use of dummy consoles.

When programs exploited the technique of using dummy TCAM terminals, their intention was usually to use the EXEC CICS SIGNON command to change the user ID of the running transaction. However, note that the behavior of the EXEC CICS SIGNON command was changed in CICS Transaction Server for z/OS, Version 2 Release 1, so that it does not normally affect the user ID currently in effect for the transaction issuing the command. The EXEC CICS SIGNON command can only change the user ID of the running transaction if you have enabled the XSNEX global user exit, and if that exit sets a return code of 4. Note that the XSNEX global user exit was provided only for migration purposes when the behavior of the EXEC CICS SIGNON command was changed, and the use of XSNEX to change the user ID of a running transaction is not recommended.

The correct way to associate a user ID with a non-terminal transaction is to start the transaction with the specified user ID using the following command:

```
EXEC CICS START TRANSID(tttt) USERID(uuuuuuuu)
```

If you need to authenticate the user ID before doing this, use the following command to validate the user's password:

```
EXEC CICS VERIFY PASSWORD(pppppppp) USERID(uuuuuuuu)
```

Neither of these commands require the transaction to have an associated principal facility. If you have any applications which use the migration aids described in this topic (dummy TCAM terminals, dummy consoles, or the XSNEX user exit), you should redesign them as soon as possible to use this correct method.

Chapter 18. Migrating from COMMAREAs to channels

CICS application programs that use traditional communications areas (COMMAREAS) to exchange data continue to work as before. If you want to take advantage of the new function, you can migrate existing applications to use channels and containers rather than COMMAREAs.

It's possible to replace a COMMAREA by a channel with a single container. While this may seem the simplest way to move from COMMAREAs to channels and containers, it's not good practice to do this. Because you're taking the time to change your application programs to exploit this new function, you should implement the "best practices" for channels and containers. Channels have several advantages over COMMAREAs and it pays to design your channels to make the most of these improvements. This section explains how to do this for several types of existing application.

User-written dynamic or distributed routing programs require migration work whether or not you plan to implement channels and containers in your own applications. If you employ a user-written dynamic or distributed routing program for workload management, rather than CICSplex SM, you must modify your program to handle the new values that it may be passed in the DYRLEVEL, DYRTYPE, and DYRVER fields of the DFHDYPDS communications area.

Migrating LINK commands that pass COMMAREAs

To migrate two programs which use a COMMAREA on a LINK command to exchange a structure, change the instructions shown in this table.

In these instructions, *structure* is the name of your defined data structure. The EXEC CICS GET CONTAINER and PUT CONTAINER commands use a 16-character field to identify the container. A helpful convention is to give the container the same name as the data structure that you are using, shown here as *structure-name*.

Table 22. Migrating LINK commands that pass COMMAREAs

Program	Before	After
PROG1	EXEC CICS LINK PROGRAM(PROG2) COMMAREA(structure)	EXEC CICS PUT CONTAINER(structure-name) CHANNEL(channel-name) FROM(structure) EXEC CICS LINK PROGRAM(PROG2) CHANNEL(channel-name) ... EXEC CICS GET CONTAINER(structure-name) CHANNEL(channel-name) INTO(structure)
PROG2	EXEC CICS ADDRESS COMMAREA(structure-ptr) ... RETURN	EXEC CICS GET CONTAINER(structure-name) INTO(structure) ... EXEC CICS PUT CONTAINER(structure-name) FROM(structure) RETURN

Migrating XCTL commands that pass COMMAREAs

To migrate two programs which use a COMMAREA on an XCTL command to pass a structure, change the instructions shown in this table.

In these instructions, *structure* is the name of your defined data structure. The EXEC CICS GET CONTAINER and PUT CONTAINER commands use a 16-character field to identify the container. A helpful convention is to give the container the same name as the data structure that you are using, shown here as *structure-name*.

Table 23. Migrating XCTL commands that pass COMMAREAs

Program	Before	After
PROG1	EXEC CICS XCTL PROGRAM(PROG2) COMMAREA(structure)	EXEC CICS PUT CONTAINER(structure-name) CHANNEL(channel-name) FROM(structure) EXEC CICS XCTL PROGRAM(PROG2) CHANNEL(channel-name) ...
PROG2	EXEC CICS ADDRESS COMMAREA(structure-ptr) ...	EXEC CICS GET CONTAINER(structure-name) INTO(structure) ...

Migrating pseudoconversational COMMAREAs on RETURN commands

To migrate two programs which use COMMAREAs to exchange a structure as part of a pseudoconversation, change the instructions shown in this table.

In these instructions, *structure* is the name of your defined data structure. The EXEC CICS GET CONTAINER and PUT CONTAINER commands use a 16-character field to identify the container. A helpful convention is to give the container the same name as the data structure that you are using, shown here as *structure-name*.

Table 24. Migrating pseudoconversational COMMAREAs on RETURN commands

Program	Before	After
PROG1	EXEC CICS RETURN TRANSID(PROG2) COMMAREA(structure)	EXEC CICS PUT CONTAINER(structure-name) CHANNEL(channel-name) FROM(structure) EXEC CICS RETURN TRANSID(TRAN2) CHANNEL(channel-name)
PROG2	EXEC CICS ADDRESS COMMAREA(structure-ptr)	EXEC CICS GET CONTAINER(structure-name) INTO(structure)

Migrating START data

To migrate two programs which use START data to exchange a structure, change the instructions shown in this table.

In these instructions, *structure* is the name of your defined data structure. The EXEC CICS GET CONTAINER and PUT CONTAINER commands use a 16-character field to identify the container. A helpful convention is to give the container the same name as the data structure that you are using, shown here as *structure-name*.

Table 25. Migrating START data

Program	Before	After
PROG1	EXEC CICS START TRANSID(TRAN2) FROM(structure)	EXEC CICS PUT CONTAINER(structure-name) CHANNEL(channel-name) FROM(structure) EXEC CICS START TRANSID(TRAN2) CHANNEL(channel-name)
PROG2	EXEC CICS RETRIEVE INTO(structure)	EXEC CICS GET CONTAINER(structure-name) INTO(structure)

Note that the new version of PROG2 is the same as that in the pseudoconversational example.

Migrating dynamically-routed applications

EXEC CICS LINK and EXEC CICS START commands, which can pass either COMMAREAs or channels, can be dynamically routed. You can migrate these commands to use a channel in place of a COMMAREA.

When a LINK or START command passes a COMMAREA rather than a channel, the routing program can, depending on the type of request, inspect or change the COMMAREA's contents. For LINK requests and transactions started by terminal-related START requests (which are handled by the *dynamic* routing program), but not for non-terminal-related START requests (which are handled by the *distributed* routing program), the routing program is given, in the DYRACMAA field of its communication area, the *address* of the application's COMMAREA, and can inspect and change its contents.

Note: The routing program's communication area is mapped by the DFHDYPDS DSECT.

If you migrate a dynamically-routed EXEC CICS LINK or START command to use a channel rather than a COMMAREA, the routing program is passed, in the DYRCHANL field of DFHDYPDS, the name of the channel. Note that the routing program is given the *name* of the channel, not its address, and so is unable to use the DYRCHANL field to inspect or change the contents of the channel's containers.

To give the routing program the same kind of functionality with channels, an application that uses a channel can create, within the channel, a special container named DFHROUTE. If the application issues a LINK or terminal-related START request (but not a non-terminal-related START request) that is to be dynamically routed, the dynamic routing program is given, in the DYRACMAA field of DFHDYPDS, the address of the DFHROUTE container, and can inspect and change its contents.

If you are migrating a program to pass a channel rather than a COMMAREA, you could use its existing COMMAREA structure to map DFHROUTE.

For introductory information about dynamic and distributed routing, see Introduction to CICS dynamic routing in the *CICS Intercommunication Guide*. For information about writing a dynamic or distributed routing program, see Writing a dynamic routing program in the *CICS Customization Guide*.

Coexistence of programs that use channels with back-level CICS releases

A CICS Transaction Server for z/OS, Version 3 Release 2 program can invoke a program on a remote CICS region and pass it a channel. For this to work successfully, the remote region must be at CICS Transaction Server for z/OS, Version 3 Release 1 or a later level. Although CICS regions before CICS Transaction Server for z/OS, Version 3 Release 1 do not support channels, you can get them to tolerate channels by applying an APAR. By “tolerate” we mean that, if the back-level CICS region is passed a channel, it returns a meaningful abend code.

If a CICS TS Version 3 application tries to send a channel to a back-level region to which the appropriate APAR has been applied, the transaction abends with a meaningful abend code. If a CICS TS Version 3 application tries to send a channel to a back-level region to which the appropriate APAR has *not* been applied, the results are unpredictable.

The CICS releases prior to CICS Transaction Server for z/OS, Version 3 Release 1 which can tolerate channels are shown in this list, with the APAR that must be applied in each case:

CICS Transaction Server for z/OS, Version 2 Release 3

APAR PQ92437

CICS Transaction Server for z/OS, Version 2 Release 2

APAR PQ92437

CICS Transaction Server for OS/390, Version 1 Release 3

APAR PQ93048

CICS Transaction Server for VSE/ESA Release 1.1

APAR PQ83049

Chapter 19. Migration for users of Debug Tool for z/OS

Debug Tool Version 5 Release 1, with PTF UQ88297 for APAR PQ94401, supports CICS TS for z/OS, Version 3.2. Earlier versions of the tool do not support this CICS release.

Debug Tool communicates with a remote debugger by using TCP/IP Sockets. With CICS TS for z/OS, Version 2.3 and later CICS releases, Debug Tool uses the CICS Sockets domain. With earlier CICS releases, Debug Tool used the TCP/IP Socket Interface for CICS feature of TCP/IP for MVS. If you use Debug Tool in remote debug mode:

- Ensure that TCP/IP support is enabled for the CICS region.
- Now that the TCP/IP Socket Interface feature is not required by Debug Tool, determine whether you use it for any other purpose. If you do not, then you can remove the TCP/IP Socket Interface feature from your system.

Chapter 20. Migration for enterprise beans

If you are migrating from CICS Transaction Server for z/OS, Version 2 Release 2 and use enterprise beans, you need to make changes to your existing applications or configuration.

Although CICS currently supports only Version 1.1 of the Enterprise JavaBeans specification, it tolerates EJB 2.0 JAR files. It ignores any 2.0-specific features in the deployment descriptor, except for local interfaces. (If you try to deploy an EJB 2.0 JAR file that contains local interfaces, CICS issues an error message and the JAR file becomes unresolved.)

Enterprise beans that support the EJB 1.0 specification need to be migrated to the EJB 1.1 specification level using the Assembly Toolkit (ATK). Enterprise beans developed using any version of the EJB specification after EJB 1.1 must restrict themselves to the EJB 1.1 APIs.

As well as the topics in this section, if you have enterprise beans that use the CICS Connector for CICS TS, see “Migration for Java applications that use a CICS connector” on page 161.

The enterprise bean deployment tool, ATK

To deploy enterprise beans into CICS, the supported deployment tool is the Assembly Toolkit (ATK), a component of the Application Server Toolkit (ASTK). The ASTK is supplied with:

- WebSphere Application Server, Version 5.1 and later
- WebSphere Developer for zSeries, Version 6.0 and later
- IBM Rational Application Developer, Version 6.0 and later
-

The predecessor of the ATK, the Application Assembly Tool (AAT), is not included in WebSphere Application Server Version 5.1 and later. The AAT can still be used but is not supported. It is recommended that you use the most recent version of ATK available to you, and that where possible, you create deployment descriptors for EJB 1.1.

The Resource Manager for Enterprise Beans

You can now use the Resource Manager for Enterprise Beans to determine which version of GIOP is advertised in the published IOR for a specific enterprise bean. For details of the Resource Manager for Enterprise Beans, see The Resource Manager for Enterprise Beans in the *CICS Operations and Utilities Guide*.

Migrating enterprise beans without exploiting the new function

To migrate enterprise beans from CICS Transaction Server for z/OS, Version 2 Release 2 to CICS Transaction Server for z/OS, Version 3 Release 2, there are a number of required actions.

- Upgrade the CSD to reflect the changes to the CORBASERVER resource definition (see “New resource definitions and new attributes” on page 33).
- Rewrite and recompile any programs that issue EXEC CICS INQUIRE CORBASERVER STATE commands. The STATE option of this command must be replaced with ENABLESTATUS. The program must handle the new CVDA

values returned by ENABLESTATUS, rather than the obsolete values that were returned by STATE. See Table 14 on page 56.

- If you use a user-written distributed routing program, rewrite and recompile it to take account of the new abend code, AIID, that may be returned in the DYRABCDE field when a routed request fails on the target region. See Parameters passed to the dynamic routing program.
- If you use a user-written IOP security program, and GIOP 1.2, you must rewrite and recompile it. See “Changes to the IOP security program, DFHXOPUS” on page 73.
- If, in CICS TS 2.2, you used the COS Naming Directory Server supplied with WebSphere Application Server Version 4, and now intend to use that supplied with WebSphere Application Server Version 5, you may need to change the `com.ibm.cics.ejs.nameserver` property in your JVM system properties files. For WebSphere Version 5, the location of the COS Naming Directory Server should be specified like this:

```
com.ibm.cics.ejs.nameserver=iop://mycsserv.hursley.ibm.com:2809/domain/legacyRoot
```

Note that, from WebSphere Application Server Version 5 onwards:

- The default TCP/IP port used by the COS Naming Directory Server is 2809 (rather than 900 in WebSphere Version 4).
- Java objects must be published to a specially-architected location called «domain/legacyRoot». (CICS publishes Java objects to a context defined by the JNDIPREFIX option of the CORBASERVER definition, where the JNDI prefix is a relative path.) If you do not specify the /domain/legacyRoot path from the root node of the name space, CICS tries to publish Java objects to a JNDI prefix location relative to the root node itself. This works for the COS Naming Directory Server supplied with WebSphere Application Server Version 4, but fails with that supplied with later versions of WebSphere Application Server.

If the location of the name server is hard-coded into your Java applications, to migrate from Version 4 to Version 5 of the WebSphere COS Naming Directory Server you may need to change your applications' source code.

For more information about specifying the location of the JNDI name server, see *Java Applications in CICS*.

Migrating enterprise beans to the new function

There are several ways in which you can migrate enterprise beans from CICS Transaction Server for z/OS, Version 2 Release 2 to take advantage of the new function introduced by CICS enhancements to EJB support.

- If you use a user-written distributed routing program, you can rewrite it to take advantage of the additional information that CICS supplies about route selection errors. For example, you could code your program so that:
 - If a routing error occurs because the target AOR, or the connection to it, is unavailable, the routing program removes the AOR, temporarily, from its routing set, until sufficient time has elapsed for the AOR or connection to be repaired. In the meantime, it directs all requests to other AORs.
 - If a routing error occurs because the target CorbaServer on the target AOR is disabled (and the AOR supports multiple CorbaServers), the routing program does *not* remove the AOR from its routing set. It redirects the failed request to a different AOR, but recognizes that the first AOR remains a valid target for requests for objects supported by its other CorbaServers.

See in the *CICS Customization Guide*.

- You can change your procedures for updating enterprise beans in a production region. The solutions described in *Java Applications in CICS* take advantage of the new ability to disable a CorbaServer without bringing down CICS.
- You can use the SELECT TYPE parameter of the statistics utility program, DFHSTUP, to cause DFHSTUP to format and print enterprise bean statistics.
- You can use the sample statistics program, DFH0STAT, to produce an enterprise bean statistics report.

Migrating a CICS TS for z/OS, Version 2.2 CORBA or EJB server to CICS TS for z/OS, Version 3.2

This section explains the changes you need to be aware of for CORBA or EJB server migration, and gives instructions to migrate a single-region or multi-region CICS CORBA or EJB server from CICS TS for z/OS, Version 2.2 to CICS TS for z/OS, Version 3.2.

Important changes to EJB, CORBA and Java support

EJB, CORBA and Java support has changed in a number of ways between CICS TS for z/OS, Version 2.2 and CICS TS for z/OS, Version 3.2. All these changes are described in detail in *Java Applications in CICS*. They are listed here, together with some general tips, as a reminder of things to be aware of when migrating an EJB server from CICS TS 2.2 to CICS TS 3.2.

1. In CICS TS 2.2, JVM profiles were stored in a PDS member. In CICS TS 3.2, they are stored in the z/OS UNIX directory pointed to by the JVMPROFILEDIR system initialization parameter.
2. The default JVM profile used by CorbaServers in CICS TS 2.2 was DFHJVMPR. In CICS TS 3.2 it is DFHJVMCD.
3. The default JVM properties file used by CorbaServers in CICS TS 2.2 was dfjjvmpr.props. In CICS TS 3.2 it is dfjjvmcd.props.
4. Don't enable any new, CICS TS 3.2-specific, attributes on resource definitions during a "rolling upgrade". For example, on a CORBASERVER definition don't specify the ASSERTED option. (For a complete list of new, CICS TS 3.2-specific, attributes on CORBASERVER, DJAR, REQUESTMODEL, and TCPIPSERVICE resource definitions, see "New resource definitions and new attributes" on page 33.) Use of these new features must wait until the whole logical server—both listener regions and AORs—has been upgraded.
5. From a CICS TS 3.2 AOR, you can re-publish a deployed JAR file that has previously been published from a CICS TS 2.2 AOR without first retracting it. The IORs of the beans are updated to CICS TS 3.2 format. **However, you cannot do the reverse.** From a CICS TS 2.2 AOR, before re-publishing a deployed JAR file that has previously been published from a CICS TS 3.2 AOR you must first retract it. Also, because CICS TS 2.2 does not understand the format of CICS TS 3.2 IORs, *you must retract it from a CICS TS 3.2 AOR*. Bear this in mind if, for any reason, you need to back out the upgrade of one or more AORs.

If you ever need to revert the IORs of enterprise beans that have been published from a CICS TS 3.2 AOR to CICS TS 2.2 level (so that they can be routed to a CICS TS 2.2 AOR once more) you must:

- a. Retract the deployed JAR file from a CICS TS 3.2 AOR
- b. Publish the deployed JAR file from a CICS TS 2.2 AOR

Trying to re-publish the beans without retracting them first, or trying to retract them from the wrong level of CICS, results in an `InvalidUserKeyException: Bad version number exception`.

Potential issues following migration

1. After the EJB server has been migrated to CICS TS 3.2, some clients may have stale, cached, IORs that point to the old server. This is because some application servers cache the results of JNDI lookups locally to increase performance. You may find that these caches have to be purged before the new IORs are used.
2. CICS TS 3.2 supports GIOP 1.2, whereas CICS TS 2.2 supported only GIOP 1.1. If a GIOP 1.2 message is received in a CICS TS 2.2 region it will be rejected. Under normal conditions this should never happen, because the maximum version of GIOP supported by CICS is stored in the IORs that CICS publishes. If a client knows that a given server only supports GIOP 1.1, it will never attempt to use anything more recent when communicating with that server. This means that CICS TS 3.2 can send GIOP messages to CICS TS 2.2.

The problem will only occur if the client thinks it is talking to CICS TS 3.2 but its message is routed to a CICS TS 2.2 region. This will only happen if CICS TS 2.2 and CICS TS 3.2 regions are set up as sibling request processors (AORs) in the same logical server. (This is one reason why mixed-level logical servers are not recommended in CICS.) During a “rolling upgrade”, the logical server does, of course, contain mixed-level request processors. However, if you follow the steps in “Performing a rolling upgrade for a multi-region CICS CORBA or EJB server” on page 121, the problem (of a GIOP 1.2 message being received in a CICS TS 2.2 region) will not occur.

3. CICS TS 3.2 uses a different format of IOR from CICS TS 2.2. If a GIOP 1.1 message intended for CICS TS 3.2 is routed to a CICS TS 2.2 region, the CICS TS 2.2 region will reject the request due to a unknown IOR format being in use. If all the regions in an EJB server are at the same level of CICS and Java, this error cannot occur.

During a “rolling upgrade”, the logical server does, of course, contain mixed-level regions. However, if you follow the steps in “Performing a rolling upgrade for a multi-region CICS CORBA or EJB server” on page 121, this problem will not occur.

Upgrading a single-region CICS CORBA or EJB server

Follow this procedure to migrate a single-region CICS CORBA or EJB server from CICS TS for z/OS, Version 2.2 to CICS TS for z/OS, Version 3.2.

1. Quiesce the CORBA and EJB workload.
2. Shut down the CICS region.
3. Upgrade the CICS region to CICS TS for z/OS, Version 3.2, following the standard migration procedures for any CICS region.
4. Review “Migrating a CICS TS for z/OS, Version 2.2 CORBA or EJB server to CICS TS for z/OS, Version 3.2” on page 119, which describes some of the changes in EJB and CORBA support between CICS TS for z/OS, Version 2.2 and CICS TS for z/OS, Version 3.2. You should also refer to “Setting up a single-region EJB server” in *Java Applications in CICS*, which describes in detail how to set up a single-region EJB server in CICS TS for z/OS, Version 3.2.
5. Restart the CICS region.
6. Republish the Interoperable Object References (IORs) for all the enterprise beans and stateless CORBA objects processed by the server. To do this, issue

a `PERFORM CORBASERVER(CorbaServer_name) PUBLISH` command. This command can be issued using EXEC CICS, CEMT, the Resource Manager for enterprise beans, or from a CICSplex SM EUI or WUI view. Remember to issue a separate command for each CORBASERVER resource definition in the region.

Upgrading a multi-region CICS EJB/CORBA server

Choose any of these methods to migrate a multi-region CICS CORBA or EJB server from CICS TS for z/OS, Version 2.2 to CICS TS for z/OS, Version 3.2.

1. **Shut down the server, upgrade all the regions, and restart the server.** This approach is very similar to that described in “Upgrading a single-region CICS CORBA or EJB server” on page 120, except that:
 - You must upgrade all the regions to CICS TS for z/OS, Version 3.2 before restarting the server.
 - You should refer to “Setting up a multi-region EJB server” in *Java Applications in CICS*, which describes in detail how to set up a multi-region EJB server in CICS TS for z/OS, Version 3.2.
 - To republish the IORs of enterprise beans and stateless CORBA objects, you need to issue a `PERFORM CORBASERVER(CorbaServer_name) PUBLISH` command on at least one of the AORs. Remember to issue a separate command for each CORBASERVER resource definition in the AOR.

The advantage of this approach is its relative simplicity, compared to solutions 2 and 3. Its main disadvantage is that the server’s applications are unavailable during the upgrade process.

2. **Create a separate, CICS TS for z/OS, Version 3.2, logical server and gradually migrate applications from the old, CICS TS 2.2, server to the new one.** To set up a new CICS TS for z/OS, Version 3.2 multi-region EJB server, follow all the steps in “Setting up a multi-region EJB server” in *Java Applications in CICS*. The advantages of this approach are:
 - Applications are kept available throughout the upgrade process.
 - You can start with a minimal CICS TS for z/OS, Version 3.2 server, perhaps consisting of just two regions—one listener and one AOR. As more applications are migrated, you can expand the CICS TS for z/OS, Version 3.2 and simultaneously reduce the number of regions in the CICS TS 2.2 server, thereby conserving resources.
 - It is probably easier to implement than solution 3.
3. **Perform a “rolling upgrade”.** In a “rolling upgrade”, one region at a time is upgraded from the previous to the current level of CICS, while keeping the server operational. The advantages of this approach are:
 - Applications are kept available throughout the upgrade process.
 - Unlike solution 2, at no stage is it necessary to set up additional CICS regions.

This method is described in detail in “Performing a rolling upgrade for a multi-region CICS CORBA or EJB server.”

Performing a rolling upgrade for a multi-region CICS CORBA or EJB server

This section describes how to perform a “rolling upgrade” of a multi-region CICS CORBA or server from CICS TS for z/OS, Version 2.2 to CICS TS for z/OS, Version 3.2.

Important

The mixed level of operation described in this section, in which different CICS regions in the same logical server are at different levels of CICS, is intended to be used only for rolling upgrades. It should not be used permanently, because it increases the risk of failure in some interoperability scenarios. The normal, recommended, mode of operation is that all the regions in a logical server should be at the same level of CICS and Java.

Requirement for a rolling upgrade

Your logical server must meet the criteria for a “rolling upgrade”.

Your server must consist of separate listener and application-owning regions. This is because the migration process requires all of the listener regions to be updated before any of the application-owning regions (AORs). If you run composite listener/AORs, which act both as request receivers and request processors, this cannot be done. And if you don't upgrade all the listeners before any of the AORs, your IIOP client applications may receive transient failures during the migration window, depending on the CICS version of the listener region that receives the request.

Preliminary steps for a CORBA or EJB server rolling upgrade

1. Review Chapter 20, “Migration for enterprise beans,” on page 117.
2. Ensure that APAR PQ 79565 is installed in all your CICS TS 2.2 regions. This APAR improves CICS TS 2.2 diagnostics, should CICS TS 3.2 workload arrive at a CICS TS 2.2 region. It also allows a CICS TS 2.2 request processor (AOR) to receive work from a CICS TS 3.2 request receiver (listener).
3. Set the AUTOPUBLISH option on all your CORBASERVER definitions to NO. Setting a CorbaServer to autopublish IORs into the JNDI name spaces could disrupt the migration process.
4. If you use a distributed routing program to balance method requests for enterprise beans and CORBA stateless objects across the AORs of your logical server, customize your routing program to use the DYRLEVEL parameter. Install your customized program on *all* the regions (both listeners and AORs) of the EJB server.

If you use CICSplex SM to workload-balance method requests you can skip this step. The CICSplex SM routing program supplied with CICS TS for z/OS, Version 3.2 checks the DYRLEVEL field and routes requests accordingly.

DYRLEVEL is a migration aid. It contains the level of CICS required in the target AOR to successfully process the routed request. (Note that this is the **specific**—*not* the minimum—level of CICS required to process the request successfully.) In a mixed-level logical server, when your routing program is invoked for route selection (or route selection error), it can use the value of DYRLEVEL to determine whether to route the request to a CICS TS 2.2 or CICS TS 3.2 AOR.

For details of how to use DYRLEVEL, and definitive information about writing a distributed routing program, see in the *CICS Customization Guide*.

Migrating the listener regions for a CORBA or EJB server rolling upgrade

1. Quiesce a listener region and bring it down.
2. Upgrade this single listener region to CICS TS for z/OS, Version 3.2, following the standard migration procedures for all CICS regions. For definitive

information about setting up a listener region in CICS TS 3.2, refer to *Java Applications in CICS*. Also note these important additional points:

- a. When you upgrade the CSD from CICS TS 2.2 to CICS TS 3.2 level, if it is shared by any CICS TS 2.2 regions other than that being upgraded, include the DFHCOMPA resource group (supplied with CICS TS 3.2) in the startup group list of these regions. DFHCOMPA is a compatibility group that provides a definition of DFJIIRP, the default request processor program, that can be used by a CICS TS 2.2 region when sharing a CICS TS 3.2 CSD. This step is necessary because, in CICS TS 3.2, the JVM profile used by DFJIIRP is DFHJVMCD. In CICS TS 2.2, it is DFHJVMPR.
 - b. At this stage, don't enable any new, CICS TS 3.2-specific, options on resource definitions, because they won't be understood by the CICS TS 2.2 AORs. Use of these new features must wait until the whole logical server, both listener regions and AORs, has been upgraded.
3. Bring the listener back up. This region is now at the newer version of CICS but may continue to participate as part of the back-level logical server.
 4. Repeat steps 1 through 3 for all of the listener regions in the logical server.

Migrating the AORs for a CORBA or EJB server rolling upgrade

1. Quiesce an AOR and bring it down.
2. Update this single AOR to CICS TS for z/OS, Version 3.2, following the standard migration procedures for all CICS regions. Part of this will involve updating the JVM profile used by the CorbaServers. Note the changes to JVM profiles and property files described in Chapter 20, "Migration for enterprise beans," on page 117. Also note these important additional points:
 - a. When you upgrade the CSD from CICS TS 2.2 to CICS TS 3.2 level, if it is shared by any CICS TS 2.2 regions other than that being upgraded, include the DFHCOMPA resource group (supplied with CICS TS 3.2) in the startup group list of these regions.
 - b. At this stage, don't enable any new, CICS TS 3.2-specific, options on resource definitions.
3. Bring the AOR back up again.
4. Ensure that all TCPIPSERVICES are open both in this AOR and in the listener regions.
5. Use the CEMT PERFORM DJAR PUBLISH command to re-publish the IORs of one or more enterprise beans in CICS TS 3.2 format. For each CorbaServer, select one or more deployed JAR files to re-publish. Re-publish the selected DJARs to the JNDI name space, in the same location as that used by the CICS TS 2.2 AORs. When choosing deployed JAR files to re-publish, bear the following in mind:
 - Try to pick DJARs whose entire work load can be processed by a single region.
 - Wherever possible, all the beans used by an application should be migrated at the same time. For example, if bean A is known to call bean B the two beans should be migrated together. If this is not possible, bean A should be migrated first. This is particularly important if the beans are installed in the same CorbaServer but in different AORs that are at different levels of CICS. This is because a CICS TS 2.2 region cannot do a JNDI look up of an object in a CICS TS 3.2 region if both objects are in the same CorbaServer. For example, bean A in CorbaServer EJB1 in a CICS TS 2.2 AOR cannot look up bean B in CorbaServer EJB1 in a CICS TS 3.2 AOR.

Note: If A and B are installed in different CorbaServers, or in AORs that are at the same level of CICS, they can be migrated separately.

At this point :

- This AOR is ready to accept workload.
- The logical server contains a pool of CICS TS 2.2 AORs and a pool (currently containing only one region) of CICS TS 3.2 AORs.
- Any clients that look up the IOR of a re-published bean in the name space get the new IOR in CICS TS 3.2 format. Your customized routing program or CICSplex SM directs such requests to the CICS TS 3.2 AOR.
- Any clients that have a stale, cached, IOR for a bean that's been re-published are still able to use the bean. Your customized routing program or CICSplex SM directs such CICS TS 2.2-format requests to one of the CICS TS 2.2 AORs.

Note: Many application servers cache the results of JNDI lookups locally to increase performance, so you may find that these caches have to be purged before the new IORs are used. Over a period of time, requests for re-published enterprise beans should move gradually from the pool of CICS TS 2.2 AORs to the pool of CICS TS 3.2 AORs.

6. Repeat steps 1 through 5 for all of the AORs in the logical server. As each AOR is upgraded:
 - a. Re-publish a different set of enterprise beans, so that gradually more and more beans are supported by the pool of CICS TS 3.2 regions.
 - b. It becomes less important, when selecting deployed JAR files to re-publish, to choose those whose entire work load can be processed by a single region—because there are more AORs in the CICS TS 3.2 pool.

Eventually, all the AORs will be running CICS TS 3.2 and processing 100% of the workload.

Tidying up after a CORBA or EJB server rolling upgrade

1. If required, reset the AUTOPUBLISH option on your CORBASERVER definitions to YES.
2. Enable any CICS TS 3.2-specific resource definition options that you want to use.

Chapter 21. Migrating to extended addressing for ESDS

Restriction: Data sets that are used internally by CICS, such as DFHDMPA, DFHDMPB, DFHINTRA, and DFHTEMP do not use extended ESDS. Do not migrate these data sets.

To use an extended ESDS data set, migrate the data set and convert existing CICS application programs that use 32-bit relative byte addressing (RBA) to 64-bit extended relative byte addressing (XRBA).

Converting a standard ESDS to an extended addressing ESDS

Before migrating a standard ESDS data set to use extended addressing, if your dataset is defined to use forward recovery you must upgrade your forward recovery product to one that can read the new log records written for extended addressing ESDS data sets. If you use CICS VR, the release required is CICS VSAM Recovery for z/OS V4.2.

To convert an existing standard ESDS to an extended addressing ESDS, re-create the data set as follows:

1. If you want to continue to use the contents of the existing data set, take a copy of its contents. You can use the AMS REPRO function to do this.
2. Delete the existing data set.
3. Create a new data set. You can base the AMS definition of the new data set on that of the old data set. The only mandatory change is that the DATACLAS parameter of the definition of the new data set must name an SMS data class that specifies both extended format and extended addressing. The *DFSMS Storage Administration Reference* manual describes how to define SMS data classes.
4. If necessary, restore the contents of the data set from the copy taken previously.

Converting a program from 32-bit RBA to 64-bit XRBA

To convert an existing program from using 32-bit RBA to 64-bit extended relative byte addressing (XRBA):

1. Replace the RBA keyword with the XRBA keyword on all the following commands:
 - EXEC CICS READ
 - EXEC CICS READNEXT
 - EXEC CICS READPREV
 - EXEC CICS RESETBR
 - EXEC CICS STARTBR
 - EXEC CICS WRITE

2. Replace all 4-byte areas used for keys with 8-byte areas. This step is very important.

If you change "RBA" to "XRBA" but do not change the length of the key areas:

- a. On STARTBR and READ commands, CICS treats your 4-byte RBAs as being the top half of 8-byte XRBAs. In most cases, this produces a huge XRBA number. You can track down this error because the program immediately receives a "no record at RBA" response.
- b. WRITE commands might produce more subtle, and therefore probably more serious, errors. The command feeds back an 8-byte XRBA, which overwrites the 4 bytes immediately following the key area.

Using RBA-insensitive programs to access extended ESDS data sets

You can reuse existing 32-bit RBA programs that do not make use of the RBAs to access 64-bit extended ESDS data sets.

For example, a common type of application has records that are first written sequentially and later browsed sequentially from the beginning. Although RBAs are passed between CICS and the program, the program makes no use of them. The program only reads or writes the next record. Such programs are “RBA-insensitive”. Other programs, such as those that directly read or update records at named RBAs, are “RBA-sensitive”.

Existing 32-bit RBA-insensitive programs can access 64-bit extended ESDS data sets without change. Both RLS and non-RLS modes are supported.

Thirty-two-bit RBA-sensitive programs cannot access 64-bit extended ESDS data sets, even if the data set contains less than 4 GB of data.

Connecting a back-level AOR to a CICS TS for z/OS, Version 3.2 FOR

In this scenario, old-style 32-bit RBA programs try to access files on a CICS TS for z/OS, Version 3.2, file-owning region (FOR). This is successful in either of the following cases:

- The target file in the FOR has not been converted from conventional ESDS to extended addressing ESDS.
- The target file has been converted to extended addressing ESDS but the program is RBA-insensitive.

If the target file has been converted to extended addressing ESDS, a 32-bit RBA-sensitive program running in the AOR cannot access it. The program receives an ILLOGIC response.

Connecting a CICS TS for z/OS, Version 3.2 AOR to a back-level FOR

In this scenario, new-style 64-bit XRBA programs try to access files on a back-level file-owning region.

Because the target region supports only 32-bit RSAs, it does not understand a 64-bit XRBA. The program receives an ILLOGIC response.

Chapter 22. Migration for intercommunication

In CICS TS for z/OS, Version 3.2 you perform the following intercommunication-related migration tasks:

- Ensure that each of your CICS regions has a unique APPLID; see “Giving each CICS region a unique applid.” This is a mandatory requirement.
- Migrate APPC or MRO connections to IP interconnectivity (IPIC); see “Migrating connections to IP interconnectivity.”
- Separate your CICS regions into multiple XCF groups; see “Using multiple CICS XCF groups” on page 137.

Giving each CICS region a unique applid

If your CICS regions are part of a z/OS sysplex, you must ensure that their *applids* (as specified on the APPLID system initialization parameter) are unique in the sysplex. If CICS is an XRF partner, its *specific* applid must be unique in the sysplex.

In CICS TS for z/OS, Version 3.2, if an applid is not unique (that is, it duplicates the specific or only applid of any other CICS region currently active in the sysplex), on startup CICS issues a message and fails to initialize.

This requirement supports IPIC connections, but it is required whether or not you plan to use that type of connection. It also allows multiple XCF groups to contain CICS regions.

Migrating connections to IP interconnectivity

Note: If you do not want to use IPIC connections, no migration work is required. Existing MRO, APPC, and LUTYPE6.1 connections will continue to operate as before.

To migrate APPC or MRO connections to IPIC you must:

1. Install support for IPIC. How to do this is described in “IP interconnectivity (IPIC)”, in the *CICS Transaction Server for z/OS Installation Guide*.
2. Migrate your existing connections to TCP/IP. CICS supplies a migration utility to help you do this: see “Migration utility for converting APPC and MRO connections to IPIC connections” on page 131.

For reference purposes, and in case you want to migrate your APPC and MRO connections manually, rather than by running the migration utility, the following four tables show the attributes of APPC CONNECTION, APPC SESSIONS, MRO CONNECTION, and MRO SESSIONS definitions, respectively, and the equivalent attributes on IPCONN definitions.

APPC

Table 26. Migrating APPC connections to IPIC. CONNECTION options and their IPCONN equivalents.

CONNECTION options	APPC possible values	IPCONN equivalent value
ACCESSMETHOD	VTAM	Not applicable.
ATTACHSEC	LOCAL IDENTIFY VERIFY PERSISTENT MIXIDPE	USERAUTH LOCAL IDENTIFY VERIFY NO CERTIFICATE

Table 26. Migrating APPC connections to IPIC. CONNECTION options and their IPCONN equivalents. (continued)

CONNECTION options	APPC possible values	IPCONN equivalent value
AUTOCONNECT	NO YES ALL	NO YES
BINDSECURITY	NO YES	SSL NO YES
DATASTREAM	USER	Not applicable
INDSYS	Not applicable (indirect connections only).	Not applicable (indirect connections only).
INSERVICE	YES NO	As is.
MAXQTIME	NO 0 - 9999	As is.
NETNAME	The VTAM APPLID of the remote region. (For XRF, the generic applid. For connections to a VTAM generic resource, either the applid or generic resource name.)	combination of APPLID and NETWORKID
PROTOCOL	APPC.	Not applicable.
PSRECOVERY	SYSDEFAULT NONE	Not applicable.
QUEUELIMIT	NO 0 - 9999	As is.
RECORDFORMAT	U	Not applicable
REMOTENAME	Name (sysid) by which the remote system is known to itself.	Not applicable
REMOTESYSNET	Applid of the remote system that owns the remote resource, if the link to the remote system is indirect.	Not applicable
REMOTESYSTEM	Name (sysid) of the remote system, or sysid of the next system in the path, if the link to the remote system is indirect.	Not applicable
SECURITYNAME	RACF ID of the remote system.	As is.
SINGLESESS	NO YES	Not applicable.
USEDFTUSER	NO YES	Not applicable
XLNACTION	KEEP FORCE	As is.

Table 27. Migrating APPC connections to IPIC. SESSIONS options and their IPCONN equivalents.

SESSIONS options	APPC possible values	IPCONN equivalent value
AUTOCONNECT	NO YES ALL	Not applicable.
BUILDCHAIN	YES	Not applicable.
CONNECTION	Name of CONNECTION that this SESSIONS definition applies to.	Not applicable.
DISCREQ	Not applicable.	Not applicable.
IOAREALEN	Not applicable.	Not applicable
MAXIMUM	1 - 999, 0 - 999	SENDCOUNT & RECEIVECOUNT
MODENAME	Name of a VTAM LOGMODE.	Not applicable.
NEPCCLASS	Transaction class for the node error program.	Not applicable.
NETNAMEQ	Not applicable.	Not applicable
PROTOCOL	APPC.	Not applicable.

Table 27. Migrating APPC connections to IPIC. SESSIONS options and their IPCONN equivalents. (continued)

SESSIONS options	APPC possible values	IPCONN equivalent value
RECEIVECOUNT	Not applicable.	Derived from MAXIMUM.
RECEIVEPFX	Not applicable.	Not applicable
RECEIVESIZE	RU size to receive: 1 - 30720	Not applicable
RECOVPTION	SYSDEFAULT CLEARCONV RELEASESESS UNCONDREL NONE	Not applicable.
RELREQ	NO YES	Not applicable.
SENDcount	Not applicable.	Derived from MAXIMUM.
SENDPFX	Not applicable.	Not applicable
SENDSIZE	RU size to send: 1 - 30720	Not applicable
SESSNAME	Not applicable.	Not applicable
SESSPRIORITY	0 - 255	Not applicable
USERAREALEN	Length of TCTTE user area: 0 - 255	Not applicable
USERID	ID for sign on.	Not applicable

MRO

We don't envisage that you will want to migrate many of your existing MRO connections to use IPIC. By definition, these are all CICS-to-CICS connections between regions in the same sysplex. For this type of connection, MRO currently holds more advantages than IPIC. For example, there is no performance improvement to be gained by using IPIC; and MRO supports all the base CICS intercommunication functions, whereas IPIC supports only DPL.

Table 28. Migrating MRO connections to IPIC. CONNECTION options and their IPCONN equivalents.

CONNECTION options	MRO possible values	IPCONN equivalent value
ACCESSMETHOD	IRC XM	Not applicable.
ATTACHSEC	LOCAL IDENTIFY	USERAUTH LOCAL IDENTIFY VERIFY NO CERTIFICATE
AUTOCONNECT	Not applicable.	NO YES
BINDSECURITY	Not applicable.	SSL NO YES
DATASTREAM	USER	Not applicable
INDSYS	Not applicable (indirect connections only).	Not applicable (indirect connections only).
INSERVICE	YES NO	As is.
MAXQTIME	NO 0 - 9999	As is.
NETNAME	The APPLID specified in remote region's SIT.	host.domain.country[:port]
PROTOCOL	Blank.	Not applicable.
PSRECOVERY	Not applicable.	Not applicable.
QUEUELIMIT	NO 0 - 9999	As is.
RECORDFORMAT	U	Not applicable
REMOTENAME	Not applicable.	Not applicable
REMOTESYSNET	Not applicable.	Not applicable
REMOTESYSTEM	Not applicable.	Not applicable

Table 28. Migrating MRO connections to IPIC. CONNECTION options and their IPCONN equivalents. (continued)

CONNECTION options	MRO possible values	IPCONN equivalent value
SECURITYNAME	Not applicable.	As is.
SINGLESESS	Not applicable.	Not applicable.
USEDFTUSER	NO YES	Not applicable
XLNACTION	KEEP FORCE	As is.

Table 29. Migrating MRO connections to IPIC. SESSIONS options and their IPCONN equivalents.

SESSIONS options	MRO possible values	IPCONN equivalent value
AUTOCONNECT	Not applicable.	Not applicable.
BUILDCHAIN	Not applicable	Not applicable.
CONNECTION	Name of CONNECTION that this SESSIONS definition applies to.	Not applicable.
DISCREQ	Not applicable.	Not applicable.
IOAREALEN	Default TIOA size: 0 - 32767 , 0 - 32767	Not applicable
MAXIMUM	Not applicable.	Not applicable
MODENAME	Not applicable.	Not applicable.
NEPCLASS	Transaction class for the node error program.	Not applicable.
NETNAMEQ	Not applicable.	Not applicable
PROTOCOL	LU61.	Not applicable.
RECEIVECOUNT	Number of receive sessions: 1 - 999	As is.
RECEIVEPFX	Termid prefix.	Not applicable
RECEIVESIZE	Not applicable.	Not applicable
RECOVOPTION	Not applicable.	Not applicable.
RELREQ	Not applicable.	Not applicable.
SENDCOUNT	Number of send sessions: 1 - 999	As is.
SENDPFX	Termid prefix.	Not applicable
SENDSIZE	Not applicable.	Not applicable
SESSNAME	Not applicable.	Not applicable
SESSPRIORITY	0 - 255	Not applicable
USERAREALEN	Length of TCTTE user area: 0 - 255	Not applicable
USERID	ID for sign on.	Not applicable

Using the CICS Transaction Gateway ECI Resource Adapter over an IPIC connection

If you use one of the CICS Transaction Gateway ECI Resource Adapters to enable a Java client to call a CICS server program, you may want to rewrite and redeploy your client program in order to take advantage of some of the new features introduced in CICS TS for z/OS, Version 3.2. These new features include support for:

- Containers. For information about using containers instead of COMMAREAs with your CICS server programs, see the *CICS Application Programming Guide*.

- IPIC connections (also known as *IPCONN*s) to CICS. For information about the attributes of IPIC connections, see the *CICS Resource Definition Guide*.
You cannot install static IPCONN connections to non-CICS Java clients: these connections are always autoinstalled. See the *CICS Customization Guide*.
- Secure Sockets Layer (SSL) authentication. SSL is supported on IPIC connections between the CICS TG and CICS, and as on client-to-CICS TG connections. For information about using SSL authentication, see the *CICS RACF Security Guide*.

For guidance about how to program the CICS resource adapters, see the *CICS Transaction Gateway Programming Guide*. For definitive reference information about the resource adapter classes, see the *CICS Transaction Gateway Programming Reference*.

Migration utility for converting APPC and MRO connections to IPIC connections

Use the DFH0IPCC utility program to convert existing APPC and MRO connections to IPIC connections (IPCONN)s. DFH0IPCC is a sample program for use with the DFHCSDUP system definition utility program. The utility generates a set of statements that form a skeleton. Review the skeleton and update it as required before using it as input to DFHCSDUP.

For information about creating IPCONN and TCPIP SERVICE resource definitions, see CREATE IPCONN and CREATE TCPIP SERVICE in the *CICS System Programming Reference*.

IPCONN attribute mapping

The following table summarizes how the DFH0IPCC utility program maps the CONNECTION attributes to the new IPCONN definition.

Table 30.

IPCONN attribute	Migrated From / Created By	Comments
APPLID	CONNECTION (NETNAME)	Direct migration
AUTOCONNECT	CONNECTION (AUTOCONNECT)	Direct migration, but if ALL, set the new value to YES
CERTIFICATE	N/A	Blank
CIPHERS	N/A	Blank
DESCRIPTION	N/A	Blank. Not migrated. You can add this in the DFH0IPCC output
GROUP	CONNECTION (GROUP) SESSIONS (GROUP)	Not changed
HOST	APPLID table	Must be specified in APPLID table
INSERVICE	CONNECTION (INSERVICE)	Direct migration
IPCONN	CONNECTION (CONNECTION)	Direct migration
MAXQTIME	CONNECTION (MAXQTIME)	Direct migration
NETWORKID	APPLID table	No equivalent; leave blank if not specified in APPLID table or in default

Table 30. (continued)

IPCONN attribute	Migrated From / Created By	Comments
PORT	APPLID table	Must be specified in APPLID table
QUEUELIMIT	CONNECTION (QUEUELIMIT)	Direct migration
RECEIVECOUNT	Sum of SESSIONS (MAXIMUM)	Direct migration from MRO SESSIONS equivalent setting or derived from APPC SESSIONS MAXIMUM setting
SENDcount	Sum of SESSIONS (MAXIMUM)	Direct migration from MRO SESSIONS equivalent setting or derived from APPC SESSIONS MAXIMUM setting
SSL	N/A	Left blank. You can modify this in the DFH0IPCC output
TCPIPService	APPLID table	Always "DFHIPIC" or as in APPLID table
XLNAction	CONNECTION (XLNAction)	Direct migration

Input to the DFH0IPCC utility program

The DFH0IPCC utility program takes input supplied in a table that you can edit, called an *APPLID table*. This table is used to store the APPLIDs of all the regions in the relevant setup, with the corresponding HOST name of the region and the listening PORT of the TCPIPService used to deal with inbound TCP/IP connections. Create this table as a fixed block 80-byte record format. The example APPLID table in this topic shows the format you must use.

You can use any method to fill the table; manually, for example, or by some utility, such as a spreadsheet or script, but you must preserve the fixed-length format. You can remove or omit any of the provided comments or header lines.

TCPIPService names

Because an IPCONN cannot deduce the TCPIPService name of a partner region, the utility cannot produce TCPIPService definitions; you must define them manually. The utility works in such a way that all TCPIPService names in regions for which the utility produces IPCONN definitions must be the same.

All IPCONN definitions created by the DFH0IPCC utility program have the default TCPIPService (DFHIPIC), unless you supply a different name using the .DEFAULT row in the APPLID file. If you specify another name, use that name for all TCPIPService definitions you create.

IPCONN names

The IPCONN names are generated to avoid duplicates. The DFH0IPCC utility program uses the name of the CONNECTION definition because there is a one-to-one relationship between a CONNECTION definition and the IPCONN definition created from it. The coexistence of same-name CONNECTIONs and IPCONN definitions is fully supported by CICS provided that the CONNECTION NETNAME and IPCONN APPLID are the same. In this instance CICS selects the IPCONN rather than the CONNECTION for routing of supported function.

Using the DFH0IPCC utility program

In these steps, the phrase *interconnected regions* means the set of CICS regions that are to be connected by IPIC connections.

1. Create TCPIP SERVICE definitions for each of the interconnected regions, specifying:

- `PROTOCOL(IPIC)`
- `TCPIP SERVICE(DFHIPIC)` or `TCPIP SERVICE(servicename)`

Specify other options, such as `PORTNUMBER`, according to the requirements of the region where the TCPIP SERVICE is to be installed. The number of definitions you require depends on, for example, the number of unique port numbers you must specify.

2. Put each TCPIP SERVICE in a resource definition group of its own. Add one or more resource groups to each CICS system definition file (CSD) used by the interconnected regions, the number depending on the number of CICS regions the CSD serves and the number of unique TCPIP SERVICES they require. Then install one such TCPIP SERVICE, named DFHIPIC, or user-defined service name, in each of the interconnected regions.
3. Complete an APPLID table; see the example below. The table must contain the application identifiers (APPLIDs), network IDs, where applicable, TCP/IP port numbers, and host names of all the interconnected CICS regions. If the previously defined TCPIP SERVICE definitions were named anything other than DFHIPIC, the table must contain a .DEFAULT record with `TCPIP SERVICE=servicename` in the HOST column.
4. Copy this table to every system that contains a CSD used by the interconnected regions.
5. Create a JCL that can be used to invoke DFH0IPCC through DFHCSDUP. The example at the end of this topic shows a typical invocation JCL.
6. On one of the CSD-owning systems, use your customized JCL file to invoke the DFH0IPCC utility program.

The JCL issues a DFHCSDUP EXTRACT command, passing the utility program as the *USERPROGRAM*. The DFH0IPCC program examines the specified lists and resource groups in the CSD, collecting information about the CONNECTION and SESSIONS definitions it finds. For each APPC or MRO pair of CONNECTION and SESSIONS definitions, it creates an IPCONN definition. Where appropriate, the attributes of the IPCONN definition are taken from the CONNECTION and SESSIONS definitions, with the values of the remaining attributes taken from the APPLID table or allowed to take their default values. When the utility program has completed an IPCONN definition, it writes a series of DEFINE statements, which form the SYSIN for your resulting DFHCSDUP invocation JCL.

7. Review the output produced by the utility program. Check that the IPCONN definitions are correct for your installation. You might want to modify the default SSL settings to add greater security controls for a particular connection. Modify the USER, PASSWORD, and library names in the generated JCL, to match those used by your location.
8. Run the generated JCL to add the new IPCONN resources to your CSD file.
9. Repeat steps 7 and 8 for each CSD file used by the interconnected CICS regions.

This is an example of an APPLID table, which shows the format you must use. The table following the example has reference information for the table format.

```

*****
*
* Description:
*   This is the Applid Table for DFH0IPCC. This table should contain the
*   APPLIDs, NETWORKIDs (where applicable for foreign network connectivity),
*   PORT numbers and TCP/IP HOST names for all CICS regions in the systems
*   for which IPCONN definitions are to be created.
*
* File Format:
*   This file must be in FB80 format, and relies on a tabular layout shown
*   below. Any characters may be used as separators. Comments can be added
*   using an asterisk in the first column of the line. A HOST name that is
*   too long to fit into the table may be continued by placing an asterisk
*   in column 80, and continuing on column 25 of the next row (the first
*   column of the space for HOST). The APPLID field of any continuation
*   record(s) must be left blank.
*
* Notes:
*   The optional .DEFAULT record (shown below) may be used to provide either
*   one or both of the following parameters:
*   > A TCIPSERVICE name, which should be provided immediately after
*   'TCIPSERVICE=' in the HOST column. If a name is not provided, it will
*   default to 'DFHIPICT'. In either case, this is the name that must be
*   used when defining the TCIPSERVICES for the CICS systems referred to
*   in this table.
*   > A default NETWORKID, which should be provided in the NET-ID column.
*   Its omission will result in the omission of the NETWORKID parameter in
*   the generated IPCONN definition statements for those APPLIDs whose
*   NET-ID column is blank.
*
*   Examples of various valid table entries are shown following the .DEFAULT
*   record. These are examples only, ensure that any non-comment rows adhere
*   to your site's standards and conventions.
*
*   Important! When editing this file, ensure that the CAPS setting is OFF,
*   otherwise the case-sensitive HOST names may be destroyed.
*
*****
*
*****
APPLID. |NET-ID. |PORT.|HOST.
*****
.DEFAULT|LOCALNET|      |TCIPSERVICE=TCPSERV1
APPL1A  |          |9876 |my.local.hostname
OTHERCIC|OTHERNET|12345|this.host.has.a.very.long.name.which.is.going.to.require*
        |          |      |e.a.continuation.record
* Comments such as this are entirely free-form other than the * in column 1
CICSXYZ |          |9875 |10.2.156.221

```

Figure 3. Example 1: APPLID table

Table 31. Format of APPLID table

Table column	Length	Description
APPLID	char 8	Unique identifier, or .DEFAULT. Use .DEFAULT to specify default values for NETID or TCIPSERVICE. The leading dot prevents the word DEFAULT being used as a valid APPLID. Only one .DEFAULT row is allowed in the table.
Separator	char 1	Any alphanumeric character.
NETID	char 8	Network identifier. When left blank, the default NETID specified by the .DEFAULT row is used.
Separator	char 1	Any alphanumeric character.
PORT	char 5	Listening port number
Separator	char 1	Any alphanumeric character
HOST	char 55	TCP/IP host name.
Continuation column	char 1	Normally blank. Any nonblank character in this field indicates that the host name is longer than 55 characters and continues in the HOST column in the following row.

This is an example of JCL that can be used to invoke DFH0IPCC through DFHCSDUP.

```

//IPCJOB   JOB user,CLASS=A,USER=user,PASSWORD=pass
/*ROUTE PRINT user
//CSDUPJOB EXEC PGM=DFHCSDUP,REGION=0M
//STEPLIB DD DSN=loadlibrary,DISP=SHR
//         DD DSN=loadlibrary,DISP=SHR
//DFHCSD   DD DSN=c sdfilename,DISP=SHR
//SYSPRINT DD SYSOUT=A
//CSDCOPY  DD UNIT=VIO
//APPLTABL DD DSN=applidtablename,
//          DISP=SHR,UNIT=SYSDA,SPACE=(CYL,(2,1)),
//          DCB=(RECFM=FB,BLKSIZE=15360,LRECL=80)
//LOGFILE  DD DSN=logfilename,
//          DISP=(MOD,CATLG,CATLG),UNIT=SYSDA,SPACE=(CYL,(2,1)),
//          DCB=(RECFM=FB,BLKSIZE=15360,LRECL=80)
//OUTFILE  DD DSN=outputfilename,
//          DISP=(MOD,CATLG,DELETE),UNIT=SYSDA,SPACE=(CYL,(2,1)),
//          DCB=(RECFM=FB,BLKSIZE=15360,LRECL=80)
//SYSUDUMP DD SYSOUT=A
//SYSABEND DD SYSOUT=A
//SYSIN    DD *
EXTRACT GR(group1) USERPROGRAM(DFH0IPCC) OBJECTS
EXTRACT GR(group2) USERPROGRAM(DFH0IPCC) OBJECTS
EXTRACT GR(list1)  USERPROGRAM(DFH0IPCC) OBJECTS
EXTRACT GR(list2)  USERPROGRAM(DFH0IPCC) OBJECTS
/*
//

```

Figure 4. Example 2: JCL to invoke DFH0IPCC through DFHCSDUP

Using TCP/IP management and control

Migration of existing functions

You can continue to use CICS, including CICSplex SM, without exploiting this new function. If you do not want to use TCP/IP management and control, you have nothing to do for migration.

Migration to the new function

You can make use of the new function with minimal changes to your monitoring and CICSplex SM WUI configurations.

Migrating multiregion operation (MRO)

To migrate CICS multiregion operation (MRO) support, install the latest DFHIRP and DFHC SVC modules in the MVS link pack area (LPA) and carry out tests.

For MRO, the interregion communication program DFHIRP is installed in the link pack area (LPA). The CICS TS for z/OS, Version 3.2 DFHIRP module is compatible with earlier releases, and works with all releases of CICS. However, the CICS TS for z/OS, Version 3.2 version of DFHIRP, required for multiple XCF group support, can be used only on z/OS Version 1.7 or later.

DFHIRP can be used only from the LPA. Therefore in an MVS image you can have only one version of the module named DFHIRP, which must be at the *highest* release level of the CICS regions that run in that MVS image.

In a Parallel Sysplex®, where MRO communication between MVS images is through XCF/MRO, the DFHIRP programs installed in the different MVS images can be at different release levels. However, the DFHIRP in an MVS image must still be installed from the *highest* release of CICS running in that MVS image. For example, a CICS TS 2.3 DFHIRP can communicate with a CICS TS for z/OS, Version 3.2 across XCF/MRO, but the CICS regions running in the MVS with the CICS TS 2.3 DFHIRP cannot be later than CICS TS 2.3.

The following steps are a guide to the migration process for MRO, to install the latest DFHIRP and DFHCSVC modules in the MVS link pack area (LPA). For information about how to perform some of these steps, such as installing the SVC or IRP modules in the LPA, see Installing CICS modules in the MVS link pack area in the *CICS Transaction Server for z/OS Installation Guide*. These steps assume that RACF is your external security manager (ESM).

1. Install the CICS SVC routine, DFHCSVC, in the LPA, and specify a new CICS SVC number for this routine in the MVS SVC Parm table. If the new DFHCSVC has to coexist with an older version, rename one of them so that both versions can be installed in the LPA. However, coexistence is not recommended or necessary: DFHCSVC is compatible with earlier releases and the latest CICS TS version supports all the earlier releases of CICS.
2. Test the new SVC on stand-alone CICS regions, without using any MRO. You can do this running the CICS IVP, DFHIVPOL.
3. Install the CICS interregion communication program, DFHIRP, in a suitable LPA library, and IPL MVS with the CLPA option. Do not use the dynamic LPA function to replace DFHIRP for migration between releases, because you might cause incompatibility between control blocks, resulting in abend situations.
4. Test your production MRO CICS regions, under your existing release of CICS, but using the new SVC number and the new DFHIRP. For this test, run without any logon or bind-time security checking: that is, do not define any RACF FACILITY class profiles.
5. Now define the required DFHAPPL.applid profiles in the RACF FACILITY general resource class. When the profiles are ready for all the MRO regions, test the production regions again with the new SVC and DFHIRP, this time using the FACILITY class profiles for logon and bind-time security checking.
6. If the production MRO regions successfully log on to the new IRP with the new SVC, and bind-time security checking works successfully, use the new DFHIRP and SVC for the production regions.
7. With the production regions running successfully under the CICS SVC and IRP, you can initialize and test some CICS Transaction Server regions using MRO. These test regions can coexist in the same MVS image as the production regions, all using the same SVC and IRP.

Using multiple CICS XCF groups

XCF group limit relief allows multiple XCF groups to contain CICS regions. Although a CICS region can still join only one XCF group, that group need not be DFHIR000. Thus, although each group is still limited to 2047 members, an absolute limit no longer applies to the number of CICS regions that a sysplex can support. The effective limit of 2047 CICS regions that a single sysplex can support has been lifted.

Migration without exploiting the new function

If you are not constrained by the limit of 2047 members of an XCF group, you do not need to take any action. You can continue to use the default DFHIR000 XCF

group; you do not have to specify DFHIR000 explicitly on the XCFCGROUP parameter of the system initialization table and DFHXCOPT EXCI table.

Migrating to multiple CICS XCF groups

If you are constrained by the limit of 2047 XCF group members, you must determine how to split your CICS regions into related groups. Typically, you do not want to create a large number of XCF groups. An obvious method of partitioning many regions is to put the production regions in a different group from the development and test regions.

Even if you are not constrained by the 2047 limit, you can use the XCF group feature to isolate your development and test regions from your production regions.

If you decide to have multiple XCF groups, note these recommendations:

- Put your production regions in a different XCF group from your development and test regions
- Do not create more XCF groups than you need; two, separated as described, may be sufficient
- Try not to move regions between XCF groups
- Try not to add or remove regions from existing XCF groups

Releases of CICS earlier than CICS TS for z/OS, Version 3.2 can join only the DFHIR000 group, so you must first migrate to CICS TS for z/OS, Version 3.2 those systems that need a different XCF group; for example, the production systems.

For details of how to set up and configure XCF/MRO, see *Generating XCF/MRO support*.

Chapter 23. Migrating Java applications

When migrating to a new CICS release, you are likely to require changes to your JVM profiles and to other aspects of your Java environment. You might also require changes to your Java applications and enterprise beans.

CICS TS 3.2 supports the JVM provided by the IBM SDK for z/OS, Java 2 Technology Edition. CICS TS 3.2 supports either Version 1.4.2 or Version 5 of the SDK. Version 5 and Version 1.4.2 of the SDK can co-exist on the same z/OS system, although a CICS region can only use one Java version at a time.

Note: 31-bit and 64-bit versions of the IBM SDK for z/OS, Java 2 Technology Edition are available. CICS TS 3.2 supports only the 31-bit versions. You can find more information about Java on the z/OS platform, and download a suitable version of the SDK, at <http://www.ibm.com/servers/eserver/zseries/software/java/>.

Earlier versions of Java

Java programs that ran under CICS Transaction Server for z/OS, Version 2 Release 2 or CICS Transaction Server for z/OS, Version 2 Release 3 can also run under CICS Transaction Server for z/OS, Version 3. CICS Transaction Server for z/OS, Version 2 supported the JVM created by the IBM Developer Kit for OS/390 Java 2 Technology Edition Version 1.3.1s.

However, the older JVM that was used in CICS Transaction Server for OS/390, Version 1 Release 3 is no longer supported. Any Java programs that ran under CICS Transaction Server for OS/390, Version 1 Release 3 must be migrated to Java 2 to run under the JVM provided by the IBM SDK for z/OS, Java 2 Technology Edition.

When you upgrade from one version of Java to another, check for compatibility issues between the Java APIs, and compatibility issues specific to the IBM SDK for z/OS. You can find this information at <http://www.ibm.com/servers/eserver/zseries/software/java/j5restrict31.html> and <http://www.ibm.com/servers/eserver/zseries/software/java/restrict14.html>, and in the Java compatibility and deprecated API information provided by Sun Microsystems Inc. at <http://java.sun.com>.

To avoid potential problems with deprecated APIs, you should develop all new Java programs for CICS Transaction Server for z/OS, Version 3 Release 2 using an application development environment that supports Java 2 at the same version of Java as used by CICS. You may run code compiled with an older version of Java in a new runtime, if it does not use APIs that have been removed in the newer version of Java.

In CICS Transaction Server for z/OS, Version 3 Release 2, resettable JVMs, which were reset between each use, are no longer supported. Any Java programs that ran in resettable JVMs must be migrated to run in continuous JVMs. Continuous JVMs generally perform better and are more consistent with other versions of Java. The migration process involves ensuring that the Java programs behave as expected when a continuous JVM is reused by a subsequent program.

JVM profiles

If you already have JVM profiles and JVM properties files that you set up in a previous CICS release, you might want to migrate these for use with the new CICS release. The settings that are suitable for use in JVM profiles can change from one CICS release to another, so check the CICS documentation for any significant changes, and compare your existing JVM profiles to the latest CICS-supplied samples. Changes to the JVM profile options in this CICS release are documented in the *CICS Transaction Server for z/OS Release Guide*. A list of suitable options for the present release is in *Java Applications in CICS*. For JVM profiles created more than one or two releases ago, you are recommended to use the new samples supplied with CICS Transaction Server for z/OS, Version 3 Release 2 to help you create new files, rather than migrating your existing files.

Make a copy of your JVM profiles in a new location on z/OS UNIX to use with the new CICS release, and make the changes that are required to migrate them (for example, changing the path for the home directory for CICS files on z/OS UNIX). Do not try to use JVM profiles with more than one CICS release at the same time, because the settings will not be compatible.

Ensure that the JVM profiles you want to use are in the z/OS UNIX directory that is specified by the **JVMPROFILEDIR** system initialization parameter. *Java Applications in CICS* explains how to set the location for the JVM profiles.

The JVM profiles DFHJVMPR and DFHJVMCD, and their associated JVM properties files, must always be available to CICS and configured so that they can be used in your CICS region. *Java Applications in CICS* tells you how to do this.

Key changes to CICS support for Java applications

Summarizes the changes that have a migration impact for your Java environment.

- In CICS Transaction Server for z/OS, Version 3 Release 2, resettable JVMs, which were reset between each use, are no longer supported. Any Java programs that ran in resettable JVMs must be migrated to run in continuous JVMs. Resettable JVMs had the option REUSE=RESET in their JVM profiles (or the older option Xresettable=YES). All the CICS-supplied sample JVM profiles for reusable JVMs now specify the option REUSE=YES, rather than REUSE=RESET. This includes the default JVM profile DFHJVMPR, and the JVM profile DFHJVMCD for CICS-supplied system programs.
- CICS Transaction Server for z/OS, Version 3 Release 2 can now support the JVM provided by the 31-bit version of IBM SDK for z/OS, Java 2 Technology Edition, Version 5. Version 1.4.2 is also still supported. If you want to start using Java 5, you can install Version 5 of the SDK and migrate some or all of your CICS regions to use it instead of Version 1.4.2.
- The Language Environment run-time library SCEERUN2 is now required to support the IBM JVM, in addition to the Language Environment run-time library SCEERUN. In your CICS startup job, the library SCEERUN2 must be defined in both the STEPLIB and DFHRPL concatenations. Both the libraries, SCEERUN and SCEERUN2, must be APF-authorized. For more information, see Installing CICS support for Language Environment in the *CICS Transaction Server for z/OS Installation Guide*.
- The library SDFJAUTH is now required for Java support. SDFJAUTH is the partitioned data set extended (PDSE) version of SDFHAUTH, and it contains some of the components of the SJ domain. A separate library is needed because these components are now built using XPLink (Extra Performance Linkage). As

for the SDFHAUTH library, the SDFJAUTH library must be APF-authorized by adding it to the list of APF-authorized libraries in an appropriate member in SYS1.PARMLIB, and a STEPLIB DD statement must be provided for it in your startup job stream. Authorizing the CICS and CICSplex® SM libraries in the *CICS Transaction Server for z/OS Installation Guide* describes this procedure for the SDFHAUTH library, and you can follow the same procedure for the SDFJAUTH library.

- JVM profiles, which contain the JVM initialization options, are now kept as z/OS UNIX files, rather than as members of a partitioned data set (PDS). The DFHJVM DD card in the CICS startup JCL, which referred to the PDS for the JVM profiles, is no longer required and should be removed. You can use several different JVM profiles in the same CICS region, and each is stored as a separate z/OS UNIX file. The name of each JVM profile (that is, the name of the z/OS UNIX file) must still be eight characters or less, so that it can be used in program definition. Use the JVMPROFILE attribute of a PROGRAM resource definition to name the JVM profile which is used to construct the JVM that runs the program. If you have modified the supplied sample JVM profiles DFHJVMPR and DFHJVMPD, and you want to re-use them, you can migrate these from PDS members to z/OS UNIX files, which you can do using the OCOPY TSO command. However, there are a number of changes to the options that you can specify in JVM profiles and JVM properties files, so you are recommended to use the new samples supplied with CICS Transaction Server for z/OS, Version 3 Release 2 to help you create new files, rather than migrating your existing files.
- Because JVM profiles are now z/OS UNIX files, case is important. When you specify the name of a JVM profile (for example, in a PROGRAM resource definition), you must enter it using the same combination of upper and lower case characters that is present in the z/OS UNIX file name. The CEDAS panels accept mixed case input for the JVMPROFILE field irrespective of your terminal's UCTRAN setting. However, this does not apply when values for this field are supplied on the CEDAS command line, or when you are using another CICS transaction such as CEMT or CECI. If you need to enter the name of a JVM profile in mixed case when you use CEDAS from the command line or when you use another CICS transaction, ensure that the terminal you use is correctly configured, with upper case translation suppressed.
- CICS-defined programs now have their own JVM profile, DFHJVMCD, to make them independent of any changes you make to the default JVM profile DFHJVMPR. DFHJVMCD is used by the default request processor program DFJIIRP, which is used by the CICS-supplied CIRP request processor transaction, and by DFJIIRQ, the CICS-key equivalent of DFJIIRP. DFHJVMCD has an associated JVM properties file, dfjjvmcd.props. You need to make changes to DFHJVMCD and dfjjvmcd.props to ensure that the settings in them are suitable for your installation (including the configuration for your JNDI nameserver). Customizing or creating JVM profiles and JVM properties files in *Java Applications in CICS* tells you how to do this. If you are using Java 1.4.2, you also need to add classes to the shareable application class path for the applications that will use the request processor program, otherwise add them to the standard class path. For enterprise beans, you need to add any classes, such as classes for utilities, that are required by your enterprise beans but are *not* included in the deployed JAR files for the enterprise beans. For CORBA stateless objects, you need to add the JAR files for the applications and any additional classes that are required. Enabling applications to use a JVM in *Java Applications in CICS* tells you how to do this.
- The user-replaceable program DFHSJJ8O, which was used in CICS Transaction Server for z/OS, Version 2 Release 1 and CICS Transaction Server for z/OS, Version 2 Release 2 to construct the Language Environment enclave for the

JVM, has been replaced by the user-replaceable program DFHJVMRO, which performs the same functions. If you had modified the settings specified in DFHSJJ8O to match more closely with the storage usage of your JVMs, you should repeat this process with DFHJVMRO, bearing in mind that the storage usage of your JVMs might have changed. Tuning Language Environment enclave storage for JVMs in the *CICS Performance Guide* tells you how to carry out this tuning process, and Using DFHJVMRO to modify the Language Environment enclave for a JVM in the *CICS Customization Guide* tells you how to modify the settings in DFHJVMRO.

- CICS now uses the z/OS shared library region, which enables address spaces to share dynamic link library (DLL) files. This feature enables your CICS regions to share the DLLs that are needed to create JVMs, rather than each region having to load them individually. The storage that is reserved for the shared library region is allocated in each CICS region when the first JVM is started in the region. The amount of storage that is allocated is controlled by the SHRLIBRGNSIZE parameter in z/OS. The minimum is 16M, and the z/OS default is 64M. You should check the setting for this parameter and, if necessary, tune it. *CICS Performance Guide* tells you how to carry out this tuning process.
- You can set up a shared class cache in each of your CICS regions, to enable the JVMs in each CICS region to share commonly-used class files and compiled classes. This means that the JVMs can start faster, and you can reduce the cost of class loading. Most JVMs can use the shared class cache, but if you do not want certain JVMs to use it, you can set them to run independently (to be standalone JVMs). The shared class cache in *Java Applications in CICS* has more information about this topic.

Invoking multiple Java programs in the same CICS task

The one-JVM-per-stack restriction has been removed. Multiple JVMs can now be allocated to a CICS task.

Previously, a stack of programs formed by a succession of EXEC CICS LINK commands, or JCICS program invocations, within the same CICS task, could not contain more than one JVM. (Distributed program link (DPL) requests were not restricted in this way.) As a CICS task could only use one JVM, applications designed in this way could only contain one Java component.

Now, you can create an application that links together multiple Java programs in the same CICS region. You can also convert your existing complex applications piece by piece, by replacing programs written in other languages with programs written in Java.

Enterprise beans can now link to another Java program within the same CICS task. However, a single CICS task still cannot contain more than one enterprise bean, because CICS treats an execution of an enterprise bean as the start of a new task. You can create an application that includes more than one enterprise bean, but the application will not operate as a single task.

Execution key for Java programs that run in a JVM

In CICS Transaction Server for OS/390, Version 1 Release 3 and CICS Transaction Server for z/OS, Version 2 Release 2, CICS made all Java programs execute in CICS key, but they now execute as specified by the EXECKEY parameter on the PROGRAM resource definition.

The default for this parameter is EXECKEY(USER), which means that the program runs in a JVM that executes in user key. (The J9 TCB, an open TCB, is used for these JVMs.) As running applications in user key extends CICS storage protection, it could be beneficial to let most of your Java programs run in a JVM in user key.

You might find that in most cases, the PROGRAM resource definitions for your Java programs are still set to the default of EXECKEY(USER). If you changed the EXECKEY parameter on the PROGRAM resource definitions for any of your Java programs to specify EXECKEY(CICS), you will need to change them back to EXECKEY(USER) if you want them to run in user key. No changes are needed to your JVM profiles, because you can use the same JVM profile to create JVMs in both storage keys.

However, you might need to execute a JVM in CICS key if the Java program that uses the JVM is part of a transaction that specifies TASKDATAKEY(CICS). If this is the case, you need to ensure that the PROGRAM resource definition for the Java program specifies EXECKEY(CICS). Before CICS Transaction Server for z/OS, Version 2 Release 3, this setting would not have mattered, because CICS would have forced the program to execute in CICS key.

For enterprise beans, CIRP (the default transaction for REQUESTMODEL definitions) specifies TASKDATAKEY(USER), and the PROGRAM resource definition for DFJIIRP (the default request processor program) specifies EXECKEY(USER), so by default enterprise beans run in user key.

A JVM can be reused by programs that specify the same execution key on their PROGRAM resource definition. You can use the INQUIRE JVM command to find out the execution key in which a JVM has been invoked. A single CICS task can include Java programs running in CICS key, and Java programs running in user key.

Changes to options in JVM profiles and JVM properties files

A reference for the new, changed, and obsolete options in JVM profiles and JVM properties files.

Table 32. Changed options in JVM profiles and JVM properties files

Option	Status	CICS and Java launcher action	Replace with	Notes
REUSE=RESET	Obsolete	JVM does not start	REUSE=YES	CICS issues message DFHSJ0524 if found.
Xresettable=YES	Obsolete	JVM does not start	REUSE=YES	CICS issues message DFHSJ0525 if found.
ibm.jvm.crossheap.events	Obsolete	Java launcher ignores	n/a	Only used in resettable JVM.
ibm.jvm.events.output	Obsolete	Java launcher ignores	n/a	Only used in resettable JVM.
ibm.jvm.reset.events	Obsolete	Java launcher ignores	n/a	Only used in resettable JVM.
ibm.jvm.resettrace.events	Obsolete	Java launcher ignores	n/a	Only used in resettable JVM.
ibm.jvm.unresettable.events.level	Obsolete	Java launcher ignores	n/a	Only used in resettable JVM.

Table 32. Changed options in JVM profiles and JVM properties files (continued)

Option	Status	CICS and Java launcher action	Replace with	Notes
Xinitacsh	Obsolete	Java launcher ignores	Add value to -Xinitsh	Only used in resettable JVM.
Xinitth	Obsolete	Java launcher ignores	Add value to -Xms	Only used in resettable JVM.
TMPREFIX	Obsolete	CICS prefixes to shareable application class path	CLASSPATH_PREFIX (see note 1)	CICS issues message DFHSJ0521 if found. Move classes with care.
TMSUFFIX	Obsolete	CICS places on shareable application class path	CLASSPATH_SUFFIX (see note 1)	CICS issues message DFHSJ0522 if found.
MAX_RESETS_TO_GC	Obsolete	CICS ignores and uses default for GC_HEAP_THRESHOLD	GC_HEAP_THRESHOLD	CICS issues message DFHSJ0528 if found.
-Dibm.jvm.shareable.application.class.path	Obsolete for Java 5	CICS adds entries to standard classpath	CLASSPATH_SUFFIX	Still valid for Java 1.4.2.
-generate (for STDOUT, STDERR)	Enhanced	Accepted	n/a	Now adds unique JVM number to generated output file names, in addition to CICS region applid, time stamp and suffix.
CICS_DIRECTORY	Renamed	CICS treats as CICS_HOME	CICS_HOME	CICS issues message DFHSJ0534 if found.
LIBPATH	Replaced by new equivalents	CICS treats as LIBPATH_SUFFIX	LIBPATH_SUFFIX (LIBPATH_PREFIX also available)	CICS issues message DFHSJ0538 if found. You do not need to specify directories for base library path, only directories that you add.
CLASSPATH	Replaced by new equivalents	CICS treats as CLASSPATH_SUFFIX	CLASSPATH_SUFFIX (CLASSPATH_PREFIX also available)	CICS issues message DFHSJ0523 if found.
VERBOSE	Withdrawn from sample profiles	Accepted	-verbose:gc	Works as before if specified in old format.
Xcheck (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xcheck	Only specify this if other than JVM default.
Xdebug (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xdebug (no value) to set debug on	Only specify this if other than JVM default.
Xnoclassgc (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xnoclassgc (no value) to specify no class garbage collection	Only specify this if other than JVM default.
Xverify (JVM default is remote)	Withdrawn from sample profiles	Accepted	n/a	Do not specify, use JVM default.

Table 32. Changed options in JVM profiles and JVM properties files (continued)

Option	Status	CICS and Java launcher action	Replace with	Notes
IDLE_TIMEOUT	New	Defaults to 30 minutes	n/a	Used to specify timeout threshold.
GC_HEAP_THRESHOLD	New	Defaults to 85%	n/a	Used to specify heap utilization limit for CICS-scheduled garbage collection
CICS_HOME	New, replaces CICS_DIRECTORY	Preferred	n/a	Used to specify home directory for CICS files in the z/OS UNIX file system.
CLASSPATH_PREFIX, CLASSPATH_SUFFIX	New, replace CLASSPATH	Preferred	n/a	Used for standard class path.
LIBPATH_PREFIX, LIBPATH_SUFFIX	New, replace LIBPATH	Preferred	n/a	Used for library path.
JAVA_DUMP_OPTS	New for CICS sample profiles	UNIX System Services environment variable set	n/a	Used to set dump options.
JAVA_DUMP_TDUMP_PATTERN	New for CICS sample profiles	UNIX System Services environment variable set	n/a	Used to specify location for Java dumps.
DISPLAY_JAVA_VERSION	New for CICS sample profiles	Preferred	n/a	Used to show JVM version in CICS MSGUSR log.
Note: 1. If you are using Java 1.4.2 then use the <code>-Dibm.jvm.shareable.application.class.path</code> system property.				

Undocumented options

Table 32 on page 143 lists only the options which were formerly used in the CICS-supplied sample files, together with the new options. Some options for JVM profiles and JVM properties files did not appear in the CICS-supplied sample files in previous CICS releases, but were documented in the CICS documentation. Some of these options have now been removed from the CICS documentation.

The `java.compiler` option has been undocumented because its primary use was to disable the Java just-in-time (JIT) compiler during the development process for applications in a resettable JVM. In a continuous JVM, this option is not required for that purpose.

The remaining undocumented options are still valid, but they can now be specified in the standard Java way (rather than in a special way for CICS), and so the documentation for the IBM SDK for z/OS, Java 2 Technology Edition and other Java documentation can be used. If you have any of these options in an existing JVM profile for CICS, they are still accepted.

The main categories of valid options which have been undocumented are:

- The options relating to assertions. You can find more information about programming with assertions, and about enabling and disabling assertions, at <http://java.sun.com/j2se/1.4.2/docs/guide/lang/assert.html>.

- Various Java nonstandard options (beginning with -X), including -Xmaxe, -Xmaxf, -Xmine, -Xminf, -Xrundllname and -Xrs. You can find more information about these options in *Persistent Reusable Java Virtual Machine User's Guide*, SC34-6201.
- Various JVM system properties, most of which should not be changed by users of the IBM JVM with CICS.

-Xquickstart option

In some earlier versions of CICS, you could use the -Xquickstart option (specified using the Xservice option) in a JVM profile to reduce the startup time for the JVM. However, with improvements in JVM technology, the -Xquickstart option is now permanently enabled, and specifying -Xquickstart in a JVM profile has no effect.

New symbol &JVM_NUM;

When the &JVM_NUM; symbol is used in a value in a JVM profile (for example, as part of the file name for a Java dump), CICS substitutes the unique JVM number for it at runtime. The new symbol can be specified for any type of output from the JVM, and it can be used in combination with the &APPLID; symbol (which provides the CICS region applid). The **-generate** option for stdout and stderr files also now adds the unique JVM number automatically.

DFHJVMAT

DFHJVMAT is a user-replaceable program that you can use to override the options specified in a JVM profile. It can only be used for a single-use JVM, and not for a continuous JVM. The use of DFHJVMAT is not recommended for new development.

Only certain options in JVM profiles are available to DFHJVMAT. There are changes to the list of available options, as follows:

CICS_DIRECTORY

No longer available

CICS_HOME

New, replaces CICS_DIRECTORY

CLASSCACHE_MSGLOG

New

CLASSPATH

No longer available

CLASSPATH_PREFIX, CLASSPATH_SUFFIX

New, replace CLASSPATH

JAVA_DUMP_OPTS

New

LIBPATH

No longer available

LIBPATH_PREFIX, LIBPATH_SUFFIX

New, replace LIBPATH

TMPPREFIX, TMSUFFIX

No longer available

Xresettable

No longer available

Several of the options available to DFHJVMAT are among the Java nonstandard options which have been undocumented. There is no further information about these options in the CICS documentation, and information about these can be found in the documentation for the IBM SDK for z/OS, Java 2 Technology Edition and other Java documentation.

Migrating from resettable to continuous JVMs

CICS Transaction Server for z/OS, Version 3 Release 2 no longer supports resettable JVMs. You must migrate any Java programs that ran in resettable JVMs, to run in continuous JVMs. The migration process involves checking for certain actions in the program code, and then changing some options in your JVM profiles.

To migrate Java programs that ran in resettable JVMs to run in continuous JVMs, follow these steps:

1. Check that your Java programs do not contain any code that might have an unwanted effect on serial isolation when the continuous JVM is reused by a subsequent program. Carry out these checks
 - a. Check for any code that changes the state of the JVM; for example, changing the default time zone. Ensure that the program resets the JVM to the original state. If you need to police any application actions in the continuous JVM, use the Java security manager to do this.
 - b. Check that any DB2 connections, or other task lifetime system resources, opened by the application are closed or released.
 - c. Use the CICS JVM Application Isolation Utility to check for the use of any static variables in your Java programs. The use of static variables might cause Java programs that were designed to execute in a resettable JVM to exhibit changed behavior when they execute in a continuous JVM. Possible Java application behavior changes in continuous JVMs explains potential problems. Review the findings of the utility and make any code changes that are necessary to preserve the original behavior. Auditing Java applications for the use of static variables tells you how to use the utility.
2. Examine the existing JVM profiles and JVM properties files for your applications. You can either make a new copy of your existing files and make changes to the options specified in them, or transfer the relevant settings from your existing files to new files based on the samples provided with CICS Transaction Server for z/OS, Version 3 Release 2. There are a number of changes to the options that you can specify in JVM profiles and JVM properties files, so you are recommended to use the new samples to help you create new files, rather than migrating your existing files.
3. Compare your existing JVM profiles and JVM properties files with the new CICS-supplied samples, and with the table of changed options shown in Changes to options in JVM profiles and JVM properties files. Identify the options and system properties which you customized in your existing files, and note any that are now obsolete or that you must specify differently.
4. Either transfer relevant settings from your existing files to new files based on the new CICS-supplied samples, or make appropriate changes to a new copy of your existing files. The most important changes to make are:
 - a. Set the correct CICS and Java home directories to match your CICS Transaction Server for z/OS, Version 3 Release 2 installation. The CICS-supplied samples already specify the correct directories.
 - b. Change REUSE=RESET to REUSE=YES or replace **Xresettable** with REUSE=YES.

- c. Add the paths to classes that were specified on class paths in your existing files to the appropriate class path in the new files. There are a number of changes to the way class paths are specified in CICS Transaction Server for z/OS, Version 3 Release 2. "Migrating class paths in JVM profiles" on page 153 explains how to handle each of the changed class paths.
- d. Migrate your storage settings from the existing files to the new files. The way in which a continuous JVM uses storage differs in some respects from the way a resettable JVM uses storage. Migrating storage settings in JVM profiles from resettable JVMs explains how to specify suitable storage settings as a starting point for your continuous JVMs.

When you use the JVM profiles, if you have omitted any key changes, CICS issues warning messages to explain what changes are still required.

Possible Java application behavior changes in continuous JVMs

Because there is no reset operation in the continuous JVM, applications that were designed to execute in a resettable JVM might exhibit changed behavior when they execute in a continuous JVM. You might have to make changes to an application in order to preserve its original behavior while running in a continuous JVM.

In a resettable JVM, the state of the JVM was reset after each use, so that no application transaction (that is, code other than trusted middleware code) could affect the operation of subsequent transactions. The JVM reset cleaned up the JVM's storage heaps, reinitialized shareable application classes, and discarded and reloaded nonshareable application classes, meaning that no objects other than trusted static middleware objects could persist in the JVM from one use of the JVM to the next.

The continuous JVM does not reset the JVM's state between uses. This continuity enables the persistence of static objects across tasks, which can be a powerful tool when used deliberately. For example, an application developer can use caching techniques to avoid reinitializing objects on each use. It can also, however, be a source of unexpected and erroneous behavior unless it is handled carefully.

Example 1: Altering static variables

The most common type of state change that an application can make is to alter the value of a static variable. static variables are shared by all instances of a class, unlike nonstatic variables, which are allocated separately for each instance.

In a resettable JVM, when a class is first loaded, the JVM takes a copy of the initial value of each static variable and uses it to restore the variable to its original state at the end of each transaction. Consider the following trivial case:

```
public class HelloWorld
{
    public static int count = 0;

    public static void main(String args[])
    {
        count++;
        System.out.println("Hello World, count is " + count);
    }
}
```

In a resettable JVM, the static variable count is reset to zero by the JVM after each invocation of the HelloWorld main() method. The message therefore shows that count is 1 each time HelloWorld is invoked.

In a continuous JVM, however, count is not reset to its original value before the next invocation of the main() method, and the old, shared, value persists. The message therefore shows the count increasing by 1 on each invocation in subsequent transactions.

To preserve the original behavior while running in a continuous JVM, the HelloWorld class could be changed to make count an instance variable and initialise it on each invocation in a constructor:

```
public class HelloWorld
{
    public int count = 0;

    public static void main(String args[])
    {
        HelloWorld hw = new HelloWorld();
        hw.count++;
        System.out.println("Hello World, count is " + hw.count);
    }

    HelloWorld()
    {
        count = 0;
    }
}
```

Example 2: Altering the contents of static objects

A more subtle type of issue can arise when the static variable is an object reference whose internal state might change, as in this example:

```
import java.util.Hashtable;
import java.util.Enumeration;

class StaticHash
{
    private static final Hashtable myHashtable = new Hashtable();

    public static void main(String[] args)
    {
        int count = myHashtable.size();
        myHashtable.put("key" + count, "value" + count);

        Enumeration keys = myHashtable.keys();
        while (keys.hasMoreElements())
        {
            Object key = keys.nextElement();
            System.out.println("Found this key in the Hashtable: " + key);
        }
    }
}
```

In a resettable JVM, a new instance of myHashtable is created every time the JVM is reset, and it will only ever contain a single key, "key0". In a continuous JVM, however, only one instance of myHashtable is created, and each time the class is run, a new key is added to it.

You can solve the problem in a similar manner to the first example, by making myHashtable an instance variable and creating the new Hashtable in a constructor. Alternatively, myHashtable could be left as a static reference and be reset each time by adding a constructor containing an invocation of myHashtable.clear().

Auditing Java applications for the use of static variables

The CICS JVM Application Isolation Utility helps system administrators and application programmers to discover static variables in Java applications that they use or plan to use in their CICS regions. Application developers then review the findings of the utility and determine whether or not the application might exhibit unintended behavior when it runs in a continuous JVM. You can use the utility when migrating Java workloads from resettable to continuous JVMs.

The CICS JVM Application Isolation Utility is shipped with CICS Transaction Server for z/OS, Version 3 Release 2 as a JAR file named `dfhjaiu.jar`. It runs under z/OS UNIX System Services as a standalone utility. You do not need to have a CICS Transaction Server for z/OS, Version 3 Release 2 region or any other CICS region running when you use the utility.

The CICS JVM Application Isolation Utility is a code analyzer tool that inspects Java bytecodes in Java Archive (JAR) files and class files. It does not alter any Java bytecodes. It helps identify potential issues before they arise in a continuous JVM under CICS. The Java application does not need to be running in a CICS region when it is inspected.

To inspect Java applications using the CICS JVM Application Isolation Utility, follow these steps:

1. Confirm that the CICS-supplied file `dfhjaiu.jar`, which is the CICS JVM Application Isolation Utility, is present in the `/utils/isolation` subdirectory of the home directory for CICS files on z/OS UNIX. The default name for the home directory is `/usr/lpp/cicsts/cicsts32/`, where `cicsts32` is defined by the USSDIR installation parameter when you installed CICS TS for z/OS, Version 3.2. You can add the `/utils/isolation` directory to the PATH environment variable in z/OS UNIX System Services, so that you do not need to give the full path to the file when you run the utility.
2. Confirm that the shell script `DFHIsoutil`, which is used to run the CICS JVM Application Isolation Utility, is also present in the `/utils/isolation` subdirectory of the home directory for CICS files on z/OS UNIX. Check that the script file specifies the correct value for the CICS_HOME environment variable, and edit the file to change this if necessary.
3. Identify the class files or JAR files that you want to specify to the utility for inspection. Bear these points in mind:
 - a. A Java application can involve classes and JAR files that are specified on several different class paths in the JVM profile or JVM properties file. Make sure you include all of them in your inspections.
 - b. You can use wildcard characters in the file names, to inspect all the class files or JAR files in a given directory.
 - c. When you specify a JAR file for inspection, the utility inspects all the classes contained in the JAR file.
 - d. If you specify an individual class file for inspection, the utility inspects only the named class. If the class includes inner classes, the utility does not automatically inspect these. Specifying JAR files, or using wildcards to inspect a whole directory, ensures that any inner classes are included in the inspection.
4. Log in to a z/OS Unix System Services shell, and enter the command
`DFHIsoutil [-verbose] filename [filename ... filename]`

In this command:

- a. DFHIsoUtil is the name of the script file which runs the CICS JVM Application Isolation Utility. If you have not set an appropriate PATH environment variable and you are not working in the directory containing the script file, give the full path to the file, for example /usr/lpp/cicsts/cicsts32/utlis/isolation/DFHIsoUtil.
- b. The **-verbose** option makes the utility provide additional information. See “The -verbose option” on page 152.
- c. *filename* specifies the names of one or more class files or JAR files that you have identified for the utility to inspect. Separate each file name with a space. Give the full path to the files if necessary. You can use wildcard (glob) characters in the file names.

For example, to inspect the class file HelloWorld and obtain the standard report (not the verbose report), enter the command

```
DFHIsoUtil HelloWorld.class
```

5. The report produced by the CICS JVM Application Isolation Utility is written to System.out. You can redirect it to another destination as required.
6. Review the findings of the utility and then examine the source code for your Java applications. The reports produced by the utility identify some potential issues, but you must check whether or not these affect the behavior of the application when it runs in a continuous JVM.

Example 1: Report showing alteration of static variables

When you use the CICS JVM Application Isolation Utility to inspect the HelloWorld class file used in Example 1 in “Possible Java application behavior changes in continuous JVMs” on page 148, the report looks like this:

```
CicsIsoUtil: CICS JVM Application Isolation Utility
```

```
Copyright (C) IBM Corp. 2006
```

```
Reading Class File: HelloWorld.class
```

```
Method: public static void main(java.lang.String[])
  Static fields written in this method:
    public static int count
```

```
Method: <clinit> (Class Initialization)
  Static fields written in this method:
    public static int count
```

```
Number of methods inspected      : 3
Total static writes for this class: 2
```

```
Number of Jar Files inspected    : 0
Number of Class Files inspected  : 1
```

The report shows that the static field count is written to during Class Initialization and in the main() method. The report indicates that count might behave differently when the class is used in a continuous JVM, rather than in a resettable JVM. The application programmer must examine the source code to decide whether count really does behave differently.

Example 2: Report showing alteration of the contents of static objects

When the CICS JVM Application Isolation Utility is used to inspect the StaticHash class file used in Example 2 in “Possible Java application behavior changes in continuous JVMs” on page 148, the report looks like this:

CicsIsoUtil: CICS JVM Application Isolation Utility

Copyright (C) IBM Corp. 2006

Reading Class File: StaticHash.class

```
Method: <clinit> (Class Initialization)
Static fields written in this method:
    private static final java.util.Hashtable myHashtable
```

```
Number of methods inspected      : 3
Total static writes for this class: 1
```

```
Number of Jar Files inspected    : 0
Number of Class Files inspected  : 1
```

Note that the static variable `myHashtable` is only written to during Class Initialization, but the internal state of the `Hashtable` changes on each invocation.

This problem is more difficult to assess. The output of the utility identifies that a static object exists. In this case, the object is a hash table; other items such as arrays might also be in this situation. The application developer must check the source code of the application to ensure that the state of the static object is not changed in a way that unintentionally affects subsequent invocations of the class in a continuous JVM.

You must also check the entire graph of other objects that might be referenced from the original static object. Any static object can contain state of its own. This state can include further objects that are not defined as static, but are included within the static context of the parent object. A large graph of objects can be built up in this way, where only the root object is declared as static, but state held in any of the objects might be available for use by subsequent applications, because of the static root object. The application developer must check for application isolation problems at every level of the object graph, in addition to checking at the root level.

The `-verbose` option

Normally, the CICS JVM Application Isolation Utility does not print details of methods which do not write to static variables, or details of static final String variables. With the `-verbose` option specified, the utility does print these extra details and also lists all static method invocations made.

This additional information can identify other potential problems with your applications. For example, this extract from a report shows code relating to the resettable JVM:

```
Static methods invoked by this method:
    boolean isResettableJVM()
        (defined in class: com.ibm.jvm.ExtendedSystem)
```

All methods in the `com.ibm.jvm.ExtendedSystem` class are related to the resettable JVM. They are all deprecated, and you should remove them from any application code.

Migrating storage settings in JVM profiles from resettable JVMs

You will probably need to adjust and tune the storage-related options in your JVM profiles when you migrate applications to run in continuous JVMs.

When you migrate an application from a resettable JVM to run in a continuous JVM, initially deal with each storage option that you have specified in the JVM profile as

shown in Table 33. The actions that you take depend on the version of the IBM SDK for z/OS, Java 2 Technology Edition that you are using for Java support.

Table 33. Migrating storage options in JVM profiles

Option (if specified)	Action for Version 1.4.2 of SDK	Action for Version 5 of SDK
-Xmx	Use the setting from the resettable JVM profile	Use the setting from the resettable JVM profile
-Xinitth	Comment out (no longer used)	Comment out (no longer used)
-Xms	Take the setting from the resettable JVM profile and increase it by the value of -Xinitth from the resettable JVM profile	Take the setting from the resettable JVM profile and increase it by the values of -Xinitth and -Xinitacsh from the resettable JVM profile
-Xinitacsh	Comment out (no longer used)	Comment out (no longer used)
-Xinitsh	Take the setting from the resettable JVM profile and increase it by the value of -Xinitacsh from the resettable JVM profile	Comment out (no longer used)

These suggestions assume that the continuous JVM is running the same application or applications as the resettable JVM; that is, you are changing an existing resettable JVM profile to become a continuous JVM profile. If the mix of applications running in the continuous JVM is different, your choice of storage settings will not fit this model.

These suggestions also assume that the storage settings for the resettable JVM were correctly tuned for the needs of your applications. If that is not the case, migrating the storage settings according to this model will not improve that situation. In particular, note that the **-Xinitsh** option and the **-Xinitacsh** option only specify the *initial* storage allocations for the system heap and application-class system heap, and the JVM profile does not specify a maximum size for these heaps. The maximum size of these heaps was restricted only by the storage available in the Language Environment enclave for the JVM. If you tuned the storage for the resettable JVM, the **-Xinitsh** option and the **-Xinitacsh** option will already be set to the amount of storage that is actually used by the application.

Use your new settings as a starting point for the continuous JVM. The way in which storage is used in a continuous JVM differs in some respects from the way it is used in a resettable JVM. In particular, bear in mind that the storage heaps in continuous JVMs are not automatically cleaned up after each program invocation. Because of this, depending on the application design and the extent to which each program cleans up after itself, compared to a resettable standalone JVM running the same workload, the continuous JVM might require either larger storage heap sizes or more frequent garbage collection.

Migrating class paths in JVM profiles

There are a number of changes to the way class paths are specified in CICS Transaction Server for z/OS, Version 3 Release 2. You must identify an appropriate class path for each of the items that you specified on class paths in your existing JVM profiles and JVM properties files.

For migration purposes, if you continue to specify items on class paths using the old options, CICS accepts these options and builds them into an appropriate class path.

If you are using IBM SDK for z/OS, Java 2 Technology Edition, Version 1.4.2 for Java support, which is the default for CICS Transaction Server for z/OS, Version 3 Release 2, the three class paths are built using the options in the order shown here:

Library path for Java 1.4.2

1. LIBPATH_PREFIX
2. CICS-supplied DLL files in the CICS_HOME/lib and CICS_HOME/ctg directories
3. IBM SDK-supplied DLL files in the JAVA_HOME/bin and JAVA_HOME/bin/classic directories
4. LIBPATH (old option)
5. LIBPATH_SUFFIX

Shareable application class path for Java 1.4.2

1. TMPREFIX (old option)
2. CICS-supplied jar files in the CICS_HOME/lib directory
3. IBM SDK-supplied jar files in the JAVA_HOME/standard directory
4. TMSUFFIX (old option)
5. ibm.jvm.shareable.application.class.path

Standard class path for Java 1.4.2

1. CLASSPATH_PREFIX
2. CLASSPATH (old option)
3. CLASSPATH_SUFFIX

If you have migrated to use IBM SDK for z/OS, Java 2 Technology Edition, Version 5 for Java support, where there is no shareable application class path, the two class paths are built using the options in the order shown here:

Library path for Java 5

1. LIBPATH_PREFIX
2. CICS-supplied DLL files in the CICS_HOME/lib and CICS_HOME/ctg directories
3. IBM SDK-supplied DLL files in the JAVA_HOME/bin and JAVA_HOME/bin/classic directories
4. LIBPATH (old option)
5. LIBPATH_SUFFIX

Standard class path for Java 5

1. TMPREFIX (old option)
2. CLASSPATH_PREFIX
3. CICS-supplied jar files in the CICS_HOME/lib directory
4. IBM SDK-supplied jar files in the JAVA_HOME/standard directory
5. TMSUFFIX (old option)
6. ibm.jvm.shareable.application.class.path (old option)
7. CLASSPATH (old option)
8. CLASSPATH_SUFFIX

Migrating class paths in JVM profiles: library path

In CICS Transaction Server for z/OS, Version 3 Release 2, the base library path is not visible in the JVM profile. You specify only any additional dynamic link library (DLL) files that you added to the library path. The option to use for this is `LIBPATH_SUFFIX`.

The base library path for the JVM is built automatically using the directories specified by the `CICS_HOME` and `JAVA_HOME` options in the JVM profile. It includes all the DLL files required to run the JVM, and the native libraries used by CICS. In previous CICS releases, you specified the base library path explicitly in the JVM profile, but now that is not required.

The `LIBPATH` option in the JVM profile is no longer used. For migration purposes, it is still accepted, but CICS issues a warning message when it is found (DFHSJ0538). If you leave any classes specified on this option, they are placed on the library path after the base library path.

You can extend the library path using the `LIBPATH_SUFFIX` option. When CICS builds the library path, these items are placed on the library path after the base library path directories. When you are creating, changing, or migrating JVM profiles, any items that you added to the library path in previous CICS releases, such as the DLL files required to use the DB2-supplied JDBC drivers, should now be specified using `LIBPATH_SUFFIX`. The CICS-supplied `/lib` and `/ctg` directories, and the IBM JVM-supplied `/bin` and `/bin/classic` directories, which you specified on the library path in the CICS-supplied sample JVM profiles in earlier CICS releases, are not now specified explicitly in the JVM profile. These directories are now part of the base library path.

The option `LIBPATH_PREFIX` is available if you need to place items before the base library path, but use this option only under the guidance of IBM support.

Migrating class paths in JVM profiles: middleware classes

In a continuous JVM in CICS Transaction Server for z/OS, Version 3 Release 2, you now place the classes formerly treated as middleware classes on the same class path as user application classes. You specified these classes on the trusted middleware class path options `TMPREFIX` and `TMSUFFIX` in the JVM profile.

For migration purposes, the trusted middleware class path options, `TMPREFIX` and `TMSUFFIX`, are still accepted, but CICS issues a warning message when they are used.

When you are creating, changing, or migrating JVM profiles, place the classes formerly treated as middleware classes on one of the following class paths:

- For Java 1.4.2, use the shareable application class path, which is defined by the `-Dibm.jvm.shareable.application.class.path` system property in the JVM properties file for the master JVM that initializes the shared class cache.
- For Java 5, use the standard class path, which is defined by the `CLASSPATH_SUFFIX` option in the JVM profile for the JVM where the application will run.

When you have placed the classes on the correct class path, remove the `TMPREFIX` and `TMSUFFIX` options from your JVM profiles.

Migrating class paths in JVM profiles: standard class path

In CICS Transaction Server for z/OS, Version 3 Release 2, the standard class path is constructed in a new way. Use the CLASSPATH_SUFFIX option to specify application classes.

CICS builds a base standard class path for the JVM using the /lib subdirectories of the directories specified by the CICS_HOME and JAVA_HOME options in the JVM profile. This standard class path contains the JAR files supplied by CICS and by the JVM. It is not visible in the JVM profile.

The CLASSPATH option in the JVM profile is no longer used. For migration purposes, it is still accepted, but CICS issues a warning message when it is found (DFHSJ0523).

Use the CLASSPATH_SUFFIX option to place classes on the standard class path. When you are creating, changing, or migrating JVM profiles, any items that you added to the standard class path in previous CICS releases should now be specified using CLASSPATH_SUFFIX.

If you are migrating JVM profiles from resettable (REUSE=RESET) to continuous (REUSE=YES), and your CICS region has no shared class cache, place application classes on the standard class path, rather than on the shareable application class path. The shareable application class path was the recommended choice for a resettable JVM, because it enabled the classes to be cached in the JVM and reinitialized when the JVM was reset, whereas classes on the standard class path were discarded and reloaded. However, in a continuous JVM, classes on the standard class path are cached in the JVM and kept across reuses. The standard class path is now the recommended choice where there is no shared class cache, because it has greater compatibility with future releases of Java.

If you are also migrating to use Version 5 of the IBM SDK for z/OS, Java 2 Technology Edition for Java support instead of Version 1.4.2, always place application classes on the standard class path, even if you have a shared class cache. There is no shareable application class path with Version 5.

Migrating to IBM SDK for z/OS, Java 2 Technology Edition, Version 5

CICS Transaction Server for z/OS, Version 3 Release 2 supports the JVM provided by the 31-bit version of IBM SDK for z/OS, Java 2 Technology Edition, Version 5, as an alternative to the JVM provided by Version 1.4.2 of the SDK. If you want to migrate a CICS region with an existing Java workload from the IBM SDK for z/OS, V1.4.2 to the IBM SDK for z/OS, V5, follow these steps.

1. Apply APAR PK59577 to CICS. This APAR enables CICS support for the IBM SDK for z/OS, V5, but you should not see any changes at this stage. Your Java workload will continue to run as normal with the IBM SDK for z/OS, V1.4.2.
2. If you are using z/OS, Version 1 Release 7, apply APAR OA11519 to z/OS. This APAR is required for class sharing. It is not required if you are using a later release of z/OS.
3. Check your Java programs against the information at <http://www.ibm.com/servers/eserver/zseries/software/java/j5restrict31.html> for compatibility issues between the IBM SDK for z/OS, V5 and the IBM SDK for z/OS, V1.4.2. The information includes links to Java compatibility and deprecated API information

provided by Sun Microsystems Inc. at <http://java.sun.com>. Make any changes that are necessary to enable your programs to run with the Java 5 API and the IBM SDK for z/OS, V5.

4. Download and install IBM 31-bit SDK for z/OS, Java 2 Technology Edition, Version 5 on your z/OS system. You can download the product, and find out more information about it, at <http://www.ibm.com/servers/eserver/zseries/software/java/j5pcont31.html>. CICS TS V3.2 supports only the 31-bit version of the SDK, not the 64-bit version. Service Refresh 7 (SR 7) is the minimum level required. The IBM SDK for z/OS, V5 can co-exist on the same z/OS system with your IBM SDK for z/OS, V1.4.2 installation, although a CICS region can only use one Java version at a time.
5. Make copies, in a new location on z/OS UNIX, of the JVM profiles and JVM properties files which you have set up for CICS Transaction Server for z/OS, Version 3 Release 2. These copies are to be set up for Version 5 of the SDK. The full path to this location, including the directory name, must be 240 characters or less, so that you can specify it on the JVMPROFILEDIR system initialization parameter for CICS. It is important to use separate directories for JVM profiles which are set up for Version 5 of the SDK, and JVM profiles which are set up for Version 1.4.2. The Java version used by the CICS region is determined by the setting for the JAVA_HOME option in the JVM profiles, so you will need to direct the CICS region to the correct set of profiles.
6. If you used the Version 1.4.2 shared class cache, and have JVM profiles for worker JVMs (which specify CLASSCACHE=YES to use the shared class cache), make changes to the copies of your JVM profiles as follows, to set them up for Version 5 of the SDK:
 - a. Locate the JVM profile for the master JVM (DFHJVMCC or a profile modeled on it), and its associated JVM properties file (dfjjvmcc.props or a file modeled on it). The CEMT INQUIRE CLASSCACHE command (or the equivalent EXEC CICS command) returns the name of the JVM profile which currently applies to the master JVM for a CICS region.
 - b. Copy the CICS_HOME, JAVA_HOME and REUSE options and their values from the master JVM profile into each of the worker JVM profiles.
 - c. Change the JAVA_HOME option in each of the worker JVM profiles to specify the install location for IBM 31-bit SDK for z/OS, Java 2 Technology Edition, Version 5. /usr/lpp/java/J5.0/ is the default install location for the product.
 - d. Copy the LIBPATH_PREFIX and LIBPATH_SUFFIX options and their values from the master JVM profile into each of the worker JVM profiles.
 - e. Copy the classes specified by the -Dibm.jvm.shareable.application.class.path system property in the JVM properties file for the master JVM, and specify them as values for the CLASSPATH_SUFFIX option in each of the worker JVM profiles. The shareable application class path in the master JVM properties file contained the shareable application classes for all the applications which ran in your worker JVMs. With Version 5, all these classes are placed on the standard class path in the individual JVM profiles, and all the classes on the standard class path are now eligible for sharing.
 - f. If you want to check the results of your changes, you can compare your JVM profiles with the updated CICS-supplied sample JVM profile DFHJVMP, which is for a JVM that uses the shared class cache. The samples were updated when you installed APAR PK59577. They are in the directory /usr/lpp/cicsts/cicsts32/JVMProfiles, where the

- | /usr/lpp/cicsts/cicsts32 directory is the install directory for CICS files on
| z/OS UNIX, specified by the USSDIR parameter in the DFHISTAR install
| job.
- | 7. In the copies of your JVM profiles for JVMs which did not use the Version
| 1.4.2 shared class cache (standalone JVMs), including the default
| CICS-supplied JVM profiles DFHJVMPR and DFHJVMCD, change the
| JAVA_HOME option to specify the install location for IBM 31-bit SDK for z/OS,
| Java 2 Technology Edition, Version 5. /usr/lpp/java/J5.0/ is the default install
| location for the product. You do not need to make any other changes to these
| JVM profiles.
 - | 8. Give all your CICS regions read and execute access on z/OS UNIX to:
 - | a. The directories and files for the IBM SDK for z/OS, V5 installation.
 - | b. Your Version 5 JVM profiles and JVM properties files and the directory
| containing them.
 - | 9. In a test CICS region, change the JVMPROFILEDIR system initialization
| parameter to specify the location on z/OS UNIX where you placed the Version
| 5 JVM profiles.
 - | 10. Restart the test CICS region and run your Java workload in it. Make these
| checks:
 - | a. Locate message DFHSJ0540 in the MSGUSER log and confirm that
| Version 5 of the SDK is in use. This message is issued when the first JVM
| is started after CICS initialization. It displays the Java version, either “1.4.2”
| or “1.5.0”. “1.5.0” is the version number used in the Java code for Version
| 5.
 - | b. Confirm that JVMs with each of your JVM profiles have been started
| successfully and can run applications. You can use the INQUIRE JVM
| command to browse the JVMs in a CICS region, identify their JVM profiles,
| and see when they are allocated to a task.
 - | c. Confirm that the shared class cache (if used) has been started
| successfully. You can use the INQUIRE CLASSCACHE command to see
| the status of the shared class cache and the number of JVMs that are
| using it.
 - | d. Check that the behavior of your applications is as it was when you used
| Version 1.4.2 of the SDK.
 - | 11. If you encounter any problems in the test CICS region:
 - | a. Check that your Version 5 SDK installation was successful, that you gave
| the CICS region the correct permissions to access it, and that the
| JAVA_HOME option in your JVM profiles correctly specifies the Version 5
| SDK installation. Abend ASJJ is issued if CICS cannot access the
| JAVA_HOME directory or if the installation appears to be invalid.
 - | b. Check that the directory specified by the JVMPROFILEDIR system
| initialization parameter is the directory containing the Version 5 JVM
| profiles, and that the CICS region has permissions for this directory and the
| files.
 - | c. If you are unable to start the shared class cache, check that the default
| CICS-supplied JVM profile DFHJVMCD is available in the directory
| specified by the JVMPROFILEDIR system initialization parameter, is set up
| correctly for use in your CICS region, and correctly specifies the Version 5
| SDK installation. With Version 5, CICS uses this JVM profile to initialize
| and terminate the shared class cache.

- d. If you had JVM profiles for Version 1.4.2 worker JVMs, check that all the items listed in 6 on page 157 have been transferred correctly from the master JVM profile to the individual JVM profiles.
 - e. Check that you have correctly addressed any compatibility issues between Java 1.4.2 and Java 5.
12. When you want to upgrade production CICS regions to use the IBM SDK for z/OS, V5, change the JVMPROFILEDIR system initialization parameter for the regions to specify the location on z/OS UNIX where you placed the Version 5 JVM profiles.
- Note:** If you have implemented workload balancing for enterprise beans, and you have a logical EJB server, which consists of cloned CICS regions that listen for and fulfil IOP enterprise bean requests, upgrade all the CICS regions in the logical EJB server to Java 5 at the same time. In a logical EJB server, IOP messages from a single client process might be handled in different CICS regions, and if the CICS regions are using different versions of Java, application errors might occur in some circumstances.
13. If you did not use the shared class cache supplied by the IBM SDK for z/OS, V1.4.2, consider using the shared class cache supplied by Version 5 of the SDK. This shared class cache requires minimal setup and administration, updates itself automatically when classes or JAR files change or when new ones are added, and is persistent across warm starts of CICS.

Related tasks

Giving CICS regions permission to access z/OS UNIX directories and files
CICS requires access to directories and files in z/OS UNIX. During installation, each of your CICS regions was assigned a z/OS UNIX user identifier (UID), and they were connected to a RACF group which was assigned a z/OS UNIX group identifier (GID). The UID and GID are used to grant permission for the CICS region to access the directories and files in z/OS UNIX.

Migrating class paths in JVM profiles: shareable application class path

If you have migrated to use CICS Transaction Server for z/OS, Version 3 Release 2 with Java 5, then the shareable application class path is not used for class sharing. To share Java classes when using Java 5, the classes should be placed on the standard class path for the JVM. It is still correct to use the shareable application class path where you have a Java 1.4.2 shared class cache.

For migration purposes, if you migrate to using Java 5 in a CICS region, and you have any classes on the shareable application class path in your JVM profiles, you need to put them on the standard class path. CICS still accepts the shareable application class path but places the classes on the standard class path instead.

When deciding where to put an application class for the first time, you should only use the shareable application class path if you have a Java 1.4.2 shared class cache. The shareable application class path is defined by the -Dibm.jvm.shareable.application.class.path system property in the JVM properties file. If you are using Java 5 (with or without class sharing) or if you are using Java 1.4.2 with no shared class cache, you should always use the standard class path.

With Java 5, the shared class cache does not have a special shareable application class path. If you request class sharing to take place with Java 5 JVMs, all of the classes in the JVMs are shared, and will all need to be placed on the standard class path which is defined by the CLASSPATH_SUFFIX option in the JVM profile.

When migrating to Java 5, all the classes should be placed in the JVM profile for the individual JVMs because unlike Java 1.4.2 there is no master JVM.

More information on the shareable application class path can be found in *Classes and class paths in JVMs*.

Migrating Java garbage collection settings

CICS now initiates garbage collection when heap utilization in the active part of the nonsystem heap reaches a specified limit. In earlier releases, CICS performed garbage collection in a JVM synchronously after a specified number of Java programs had been run. You might need to adjust the new garbage collection option `GC_HEAP_THRESHOLD` if you want to keep the same frequency of garbage collection as you had in previous releases.

- If you have specified the `MAX_RESETS_TO_GC` option in your JVM profiles, remove it. CICS now ignores this option and issues a warning message at JVM startup if it is found.
- If you need to tune the frequency of garbage collections initiated by CICS in your JVMs, use the `GC_HEAP_THRESHOLD` option. This option specifies a percentage limit for heap utilization in the active part of the nonsystem heap, above which CICS initiates garbage collection. The default setting is 85%.
- If you previously tuned your JVMs so that your applications used almost all of the storage in the active part of the nonsystem heap before garbage collection took place, you might find that the default setting for `GC_HEAP_THRESHOLD` causes more frequent garbage collections in your JVMs. If this is the case, adjust the `GC_HEAP_THRESHOLD` setting to a higher level to return to the same frequency of garbage collection.

Migration for HPJ-compiled Java programs (Java program objects)

Runtime support for Java program objects and for hot-pooling (HPJ) was withdrawn in CICS Transaction Server for z/OS, Version 3 Release 1. Any Java programs that you had processed using the VisualAge for Java, Enterprise Edition for OS/390 bytecode binder (HPJ) to run as Java program objects in CICS, must be migrated to run in a Java Virtual Machine (JVM).

1. Set up the JVM environment, as described in *Setting up Java support in Java Applications in CICS*.
2. Place the class files (with the extension `.class`) for the Java programs in directories in z/OS UNIX where they can be loaded by the JVM. Ensure that CICS has read and execute access to these directories, as described in *Giving CICS regions permission to access z/OS UNIX directories and files in Java Applications in CICS*. If you want to, you can build the class files into packages or JAR files (with the extension `.jar`) before placing them in the z/OS UNIX directory. In order to create Java program objects, you had to use the `javac` compiler (or an equivalent Java compiler, such as VisualAge for Java or WebSphere Studio Application Developer) to compile the Java source files into class files, and then use the VisualAge for Java, Enterprise Edition for OS/390 bytecode binder to compile the class files into Java program objects.
 - a. If you saved the class files during this process, you can use these to run in the JVM.
 - b. If you did not keep the class files, re-run the Java compiler against your Java source files to produce new class files.

3. Modify the PROGRAM resource definitions to add the JVM, JVMCLASS, and JVMPROFILE options, and add the classes that the applications use to the class paths for their JVMs, as described in Enabling applications to use a JVM in *Java Applications in CICS*.
4. If the Java programs access DB2, follow the instructions in Requirements to support Java programs in the CICS DB2 environment in the *CICS DB2 Guide* to add the necessary DB2 directories and files to the class paths in the JVM profiles, and ensure that you have applied any DB2 APARs that are needed for your version of DB2.
5. Test that the Java programs work correctly in the JVMs that you have defined for them.

Migration for Java applications that use a CICS connector

Runtime support for the CICS Connector for CICS TS, introduced in CICS TS for z/OS, Version 2.1, was withdrawn in CICS TS for z/OS, Version 3.1. You need to migrate any existing applications that use the CICS Connector for CICS TS to use the CCI Connector for CICS TS instead. All new connector applications must use the CCI Connector for CICS TS.

A CICS connector is a software component that allows a Java client application to invoke a CICS application. CICS TS for z/OS, Version 2.3 introduced a new CICS connector, the CCI Connector for CICS TS, which performs a similar role to the CICS Connector for CICS TS. It enables a Java program or enterprise bean running on CICS Transaction Server for z/OS to link to a CICS server program. The old CICS Connector for CICS TS implemented the IBM-proprietary CCF interface, but the new CCI Connector for CICS TS implements the industry-standard Common Client Interface (CCI) defined by the J2EE Connector Architecture Specification, Version 1.0.

For information on using the CCI Connector for CICS TS in new connector applications, and on migrating existing applications that use the CICS Connector for CICS TS to use the CCI Connector for CICS TS instead, see *Java Applications in CICS*.

Chapter 24. Migration for the Link3270 bridge

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2, there are changes to the 3270 bridge mechanism. The older 3270 bridge mechanism using the START BREXIT interface is still supported, and applications continue to run unchanged, but you are recommended to migrate to the Link3270 mechanism. If you are already using the Link3270 bridge, and you want to add support for the ACCUM option, you need to recompile your programs to gain this support.

There are two versions of the Link3270 bridge in CICS Transaction Server for z/OS, Version 3 Release 2:

- Link3270 bridge with basic support, which provides the same support as that provided by the CICS TS for z/OS, Version 2.2 Link3270 bridge. If you only need basic support, no action is necessary. Use the basic copybooks as before. There is no need to recompile any existing Link3270 bridge programs.
- Link3270 bridge with extended support, which provides support for the ACCUM option on the SEND TEXT, SEND MAP, and SEND CONTROL commands. To provide this support, two new vectors are introduced: SEND PAGE and PURGE MESSAGE. New copybooks are also provided. If you want to take advantage of the extended support, recompile your Link3270 bridge programs (or compile new programs) using the extended copybooks, and the extended support will be provided.

More information about the use of the Link3270 bridge can be found in Bridging to 3270 transactions in the *CICS External Interfaces Guide*.

The Link3270 mechanism is the recommended way to use the 3270 bridge. If you are not yet using the Link3270 mechanism, you are recommended to migrate to it. Use of the START BREXIT interface is no longer described in the CICS documentation, and you should refer to the publications for CICS Transaction Server for OS/390, Version 1 Release 3 if you need to implement new applications using this interface.

The bridge mechanism using the START BREXIT interface required the client (end-user) application to send messages to a monitor program, which established the bridge environment by issuing a START BREXIT command. User-supplied (or sample) bridge exit and formatter user-replaceable programs translated 3270 commands to messages that were sent to the client.

A sample program, DFH0CBRM, is provided to assist migration to the Link3270 mechanism. To use it, change your monitor program to issue an EXEC CICS LINK to DFH0CBRM, instead of issuing a START BREXIT command. DFH0CBRM converts existing messages to Link3270 format messages and drives the new Link3270 mechanism. Note that there are some changes to error processing, such as abend codes. Any restrictions in the use of the migration aid, which uses the WebSphere MQ CICS interface header (MQCIH), are described in comments in the source of DFH0CBRM, which is supplied in SDFHSAMP library. The generated version is supplied in SDFHLOAD, ready to use.

There is a one-to-one mapping between the old style message vectors and the Link3270 message vectors, but there are new fields in the Link3270 message header that should be reviewed if you want to exploit new function.

Chapter 25. Migration for threadsafe programming and the open transaction environment (OTE)

The open transaction environment (OTE) function was introduced in CICS Transaction Server for OS/390, Version 1 Release 3 for Java applications, and extended in CICS Transaction Server for z/OS, Version 2 Release 2 and later releases to other types of application. The open transaction environment is an environment where CICS application code can use non-CICS services (facilities outside the scope of the CICS API) within the CICS address space, without interference with other transactions.

Before CICS Transaction Server for OS/390, Version 1 Release 3, user applications and exits operated in a restricted, or closed, environment. Although the applications could use the functionally-rich CICS application program interface (API), direct invocation of other services was not supported. This is because CICS ran all user transactions under a single z/OS TCB, known as the CICS quasi-reentrant (QR) TCB. Direct invocation of other services outside the scope of the CICS permitted interfaces could interfere with the use by CICS of the QR TCB. In particular, requests resulting in the suspension ("blocking") of the QR TCB, which happens when an MVS wait is issued, would cause all CICS tasks to wait.

Applications that exploit the open transaction environment run on their own open TCB, rather than on the QR TCB. Unlike the QR TCB, CICS does not perform sub-dispatching on an open TCB. If the application running on an open TCB invokes a non-CICS service which blocks the TCB, the TCB blocking does not affect other CICS tasks. For example, some services provided by DB2, MVS, UNIX System Services, or TCP/IP, might result in TCB blocking.

The open TCBs that are used in the open transaction environment are managed in separate pools, with each pool containing a different type, or operational mode, of open TCB. Each mode has a specific purpose, and is handled by CICS in a different way. The types, or modes, of open TCB are:

J8 mode TCBs and J9 mode TCBs

are used to run Java programs under a Java Virtual Machine (JVM). The JVM is created on the TCB.

J8 TCBs are used for JVMs when the Java programs are defined as executing in CICS key, and J9 mode TCBs are used for JVMs when the Java programs are defined as executing in user key and storage protection is active. *Java Applications in CICS* has more information about how CICS manages JVMs and their TCBs.

The MAXJVMTCBS system initialization parameter controls the number of J8 and J9 TCBs in the JVM pool.

L8 mode TCBs and L9 mode TCBs

are both used to run OPENAPI programs, that is, those defined as OPENAPI by their PROGRAM resource definition.

- L8 mode TCBs are used for CICS key OPENAPI application programs.
- L9 mode TCBs are used for user key OPENAPI application programs.

L8 mode TCBs are also used when programs need access to a resource manager through a task-related user exit (TRUE) enabled using the OPENAPI option on the ENABLE PROGRAM command. An open API TRUE is given control under an L8 mode TCB, and can use non-CICS APIs without having to create subtask TCBs. The CICS DB2 task-related user

exit operates in OPENAPI mode (it is an open API TRUE), so the CICS DB2 attachment facility uses L8 TCBs for DB2 request processing.

L8 mode TCBs are also used by CICS itself, because CICS uses CICS key OPENAPI programs which run on L8 TCBs when processing Web services requests, parsing XML, and accessing z/OS UNIX files for CICS Web support.

The MAXOPENTCBS system initialization parameter controls the number of L8 and L9 TCBs in the pool of L8- and L9-mode open TCBs.

SP mode TCB and S8 mode TCBs

are used by CICS to manage SSL connections. The S8 TCBs run within a single enclave, which is owned by the SP TCB and also contains the SSL cache.

The MAXSSLTCBS system initialization parameter controls the number of S8 TCBs in the SSL pool.

X8 mode TCBs and X9 mode TCBs

are both used to run C and C++ programs compiled with the XPLINK option. X8 TCBs are used for programs in CICS key, and X9 mode TCBs are used for programs in user key. Each instance of an XPLink program uses one X8 or X9 TCB. The *CICS Application Programming Guide* has more information about using XPLink.

The MAXXPTCBS system initialization parameter controls the number of X8 and X9 TCBs in the pool of X8- and X9-mode open TCBs.

Existing or new CICS DB2 applications written in any language that access DB2 are automatically involved with the open transaction environment through the CICS DB2 task-related user exit. You have the opportunity to gain performance benefits for these applications. These performance benefits can be gained because open TCBs may be used for both non-CICS API requests (including requests to DB2) and application code. Because application code can be executed on the open TCB, the application should not need to switch between different TCBs several times during the execution of a CICS DB2 application, as was the case before the open transaction environment was available, when subtask thread TCBs were used for requests to DB2. This situation also decreases usage of the QR TCB.

The most important condition to be met to achieve this is that the user application program, the EXEC CICS commands used in the application, and any user exit programs involved with the application program, must be **threadsafe**. The CICS DB2 application must have threadsafe application logic (that is, the native language code in between the EXEC CICS commands must be threadsafe), use only threadsafe EXEC CICS commands, and be defined to CICS as threadsafe. It must use only threadsafe dynamic plan exits, task-related user exits and global user exits. Only code that has been identified as threadsafe is permitted to execute on open TCBs. The next topic explains in detail what it means for an application to be threadsafe.

An application like this will move to an L8 TCB when it makes its first SQL request, and then continue to run on the L8 TCB through any amount of DB2 requests and application code, requiring no TCB switching. This situation produces a significant performance improvement where an application program issues multiple SQL calls. The gains are also significant when using an enterprise bean, because when enterprise beans make DB2 requests, they require additional TCB switches to and from the enterprise bean's own TCB. If the application program does not issue many SQL calls, the performance benefits might not be as significant.

For applications that do not make DB2 requests, you can opt to use the open transaction environment by defining user application programs, PLT programs, user replaceable modules or task related user exits as OPENAPI programs. (Global user exits cannot be defined as OPENAPI programs.) Defining a program as an OPENAPI program means that it always runs on an open TCB (L8 or L9), from the start of the program. This allows application workloads to be moved off the QR TCB onto multiple open TCBs, giving the possibility of achieving better throughput, particularly with CPU-intensive programs. It also allows you to use other (non CICS) APIs, but you should note that the use of other (non CICS) APIs within CICS is entirely at the discretion and risk of the user. No testing of other (non CICS) APIs within CICS has been undertaken and the use of such APIs is not supported by IBM Service.

OPENAPI programs must be defined to CICS as threadsafe and have threadsafe application logic. As for CICS DB2 applications, the use of nonthreadsafe EXEC CICS commands, nonthreadsafe task-related user exits, or nonthreadsafe global user exits causes a switch to the QR TCB, and should be avoided. OPENAPI programs have some additional obligations: for example, they must ensure that all non-CICS resources acquired specifically on behalf of the terminating task are freed, and they must not use certain MVS system services.

The use of OPENAPI programs can cause more TCB switching than ordinary threadsafe programs. After any switch to the QR TCB, there is an extra switch, because CICS switches back to the open TCB to continue running the application logic. Additional TCB switching may be involved because of the requirement for the key of the TCB to be correct for OPENAPI programs. OPENAPI TRUEs always run in CICS key on an L8 TCB, so, for example, if a user key OPENAPI program runs on an L9 TCB but makes a DB2 call, CICS switches to an L8 TCB to call DB2, then returns to the L9 TCB to continue running the program. Because of this, CICS DB2 applications should normally be defined as ordinary (CICSAPI) threadsafe programs, rather than as OPENAPI programs. CICS key CICS DB2 applications may be defined as OPENAPI programs if wanted.

How can I make my applications threadsafe?

Applications that involve a task-related user exit (TRUE) enabled using the OPENAPI option, such as applications which access DB2 resources, are already involved with the open transaction environment, and they can gain performance benefits from being threadsafe. For other applications, you can opt to use the open transaction environment by defining them as OPENAPI programs, in which case they must be threadsafe.

Applications can be defined to CICS as either quasi-reentrant or threadsafe. When an application is defined to CICS as quasi-reentrant, it executes on the QR TCB. When running under this TCB, a program can be sure that no other quasi-reentrant program can run until it relinquishes control during a CICS request. Quasi-reentrancy therefore allows programs to access globally shared resources, for example, the CICS common work area (CWA), without the need to protect those resources from concurrent access by other programs. Such resources are effectively locked exclusively to the running program, until it issues its next CICS request.

When applications are defined to CICS as threadsafe, they can run concurrently on open TCBs. Because of this, they cannot rely on quasi-reentrancy to protect shared resources from concurrent access by another program. Furthermore, quasi-reentrant programs might also be placed at risk if they access shared

resources that can also be accessed by a user task running concurrently under an open TCB. The techniques used by user programs to access shared resources must therefore take into account the possibility of simultaneous access by other programs. To gain the performance benefits of the open transaction environment while maintaining the integrity of shared resources, serialization techniques must be used to prohibit concurrent access to shared resources. Programs that use appropriate serialization techniques when accessing shared resources are described as threadsafe.

The goal of making programs threadsafe is to enable them to remain on an open TCB, rather than switching back and forth between the open TCB and the QR TCB. TCB switching from an open TCB to the QR TCB occurs in the following circumstances:

- When a program that is defined as threadsafe and is executing on an open TCB invokes any EXEC CICS commands which are not threadsafe, CICS switches back from the open TCB to the QR TCB to execute the non-threadsafe code. If the program is defined as OPENAPI, CICS then switches back to the open TCB to continue running the application logic. If the program is not defined as OPENAPI, it continues to execute on the QR TCB. For a CICS DB2 application, if the program is not defined as OPENAPI and does not make any further DB2 requests, then the switch back to the QR TCB is only a disadvantage because it increases the usage of your QR TCB for the time taken to run any remaining application code. However, if the program makes any further DB2 requests, CICS must switch back again to the open TCB.
- When a program that is defined as threadsafe and is executing on an open TCB invokes a threadsafe CICS command, it is possible for a global user exit to be invoked as part of executing the command. If a global user exit program is used which is not defined as threadsafe, CICS switches back to the QR TCB and gives control to the global user exit program. When the user exit program completes processing, CICS switches back to the open TCB to continue processing the threadsafe CICS command.
- When a program that is defined as threadsafe and is executing on an open TCB invokes a task-related user exit program which is not defined as threadsafe, CICS switches back to the QR TCB and gives control to the task-related user exit program. When the task-related user exit program completes processing, the situation is the same as after a non-threadsafe EXEC CICS command: an OPENAPI program switches back to the open TCB, and a program not defined as OPENAPI continues to execute on the QR TCB.
- When a user exit program that is not defined as threadsafe is used in the course of a DB2 request, CICS switches from the open TCB (where the DB2 request is executing) to the QR TCB. The user exit program is executed on the QR TCB, and then the task is switched back to the open TCB to complete the DB2 request. For example, the XRMIIN and XRMIOU global user exits might be invoked in the course of the DB2 request. If the exit programs are not defined as threadsafe, this TCB switching occurs. If the exit programs are defined as threadsafe, processing will continue throughout on the open TCB.
- When a program that is defined as threadsafe and is executing on an open TCB completes, CICS switches back to the QR TCB for task termination. This switch is always necessary.

If you want to make an application program remain on an open TCB:

1. **Ensure that the system initialization parameter FORCEQR is not set to YES.** FORCEQR forces programs defined as threadsafe to run on the QR TCB,

and it might be set to YES as a temporary measure while problems connected with threadsafe-defined programs are investigated and resolved.

2. **Ensure that the program is defined to CICS as threadsafe.** Use the CONCURRENCY attribute of the program resource definition to do this. OPENAPI programs are required to be defined as threadsafe. By defining a program to CICS as threadsafe, you are only specifying that the application logic is threadsafe, not that all the EXEC CICS commands included in the program are threadsafe. CICS can ensure that EXEC CICS commands are processed safely by using TCB switching. In order to permit your program to run on an open TCB, CICS needs you to guarantee that your application logic is threadsafe.
3. **Ensure that the program's logic is threadsafe.** That is, the native language code between the EXEC CICS commands must be threadsafe. If you define a program to CICS as threadsafe but include application logic that is not threadsafe, the results are unpredictable, and CICS is not able to protect you from the possible consequences. "Threadsafe programs" in the *CICS Application Programming Guide* tells you how to produce threadsafe application logic.
4. **Ensure that the program uses only threadsafe EXEC CICS commands.** The commands that are threadsafe are indicated in the command syntax diagrams in the *CICS Application Programming Reference* and the *CICS System Programming Reference* with the statement "This command is threadsafe", and are listed in the threadsafe command list in the *CICS Application Programming Reference* and the threadsafe command list in the *CICS System Programming Reference*. If you include a non-threadsafe EXEC CICS command in a program which is running on an open TCB, CICS switches back from the open TCB to the QR TCB to ensure that the command is processed safely. The TCB switching could be detrimental to the application's performance.

As well as checking EXEC CICS commands that you code explicitly, be aware of high-level language constructs or Language Environment callable services used by your program that result in using CICS services. CICS services used in this way might involve non-threadsafe CICS commands, and cause a switch back to the QR TCB. In particular, the COBOL statement DISPLAY UPON SYSOUT, some types of PL/I and C++ output, and the Language Environment callable services CEEMOUT and CEE3DMP, write data to the Language Environment transient data destinations CESE and CESO. This involves an EXEC CICS WRITE TD command, which is not threadsafe.

5. **Ensure that any user exit programs in the execution path used by the program are coded to threadsafe standards and defined to CICS as threadsafe.** This might include dynamic plan exits, global user exits, or task-related user exits. (Note that for task-related user exits, enabling the exit program using the OPENAPI option on the ENABLE PROGRAM command means that CICS overrides the CONCURRENCY setting on the exit's program definition with OPENAPI.)

The CICS DB2 task-related user exit DFHD2EX1 is threadsafe. SQL, threadsafe and other programming considerations for CICS DB2 applications "SQL, threadsafe and other programming considerations for CICS DB2 applications" in the *CICS DB2 Guide* has more information on other exits that are particularly important for CICS DB2 requests. These exits include the default dynamic plan exit DSNCEXT (which is not defined as threadsafe), the alternative dynamic plan exit DFHD2PXT (which is defined as threadsafe), and the global user exits XRMIIN and XRMIOUT. Also be aware of the global user exits XEIIN and XEIOUT, which are invoked before and after EXEC CICS commands, and XPCFTCH, which is invoked before a PPT-defined program receives control. Be

sure that user exit programs supplied by any vendor software are coded to threadsafe standards and defined to CICS as threadsafe.

6. **If you are coding a user exit program** (a global user exit or a task-related user exit), you can define it as threadsafe so that it can be used on the same L8 TCB as a threadsafe application which calls it.

Global user exit programs cannot be defined as OPENAPI, but they can be defined as threadsafe, and treated in the same way as an ordinary application program, by using threadsafe application logic and threadsafe EXEC CICS commands. Writing global user exit programs“Writing global user exit programs” in the *CICS Customization Guide* has general information about writing this type of program.

A task-related user exit can be defined as threadsafe in the same way as an ordinary application program, or it can be enabled using the OPENAPI option on the ENABLE PROGRAM command, so that it will be given control under an L8 TCB, use non-CICS APIs without having to create and manage subtask TCBs, and exploit the open transaction environment for itself. (Enabling the exit program using the OPENAPI option on the ENABLE PROGRAM command means that CICS overrides the CONCURRENCY setting on the exit's program definition with OPENAPI.) For task-related user exit programs, see Writing a task-related user exit program in the *CICS Customization Guide* for more detailed information about how this type of program can exploit the open transaction environment safely. Note when you enable an exit program using the OPENAPI option, this indicates to CICS that the program's logic is threadsafe.

Important changes to accounting for processor time in the open transaction environment

The CICS DB2 attachment facility uses CICS-managed open TCBs rather than CICS DB2 subtask TCBs. This means the CICS monitoring facility can measure activity that was previously (with DB2 Version 5 or earlier) only reported in the DB2 accounting record (the SMF type 101 record).

For example, CICS can now measure the processor time consumed on the DB2 thread and the processor time consumed in DB2 (the CLASS 1 and CLASS 2 CPU time). When CICS is using L8 open TCBs, the CPU time reported for these TCBs by the CICS monitoring facility includes the DB2 CLASS 1 processor time.

When CICS is connected to DB2 Version 6 or later, **do not** add together the processor time from the CICS records (SMF type 110 records) and the DB2 accounting records (SMF type 101 records) when calculating the total processor time for a single transaction, because the DB2 processor time would then be included twice. The total processor time for a single transaction is recorded in the USRCPUT field in the CICS records (performance class data field 008 from group DFHTASK). This field includes all processor time used by the transaction when it was executing on any TCB managed by the CICS dispatcher. CICS-managed TCBs include the QR, RO, CO, J8, J9, L8, L9, X8 and X9 mode TCBs.

In the open transaction environment, the CICS L8 task processor time can also include the cost of creating a DB2 thread. If a transaction causes a DB2 thread to be created, you can expect the total task processor time accounted for to be higher than that accounted for by a CICS system running with earlier DB2 releases. Correspondingly, if at the end of a transaction, the thread is terminated (because it is unprotected and no other task is waiting to use it), then the cost of thread

termination is included in the CICS L8 task processor time. Again, this cost was not accounted for by a CICS system connected to DB2 Version 5 or earlier.

From a DB2 perspective, when the CLASS 1 recording becomes active for a thread, it is now recording time spent on the L8 open TCB. Because the L8 TCB is used for both CICS activity and DB2 activity, this includes processor time spent in the CICS-DB2 attachment facility, including trace calls, and also includes processor time spent running application code (if the application is threadsafe) and threadsafe CICS commands on the open TCB. If a thread is reused, the thread housekeeping processor time is also included in the CLASS 1 processor time. As in previous releases, there is a proportion of thread creation and thread termination processing that is not captured by CLASS 1 time. The CLASS 1 processor time does not include any time spent running application code on the QR TCB. (When an application issues a non-threadsafe CICS command, it is forced back to the QR TCB.) When CICS is connected to DB2 Version 5 or earlier, CLASS 1 processor time does not include any processor time spent in application code, because all application code is executed under the QR TCB. The CLASS 2 processor time recorded by DB2, which is a subset of the CLASS 1 processor time showing the time spent in DB2 itself, is not affected by the open transaction environment.

For more information about calculating processor times for CICS and DB2 and a full explanation of how processor times are recorded, see Accounting for processor usage in a CICS DB2 environment in the *CICS DB2 Guide*.

Chapter 26. Migration for the CICS-WebSphere MQ connection

The CICS-WebSphere MQ adapter, bridge, trigger monitor and API crossing exit are moved from WebSphere MQ to CICS in CICS TS 3.2. You must make some changes to your configuration.

Review availability of TCBs for CICS-WebSphere MQ connection (MAXOPENTCBS setting)

Before CICS TS for z/OS, Version 3.2, a CICS region used a pool of eight subtask TCBs to connect to WebSphere MQ queue managers. The subtask TCBs were not owned by the CICS tasks that made the requests to connect to WebSphere MQ. When a subtask TCB returned the results of a request to a CICS task, the subtask TCB became available for other CICS tasks that needed to connect to WebSphere MQ.

From CICS TS for z/OS, Version 3.2, a CICS region uses open TCBs in L8 mode to connect to WebSphere MQ queue managers. When a CICS task makes a request to connect to WebSphere MQ, it obtains an L8 TCB from the pool in the CICS region, and keeps the L8 TCB from the time it is allocated to the end of the task. Even if the CICS task switches back to run on the QR TCB or makes no further requests to connect to WebSphere MQ, the L8 TCB is not released until the CICS task ends. Each concurrent CICS task that connects to WebSphere MQ therefore requires one L8 TCB for the duration of the task.

The availability of L8 TCBs in the pool is determined by the setting for the MAXOPENTCBS system initialization parameter, and by the number of other CICS tasks that are using L8 or L9 TCBs, such as CICS applications that connect to DB2. A CICS task is allowed at most one L8 TCB, which the task can use for any purpose that requires an L8 TCB. For example, a task that connected to both WebSphere MQ and DB2 would use only one L8 TCB. Within the overall limit set for the TCB pool by MAXOPENTCBS, there is no specific limit on the number of L8 TCBs that are allocated for CICS tasks that connect to WebSphere MQ queue managers; these tasks can potentially occupy all of the available L8 TCBs in the pool.

When you upgrade from a release earlier than CICS TS for z/OS, Version 3.2, it is important to review your setting for the MAXOPENTCBS system initialization parameter to ensure that enough L8 TCBs are available to provide one for each concurrent CICS task that connects to WebSphere MQ, and to leave sufficient L8 and L9 TCBs available for the other users of these TCBs in the CICS region. For guidance on reviewing your setting for the MAXOPENTCBS system initialization parameter, see "MAXOPENTCBS" in the *CICS Performance Guide* and "Setting MAXOPENTCBS" in the *CICS Performance Guide*. It is helpful to review the MAXOPENTCBS setting each time you upgrade to a new CICS release.

CICS tasks that connect to WebSphere MQ require storage in the WebSphere MQ subsystem. When you upgrade from a release earlier than CICS TS for z/OS, Version 3.2, or when the peak number of concurrent CICS tasks that connect to WebSphere MQ changes, review the use of common storage in the WebSphere MQ subsystem. For information about common storage and connections from CICS to WebSphere MQ, see the topic "Common storage" in the WebSphere MQ information center. For further information about storage and performance

requirements in WebSphere MQ, including velocity goals for CICS regions, see the topic "Planning your storage and performance requirements" in the WebSphere MQ information center.

If CICS is connecting to WebSphere MQ Version 6, you might also need to increase your setting for the WebSphere MQ subsystem tuning parameter CTHREAD. Before CICS TS for z/OS, Version 3.2, CICS always took up nine of the connections specified by CTHREAD, plus one for each task initiator (CKTI). From CICS TS for z/OS, Version 3.2, the number of connections depends on the number of CICS tasks that are using L8 TCBs to connect to WebSphere MQ. In WebSphere MQ Version 6, you can change the value of CTHREAD using the WebSphere MQ SET SYSTEM command. From WebSphere MQ Version 7, the CTHREAD parameter cannot be adjusted in WebSphere MQ.

CICS-WebSphere MQ connection components moved to CICS

You must take the following actions to use the CICS-WebSphere MQ connection components in their new location:

- If you are using WebSphere MQ Version 6, apply the PTF for APAR PK42616 to WebSphere MQ to police the use of the correct adapter. This PTF is not required if you are using WebSphere MQ Version 7.
- If you are using WebSphere MQ Version 7 and you want to use the API calls that are new in Version 7 in your CICS application programs, the WebSphere MQ queue manager must be at WebSphere MQ Version 7.0.1 or higher, and you must apply the following PTFs:

- In CICS, the PTF for APAR PK66866
- In WebSphere MQ Version 7.0.1, the PTFs for APARs PK97364 and PK97972

If you have WebSphere MQ Version 7 installed and you have applied the PTF for APAR PK66866, ensure that your CICS STEPLIB concatenation only includes the WebSphere MQ Version 7 SCSQAUTH. All modules in WebSphere MQ Version 7 SCSQAUTH are downward compatible.

Applications that do not use the Version 7 API calls can operate without these PTFs.

- When you have applied the PTF for APAR PK66866, you must upgrade the CICS-WebSphere MQ resource definitions in the CSD by running a DFHCSDUP job with the command UPGRADE USING(DFHCURDM). After the upgrade, the DFHMQ group contains definitions for programs CSQBCRMH, CSQCBFMH, CSQBPAPI, CSQCCTMH, CSQCCTMH, CSQCCTMP, CSQCIQMP, CSQCMHBF, CSQCSTAT, CSQCSTMP, and DFHMQMCM. If you are installing CICS TS 3.2 with this maintenance applied, the DFHCSDUP job with the command UPGRADE REPLACE includes the CICS-WebSphere MQ resource definitions.
- New or changed CICS applications that use the API calls that are new in WebSphere MQ Version 7 must be link-edited with the WebSphere MQ API stub modules that are shipped with CICS. The new API calls are MQBUFMH, MQCB, MQCTL, MQCRTMH, MQDLTMH, MQDLTMP, MQINQMP, MQMHBUF, MQSETMP, MQSTAT, MQSUB, and MQSUBRQ. These Version 7 API calls are only supported in CICS when you use the stubs shipped with CICS, not the stubs shipped with WebSphere MQ. New and existing CICS applications that do not use the Version 7 API calls can use the stubs shipped with CICS or WebSphere MQ.
- If you use the new Version 7 API calls MQCB and MQCTL for asynchronous message consumption by CICS applications, you must code your program using information given in the CICS documentation, in addition to the WebSphere MQ programming documentation. The requirements for asynchronous message

consumption in a CICS environment are listed in "Asynchronous message consumption and callback routines" in the CICS integration with WebSphere MQ documentation.

- If you do not share your CSD with earlier releases of CICS, you can remove the existing groups CSQCAT1 and CSQCKB, which contain CSQCxxx definitions, from your CSD.
- If you do share your CSD with earlier CICS releases, ensure that CSQCAT1 and CSQCKB are not installed for CICS TS 3.2. You must also delete the CKQQ TDQUEUE from group CSQCAT1. For CICS TS releases earlier than CICS TS 3.2, install the CSQCAT1 and CSQCKB groups as part of a group list, after installing DFHLIST. This overrides group DFHMQ and correctly installs the required definitions.
- The WebSphere MQ libraries in the CICS STEPLIB and DFHRPL concatenation of the CICS procedure must be included after the CICS libraries to ensure the correct adapter, trigger monitor and bridge is used.
- Unlike WebSphere MQ, CICS does not support upper case English. If you want to use upper case English for your CICS-WebSphere MQ components, you must ensure that ASSIGN NATLANGINUSE returns E (US English), and the system initialization parameter is set to MSGCASE=UPPER. This allows the upper case English mapset to be used.
- CICS supplies the program definition for CSQCAPX in group DFHMQ with the parameter CONCURRENCY(THREADSAFE). Specify CONCURRENCY(THREADSAFE) when you define your exit program and any programs that your exit program calls, and use only threadsafe CICS commands within the exit. You should also examine any existing API crossing exits to ensure that their logic is threadsafe.
- CICS-WebSphere MQ messages are changed from the format CSQCxxx to DFHMQ0xxx. Ensure that your message retrieval applications cope with this change.
- All trace entries produced by the CICS-WebSphere MQ components now use the CICS trace domain. If you have user tracing enabled for WebSphere MQ tracing only, you can turn off user tracing, saving the overhead of application trace.
- If you want the CICS-WebSphere MQ connection to start automatically at CICS start up, add the system initialization parameter MQCONN to the system initialization table. You must also rename the CSQCPARM parameter to DFHMQPRM, and remove the TN=*traceptid* parameter.
- In CICS/TS 3.2 the MQ OPEN TCBs are allocated for the duration of the CICS task unlike CICS/TS 3.1 where the MQ TCB's are allocated only for the duration of the MQ request.

Some additional functional changes do not require any action:

- Modules are renamed to use CICS naming conventions, except for all WebSphere MQ stubs and exits. The names for these have been preserved so that existing JCL works, and you are not required to relink-edit existing applications, unless you modify them to use the new API calls that were added in Version 7 of WebSphere MQ.
- CSQCCOPEN, CSQCCLOS, CSQCGET, CSQCPUT1 and CSQCINQ are shipped unchanged, and are all entry points into DFHMQSTB, which is loaded from SDFHLOAD.
- There are two new transient data queues, CMQM and CKQQ, both defined in group DFHDCTG. CMQM logs all CICS-WebSphere MQ messages issued by the CICS-WebSphere MQ adapter, trigger monitor and bridge. CKQQ logs all messages relating to CICS-WebSphere MQ connection and disconnection.

- WebSphere MQ statistics can now be reset during the life of a CICS execution. This means that when you use the **CKQC DISPLAY** commands, you see only active CICS-WebSphere MQ threads, so numbers can go down or reduce to zero.

Chapter 27. Migration for CICS Web support applications

CICS Transaction Server for z/OS, Version 3 Release 2 supports your existing CICS Web support architecture for both Web-aware and non-Web-aware application programs. The **EXEC CICS WEB API** command changes are designed to allow existing Web-aware application programs that send and receive HTTP messages to work unchanged, until you choose to migrate them to take advantage of the enhancements that are now available. If you have existing CICS Web support applications from earlier releases, note these migration points.

- **If you are using CICS Web support to process non-HTTP requests, specify the new USER protocol on the TCPIP SERVICE definition that defines the port for these requests.** This also applies to HTTP requests with nonstandard request methods, which are now rejected if they are received on the HTTP protocol (previously, they were accepted and processed as non-HTTP). Processing for all non-HTTP requests must now be carried out under the USER protocol, so that they are protected from the basic acceptance checks which CICS carries out for requests using the HTTP protocol. The requests are flagged as non-HTTP and passed unchanged to the analyzer program for the TCPIP SERVICE. CICS Web support facilities are used for handling the request, but no acceptance checks are carried out for messages sent and received using this protocol.

Note: Because only one active TCPIP SERVICE definition can exist for each port, non-HTTP requests can no longer use the same port as HTTP requests. The well-known port numbers 80 (for HTTP) and 443 (for HTTPS) must have the HTTP protocol and therefore cannot accept non-HTTP requests. Web clients must specify any changed port in the URL for their requests.

- **Check the settings for your TCPIP SERVICE resource definitions with the HTTP protocol.**
 1. The SOCKETCLOSE attribute must no longer have a zero setting (SOCKETCLOSE(0)).
 - A zero setting for SOCKETCLOSE means that CICS closes the connection immediately after receiving data from the Web client, unless further data is waiting. This means that persistent connections cannot be maintained.
 - A non-zero setting for SOCKETCLOSE enables persistent connections with both HTTP/1.1 clients, and HTTP/1.0 clients (where the client supports this).
 2. The new MAXDATALEN option should be specified to limit the maximum length of data that may be received by CICS as an HTTP server. This setting helps to guard against denial of service attacks involving the transmission of large amounts of data.
- **Choose what to do with the new XRES system initialization parameter, which sets resource security for document templates.** For XRES, YES is the default setting, and in this case CICS uses the default class names RCICSRES and WCICSRES. If security checking is active for the CICS region (SEC=YES system initialization parameter), your choices are as follows:
 - Specify XRES=NO explicitly to remove resource security for document templates, and allow any user ID to access them. If you specify XRES=NO, you do not need to make any security changes.
 - Specify XRES=YES (the default).

- Specify `XRES=name` and define your own resource classes in either the RACF static class descriptor table or the RACF dynamic class descriptor table.
- If you decide to specify `XRES=YES` or `XRES=name`, follow the instructions in “Implementing resource security for CICS document templates and z/OS UNIX files” on page 181.

When CICS is initializing, it requests RACF to bring resource profiles into main storage to match all the resource classes that you specify on system initialization parameters. If CICS requests RACF to load a resource class that does not exist or is not correctly defined, CICS issues a message indicating that external security initialization has failed, and terminates CICS initialization.

- **Choose what to do with the new XHFS system initialization parameter, which specifies access control for z/OS UNIX files.** For XHFS, YES is the default setting, which means that access control for z/OS UNIX files is active. If security checking is active for the CICS region (`SEC=YES` system initialization parameter), your choices are:
 - Specify `XHFS=NO` explicitly to remove access control for z/OS UNIX files and allow any user ID to access them. If you specify `XHFS=NO` you do not need to make any security changes.
 - Specify `XHFS=YES` (the default). Access permissions for z/OS UNIX files are specified in z/OS UNIX System Services, so you do not need to define RACF profiles for individual files. However, if you are using access control lists (ACLs) to control access to z/OS UNIX files, activate the FSSEC class in RACF. If you decide to specify `XHFS=YES`, follow the instructions in “Implementing resource security for CICS document templates and z/OS UNIX files” on page 181.
- **The analyzer program now allows you to supply codepage conversion parameters to CICS Web Support instead of supplying the name of a DFHCNV table entry.** If you want to continue to use an analyzer program that you coded in an earlier CICS release to reference DFHCNV, you must either continue to supply the entries in the code page conversion table, or change the analyzer program. Changing the analyzer program involves coding two new output parameters to specify the client and server code pages, in place of the output parameter that specified the name of a DFHCNV entry.
- **If you use a code page other than 037 (the EBCDIC Latin character set) in your CICS Web support applications, use the LOCALCCSID system initialization parameter to specify this code page.** The LOCALCCSID system initialization parameter supplies the code page into which CICS converts inbound HTTP headers and query strings, including form data transmitted in a query string. Before CICS Transaction Server for z/OS, Version 3, the code page for this conversion was specified by the DFHWBHH template in the DFHCNV code page conversion table. You can set the LOCALCCSID system initialization parameter to any EBCDIC code page into which the ASCII Latin-1 character set ISO-8859-1 (code page 819) can be converted. If LOCALCCSID is set to an unsuitable code page, CICS uses the default 037 for inbound HTTP headers and query strings.
- **CHARACTERSET and HOSTCODEPAGE options for the GET and POST methods are now the same, and in certain circumstances, you will now receive data in your local CCSID.** The CHARACTERSET (previously CLNTCODEPAGE) and HOSTCODEPAGE options now take effect for forms submitted with the GET method as well as the POST method, and the defaults are the same in both cases. Therefore, if the form uses the POST method and you do not specify the HOSTCODEPAGE option, and your LOCALCCSID initialization parameter is not 037, you receive your data in your local CCSID,

instead of CCSID 037 (the default EBCDIC code page). To specify 037 as the host code page, either change your LOCALCCSID parameter to 037 or modify your application to explicitly use "037".

- **There are certain considerations for code page conversion to take place when using buffers (with either the INTO or SET option specified).** If you are receiving data into a buffer, and CHARACTERSET and CLICONVERT are not specified, the media type for the message must specify text as the data content type (according to the IANA definitions) for code page conversion to take place. For messages where no media type is given, but CLICONVERT is specified, code page conversion also takes place. If a nontext media type is present, CICS does not convert the message body. If you are using the DFHWBCLI Web Client interface, you must either specify a WBCLI_MEDIATYPE of TEXT, or you must include the required WBCLI_CHARSET value for DFHWBCLI to perform the required code page conversion.
- **If you have modified the user-replaceable Web error program DFHWBEP to customize the HTTP responses provided in error situations, be aware that CICS now uses additional status codes, and uses some existing status codes in a wider range of situations.**
 1. Check that your program is using an appropriate range of input parameters to identify the situation to which the customized response applies, rather than relying on the status code alone. The error code, abend code, message number, response and reason codes, or program name can be used to identify the situation that has given rise to the HTTP response. If these checks are not made, you might find that where CICS is using the status code for a new purpose, an inappropriately customized response is returned.
 2. Check that your program includes logic to pass through unchanged any HTTP responses with status codes that are not known to the program.
- **If you are using the SSL or TLS security protocols, check your SSL-related system initialization parameters and TCPIPService resource definitions.**
 1. The default setting for the ENCRYPTION system initialization parameter has changed to STRONG. If you have no high encryption ciphers installed (security level 3) on z/OS, then you need to downgrade the default setting for the ENCRYPTION system initialization parameter. The NORMAL setting that was used as the default in earlier releases, has changed to MEDIUM. For migration purposes, NORMAL is accepted as an alternative to MEDIUM.
 2. The SSLTCBS system initialization parameter is now obsolete and has been replaced by MAXSSLTCBS. MAXSSLTCBS controls the maximum number of S8 TCBs that are allowed to run concurrently in the open transaction environment (OTE) TCB pool for SSL.
 3. You can use the new CRLSERVER and SSLCACHE system initialization parameters to verify certificates in the SSL handshake and improve the performance of the handshake through sharing the SSL cache across CICS regions.
 4. You can use the new CIPHERS option on TCPIPService resource definitions to specify a list of cipher suite codes for use with SSL or TLS. The PRIVACY attribute of the TCPIPService resource definition changes to reflect the CIPHERS attribute value.

Suggestions for migrating to the new enhancements

CICS Web support has many enhancements to provide automatic and administrator control of functions that were previously handled by user-replaceable programs. In particular, you are recommended to investigate migration possibilities for the following elements of your CICS Web support architecture:

- You should usually be able to replace the request processing functions of your analyzer program with URIMAP resource definitions, which can be changed and controlled using CICS system programming commands. URIMAP definitions can be used to match the URLs of requests and map them to application programs, and specify a converter program, alias transaction and user ID. If your analyzer program provides additional functions, you can continue to use it instead of a URIMAP definition, or you can combine it with a URIMAP definition. While migrating to the use of URIMAPs:
 1. You can introduce URIMAP resource definitions progressively for a small number of requests at a time. Depending on the type of processing carried out by your analyzer program, and the type of application that handles the request, you can choose whether or not to continue using the analyzer program in the processing path for each request.
 2. You might prefer to select and publish new URLs for requests handled by URIMAP resource definitions, rather than retaining your existing URLs. When you are ready to discontinue the use of the old processing path for a request, you can set up a URIMAP definition to permanently redirect requests from the old URL to the new URL.
 3. Ensure that your analyzer program still contains basic handling procedures for unrecognized requests, even if it is no longer involved in the processing path for any requests. The analyzer program is still required on the TCIPSERVICE definition, and receives requests in situations such as the end user mis-typing a URL.
- For application programs that do not use the EXEC CICS WEB API commands but produce an HTTP response in a block of storage, CICS Web support is not able to assist with assembling the message structure correctly, or to carry out its full range of checks on the response. To take advantage of all the available CICS Web support facilities, it is recommended that you plan to convert these applications to use the WEB API commands. You can now use the WEB API commands in converter programs and in the user-replaceable Web error program DFHWBEP, which enables you to migrate with minimal disruption to your existing CICS Web support architecture. If you use DFHWBEP, you must specify ACTION(IMMEDIATE) in your command, as the default of ACTION(EVENTUAL) is not permitted.
- URIMAP resource definitions can be used to deliver the contents of a CICS document or z/OS UNIX file as a static response, or to deliver a redirection response, without involving a user-written application program. You could consider using this mechanism, instead of an application program, for simple responses that do not involve dynamic processing.
- Check that code page conversion is operating in the most efficient way. With minor changes to your application, you can take advantage of new CICS Web support facilities to:
 - Avoid setting up and using a code page conversion table (DFHCNV) for CICS Web support.
 - Allow CICS to identify and use the Web client's character set for code page conversion, rather than specifying this yourself.
 - Use the local system default (LOCALCCSID system initialization parameter) to identify the application program's code page, rather than specifying this yourself.
 - Convert to and from the UTF-8 and UTF-16 character sets.

In some cases, making these changes could enable you to discontinue the use of an analyzer program.

Implementing resource security for CICS document templates and z/OS UNIX files

If you decide to specify the system initialization parameters `XRES=YES`, `XRES=name`, or `XHFS=YES`, follow these instructions. `XRES=YES` and `XHFS=YES` are the defaults.

- If you decide to specify `XRES=YES` or `XRES=name` to activate resource security for CICS document templates, check the `RESSEC` attribute in the `TRANSACTION` resource definitions of any transactions in your CICS region that access document templates, including the following:
 - `CEMT` and any other transactions that include `EXEC CICS CREATE`, `DISCARD` or `INQUIRE DOCTEMPLATE` commands.
 - `CWXN`, if you are using `URIMAP` definitions to provide static responses from CICS Web support.
 - Alias transactions for CICS Web support application programs. `CWBA` is the default alias transaction.
 - Transactions for other application programs that use `EXEC CICS CREATE` or `INSERT DOCUMENT` commands with the `TEMPLATE` option.

If `RESSEC=YES` is specified for any of these transactions, give the user IDs for the transaction permission to use the appropriate document templates. `ALTER` permission is required to create or discard document templates and `READ` permission is required for all other uses, including the API commands `DOCUMENT CREATE` and `DOCUMENT INSERT`.

Note: You cannot change the `RESSEC` attribute for CICS-supplied transactions in the CICS-supplied RDO groups. To change this attribute, copy the definitions to your own group, where you can change the attribute. `CEMT` is in group `DFHOPER`; `CWBA` and `CWXN` are in group `DFHWEB`.

- In the resource classes that are specified by your `XRES` system initialization parameter, supply RACF profiles for all the CICS document templates used by transactions with `RESSEC=YES` in your CICS region.
 1. Make sure you use the correct profile name for the CICS document templates. Use the name of the `DOCTEMPLATE` resource definition (and not the 48-character `TEMPLATENAME` attribute, which is used by `EXEC CICS` commands), prefixed by the resource type `DOCTEMPLATE`. The security checking process is case sensitive, so the case of the profile name must match the case of the resource type and resource definition name.
 2. Make sure you give permission to the correct user IDs. For CICS Web support, the user ID associated with the transaction can vary depending on your CICS Web support architecture. User IDs for access to document templates and z/OS UNIX files used by CICS Web support has more information.
- If you decide to specify `XHFS=YES` to activate access control for z/OS UNIX files, follow the instructions in Implementing security for z/OS UNIX files to allow Web clients to access these files.

You do not need to check the `RESSEC` attribute in the `TRANSACTION` resource definition of the transactions that access the files. If `XHFS=YES` is specified as a system initialization parameter for the CICS region, all z/OS UNIX files used by CICS Web support as static responses are normally subject to security checking, regardless of the `RESSEC` attribute for the transaction that is accessing them.

As an exception, if z/OS UNIX files are defined as CICS document templates and used in that way (for example, by applications), resource security for CICS

document templates, specified by the XRES system initialization parameter, controls access to them for users. In this situation, you do not need to set up resource security in z/OS UNIX System Services for the files. However, the CICS region user ID always needs to have *read* permissions to z/OS UNIX files, even if they are defined as document templates.

Chapter 28. Migration for CICS Web services

If you have used CICS Web services in earlier releases, note these migration points.

Migration for the Web services assistants

The Web services assistant batch jobs DFHWS2LS and DFHLS2WS both require a certain amount of memory to create Web service binding files.

The amount of memory required has increased to enable the Web services assistants to process large and complex Web service descriptions. As a result, the region size must now be at least 200 MB. You can either increase the size accordingly or set the region size to 0M.

If you redeploy your existing Web services in a CICS TS 3.2 region, the regenerated Web service binding files are slightly larger in size.

Migration for MTOM/XOP support

MTOM/XOP support is provided as an optional set of elements in the pipeline configuration file.

If you want to enable your pipeline to take advantage of the MTOM/XOP support, note the following:

- If you use your own application handler rather than the default that is provided by CICS Web services support, the pipeline processes MTOM messages in compatibility mode. You must specify DFHPITP as the application handler in your pipeline configuration file if you want the pipeline to process MTOM messages in direct mode.
- If you use the default CICS Web services application handler, the pipeline processes MTOM messages in direct mode. Ensure that your message handlers can still run successfully when processing containers that hold XOP documents and binary attachments.
- Only configure the attribute `send_mtom="yes"` in a provider pipeline configuration file when you are sure that all of your Web service requesters can receive MTOM messages. The default value is `send_mtom="same"`, so that MTOM messages are sent only when an MTOM message is received.

If you enable MTOM/XOP support in your pipeline, you can retrieve the options that you have specified by using the **INQUIRE PIPELINE** command.

Chapter 29. Migrating to the XPLINK option for C and C++ programs

To continue running your C and C++ programs without exploiting the XPLINK option of the compiler, no action is needed. To exploit the XPLINK option with C and C++ programs, you might have to make changes to your existing applications or configuration.

1. Ensure that your C or C++ program is reentrant, and threadsafe, or modify it so that it conforms to these standards. Chapter 25, “Migration for threadsafe programming and the open transaction environment (OTE),” on page 165 has more information about this.
2. If your program uses the XPCFTCH or XPCTA exits, take note of the advice in “Global User exits and XPLink” in the *CICS Application Programming Guide*:
 - CICS disregards any attempt by XPCFTCH to modify the entry point.
 - CICS disregards any attempt by XPCTA to define a resume address.

This is because the batch Language Environment runtime used for XPLink programs does not give control to CICS when a program abends, but goes through its own abend handling. When control reaches CICS, the Language Environment enclave has terminated, so CICS is unable to honor an entry point address or a resume address. You must find other ways to manage such requirements, or conclude that this program is not a suitable candidate for XPLINK optimization. One possible solution is to write a Language Environment abnormal termination exit, as described in “Customizing user exits” in the *z/OS Language Environment Customization* manual.

3. Recompile the program using the XPLINK compiler option.
4. Update the concurrency attribute of the PROGRAM resource definition for this program, setting the value to threadsafe.

Part 3. Changes to CICSplex SM externals

Chapter 30. Changes to CICSplex SM installation and definition

This section summarizes the changes to CICSplex SM installation, initialization and system parameters, resource definition, and setup.

Integration of CICSplex SM and CICS installation

You can now edit the DFHISTAR job to modify both the CICS and CICSplex SM installation parameters for your environment. EYUISTAR is no longer available as a job to modify CICSplex SM installation parameters.

DFHISTAR produces customized JCL for CICS and CICSplex SM. It now includes a combination of parameters that apply only for CICSplex SM, parameters that apply only for CICS, and parameters that are common to CICS and CICSplex SM.

For CICSplex SM, DFHISTAR generates sample JCL procedures to:

- Create CMAS data sets
- Start a CMAS
- Create Web User Interface (WUI) data sets
- Start a WUI
- Create MAS data sets
- Run a MAS
- Move MAS modules to the link pack area (LPA)

These procedures enable you to create a CICSplex SM configuration that consists of a CMAS, a WUI, and a managed CICS system (MAS). The CICSplex SM Starter Set, which contained samples of JCL for this purpose, is no longer provided.

Removal of the CAS

Because of the removal of the CICSplex SM TSO end user interface (EUI), you no longer need to set up and use a CAS (coordinating address space) to support a CICS Transaction Server for z/OS, Version 3 Release 2 CMAS (CICSplex SM address space).

Any attempt to run EYUCAS JCL to start a CAS results in an abend. The removal of the CAS means that there are no CAS-related data sets to install and no CAS to CAS links to configure. This allows the installation of CICSplex SM to be simplified and streamlined.

Any attempt to run CMAS startup JCL from previous releases will fail because of the references to obsolete components. All data sets beginning with the characters BB are now obsolete, and the CAS initialization program BBM9ZA00 is no longer included in the EYUAUTH library.

The CICSplex SM system parameter CASNAME identified the CAS subsystem with which a CMAS was associated. This parameter was specified by means of the extrapartition transient data queue COPR assigned to the extrapartition transient data queue EYUPARM. With the removal of the CAS, this parameter is no longer valid. Any attempt to specify CASNAME now results in the invalid parameter

message EYUXL0206E. The CASNAME parameter is still valid for CICSplex SM configurations prior to CICS Transaction Server for z/OS, Version 3 Release 2.

Datasets *.SEYUADDEF, *.SEYUVDEF, and *.SEYUJCL, which were supplied in previous releases to support the EUI, are not shipped as part of CICS Transaction Server for z/OS, Version 3 Release 2.

All EUI and CAS-related messages and abend codes have been removed. This includes messages that begin with the prefix BB, unnumbered ISPF messages, and all Uxxxx abend codes. CAS IPCS dialogs and IPCS CICS VERBEXIT keyword are now obsolete.

The XLEC transaction, which was used to connect a CMAS to a CAS, is obsolete.

Message EYUXL0008I has been removed. The message EYUXL0008I *applid* CICSplex registration complete was the final message issued for a successful CMAS startup.

The final message for a successful CMAS startup is now: EYUXL0010I *applid* CMAS initialization complete.

Dynamic creation of CICS resource definitions for CICSplex SM

The additional CICS resource definitions specifically required to run CICSplex SM CMAS, WUI and MAS are now created dynamically during initialization and when a CICSplex SM system is started by a transaction. You no longer need to manipulate the CICS CSD to obtain the default resource definitions. The CICSplex SM Starter Set, which contained samples of CICSplex SM definitions, is no longer provided.

This removes complexity from the CICSplex SM installation process. There is no longer the need to run CSD UPGRADE jobs for your CMASes, WUIs, and MASes, and then use the lists and groups produced by the upgrade in the startup of these systems. The CSD UPGRADE process can be particularly complex where a CSD is shared across CICS releases.

Note: You must run CSD UPGRADE jobs for CICS. For details about upgrading the CICS resource definitions, see “Upgrading the CSD for CICS-supplied and other IBM-supplied resource definitions” on page 97. For information about sharing CSDs across CICS releases, see “CSD compatibility between different CICS releases” on page 100.

You continue to have the facility to alter certain CICSplex SM definition properties:

- EYUPARMs COIRTASKPRI, COHTTASKPRI, MASALTLRTPRI, and TASKPRIORITY are available to set priorities for certain CICSplex SM transactions.
- You can use the CICS system initialization parameters LPA and PRVMOD to control whether to search the LPA for CICSplex SM modules.

If you want to change any other properties, you can include modified definitions on the CSD.

CICS autoinstalls the initial CICSplex SM programs for a CMAS, MAS, and WUI.

New method for WUI and CICSplex definition

The EYU9XDUT CICSplex definition utility can provide the CICSplex SM definitions to start a WUI and CICSplex as part of data repository initialization. You would previously have had to use the end user interface or a batch utility to create these definitions.

The utility optionally creates the following CICSplex SM definitions:

- CPLEXDEF, CICSplex definition
- CPLXCMAS, CMAS in CICSplex
- PLEXCMAS, plex descriptor for the maintenance point CMAS
- CMASCPLX, CMAS in CICSplex
- CSYSDEF, CICS system definition for the WUI

The CMAS SYSID is the basis for the WUI plex name and the WUI name but you can override these using the WUIPLEX and WUINAME parameters in DFHISTAR. The WUI parameter in DFHISTAR specifies whether a WUI is to be created (the default is to create a WUI).

New CICSplex SM system parameters

You use CICSplex system parameters to identify or alter CICSplex SM attributes. These parameters are specified in the extrapartition transient data queue COPR. The parameters can be assigned to a DD * file, sequential data set, or a partitioned data set member. The DD name for the extrapartition transient data queue is EYUPARM.

New system parameters in CICS Transaction Server for z/OS, Version 3 Release 2

MASALTLRTCNT={0 - 5 | 0}

This system initialization parameter was available as a PTF for CICS TS for z/OS, Version 3.1, CICS TS for z/OS, Version 2.3, and CICS TS for z/OS, Version 2.2. It determines the number of alternate long running tasks (CONA) started in the MAS during MAS agent initialization. These tasks remain active until the MAS agent terminates or goes into restart mode, and handles all API, WUI, and RTA requests normally handled by the CONL task, allowing the CONL task to perform other processing in the MAS. At any time, only one of the CONA tasks processes requests. If the CONA task that is currently processing requests becomes busy (as determined by the value of the MASALTLRTTIM EYUPARM), subsequent requests are directed to another CONA task.

If zero (0) is specified, no CONA tasks are started and the CONL task services the API, WUI, and RTA requests that are normally directed to the long running task.

Note: Specifying different values for MASALTLRTCNT for multiple WLM target regions might result in an uneven distribution of transactions to those regions because of differing long running task counts.

MASALTLRTPRI={0 - 255 | 255}

This system initialization parameter was available as a PTF for CICS TS for z/OS, Version 3.1, CICS TS for z/OS, Version 2.3, and CICS TS for z/OS, Version 2.2. It determines the priority given to the CONA transaction for the current execution of the MAS.

Note: Specifying this value less than 255 can adversely affect the response time of API, and WUI users, and might result in RTA EVENTS not being created or resolved in a timely manner.

MASALTLRTTIM={1 - 3600 | 10}

This system initialization parameter was available as a PTF for CICS TS for z/OS, Version 3.1, CICS TS for z/OS, Version 2.3, and CICS TS for z/OS, Version 2.2. It determines the amount of time in seconds for which a CONA task can be busy before subsequent requests are directed to another active CONA task.

STALLxxxTSK

Where xxx represents a CICSplex SM suspend class.

Identifies the minimum number of concurrent tasks required to enter the suspend class. The value can be 0 - 999. Use 0 to indicate STALL detection for the xxxsuspend class is not active.

STALLxxxCNT

Where xxx represents a CICSplex SM suspend class.

Identifies the number of consecutive occurrences of an entry in the suspend class required for CICSplex SM to report a STALL. The value can be 0 - 999. Use 0 to indicate STALL detection for the xxx suspend class is not active.

New CICSplex SM WUI server initialization parameters

CICSplex SM Web User Interface server initialization parameters can be specified in the start-up job or in a fixed block 80 data set.

New initialization parameters in CICS Transaction Server for z/OS, Version 3 Release 2

AUTOIMPORTDSN(*dsn_name*)

Specifies the name of the data set containing IBM-supplied view and menu definitions. The data set cannot be longer than 31 characters. Currently, the supplied set of WUI view and menu definitions is in the SEYUVIEW data set. If you specify an AUTOIMPORTDSN name, you must specify the name of a data set member using the AUTOIMPORTMEM parameter.

Use the AUTOIMPORTDSN and AUTOIMPORTMEM parameters when you want to import specific IBM-supplied view set and menu definitions as a result of service (by a PTF).

AUTOIMPORTMEM(*member_name*)

Specifies the name of the data set member containing the specific IBM-supplied view and menu definitions that you want to import. You can use an asterisk at the end of the name to specify a group of data set members that begin with the same characters. For example, specifying AUTOIMPORTMEM(EYUEA*) with the IBM-supplied SEYUVIEW data set in AUTOIMPORTDSN imports all of the members beginning with the characters EYUEA.

Use the AUTOIMPORTDSN and AUTOIMPORTMEM parameters when you want to import specific IBM-supplied view set and menu definitions as a result of service (by a PTF).

DEFAULTMAPBAS(*name* | EYUSTARTMAPBAS)

Specifies the name of the map object used to generate maps of business application services definitions.

DEFAULTMAPCOLL(value | 0)

Specifies the number of rows in a generated map below which a map opens in the expanded state. If the number of rows to be displayed is above this number, the map opens in a fully collapsed state. The default value of 0 means that in every generated map all of the rows are visible when opened.

DEFAULTMAPMON(name | EYU9XDBT)

Specifies the name of the map object used to generate maps of monitoring definitions.

DEFAULTMAPRTA(name | EYU9XDBT)

Specifies the name of the map object used to generate maps of real-time-analysis definitions.

DEFAULTMAPWLM(name | EYU9XDBT)

Specifies the name of the map object used to generate maps of workload management definitions.

New EYU9XDBT utility for CMAS and CICSplex definition

You can use the new EYU9XDBT utility to perform all CMAS and CICSplex definition activities once the basic CMAS environment has been established. You specify the required CICSplex names in some simple parameter, and the utility sets up the definitions for you.

You can use the utility for:

- Defining and removing CICSplexes to and from a CMAS.
- Defining and removing CICS regions to and from a CICSplex.
- Defining and removing CICS groups to and from a CICSplex.
- Adding and removing CICS regions to and from CICS groups.
- Importing, printing or exporting CICSplex SM objects defined to CMAS or CICSplex contexts.

Change to Common Work Area size for a CMAS

The size of the Common Work Area has increased to 2048 bytes. The Common Work Area size is specified by the CICS system initialization parameter WRKAREA.

For a complete list of CICS system initialization parameters for a CMAS, see in the *CICS Transaction Server for z/OS Installation Guide*.

Changes with RASGNDEF processing in CICSplex SM

The change described in this topic was implemented through APARs for previous releases of CICSplex SM. If the version of CICSplex SM from which you are migrating does **not** have the PTF for the APAR applied, then changes could occur in the way PROGDEFs and TRANDEFs are installed through RASGNDEFs (resource assignment definitions).

The relevant APARs for previous releases of CICSplex SM are:

- CICSplex SM Release 4: APAR PK15477
- CICSplex SM Version 2.2: APAR PK17773
- CICSplex SM Version 2.3: APAR PK17773
- CICSplex SM Version 3.1: APAR PK17787

If a PROGDEF or TRANDEF is automatically installed through a RASGNDEF that specifies a USAGE of REMOTE and a MODE of STAT, then the REMOTESYSTEM used when the PROGDEF or TRANDEF is installed in the target system will be the CICS system ID (SYSIDNT) of the related system. In versions of CICSplex SM that did not have the equivalent PTF applied, if the PROGDEF or TRANDEF specified a REMOTESYSTEM, or the RASGNDEF override specified a REMOTESYSTEM, this would be used.

You need to ensure that all BAS definitions are updated to tolerate this change before migrating to CICSplex SM Version 3.2.

Table 34 illustrates the differences in processing from versions of CICSplex SM where the PTF for the APAR is not applied. CICA is the actual SYSIDNT of the target system. CICB is the actual SYSIDNT of the related system.

Table 34.

PROGDEF or TRANDEF REMOTE- SYSTEM	RASGNDEF USAGE	RASGNDEF MODE	RASGNDEF REMOTE- SYSTEM OVERRIDE	Target REMOTE- SYSTEM <i>without</i> PTF applied	Target REMOTE- SYSTEM <i>with</i> PTF applied
none	REMOTE	STAT	none	CICB	CICB
none	REMOTE	STAT	CICX	CICX	CICB (1)
CICZ	REMOTE	STAT	none	CICZ	CICB (1)
CICZ	REMOTE	STAT	CICX	CICX	CICB (1)
none	REMOTE	DYNAM	none	CICA	CICA (2)
none	REMOTE	DYNAM	CICX	CICX	CICX
CICZ	REMOTE	DYNAM	none	CICZ	CICZ
CICZ	REMOTE	DYNAM	CICX	CICX	CICX
Note: 1. Note the difference from versions of CICSplex SM where the PTF for the APAR is not applied. 2. CICSplex SM BAS does not provide a value for this during install. CICS defaults to the target system's SYSIDNT.					

Changes to CICSplex SM MAS system dump and transaction dump codes

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, this change applies. When the CICSplex SM MAS agent starts, it automatically adds one CICS TRANDUMPCODE (TRANDUMP) entry for transaction dump code 'EYUN' and two SYSDUMPCODE (SYSDUMP) entries for system dump codes 'EYU0XZPT' and EYU0XZSD'. These codes enable you to use the ADD action from the EYUSTARTTRANDUMP and EYUSTARTSYSDUMP Web User Interface view sets to add your own TRANDUMP or SYSDUMP entries.

Changes to CMAS journaling

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, three new fields have been added to the EYUBCPJR DSECT.

- Two new fields have been added to CPJR_DEF_DATA:

CPJR_DEF_MAJORVR

Major version

CPJR_DEF_MINORVR

Minor version

- A new field has been added to CPJR_OPS_DATA:

CPJR_ACTION

Name of action

CPJR_ACTION replaces CPJR_OPSTYPE which has been removed.

The EYUBCPJR DSECT is described in in the *CICS Transaction Server for z/OS Installation Guide*.

Change to generic alert structures used by CICSplex SM

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2, there is a change to SNA generic alerts and resolutions as they are used by CICSplex SM. "Product Set ID" (X'10') MS common subvector is a "Product ID" (X'11') common subvector that identifies the product as IBM Software (X'04'). It contains a "Product Number" (X'08') Product ID subfield that identifies the product number. This has changed from 5695081 to 5655M15.

Chapter 31. Changes to CICSplex SM views and resource tables

This section summarizes the changes affecting CICSplex SM views, resource tables, and Business Application Services definition objects.

Removal of the CICSplex SM TSO end user interface (EUI)

With the new enhancements to the CICSplex SM Web User Interface (WUI) functionality and provision of the EYU9XDBT batch facility, the CICSplex SM WUI now provides the ability to perform the CICS management tasks supported by the CICSplex SM TSO end user interface (EUI). As previously announced, the EUI has therefore been removed from CICS Transaction Server for z/OS, Version 3 Release 2.

All of the functionality of the MVS/TSO ISPF end user interface has been removed. This includes all associated views, panels, menus and action commands, together with the supporting CAS and all PlexManager functions. Equivalent functionality is available solely via the CICSplex SM Web User Interface. Note there is no WUI equivalent function for the temporary maintenance point CMAS function of the EUI.

With the removal of all EUI-related components, the entire CICSplex SM installation process has been redesigned to make it an integral part of the installation of CICS Transaction server. See “Integration of CICSplex SM and CICS installation” on page 189.

New data type SCLOCK12

The new data type SCLOCK12 is introduced in CICS Transaction Server for z/OS, Version 3 Release 2.

SCLOCK12

CICS monitoring facility (CMF) 12 byte interval store clock. Maintained internally as a binary value.

The first 8 bytes contain the time accumulated by the clock, and they are displayed externally as a formatted value, with the default format `HHHH:MM:SS.thmiju` (where *t* is tenths of seconds, *h* is hundredths of seconds, *m* is milliseconds, *i* is ten-thousandths of seconds, *j* is hundred-thousandths of seconds, and *u* is microseconds).

The last 4 bytes contain a count of the measurement periods during which the time was accumulated. The count can be displayed externally by selecting the count formatting option for the attribute.

EXEC CPSM API programs have access to the entire internal SCLOCK12 data value, but REXX applications only have access to the first 8 bytes containing the time.

When specified in an RTA EVALDEF, the last 4 bytes containing the count are not available. The other data must be entered in one of the following formats, with leading zeros, if necessary:

1. HH:MM:SS
2. HH:MM:SS.thmi
3. HHHH:MM:SS.thmi
4. HHHH:MM:SS

5. HHHH:MM:SS.thmiju

Only the first **three** of these formats are compatible with earlier releases of CICSplex SM. If you need to use an EVALDEF involving SCLOCK12 data with an earlier release of CICSplex SM, do not use format 4 or 5. This applies to EVALDEFs installed directly on a back-level CICSplex SM system, and also to EVALDEFs installed as part of a batched repository update job (BATCHREP) or using the EYU9XDBT utility. For more information about clocks see the *CICS Performance Guide*.

The numeric value representing the internal data type for SCLOCK12 is 152.

Like the existing data type SCLOCK (the 8 byte interval store clock), the new data type SCLOCK12 can be used as a filter on the DATA/GET command, and it can be used when specifying summary expressions.

In views, SCLOCK12 is treated in the same way as SCLOCK. The time can be displayed in a number of different formats, and the count of measurement periods can also be displayed.

Resource table attributes converted to SCLOCK12 data type

Some resource table attributes that had the data type SCLOCK have been converted to the new data type SCLOCK12. The resource tables in which attributes have been converted are:

- TASK
- HTASK
- TASKRMI

Where a count of measurement periods was available for the SCLOCK data type before conversion, it is also available for the SCLOCK12 data type after conversion.

Application programs must be recompiled if they extract data from these resource tables using EXEC CPSM GET commands, Web User Interface server DATA/GET commands, or REXX TPARSE and TBUILD commands.

New time formatting options for clock data in CICSplex SM views

Attributes with the data type SCLOCK12, which use the 12 byte CMF interval store clock, can be displayed in any of the time formats. For attributes with the data type SCLOCK (the 8 byte store clock), you can only use certain time formats.

In the time formats that include fractions of a second, t is tenths of seconds, h is hundredths of seconds, m is milliseconds, i is ten-thousandths of seconds, j is hundred-thousandths of seconds, and u is microseconds.

The time formats are:

- HHHH:MM:SS.thmiju, which shows a 4 digit count for hours, and displays the time to 6 decimal places (down to one microsecond). This is the default format for the data type SCLOCK12. It is not available for SCLOCK. This format is the same as the format used in the CICS statistics reports.
- DDD.HH:MM:SS.thmiju, which shows a count for days, and displays the time to 6 decimal places (down to one microsecond). This format is available for the data type SCLOCK12. It is not available for SCLOCK.

- HH:MM:SS.thmi, which shows a 2 digit count for hours, and displays the time to 4 decimal places (down to one ten-thousandth of a second). This is the default format for the data type SCLOCK, and it is also available for SCLOCK12.
- HH:MM:SS, which shows a 2 digit count for hours, and no decimal places. This format is available for both the data types SCLOCK and SCLOCK12.

The longer time formats hhhh:mm:ss.thmiju and ddd.hh:mm:ss.thmiju are new.

Choose one of the longer time formats for larger time values, such as those for long-running tasks, or for time values where you need maximum precision.

For attributes with the data types SCLOCK12 and SCLOCK, you can also display a count. The count is taken from the last 4 bytes of the clock data. It gives the number of measurement periods during which the time recorded by the timer component of the clock was accumulated.

You can use the CICSplex SM Web User Interface view editor to customize your views to use the new time formats. You can edit view components from the **Tabular View Components** screen (select the **Table contents** option on that screen) or the **Detailed Form Components** screen (select **Form contents**). On the **Table contents** or **Form contents** screen, click **Append** or **Insert** to see the list of available view items. If the new time formats are available for an attribute in the view, the list displays the attribute with the new time formats, as well as with the old formats. Select the attribute with an appropriate time format to add it to your view. Then delete the attribute with the old time format from your view.

Changes to CICSplex SM Web User Interface security

In CICS TS for z/OS, Version 3.2 you can use your external security manager to control user access to views, menus, help information and the View Editor. In order to do this you need to create an appropriate profile in the FACILITY class.

The following ESM FACILITY profiles are available:

EYUWUI.wui_server_applid.VIEW.viewsetname
Used to protect view sets.

EYUWUI.wui_server_applid.MENU.menuname
Used to protect menus.

EYUWUI.wui_server_applid.HELP.helpmembername
Used to protect help pages.

EYUWUI.wui_server_applid.EDITOR.
Used to protect the View Editor..

wui_server_applid is the CICS APPLID of the server.

Users can be given read or update access to views and menus:

- Read access allows users to use the views or menus in the main interface. This enables you to prepare and protect views for specific user groups.
- Update access allows users to create, update or remove items in the view editor or import using COVC. This enables you to open the view editor to more users, while restricting the view sets and menus that individuals can modify.

If the ESM that you are using neither grants nor refuses access to a profile (for example, if no RACF profile is defined), all users who are successfully signed on to

the Web User Interface have access to the resources. You can make not authorized the default by setting up a generic profile.

Note: This security is designed to protect the views and menus themselves and not the objects they manage, which is covered by normal CICSplex SM security.

Obsolete CICSplex SM views, resource tables and attributes

These CICSplex SM views and resource tables have had certain functions removed, or have been removed completely, because of changes to CICS resource types and functions.

In the operations view **Enterprise Java component operations views > Java virtual machine (JVM) pool**, the field "Number of JVM requests with JVM reset" is displayed as "Not applicable" for CICS Transaction Server for z/OS, Version 3 Release 2 regions. The corresponding SJGREQSRESET attribute in the JVMPOOL resource table returns "Not applicable" for CICS Transaction Server for z/OS, Version 3 Release 2 regions.

In the operations view **Enterprise Java component operations views > Java virtual machine (JVM) profile**, the fields "Number of CICS key JVMs not resettable" and "Number of USER key JVMs not resettable" are displayed as "Not applicable" for CICS Transaction Server for z/OS, Version 3 Release 2 regions. The corresponding CJVMSUNRESET and UJVMSUNRESET attributes in the JVMPROFILE resource table return "Not applicable" for CICS Transaction Server for z/OS, Version 3 Release 2 regions.

In the Business Application Services (BAS) view **Administration views > Basic CICS resource administration views > CICS resource definitions > Program definitions**, and the operations view **Program operations views > Programs**, the HOTPOOLING attribute is not valid from CICS Transaction Server for z/OS, Version 3 Release 1

In the Business Application Services (BAS) view **Administration views > Basic CICS resource administration views > CICS resource definitions > Terminal definitions**, the CONSOLE attribute is not valid from CICS Transaction Server for z/OS, Version 3 Release 1.

The monitor view EYUSTARTMJOURNAL was removed in CICS Transaction Server for z/OS, Version 2 Release 3. You should review your applications and remove references to this obsolete resource.

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, these resource tables have been removed because they are obsolete:

- DSKJRNL
- JOURNAL
- JRNLDEF
- JRNINGRP
- SMFJRNL
- TAPEJRNL
- VOLUME
- XTASK

CICSplex SM resource tables no longer supported in CICS Transaction Server for z/OS, Version 3 Release 2

As previously announced, a number of CICSplex SM resource tables are no longer supported in CICS Transaction Server for z/OS, Version 3 Release 2. The information in them has migrated to other tables.

The unsupported resource tables are XDSPGBL, XDSPPOOL, XJVMPOOL, XLSRPBUF, XMONITOR, XPROGRAM, XSTREAM, XTASK, and X2TASK.

The information they contained is available in other resource tables as follows:

XDSPGBL	DSPGBL
XDSPPOOL	DSPPOOL
XJVMPOOL	JVMPOOL
XLSRPBUF	LSRPBUF
XMONITOR	MONITOR
XPROGRAM	PROGRAM
XSTREAM	STREAMNM
XTASK	TASK
X2TASK	TASK

Edit and recompile your CICSplex SM API programs to use the equivalent supported resource table. Before you migrate to CICS TS 3.2, recreate your WUI views and update your RTA definitions (EVALDEFs) to use the equivalent resource table on your earlier release.

Changed CICSplex SM views and resource tables

These existing CICSplex SM views and resource tables have been changed to support new or changed CICS resource types and functions.

Map function for resource definitions

All IBM-supplied tabular and detail views that display resource definitions now include a map button. The map function is invoked by clicking this button. It generates a visual representation of the associations between CICS resource definitions defined to CICSplex SM for the selected resource. The map function is equivalent to the CICSplex SM end user interface MAP command in releases of CICS TS where the EUI was provided.

Changed CICSplex SM views

Table 35. Changed CICSplex SM views

Changed CICS resource type or function	Corresponding CICSplex SM views which have changed
Delay times for change mode and SSL TCBs	CICS operations views > Task operations views > Active tasks
Document template statistics and refresh (newcopy) function	CICS operations views > Document template operations views > Document template
Document deletion	CICS operations views > Task operations views > Active tasks CICS operations views > Task operations views > Completed task

Table 35. Changed CICSplex SM views (continued)

Changed CICS resource type or function	Corresponding CICSplex SM views which have changed
Document templates in HFS files	CICS operations views > Document template operations views > Document template Administration views > Basic CICS resource administration views > Resource definitions > Document template definitions
ISC and MRO statistics	CICS operations views > Connections operations views > ISC and MRO connections
Java programs: use count and JVM profile	CICS operations views > Program operations views > Programs
JVMs: manual start up, and changes to termination	CICS operations views > Enterprise Java component operations views > JVM pool
JVMs: withdrawal of resettable mode	CICS operations views > Enterprise Java component operations views > JVM pool CICS operations views > Enterprise Java component operations views > JVM profile CICS operations views > Enterprise Java component operations views > JVM status CICS operations views > Enterprise Java component operations views > JVM Class Cache status
LIBRARY resources	CICS operations views > Program operations views > Program
MVS workload manager statistics	CICS operations views > CICS region operations views > MVS workload management
Storage information for MVS TCBs	CICS operations views > CICS region operations views > MVS TCBs CICS operations views > CICS region operations views > Global MVS TCB information CICS operations views > CICS region operations views > MVS storage areas
TCP/IP service	CICS operations views > TCP/IP service operations views > TCP/IP service
TCPIPSERVICE resource definition attributes	Administration views > Basic CICS resource administration views > Resource definitions > TCP/IP service definitions
XCF group ID	CICS regions > region name
Internet security	CICS operations views > Enterprise Java component operations views > CorbaServers CICS operations views > TCP/IP service operations views > TCP/IP service CICS operations views > TCP/IP service operations views > TCP/IP global status Administration views > Basic CICS resource administration views > Resource definitions > Enterprise Java CORBASERVER definitions Administration views > Basic CICS resource administration views > Resource definitions > TCP/IP service definitions

Changed CICSplex SM resource tables

Review these resource tables for possible impact on any RTA evaluation definitions (EVALDEF) or CICSplex SM API programs that you are using.

- CLCACHE
- CMAS
- CICSRGN
- CONNECT
- DOCDEF
- DOCTEMP
- DSPGBL
- EJCODEF
- HTASK
- JVM
- JVMPOOL
- JVMPROF
- LOCFILE
- MONITOR
- MVSESTG
- MVSTCB
- MVSTCBGL
- MVSWLM
- PROGDEF
- PROGRAM
- RESGROUP
- TASK
- TASKRMI
- TCPDEF
- TCPIPGBL
- TCPIPS
- TERMDEF
- TSMODEL (The TSMODEL base table attribute called DESCRIPTION in earlier releases, has been renamed to RSVRD1.)
- WORKREQ

New CICSplex SM views and resource tables

These new views and resource tables have been added to CICSplex SM to support CICS resource types and functions.

Table 36. New CICSplex SM views and resource tables

Resource type or function	CICSplex SM views	CICSplex SM resource tables
Association data for tasks	CICS operations views > Task operations views > Task association data	TASKASSC

Table 36. New CICSplex SM views and resource tables (continued)

Resource type or function	CICSplex SM views	CICSplex SM resource tables
Batched repository update job	Administration views > General views > Batched repository update job	BATCHREP
CMASs and CICSplexes (this view previously supported only by the EUI)	Administration views > CMAS configuration administration views > CMAS in CICSplex definitions	CPLXCMAS (existing resource table)
Transient data queues (this view previously supported only by the EUI)	CICS operations views > Transient data queue (TDQ) operations views > Topology data for transient data queue	CRESTDQ (existing resource table)
HOST resource definition (virtual hosts)	CICS operations views > TCP/IP service operations views > URI host	HOST
Historical data for tasks	EYUSTARTHTASK EYUSTARTMASHIST EYUSTARTTASKRMI	HTASK (existing resource table) MASHIST TASKRMI
IPIC connection	CICS operations views > Connection operations views > IP connections	IPCONN
LIBRARY	CICS operations views > Program operations views > Program	LIBRARY
LIBRARY data set names	CICS operations views > Program operations views > Program	LIBRARY LIBDSN
LIBRARY resource definitions	Administration views > Basic Resource definitions > LIBRARY definitions	LIBRARY resource administration views > LIBRARY definitions
LIBRARY definitions in a resource group	Administration views > Basic Resource definitions in a resource group	LIBRARY resource administration views > LIBRARY definitions in a resource group
WebSphere MQ connections	CICS operations views > DB2, DBCTL and WebSphere MQ operations views > WebSphere MQ connections	MQCONN
PIPELINE resource definition	CICS operations views > TCP/IP service operations views > Pipeline Administration views > Basic CICS resource definitions > Pipeline definitions	PIPELINE PIPEDEF
Resource definitions in a resource group	Administration views > Basic CICS resource definitions in a resource group	RESOURCE resource administration views > RESOURCE definitions in a resource group
Channels	CICS operations views > Active tasks > Channel usage	TASK (existing resource table)
Task element storage	EYUSTARTTASKESTG	TASKESTG
Task file usage	EYUSTARTTASKFILE	TASKFILE
Task temporary storage queue usage	EYUSTARTTASKTSQ	TASKTSQ
URIMAP resource definition	TCP/IP service operations views > URI mapping Administration views > Basic CICS resource definitions > URI mapping definitions	URIMAP URIMAPDEF

Table 36. New CICSplex SM views and resource tables (continued)

Resource type or function	CICSplex SM views	CICSplex SM resource tables
URIMAP global statistics	CICS operations views > TCP/IP service operations views > URIMAP global statistics	URIMPGBL
Web services	CICS operations views > TCP Administration views > Basic CICS resource definitions > Web service definitions	WEBSERV, WEBSIDE CICS resource administration Web service definitions

New Business Application Services definition objects

Table 37. New BAS definition objects

BAS object	What is it?
IPCINGRP	BAS definition that describes the membership of an IPIC connection definition (IPCONDEF) in a resource group.
IPCONDEF	CICS definition that describes an IPIC connection.
LIBINGRP	BAS definition that describes the membership of a LIBRARY definition (LIBDEF) in a resource group.
LIBDEF	CICS definition that describes an LIBRARY resource.

Changed Business Application Services definition objects

Table 38. Changed BAS definition objects

BAS object	Change
EJCODEF	New attribute added: STATUS
PIPEDEF	New attribute added: RESPWAIT
RASGNDEF	New REDEFTYPE values: IPCONDEF LIBDEF
RESDESC	New attributes added: IPCDEFRG IPCDEFTS IPCDEFRS LIBDEFRG LIBDEFTS LIBDEFRS
TCPDEF	<ul style="list-style-type: none"> Attribute changed: AUTHENTICATE New attribute added: PRIVACY New attribute added: REALM New value allowed for PROTOCOL attribute: IPIC

Chapter 32. National language support for CICSplex SM messages

The capability of issuing CICSplex SM messages, that have a destination of EYULOG, in national languages other than English, using the CICS message domain, has been added in CICS Transaction Server for z/OS, Version 3 Release 2. Also, the CICS XMEOUT global user exit has been enhanced to allow suppression and rerouting of CICSplex SM messages that use the message domain. These messages may be suppressed or rerouted from the joblog or console but not from the EYULOG.

“Changes to global user exits” on page 64 lists the new fields added to XMEOUT to support this function.

Because CICSplex SM is now using the CICS message domain to enable national language support, some of the CICSplex SM messages might change to multiple-line formats. This might have an effect on tools that you are using to monitor messages.

Note: CICSplex SM messages are not available through the CMAC transaction.

Problem determination system parameters removed

The CICSplex SM problem determination system parameters (EYUPARMS) for a CMAS in the format xxxCONMSG or xxxTDQMSG have been removed. They are no longer supported as valid CICSplex SM system parameters. You must remove them, because if they are used for a CMAS it fails to initialize. Message EYUXL0206E is issued in this situation.

The redundant system parameters are:

- BASCONMSG
- BASTDQMSG
- CHECONMSG
- CHETDQMSG
- COMCONMSG
- COMTDQMSG
- DATCONMSG
- DATTDQMSG
- KNLCONMSG
- KNLTDQMSG
- MASCONMSG
- MASTDQMSG
- MONCONMSG
- MONTDQMSG
- MSGCONMSG
- MSGTDQMSG
- QUECONMSG
- QUETDQMSG
- RTACONMSG

- RTATDQMSG
- SIMCONMSG
- SIMTDQMSG
- SLMCONMSG
- SLMTDQMSG
- SRVCONMSG
- SRVTDQMSG
- TOPCONMSG
- TOPTDQMSG
- TRCCONMSG
- TRCTDQMSG
- WLMCONMSG
- WLMTDQMSG

Messages added

The following messages have been added to support the NLS-enablement of CICSplex SM messages:

- EYUBM0329I
- EYUBM0330I
- EYUBM0331I
- EYUBM0332I
- EYUBM0333I
- EYUBM0334I
- EYUBM0335I
- EYUBM0336I
- EYUBM0337I
- EYUBM0338I
- EYUBM0339I
- EYUBM0340I
- EYUBM0341I
- EYUBM0342I
- EYUBM0343I
- EYUBM0344I
- EYUBM0345I
- EYUBM0346I
- EYUBM0347I
- EYUBM0348I
- EYUBN0013W
- EYUBN0014W
- EYUBN0015W
- EYUBN0016W
- EYUBN0017W
- EYUXL0030I
- EYUXL0031I
- EYUXL0032I

Messages removed

The following messages have been removed:

- EYUBM0322I
- EYUBM0323I
- EYUBM0324I
- EYUBM0325I
- EYUBM0326I
- EYUBM0327I
- EYUBN0012W
- EYUXL0020I

Chapter 33. Programs that connect to a previous release of CICSplex SM

CICSplex SM API programs that use the CONNECT verb specifying a VERSION keyword for a previous release of CICSplex SM can experience significant increases in both CPU consumption by the CMAS address space, and data space storage utilization by the Environment Services System Services (ESSS) address space.

API programs that specify a CRITERIA string to limit the size of a result set on a GET or PERFORM OBJECT request, or use the SPECIFY FILTER verb, can experience the increase in CMAS CPU and ESSS storage. Batch job runtimes might also increase.

You are not required to recompile your CICSplex SM API programs when you migrate releases. However, if you do not recompile affected programs, the CMAS has to convert the records from the current release format, to the level specified on the VERSION keyword on the CONNECT verb. This transformation process is highly intensive for CPU and storage when the result set is very large, for example, 300K to 500K records. The increases are observed in most cases when a criteria string is used to filter the result set; for example, specifying a criteria for the PROGRAM object using the NAME key for a specific or generic program. In this scenario, CICSplex SM has to retrieve all program objects and return them to the CMAS where the API is connected, transform the records to the version of the API, and then apply the filtering.

If you recompile your programs to specify the VERSION keyword to match the current release of CICSplex SM, this conversion does not take place, and there is no significant increase in storage or CPU consumption.

Member DFHEILID has moved

If you are migrating from CICS Transaction Server for OS/390, Version 1 Release 3 or CICS Transaction Server for z/OS, Version 2 Release 2, member DFHEILID has moved from the SDFHC370 library to the SDFHSAMP library. The change affects the COPYLINK step of the sample jobs supplied by CICS and CICSplex SM to translate, compile, link-edit and install application programs.

The sample jobs supplied by CICS have names in the format DFHxxTxL (for example, DFHYITDL, DFHZITCL) and are supplied in the SDFHPROC library. The sample job supplied by CICSplex SM is supplied in member EYUEITDL of the SEYUPROC library.

If you are using an older version of these supplied sample jobs, or if you have created your own job based on the supplied samples, ensure that you apply the change for DFHEILID to the COPYLINK step in the job.

Part 4. Migration tasks for CICSplex SM

Chapter 34. Running CICSplex SM Version 3.2 and earlier releases concurrently

You can run CICSplex SM Version 3.2 and earlier releases concurrently, but note the conditions listed in this topic.

CICSplex SM release names

Throughout this section, CICSplex SM releases are referred to as follows:

Version 3.2

Version 3 Release 2 (the CICSplex SM element of CICS Transaction Server for z/OS, Version 3 Release 2)

Version 3.1

Version 3 Release 1 (the CICSplex SM element of CICS Transaction Server for z/OS, Version 3 Release 1)

Version 2.3

Version 2 Release 3 (the CICSplex SM element of CICS Transaction Server for z/OS, Version 2 Release 3)

Version 2.2

Version 2 Release 2 (the CICSplex SM element of CICS Transaction Server for z/OS, Version 2 Release 2)

The CICSplex SM elements of CICS TS for z/OS, Version 3.2, CICS TS for z/OS, Version 3.1, CICS TS for z/OS, Version 2.3 and CICS TS for z/OS, Version 2.2 are **not** available as separate products.

You can run CICSplex SM Version 3.2, Version 3.1, Version 2.3, and Version 2.2, at the same time, with interconnected CMASs at different levels. The ability to do this allows gradual migration of the environment to Version 3.2. However, in CICS TS for z/OS, Version 3.2, a CICSplex SM CMAS will run only in a CICS system at the same release level.

CICS systems (MASs) running the following supported CICS releases can be connected to CICSplex SM Version 3.2:

- CICS TS for z/OS, Version 3.1
- CICS TS for z/OS, Version 2.3
- CICS TS for z/OS, Version 2.2

To connect these CICS systems to CICSplex SM Version 3.2, you must apply compatibility APARs to the CICS systems as follows:

- APAR PK17360 for CICS TS 3.1
- APAR PK16582 for CICS TS 2.3
- APAR PK16582 and APAR PQ65168 for CICS TS 2.2

Conditions for running CICSplex SM Version 3.2 and earlier releases concurrently

The following conditions apply to environments in which CICSplex SM Version 3.2 and earlier releases of CICSplex SM are running concurrently:

- In order for a CMAS and a MAS (including those MASs that act as Web User Interface servers) to communicate, they must all be running the same release of CICSplex SM. That is:
 - A MAS (including those MASs that act as Web User Interface servers) must be connected to a CMAS running at the same release of CICSplex SM as the MAS.
- A CMAS running at Version 3.2 can be connected to a CMAS running at Version 3.1, Version 2.3, or Version 2.2. However:
 - In a CICSplex that consists of CMASs at the Version 3.2 level and the Version 3.1, Version 2.3, or Version 2.2 level, the maintenance point CMAS must be at the Version 3.2 level. That is, when a CICSplex contains CMASs at more than one level, the first CMAS converted to Version 3.2 must be the maintenance point.
 - If you are using the API or Web User Interface to manage MASs connected to a CMAS at an earlier release, you must ensure that the MASs are managed indirectly from the Version 3.2 CMAS. You must ensure that:
 - All API programs run so that they are connected to the Version 3.2 CMAS.

Note: This is only required if the API program needs to access new fields or later level CICS systems. If the API program connects to a lower level CMAS, any resource tables which contain new or updated fields for the new release would not be returned to the API program connected to the lower release level CMAS.

- All Web User Interface servers connect to the Version 3.2 CMAS.
 - You cannot view resources of a CICS Version 3.2 region using a CMAS running at an earlier release.
- The following definitions, if required, must be created using a WUI server or EUI running at the same CICSplex SM release level as the maintenance point CMAS:
 - CPLEXDEF
 - CMTCMDEF
 - CSYSGRP
 - PERIODEF
 - MONSPEC
 - MONGROUP
 - MONDEF
 - RTAGROUP
 - RTADEF
 - WLMSPEC
 - WLMGROUP
 - WLMDEF
 - TRANGRP

CICSplex SM and the maintenance point CMAS release level must, again, be at the same release level if you use the API or BATCHREP to create these definitions.

Chapter 35. Removal of support for Windows remote MAS

Previous releases of CICSplex SM have supported the CICS for Windows component of TXSeries, Version 4.3.0.4 and TXSeries, Version 5.0 (also known as NT 4.3 and NT 5.0) in the management of a remote managed application system (RMAS). This support is no longer necessary and the CICSplex SM TXSeries agent has been removed for CICS Transaction Server for z/OS, Version 3. Therefore, it is no longer possible to set up a CICSplex SM remote MAS agent for Windows.

You can continue to use the CICS Transaction Servers 2.3 or 2.2 for TXSeries support in CICSplex SM.

Chapter 36. Upgrade procedures for CICSplex SM

Make sure that you complete all your upgrades to CICS TS for z/OS, Version 3.2 CICSplex SM, including your CMAS, all MASs that are connected to it, and all MASs that act as Web User Interface servers for it, before you restart CICSplex SM.

Several skeleton postinstallation members are distributed with CICSplex SM. You should generate these postinstallation members for use during the upgrade. For information about generating the postinstallation members, see *CICS Transaction Server for z/OS Installation Guide*.

To enable you to revert to the previous release of CICSplex SM if you encounter problems during the upgrade to CICS TS for z/OS, Version 3.2 CICSplex SM, you should take backup copies of the previous release components such as JCL, CLISTs, CICS tables, CMAS data repositories, and WUI repositories before you start the upgrade process.

Upgrading a CMAS

You must upgrade your CICSplex SM CMAS to Version 3 Release 2 at the same time as you upgrade the CICS system on which it runs. This is because a CICSplex SM CMAS will run only in a CICS system at the same release level. During startup the CMAS checks the CICS release level and terminates with message EYUXL0142 if the release does not match.

Follow these steps to upgrade your CMAS to Version 3 Release 2:

1. In the z/OS image that contains the CMAS, verify that the IEASYSxx member of the SYS1.PARMLIB library that you use for z/OS initialization includes the **MAXCAD** and **NSYSLX** parameters, with appropriate values. Updating IEASYSxx (CMAS) the *CICS Transaction Server for z/OS Installation Guide* explains what values are suitable. If you are running both a previous release and Version 3 Release 2 of CICSplex SM, an Environment Services System Services (ESSS) space will be started for each release, so you might need to modify the **NSYSLX** value.
2. Authorize the Version 3 Release 2 libraries. For information about how to do this, see Authorizing the CICS and CICSplex SM libraries the *CICS Transaction Server for z/OS Installation Guide*.
3. Update the MVS linklist with the Version 3 Release 2 modules. For information about this step, see Installing CICS-required modules in the MVS linklist the *CICS Transaction Server for z/OS Installation Guide*.
4. Upgrade the CSD file with the Version 3 Release 2 group of resource definitions and CICS startup group list. For information about how to do this, see “Upgrading the CSD for CICS-supplied and other IBM-supplied resource definitions” on page 97. You do not need to carry out an additional upgrade using a release-dependant set of definitions for CICSplex SM.
5. Edit the JCL used to start the CMAS, changing the previous release of CICSplex System Manager library names to the Version 3 Release 2 names. For information about the CMAS startup JCL, see Preparing to start a CMAS the *CICS Transaction Server for z/OS Installation Guide*.
6. Upgrade the data repository to Version 3 Release 2. For information about how to upgrade the data repository, see Converting the CICSplex SM data repository the *CICS Transaction Server for z/OS Installation Guide*.

Note: The conversion utility copies the contents of the existing data repository to a newly allocated data repository. The existing data repository is not modified.

7. Ensure that you have deleted, redefined and initialized the CICS local catalog (LCD) and global catalog (GCD) using the DFHCCUTL and the DFHRMUTL utility programs.
8. Verify the CICSplex SM system parameters referenced by the EYUPARM DD statement. For information about these parameters, see CICSplex SM system parameters the *CICS Transaction Server for z/OS Installation Guide*.

When you have completed all these steps, the CMAS is ready to be cold started.

Converting a MAS to Version 3.2

Before you convert a MAS to Version 3.2 ensure that you have updated the CSD file with the Version 3.2 group of resource definitions and CICS startup group list as part of your CICS migration procedures. For information about how to do this, see the *CICS Transaction Server for z/OS Installation Guide*. You do not need to carry out an additional upgrade using a release-dependant set of definitions for CICSplex SM

Now you need to do the following:

- Authorize the Version 3.2 libraries. (For information about doing this, see the *CICS Transaction Server for z/OS Installation Guide*.)
- Reassemble the CICS resource definition table load modules. Reference the library containing the Version 3.2 resource entry copy books to update the resource tables with the newest entries. (For information about updating the resource definition table load modules for a MAS, see the *CICS Transaction Server for z/OS Installation Guide*.)
- When previous release modules are in the link pack area (LPA), you must ensure the Version 3.2 modules are used in place of the previous release modules. (For information about how to do this, see the *CICS Transaction Server for z/OS Installation Guide*.)
- Edit the JCL used to start the MAS changing the previous release of CICSplex System Manager library names to the Version 3.2 names. (For information about the MAS startup JCL, see the *CICS Transaction Server for z/OS Installation Guide*.)
- In the sequential data set or partitioned data set member identified by the CICS SYSIN statement, verify that the CICS system initialization table (SIT) parameter **EDSALIM** is included, and set it to a value of at least 50MB. 50MB is the minimum EDSALIM required to start the MAS agent for CICSplex SM Version 2.3 and later versions.
- Ensure that you have deleted, redefined and initialized the CICS local catalog (LCD) and global catalog (GCD) using the DFHCCUTL and the DFHRMUTL utility programs.
- If you intend to use MAS history recording, it is recommended that you define new history data sets using the EYUJHIST sample job. If, however, you need to migrate your existing history data sets, you may still use the EYUJHIST sample job, following the migration instructions, supplied as comments, within the sample. The EYUJHIST sample is supplied uncustomized in the TDFHINST library and customized by DFHISTAR in the XDFHINST library. Remember to edit the MAS start up JCL to include the history data sets.

The MAS is ready to be cold started.

When you have successfully migrated all your systems to CICSplex SM Version 3.2 you can delete the previous release groups from each MAS's CSD. (For information about how to do this, see "Deleting the previous release definitions from CSD files" on page 224.)

Migration for CICSplex SM workload management

If you use the workload management functions of CICSplex SM and you use your own version of the CICSplex SM user-replaceable Workload Routing Action Module, EYU9WRAM, you must recompile and link-edit your version of EYU9WRAM using the Version 3.2 libraries. For information on how to do this, see the description of customizing the dynamic transaction routing program in the *CICSplex System Manager Managing Workloads* manual.

If your application programs have been modified to make a call to EYU9XLOP using the EYUAWTRA commarea, they must also be recompiled and link-edited with the Version 3.2 libraries.

IPIC connections with workload management

CICSplex SM workload management has been updated to support MASs connected with CICS IPIC connections (IPCONNs). There are no new external changes to workload management to exploit CICS IP connections but you may notice different behavior when CICS IPIC connections are introduced into a workload. For CICS TS Version 3.2, CICS IP connections can only be used by Distributed Program Link (DPL). If a routing request other than DPL is being executed, all normal workload management routing algorithms will apply. This means that MASs that are connected only by CICS IPIC connections can only support DPL requests.

Consider a simple workload installed on a routing region that needs to balance DPL requests to a pair of target regions. One target region is connected to the routing region via MRO, and the other target region is connected to the routing region via a CICS IPIC connection. In situations where the target regions are running at the same health and load levels, their connection link weights will be the deciding factor when determining a DPL target. In this situation, CICSplex SM would always select the MRO-connected target region as the DPL target, because its link weight is less than that for IPIC connections. Now assume that the MRO-connected regions also have a CICS IPIC connection installed. If there are identical health and load levels for the target regions, routing requests may vary between the two target regions because CICS will always choose to use an IPIC connection for DPL requests over any other connection type. Therefore, when the MRO-connected target region had a CICS IPIC connection installed, this equalized the link weight of the DPL targets, as they both now have a CICS IPIC connection. It is recommended that workloads are not actively spread across earlier CICS TS releases and a CICS TS Version 3.2 CICSplex. New workloads should be established for CTS Version 3.2 managed regions, and regions managed by earlier CICS TS releases should be isolated from them.

Application programming interface

CICSplex SM API programs written to run in a previous release MAS can be run in a Version 3.2 MAS. You can either continue to access the data provided by the previous release or access the new data available from Version 3.2. For a

discussion of the compatibility between releases of the API, see the *CICSplex System Manager Application Programming Guide*.

Converting a Web User Interface Server to Version 3.2

Both the Web User Interface server and the CMAS that it connects to must be at the highest level of CICSplex SM and CICS within the CICSplex. This means that both must be at the same level as the maintenance point CMAS.

Before you migrate a Web User Interface server, you must migrate the CMAS that it connects to. You must migrate the Web User Interface server before you migrate any other MASs. If the CMAS that the Web User Interface server connects to is not the maintenance point CMAS, you must migrate the maintenance point CMAS at the same time.

It is advisable to increase the size of the DFHTEMP data set. This is used in the COVC import process. The standard CICS sample just has a primary allocation but you should include a secondary allocation for RECORDS as follows:

```
//DEFTS    JOB accounting info,name
//AUXTEMP  EXEC PGM=IDCAMS
//SYSPRINT DD  SYSOUT=A
//SYSIN    DD  *
           DEFINE CLUSTER(NAME(CICSTS32.CICS.CNTL.CICSqualifier.DFHTEMP)-
                           RECORDSIZE(4089,4089)           -
                           RECORDS(200 200)                 -
                           NONINDEXED                        -
                           CONTROLINTERVALSIZE(4096)         -
                           SHAREOPTIONS(2 3)                 -
                           VOLUMES(volid))                   -
                           DATA(NAME(CICSTS32.CICS.CNTL.CICSqualifier.DFHTEMP.DATA) -
                           UNIQUE)
/*
```

As the CICS system that acts as your Web User Interface server is a local MAS, all the considerations that apply to a local MAS also apply to a Web User Interface server.

To convert a Web User Interface server to Version 3.2 you should:

- Upgrade the CSD for CICS, see “Upgrading the CSD for CICS-supplied and other IBM-supplied resource definitions” on page 97.
- Migrate the MAS that acts as your Web User Interface server.
- Migrate the contents of the Web User Interface server repository (EYUWREP).

If you have Web User Interface servers connected to CMASs other than the maintenance point CMAS, which have many other MASs connected to them, you might not want to migrate the other MASs at the same time as the CMAS. In that case you might consider using the following phased migration path:

1. Define a new Version 3.2 CMAS on the same MVS image as the Web User Interface server.
2. Connect the Version 3.2 CMAS to the CICSplex that the Web User Interface server CMAS is connected to. (It will not become available for use until the maintenance point CMAS has been migrated. If you see message EYUCP0022E at this time, there is no need to take any action.)
3. Migrate the maintenance point CMAS to Version 3.2 and take down the Web User Interface server at the same time. Migrate the Web User Interface server

to Version 3.2 and, when you restart it, connect it to the Version 3.2 CMAS. The Version 3.2 CMAS should now connect successfully to the Version 3.2 maintenance point CMAS.

4. Migrate the remaining MASs when required, and connect them to the Version 3.2 CMAS as you restart them.
5. When you have moved all the MASs to the Version 3.2 CMAS, you can remove the original CMAS.

Assuming you are running the latest CICSplex SM 3.1 and 3.2 maintenance levels, you can convert one LPAR at a time from 3.1 to 3.2.

- A CICSplex SM 3.2 WUI can only connect to a 3.2 CMAS.
- A CICSplex SM 3.1 WUI can only connect to a 3.1 CMAS.
- A CICSplex SM 2.3 WUI can only connect to a 2.3 CMAS.
- A CICSplex SM 2.3 WUI connected to a 2.3 CMAS can retrieve data from a MAS connected to a 3.2 CMAS (assuming it is not a resource type which is unique to CICS TS 3.2) if the CMAS participates in the management of the CICSplex.
- A CICSplex SM 2.2 WUI can only connect to a 2.2 CMAS.
- A CICSplex SM 2.2 WUI connected to a 2.2 CMAS can retrieve data from a MAS connected to a 3.2 CMAS (assuming it is not a resource type which is unique to CICS TS 3.2) if the CMAS participates in the management of the CICSplex.
- A CICSplex SM 3.2 WUI connected to a 3.2 CMAS can retrieve data from any MAS connected to any CMAS if the CMAS participates in the management of the CICSplex.

Migrating the MAS and updating the Web User Interface CSD group

To migrate the MAS and update the Web User Interface CSD group you should follow the instructions for converting a MAS as described in “Converting a MAS to Version 3.2” on page 220. You must also update the CICS SIT GRPLIST parameter to reference the CICS-supplied default startup group list, DFHLIST.

Migrating the contents of the Web User Interface server repository (EYUWREP)

In CICS TS for z/OS, Version 3.2 some internal Web User Interface repository record versions have been incremented to facilitate the new features in view definitions. For this reason, if your existing Web User Interface repository contains customized view sets or menus, it is essential that you migrate your view set and menu definitions.

You can import a view set and menu definitions from a previous release into a CICS TS for z/OS, Version 3.2 Web User Interface server repository.

To migrate the Web User Interface server repository to the current version:

1. Export your view set and menu definitions with your Web User Interface server still running at your current release. It is not necessary for the Web User Interface server to be connected to a CMAS to do this.

For information about exporting definitions see the *CICSplex System Manager Web User Interface Guide*.

2. Create a new Web User Interface server repository using the JCL described in the *CICS Transaction Server for z/OS Installation Guide*.

3. Start the Web User Interface server at the new release using the new Web User Interface server repository.
4. Import the new starter set definitions (the supplied set of view set and menu definitions with names beginning EYUSTART).
5. Import your previous release view set definitions by specifying the data set that you had exporting them to on the AUTOIMPORTTDQ parameter making sure that the TDQ you specify references the data set that you exported to. This will need to be done for each type of resource (VIEW, MENU, USER, USERGRP, and so on) that you had previously customized. Now use COVC to import the new starter set definitions specifying the OVERWRITE option on the **Import option** field of the COVC panel to ensure that none of the new starter set views have been accidentally overwritten by views from a previous release.

For information about using COVC, see the *CICSplex System Manager Web User Interface Guide*

You do not need to make any changes to existing customized views and menus, but you can consider modifying or creating view sets to take into account the new attributes and resources.

You can also export view set and menu definitions from a CICS TS for z/OS, Version 3.2 Web User Interface server and import them into a server repository of a previous release. However, any new attributes or resources that are new in this release are not accessible in previous releases. You can remove these attributes and view sets using the View Editor. For information about the View Editor see the *CICSplex System Manager Web User Interface Guide*.

Deleting the previous release definitions from CSD files

When you have successfully migrated all your systems to CICSplex System Manager Version 3.2, you can delete the Version 3.1, Version 2.3 or Version 2.2 definitions from each CMAS's and MAS's CSD. This can be done by upgrading each CSD using module EYU9Rxxx, where xxx is the release number for the previous release, for example EYU9R230 for Version 2.3. This module is supplied in CICSSTS32.CPSM.SEYULOAD.

```
//CSDUP   EXEC PGM=DFHCSDUP
//STEPLIB DD DSN=cics.index.SDFHLOAD,DISP=SHR
//        DD DSN=cpsm.index.SEYULOAD,DISP=SHR
//DFHCSD  DD DSN=cics.dfhcscd,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSIN   DD *
          UPGRADE USING(EYU9Rxxx)
/*
```

Figure 5. JCL to delete previous release groups and group lists from the CSD

When this JCL is run, EYU9Rxxx attempts to delete all the groups and group lists for that CICSplex System Manager version from the CSD. However, because not all of the items the job attempts to delete are actually defined in the CSD, DFHCSDUP gives a return code of 04. The DFHCSDUP SYSPRINT output lists those items that were deleted and those that were not found. For further information about updating the CSD, see the *CICS Transaction Server for z/OS Installation Guide*.

Chapter 37. A phased migration scenario

The figures “The environment,” “Objective 1: Add a WUI server at the earlier release” on page 227, “Objective 2: Convert MP CMAS to the new version” on page 228, “Objective 3: Convert CMAS B to the new version” on page 230, and “Objective 4: Convert CMAS C to the new version” on page 232 and the discussions that accompany them show a CICSplex System Manager environment at an earlier release and the steps you would take to convert that environment to Version 3.2. Note that this scenario presents one way you might perform the migration; you might find another set of procedures to be more appropriate to your own environment.

The environment

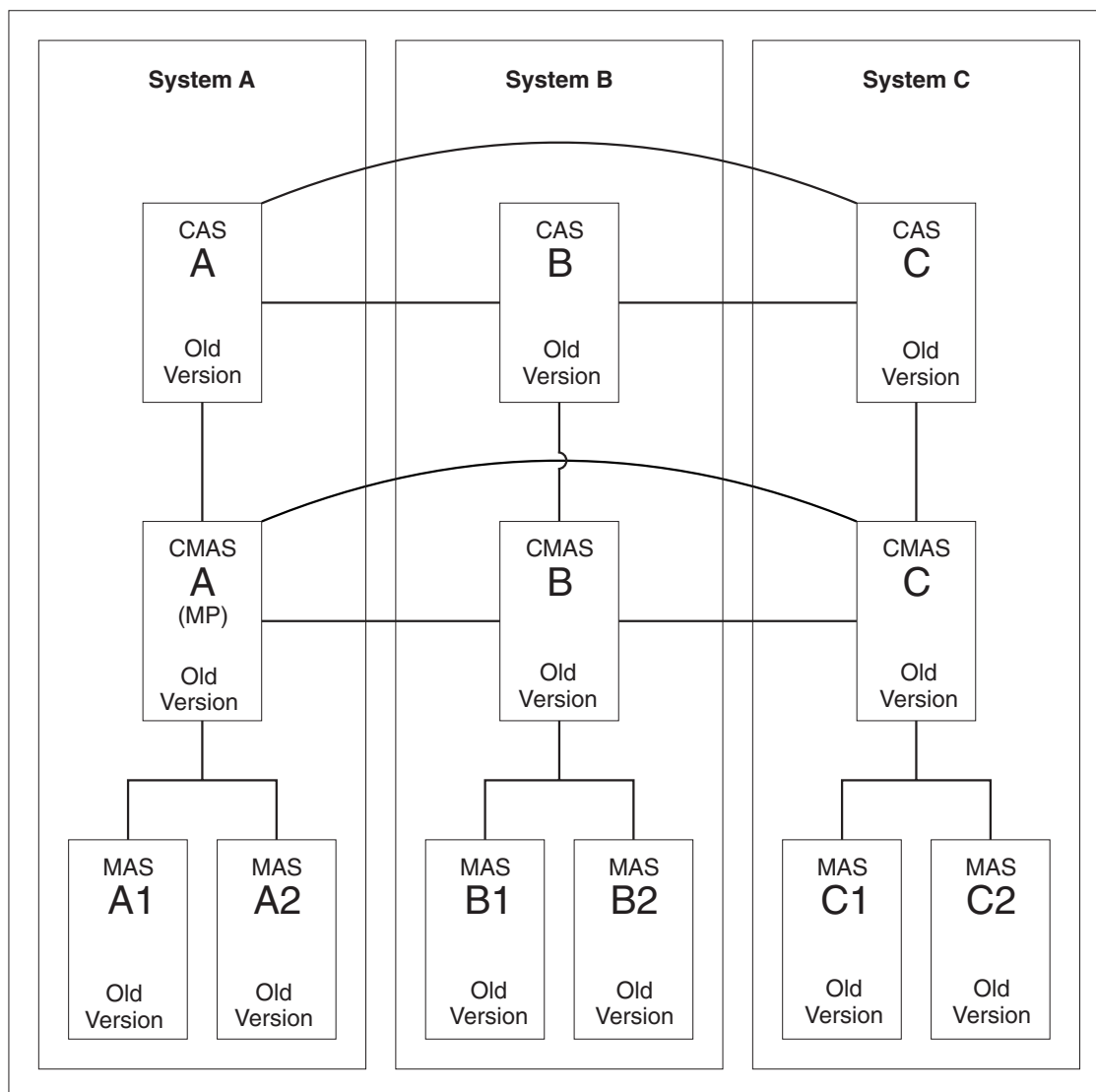


Figure 6. An environment at an earlier release

Figure 6 on page 225 shows a CICSplex System Manager environment that is made up of the following components:

- 3 MVS systems (System A, System B, System C)
- 3 CASs
 - All interconnected
- 3 CMASs
 - All interconnected
 - CMAS A connects to CAS A (both are in System A)
 - (This is the maintenance point CMAS.)
 - CMAS B connects to CAS B (both are in System B)
 - CMAS C connects to CAS C (both are in System C)
- 1 CICSplex
 - CMAS A is the maintenance point
- 6 CICS regions
 - 6 local MASs
 - MAS A1 and MAS A2 connect to CMAS A (all are in System A)
 - MAS B1 and MAS B2 connect to CMAS B (all are in System B)
 - MAS C1 and MAS C2 connect to CMAS C (all are in System C)
 - Systems A, B and C are at the old CICS TS release.

Objective 1: Add a WUI server at the earlier release

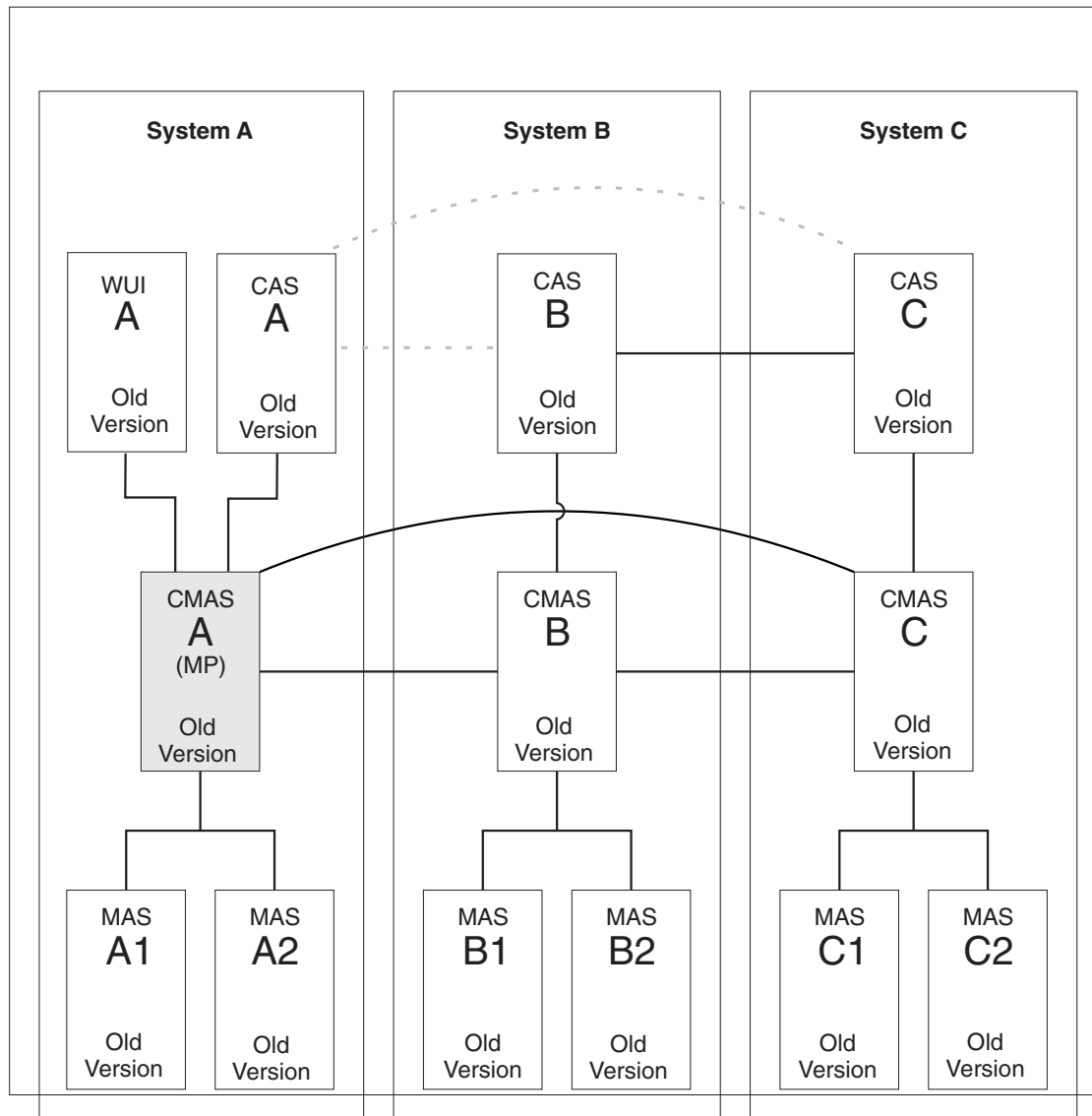


Figure 7. Adding a WUI server at the earlier release

When you complete Objective 1, a WUI at the earlier release level will have been connected to CMAS A.

The addition of a WUI to System A requires the following:

- Connect a WUI server to the maintenance point CMAS A at the old CICS Transaction Server release level.
- Create a separate CICSplex for the WUI server, defining CMAS A as the maintenance point.

Objective 2: Convert MP CMAS to the new version

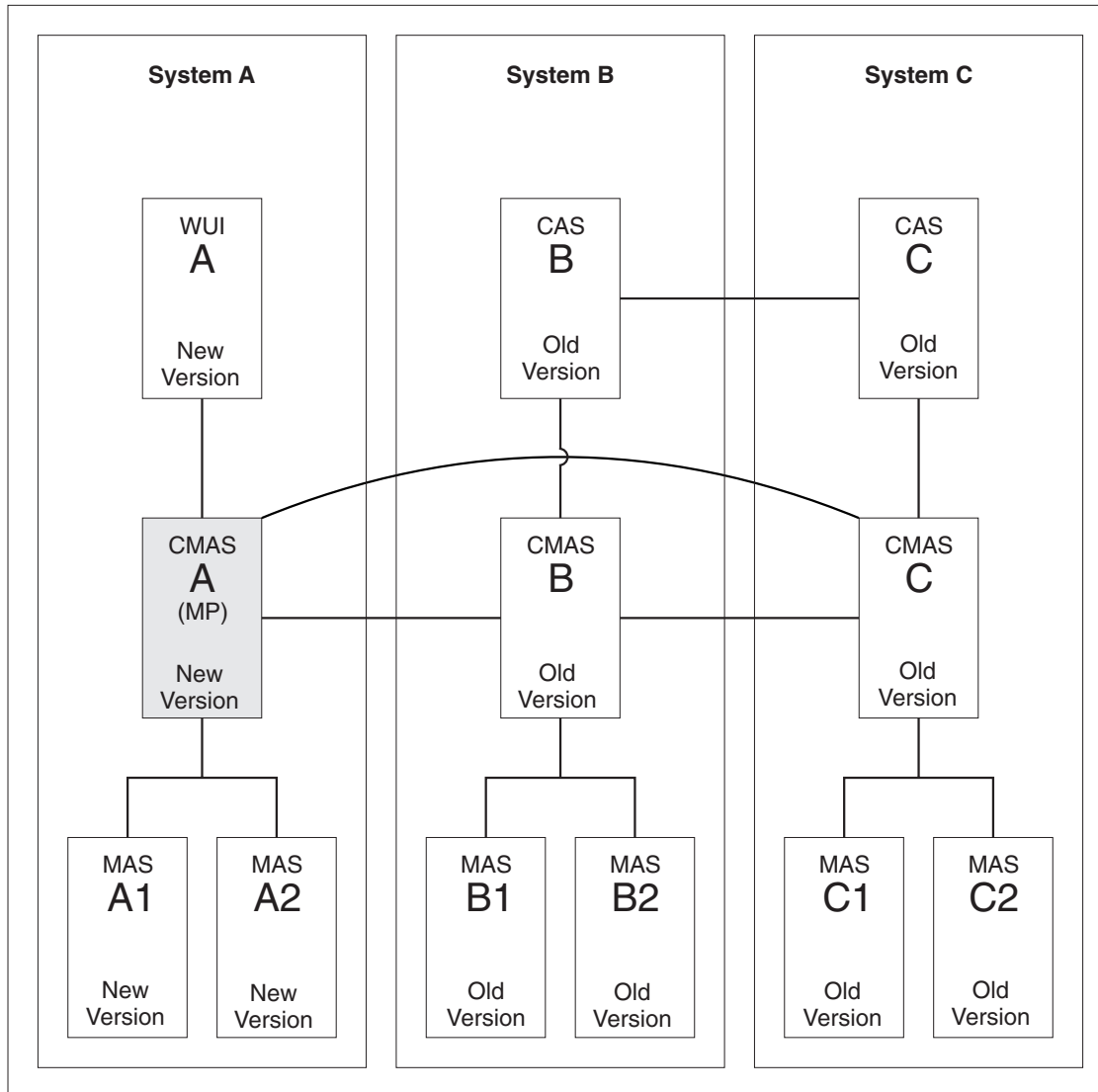


Figure 8. Converting the maintenance point CMAS to the new version

When you complete Objective 2, all CICS systems in System A are at the new version. The CMAS systems (A, B, and C) remain interconnected despite the different release levels they are at. CAS A and its connections are removed but CAS B and CAS C remain connected to one another.

The conversion of the maintenance point CMAS A to the new version requires conversion for the following:

- CMAS A
- WUI A
- MAS A1
- MAS A2

Step 1: Terminate executing regions that are to be converted

- If the following systems are running, terminate them:

- CMAS A
- WUI A
- MAS A1
- MAS A2

Step 2: Convert CMAS A to the new version

- Upgrade the CSD for CICS, see “Upgrading the CSD for CICS-supplied and other IBM-supplied resource definitions” on page 97.
- Change the appropriate IEAAPFxx member of the SYS1.PARMLIB library to authorize the CICSTS32.CPSM.SEYUAUTH library.
- Ensure that modules EYU9A320 and EYU9X320 in the CICSTS32.CPSM.SEYULINK data set are in the MVS link-list concatenation.
- Update the CICS group list for CMAS A to use DFHLIST.
- Run EYU9XDUT to convert the EYUDREP data set for CMAS A to the new Version.

Note: After converting the EYUDREP data set for CMAS A, the next time CMAS A is started it must point to the converted EYUDREP data set. If it does not, data repository updates may be lost. This can lead to invalid results, which can include other CMAS's isolating themselves when they connect to this CMAS.

- Update the JCL used to start CMAS A to point to the new data sets.
- Delete CASNAME from the EYUPARM parameters.
- Delete the BBACTDEF, BBVDEF, BBIPARM DD statements from the CMAS startup JCL.
- Start CMAS A.

Step 3: Convert WUI A to the new version

- Update the CICS group lists to use DFHLIST.
- Update the JCL used to start WUI A to point to the new data sets.
- Start WUI A.

Step 4: Convert MAS A1 and MAS A2 to the new version

- Update the CICS group lists for MAS A1 and MAS A2 to use DFHLIST and the lists of definitions for your own applications.
- Update the JCL used to start MAS A1 and for MAS A2 to point to the new data sets.
- Start MAS A1 and MAS A2.

Objective 3: Convert CMAS B to the new version

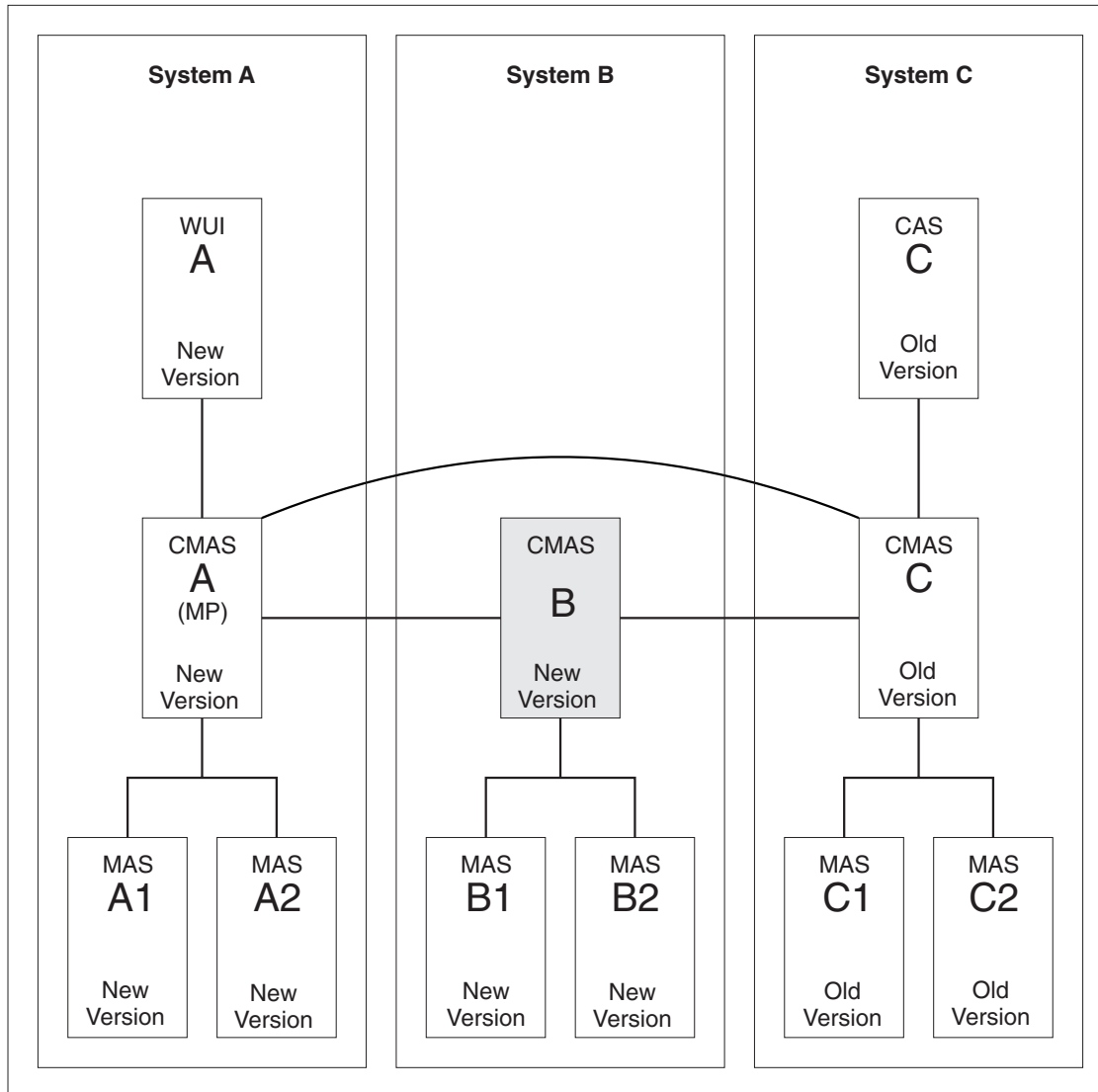


Figure 9. Converting CMAS B to the new version

When you complete Objective 3, all CICS systems in System B are at the new version. The CMAS systems (A, B, and C) remain interconnected despite being at different release levels. CAS B and its connection to CAS C are removed.

The conversion of CMAS B to the new version requires conversion for the following:

- CMAS B
- MAS B1
- MAS B2

Step 1: Terminate executing regions that are to be converted

- If the following systems are running, terminate them:
 - CMAS B
 - MAS B1

- MAS B2

Step 2: Convert CMAS B to the new version

- Change the appropriate IEAAPFxx member of the SYS1.PARMLIB library to authorize the CICSTS32.CPSM.SEYUAUTH library.
- Ensure that modules EYU9A320 and EYU9X320 in the CICSTS32.CPSM.SEYULINK data set is in the MVS link-list concatenation.
- Update the CICS group list for CMAS B to use DFHLIST.
- Run EYU9XDUT to convert the EYUDREP data set for CMAS B to the new version.

Note: After converting EYUDREP data set for CMAS B, the next time CMAS B is started, it must point to the converted EYUDREP data set. If it does not, data repository updates may be lost. This can lead to invalid results, which include other CMAS's isolating themselves when they connect to this CMAS.

- Update the JCL used to start CMAS B to point to the new data sets.
- Delete CASNAME from the EYUPARM parameters.
- Delete the BBACTDEF, BBVDEF and BBTPARM DD statements from the CMAS startup JCL.
- Start CMAS B.

Step 3: Convert MAS B1 and MAS B2 to the new version

- Update the CICS group lists for MAS B1 and MAS B2 to use DFHLIST and the lists of definitions for your own applications.
- Update the JCL used to start MAS B1 and for MAS B2 to point to the new data sets.
- Start MAS B1 and MAS B2.

Objective 4: Convert CMAS C to the new version

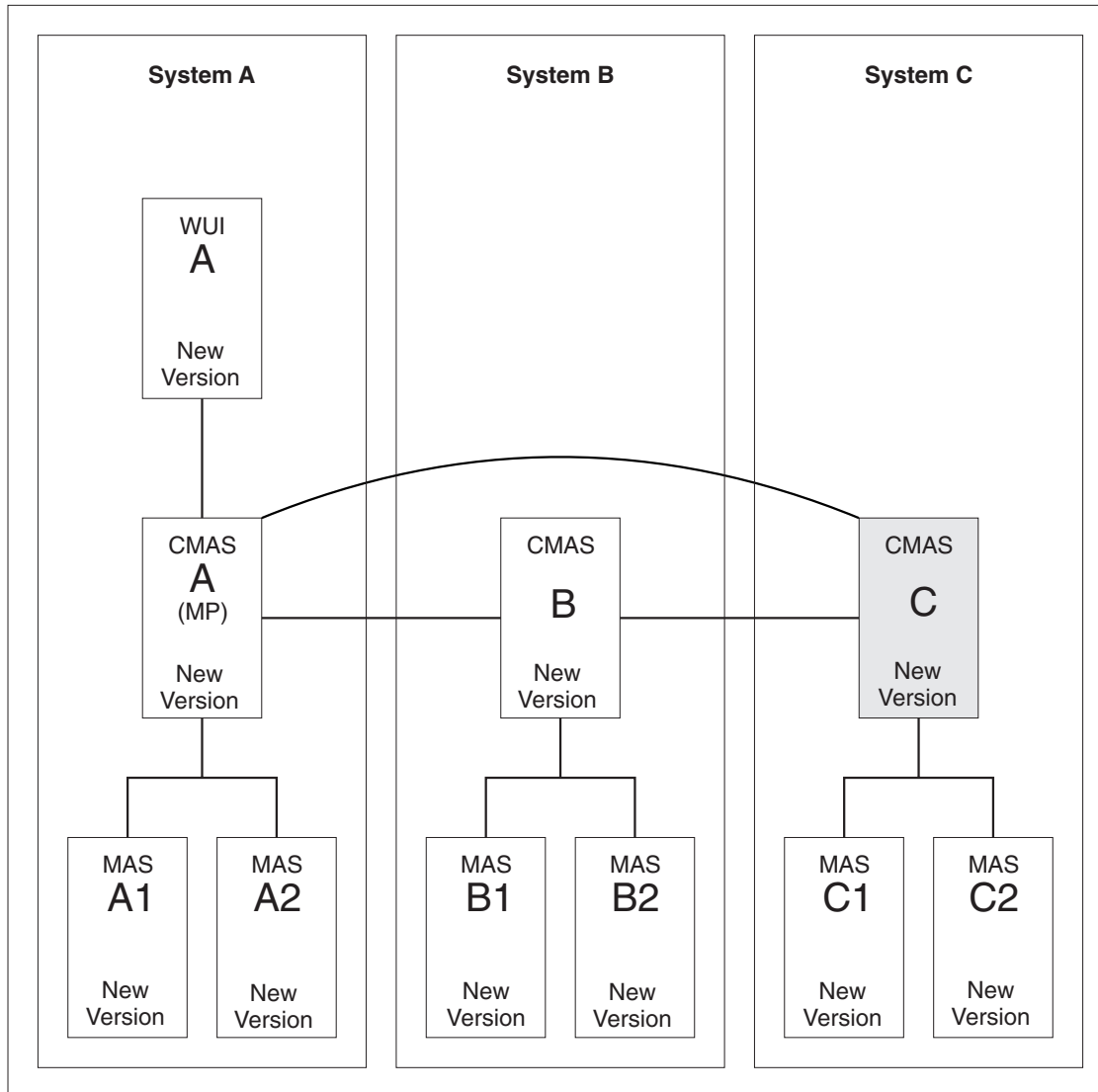


Figure 10. Converting CMAS C to the new version

When you complete Objective 4, all CICS systems are at the new version. All CASs will have been removed.

The conversion of CMAS C to the new version requires conversion for the following:

- CMAS C
- MAS C1
- MAS C2

Step 1: Terminate executing regions that are to be converted

- If the following systems are in execution, terminate them:
 - CMAS C
 - MAS C1
 - MAS C2

Step 2: Convert CMAS C to the new version

- Change the appropriate IEAAPFxx member of the SYS1.PARMLIB library to authorize the CICSTS32.CPSM.SEYUAUTH library.
- Ensure that modules EYU9A320 and EYU9X320 in the CICSTS32.CPSM.SEYULINK data set are in the MVS link-list concatenation.
- Update the CICS group list for CMAS C to use DFHLIST.
- Run EYU9XDUT to convert the EYUDREP data set for CMAS C to the new version.

Note: After converting EYUDREP data set for CMAS C, the next time CMAS C is started, it must point to the converted EYUDREP data set. If it does not, data repository updates may be lost. This can lead to invalid results, can which include other CMAS's isolating themselves when they connect to this CMAS.

- Update the JCL used to start CMAS C to point to the new data sets.
- Delete CASNAME from the EYUPARM parameters.
- Delete the BBACTDEF, BBVDEF, BBIPARM DD statements from the CMAS startup JCL.
- Start CMAS C.

Step 3: Convert MAS C1 and MAS C2 to the new version

- Update the CICS group lists for MAS C1 and MAS C2 to use DFHLIST and the lists of definitions for your own applications.
- Update the JCL used to start MAS C1 for MAS C2 to point to the new data sets.
- Start MASs C1 and C2.

Part 5. Changes to CICS messages and codes

Chapter 38. Changes to CICS Messages and Codes

This section lists messages that have been removed, changed, and added for CICS TS Version 3.2.

Deleted messages

This section lists messages deleted for CICS TS Version 3.2.

This message is not applicable for CICS TS Version 3.2.

- DFHPI0999

Changed Messages

This section lists messages that have changed for CICS TS Version 3.2

Table 39. Changed messages

Message number	Message text
DFHAC2216	<i>time applid</i> Transaction termination processing for transaction <i>tranid</i> has failed because a connected system has requested that the UOW be rolled back. <i>condmsg</i>
DFHAC2234	<i>date time applid</i> A commit failure has occurred during syncpoint processing for transaction <i>tranid</i> , terminal <i>termid</i> . The transaction will be allowed to complete normally { <i>EXCI job = }exci_id. condmsg</i>
DFHAC2235	<i>date time applid</i> A backout failure has occurred during syncpoint processing for transaction <i>tranid</i> , terminal <i>termid</i> . The transaction will be allowed to complete normally { <i>EXCI job = }exci_id. condmsg</i>
DFHAC2246	<i>date time applid</i> Transaction termination processing for transaction <i>tranid</i> could not be completed normally because a connected system has requested that the unit of work be rolled back{ <i>EXCI job = }exci_id. condmsg</i>
DFHAC2247	<i>date time applid</i> Transaction <i>tranid</i> running program <i>program name</i> term <i>termid</i> has requested rollback, but was using a type of processing for which rollback is not supported. The transaction has been abnormally terminated with code ASP8 { <i>EXCI job = }exci_id. condmsg</i>
DFHAM4834 E	<i>applid</i> Install of { <i>TDQUEUE PROCESSTYPE LIBRARY URIMAP</i> } <i>resourcename</i> failed because the installed definition is not disabled.
DFHAM4851 E	<i>applid</i> Install of { <i>DB2ENTRY DB2TRAN DB2CONN LIBRARY</i> } <i>name</i> failed because of a security error.
DFHAM4889 E	<i>applid</i> Install of { <i>JOURNALMODEL TSMODEL TCPIPService CORBASERVER IPConn URIMAP</i> } <i>resourcename</i> failed because <i>attribute attrname</i> is invalid.
DFHAM4898 E	<i>applid</i> Installation of { <i>TDQUEUE PROCESSTYPE LIBRARY</i> } <i>resourcename</i> failed because of insufficient storage.
DFHAM4920 E	<i>applid</i> The installation of { <i>CORBASERVER DJAR PIPELINE WEBSERVICE LIBRARY</i> } <i>resourcename</i> has failed because it is a duplicate of one which already exists.
DFHAM4928 E	<i>applid</i> Install of { <i>TCPIPService CORBASERVER IPConn URIMAP</i> } <i>resourcename</i> failed because the specified certificate is { <i>expired not yet current not owned by this CICS not trusted</i> }.
DFHAP1300	<i>date time applid</i> The JVM at address <i>X'jvm_anchor'</i> on thread <i>X'thread_anchor'</i> has encountered an error (reason code: <i>X'reason_code'</i>) and has requested further diagnostic data from CICS. More information may be found in the STDERR file: <i>stderr</i> .
DFHCA5147 E	<i>date time applid netname tranid</i> Command not executed. <i>lname</i> already exists as a <i>group-or-list</i>
DFHCA5190 S	<i>date time applid netname tranid</i> Command is not executed. Unable to get storage for service module <i>progrname</i>
DFHCA5272 I	<i>date time applid netname tranid resource object</i> deleted from group <i>grpname</i>
DFHCA5288 E	Get-command terminated at user's request. RC= <i>retcode</i>

Table 39. Changed messages (continued)

Message number	Message text
DFHDB2063	<i>date time applid</i> Authorization failure starting the CICS-DB2 attachment with RESP=xxxx and RESP2=yyyy
DFHEJ0601 W	<i>date time applid</i> JRAS_informational_message
DFHFC0312	<i>applid</i> Message <i>msgno</i> data set <i>dsname</i>
DFHFC6018	<i>date time applid</i> Attempt by CICS to cancel a {non-BWO / BWO} backup of a data set failed because the SMSVSAM server is not available. Data set <i>dsname</i>
DFHFC6026	<i>date time applid</i> An error has occurred while notifying VSAM RLS of the completion of CICS processing for a data set quiesce or backup. The SMSVSAM server is not available. Data set <i>dsname</i>
DFHFC6031	<i>date time applid</i> Attempt by {CICS / user} to process data set operation request {quiesce / unquiesce} failed because the SMSVSAM server detected an internal error. Data set <i>dsname</i>
DFHFC6034	<i>date time applid</i> Attempt by {CICS / user} to process data set operation request {quiesce / unquiesce} failed because the user is not authorized to access the sphere. Data set <i>dsname</i>
DFHII1013 E	<i>date time applid</i> Failure establishing connection to host <i>host port port</i> . Reason is: <i>exception</i> .
DFHNC0944 I	R12=prv CF Exit response Name=counter
DFHPI0301	<i>date time applid</i> CICS was unable to link to PROGRAM <i>program_name</i> while attempting to invoke WEBSERVICE <i>WebService</i> . {The program abended. / The program was not defined. / The program was not enabled. / The program was not loadable. / No further details are available.}
DFHPI0400	<i>date time applid tranid</i> The CICS pipeline HTTP transport mechanism failed to send a request because {the request was using an invalid host codepage / there was a socket error / the URL was invalid / the connection was closed}.
DFHPI0401	<i>date time applid tranid</i> The CICS pipeline HTTP transport mechanism failed to send a response or receive a request because {the codepage was not found / there was a socket error / the connection was closed / the client codepage was invalid}.
DFHPI0700 S	<i>date time applid userid</i> PIPELINE <i>pipeline</i> failed to install completely because PL/I support is not available and is required for pipeline usage.
DFHPI0704 I	<i>date time applid userid</i> PIPELINE <i>pipeline</i> Implicit scan has completed. Number of wsbind files found in the WSDIR directory: <i>num_files</i> . Number of successful WEBSERVICE creates: <i>num_ok</i> . Number of failed WEBSERVICE creates: <i>num_failed</i> .
DFHPI0715 I	<i>date time applid userid</i> PIPELINE <i>pipeline</i> explicit scan has completed. Number of wsbind files found in the WSDIR directory: <i>num_files</i> . Number of WEBSERVICEs created or updated: <i>num_ok</i> . Number of WEBSERVICEs not requiring an update: <i>num_nun</i> . Number of failed WEBSERVICE creates or updates: <i>num_failed</i> .
DFHPI0716 E	<i>date time applid userid</i> Unable to dynamically create a WEBSERVICE for PIPELINE <i>pipeline</i> . The complete WSBIND file name is too long.
DFHPI0720 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file filename at offset X'offset'. Found : <i>element_found</i> yet expected : {<service> / <transport> or <service> / a transport handler list / <service_handler_list> or <terminal_handler> / <handler> / <program> / <handler_parameter_list> / <name> / <cics_soap_1.1_handler> / <cics_soap_1.2_handler> / <header_program> / <service> / <service_handler_list> / <default_target> or a default handler list / <program_name> / <namespace> / <localname> / <mandatory> / true, false, 1 or 0 / <terminal_handler> / <service_parameter_list> / <service>, <transport> or <service_parameter_list> / /}.
DFHPI0730	<i>date time applid</i> An attempt to register a remote Web service as a participant in unit of work - X'uwoid' has failed.
DFHPI0914 E	<i>date time applid userid</i> WEBSERVICE <i>WebService</i> is UNUSABLE because: {the WSBind file was not found / CICS is not authorized to read the WSBind file / there is insufficient storage to load the WSBind file / the HFS read for the WSBind file failed / writing the WSBind file to the shelf failed / the PIPELINE is incompatible with this WEBSERVICE / the CPIR resolution transaction could not be attached / the direction of the PIPELINE can't be determined / the WSBind file is corrupt / the WSBind file has an invalid version number / the WSBind file has an out of date version number / the WSBind file product number was not recognised / the PIPELINE is not a SOAP PIPELINE / the PIPELINE does not support SOAP version 1.2 / the PIPELINE is not configured for SOAP version 1.1}.

Table 39. Changed messages (continued)

Message number	Message text
DFHPI1001	<i>date time applid</i> Validation of a { <i>request</i> / <i>response</i> } message for WEBSERVICE <i>webservicename</i> and operation <i>operationname</i> failed. The failure response contains the following message: ' <i>message</i> '.
DFHPI1002	<i>date time applid</i> Validation of a { <i>request</i> / <i>response</i> } message for WEBSERVICE <i>webservicename</i> and operation <i>operationname</i> was successful.
DFHSI1519 I	<i>applid</i> The interregion communication session was successfully started in XCF group <i>xcfgroup</i>
DFHSJ0201	<i>date time applid JVMProfile</i> A call to CEEPIPI with function code INIT_SUB_DP has failed. (Return code - <i>X'rc'</i>).
DFHSJ0202	<i>date time applid JVMProfile</i> A call to CEEPIPI with function code TERM has failed. (Return code - <i>X'rc'</i>). See the JVM's STDERR log for further details.
DFHSJ0203	<i>date time applid JVMProfile</i> A call to CEEPIPI with function code CALL_SUB has failed. (Return code - <i>X'rc'</i>). See the JVM's STDERR log for further details.
DFHSJ0204	<i>date time applid JVMProfile</i> A call to CEEPIPI with function code CALL_SUB has failed. (Return code - <i>X'rc'</i>). See the JVM's STDERR log for further details.
DFHSJ0205	<i>date time applid JVMProfile</i> A call to CEEPIPI with function code CALL_SUB has failed. (Return code - <i>X'rc'</i>). See the JVM's STDERR log for further details.
DFHSJ0501	<i>date time applid JVMProfile</i> An attempt to obtain the CICS Wrapper class <i>wrapper_name</i> using the JNI function 'FindClass' has failed.
DFHSJ0502	<i>date time applid JVMProfile</i> Attempt to change the HFS working directory to <i>pathname</i> has failed. Runtime error message is <i>errmsg</i>
DFHSJ0503	<i>date time applid JVMProfile</i> Attempt to load DLL <i>dllname</i> has failed. Runtime error message is <i>errmsg</i>
DFHSJ0505	<i>date time applid</i> Attempt to open <i>jvmprofile filename</i> has failed. Runtime error message is <i>errmsg</i>
DFHSJ0507	<i>date time applid JVMProfile</i> The option <i>option</i> is not recognized, and has been ignored.
DFHSJ0508	<i>date time applid JVMProfile</i> The maximum number of JVM options has been exceeded. Option <i>option</i> has been ignored.
DFHSJ0509	<i>date time applid JVMProfile</i> Attempt to open JVM system properties file <i>filename</i> has failed. Runtime error message is <i>errmsg</i>
DFHSJ0511	<i>date time applid JVMProfile</i> Attempt to open <i>filename</i> in work directory <i>dirname</i> for output has failed. Runtime error message is <i>errmsg</i>
DFHSJ0512	<i>date time applid JVMProfile</i> Unexpected end of file while concatenating lines in system properties file.
DFHSJ0513	<i>date time applid JVMProfile</i> Unable to build shareable application class path: { <i>Either CICS_HOME or JAVA_HOME too long</i> / <i>CICS_HOME or JAVA_HOME or TMPPREFIX too long</i> / <i>CICS_HOME not specified in JVM profile</i> / <i>JAVA_HOME not specified in JVM profile</i> / <i>Cannot add TMSUFFIX as class path would be too long</i> / <i>Cannot add ibm.jvm.shareable.application.class.path</i> }.
DFHSJ0514	<i>date time applid JVMProfile</i> Problem encountered on line <i>line_number</i> of the JVM profile: { <i>Unexpected EOF while concatenating lines</i> / <i>Concatenation too long</i> }.
DFHSJ0515	<i>date time applid JVMProfile</i> Problem encountered on line <i>line_number</i> of the JVM system properties file { <i>Unexpected EOF while concatenating lines</i> / <i>Concatenation too long</i> / <i>CICS ignoring this tm classpath setting</i> / <i>CICS ignoring this java.class.path setting</i> }.
DFHSJ0516	<i>date time applid JVMProfile</i> An attempt to create a Java Virtual Machine using the JNI has failed. See the JVM's STDERR log for further details.
DFHSJ0520	<i>date time applid</i> The setting for environment variable <i>env_var1</i> in JVM Profile <i>JVMprof</i> is not valid for a master JVM.
DFHSJ0706	<i>date time applid</i> During processing of transaction <i>tranid</i> , a call to CEEPIPI with function code INIT_SUB_DP has failed. (Return code - <i>X'rc'</i>).
DFHSJ0707	<i>date time applid</i> During processing of transaction <i>tranid</i> , a call to CEEPIPI with function code CALL_SUB has failed. (Return code - <i>X'rc'</i> , sub-routine return code - <i>X'subrc'</i>). See the JVM's STDERR log for further details.
DFHSJ0708	<i>date time applid</i> During processing of transaction <i>tranid</i> , a call to CEEPIPI with function code TERM has failed. (Return code - <i>X'rc'</i>). See the JVM's STDERR log for further details.

Table 39. Changed messages (continued)

Message number	Message text
DFHSJ0801	<i>date time applid</i> An attempt to create a master Java Virtual Machine using the JNI has failed. See the JVM's STDERR log for further details.
DFHSJ0802	<i>date time applid</i> Attempt to load DLL <i>dllname</i> has failed for the master JVM. Runtime error message is <i>errmsg</i>
DFHSJ0803	<i>date time applid</i> Attempt to change the HFS working directory to <i>pathname</i> has failed for the master JVM. Runtime error message is <i>errmsg</i>
DFHSO0123	<i>date time applid</i> Return code <i>rc</i> received from function '{ <i>unknown</i> <i>gsk_environment_init</i> <i>gsk_environment_open</i> <i>gsk_environment_close</i> <i>gsk_secure_socket_init</i> <i>gsk_secure_socket_open</i> <i>gsk_secure_socket_close</i> <i>gsk_secure_socket_read</i> <i>gsk_secure_socket_write</i> <i>gsk_attribute_set_buffer</i> <i>gsk_attribute_set_callback</i> <i>gsk_attribute_set_enum</i> <i>gsk_attribute_set_numeric_value</i> }' of System SSL. Reason: { <i>Unrecognized return code</i> <i>Key database not found</i> <i>Key database access not authorized</i> <i>Invalid password for key database</i> <i>Expired password for key database</i> <i>Stashed password file not found</i> <i>Session timeout value is invalid</i> <i>An I/O error occurred</i> <i>An unknown error occurred</i> <i>Invalid distinguished name</i> <i>No common ciphers negotiated</i> <i>No certificate available</i> <i>Server certificate rejected by client</i> <i>Root certificate authority not supported</i> <i>Unsupported operation</i> <i>Invalid certificate signature</i> <i>SSL protocol violation</i> <i>Not authorized</i> <i>Self-signed certificate</i> <i>Invalid session state</i> <i>Handle creation failed</i> <i>No private key</i> <i>Untrusted Certificate Authority</i> <i>Certificate date invalid</i> <i>Invalid cipher suite</i> <i>Handshake abandoned by client</i> <i>Cannot open key database</i> <i>Host certificate not yet valid</i> <i>Certificate parsing error</i> <i>Certificate is revoked</i> <i>LDAP server is inactive</i> <i>Unknown Certificate Authority</i> }. Client: <i>clientaddr</i> , TCIPSERVICE: <i>tcpipservice</i> .
DFHTC2534	<i>date time applid</i> Invalid destination at term <i>termid</i> {, <i>trans</i> } <i>tranid,time</i>
DFHUP0203	<i>applid</i> USAGE DATA COLLECTION FUNCTION IS NOT AVAILABLE ON THIS SYSTEM. IFAUSAGE RC 16 HAS BEEN ISSUED. MODULE <i>module</i>
DFHWB0101	<i>date time applid tranid</i> The CICS Web Interface alias program DFHWBA detected a failure in program DFHWBBLI. Host IP address <i>hostaddr</i> . Client IP address: <i>clientaddr</i> .{ TCIPSERVICE: <i>tcpipservice</i>
DFHWB0151	<i>date time applid tranid</i> The CICS Web Interface 3270 emulation code was unable to process the data it was passed.{ TCIPSERVICE: <i>tcpipservice</i>
DFHWB0731	<i>date time applid tranid</i> CICS Web attach processing detected an HTTP header longer than 32767 bytes. Host IP address <i>hostaddr</i> . Client IP address: <i>clientaddr</i> .{ TCIPSERVICE: <i>tcpipservice</i>
DFHWB0734	<i>date time applid tranid</i> CICS Web attach processing failed because the SSL handshake with the client has failed. Host IP address <i>hostaddr</i> . Client IP address: <i>clientaddr</i> .{ TCIPSERVICE: <i>tcpipservice</i>
DFHXC6646 I	<i>applid</i> ERROR CALLING CICS SVC - xxxxxxxxxxxx
DFHXS1115	<i>applid</i> USER <i>userid</i> IS NOT AUTHORIZED TO INVOKE { <i>HOME</i> <i>REMOTE</i> } METHOD <i>method-name</i> FROM BEAN <i>bean-name</i> {FOR APPLICATION <i>application-name</i> } IN CORBASERVER <i>cs-name</i> . USER HAS NO ACCESS TO ANY OF THESE ROLES {FOR METHOD(*)}: <i>role-name-list</i>
DFHZC3205 E	<i>date time applid</i> Transaction CTIN - virtual terminal <i>termid</i> VTAM netname <i>netname</i> . CICS cannot support the { <i>n.a.</i> <i>n.a.</i> <i>n.a.</i> <i>combination of client and virtual terminal codepage.</i> <i>client codepage.</i> <i>virtual terminal codepage.</i> }
DFHZC5908 E	<i>date time applid</i> Install for terminal <i>termid</i> failed. The security manager gave return code <i>retcode</i>
DFHZC5939 E	<i>date time applid</i> Install for <i>name</i> failed. Duplicate session- or modegroup-name for connection <i>sysid</i>
DFHZC5978 E	<i>date time applid</i> Unable to replace pool <i>pppp</i>
DFHZC5983 E	<i>date time applid</i> Unable to replace <i>resource</i>

New Messages

This section lists new messages introduced for CICS TS Version 3.2.

Table 40. new and changed messages I

Message number	Message text
DFHAM4812 W	<i>applid</i> Install of LIBRARY <i>libname</i> encountered a data set { <i>allocation</i> / <i>concatenation</i> / <i>open</i> } failure. The LIBRARY is installed but disabled.
DFHAM4813 W	<i>applid</i> Install of LIBRARY <i>libname</i> encountered an MVS ABEND. The LIBRARY is installed but disabled.
DFHAM4817 E	<i>applid</i> Install of LIBRARY <i>libname</i> failed with an MVS ABEND. The LIBRARY is not installed.
DFHAM4878 E	<i>applid</i> Install of { <i>IPCONN</i> } <i>resourcenname</i> failed because one with this name is already installed and is in use.
DFHAM4885 E	<i>applid</i> Install of <i>IPCONN</i> <i>resourcenname</i> failed. Duplicate <i>applid</i> <i>applid</i> found.
DFHAM4913 E	<i>applid</i> Install of { <i>IPCONN</i> } <i>resourcenname</i> failed because a CONNECTION resource with this name and a different APPLID is already installed.
DFHAM4914 E	<i>applid</i> Install of <i>resourcetype</i> <i>resourcenname</i> failed. The specified <i>targetresource</i> is unusable.
DFHAM4917 W	<i>applid</i> { <i>CORBASERVER</i> / <i>TCPIPSERVICE</i> / <i>IPCONN</i> / <i>URIMAP</i> } <i>resourcenname</i> was installed with a reduced set of CIPHER codes.
DFHAM4918 E	<i>applid</i> The installation of { <i>CORBASERVER</i> / <i>TCPIPSERVICE</i> / <i>IPCONN</i> / <i>URIMAP</i> } <i>resourcenname</i> has failed because its requested CIPHER list was rejected.
DFHAM4934 E	<i>applid</i> The installation of <i>URIMAP</i> <i>resourcenname</i> failed because <i>HOSTCODEPAGE</i> <i>hcodepage</i> is not valid in combination with <i>CHARACTERSET</i> <i>charset</i> .
DFHAM4935 E	<i>applid</i> Install of { <i>TCPIPSERVICE</i> / <i>CORBASERVER</i> / <i>IPCONN</i> / <i>URIMAP</i> } <i>resourcenname</i> failed because the KEYRING has no default certificate.
DFHAM4999 E	<i>applid</i> Install of <i>resourcetype</i> resources is not supported.
DFHAP1500	<i>applid</i> The CICS time-of-day is no longer synchronized with the system time-of-day.
DFHCA5553 E	<i>date time applid netname tranid</i> Command not executed. <i>field</i> cannot start with a 'char'.
DFHCA5554 W	<i>date time applid netname tranid</i> Use of static attribute <i>field1</i> forces <i>field2</i> .
DFHCA5555 E	<i>date time applid netname tranid</i> Command not executed. There must be at least one attribute specified.
DFHCA5556 E	<i>date time applid netname tranid</i> Command not executed. <i>resource</i> names beginning with 'yyy' are reserved and cannot be used.
DFHCA5557 E	<i>date time applid netname tranid</i> Command not executed. 'xxxxxxx' is a reserved name and cannot be used as a <i>resource</i> name.
DFHCA5558 W	<i>date time applid netname tranid</i> A ranking value less than 10 for LIBRARY ' <i>resource</i> ' means it will appear before DFHRPL in the search order.
DFHCF0123	<i>IXCARM</i> REQUEST= <i>reqtype</i> failed, return code <i>retcode</i> , reason code <i>rsncode</i> .
DFHDD0004	<i>applid</i> A possible loop has been detected at offset <i>X'offset'</i> in module <i>modname</i> .
DFHDD0006	<i>applid</i> Insufficient storage to satisfy Getmain (code <i>X'code'</i>) in module <i>modname</i> . MVS code <i>mvscode</i> .
DFHFC0119	<i>applid</i> The load of callable service IGGCSI00 has failed with return code <i>X'eeee'</i> .
DFHFC0517	<i>applid</i> { <i>RLS</i> / <i>Non-RLS</i> } OPEN of file <i>filename</i> failed. An error was detected when reading the VSAM catalog.
DFHFC0518	<i>applid</i> File Control is using an extended addressing ESDS dataset.
DFHFC0519	<i>applid</i> Call to VSAM Catalog utility IGGCSI00 for dataset <i>dsname</i> failed. Return code <i>X'rrrr'</i> Reason code <i>X'cccc'</i> .
DFHFC6037 I	<i>date time applid</i> Program <i>program name</i> has issued an RBA request against an extended addressing ESDS data set. File <i>filename</i> . Data set <i>dsname</i> .
DFHFC6038	<i>date time applid</i> Program <i>program name</i> has issued an unsupported type of RBA request against an extended addressing ESDS. The request has failed. File name <i>filename</i> . Data set name <i>dsname</i> .
DFHIS0001	<i>applid</i> An abend (code <i>aaa/bbbb</i>) has occurred at offset <i>X'offset'</i> in module <i>modname</i> .
DFHIS0002	<i>applid</i> A severe error (code <i>X'code'</i>) has occurred in module <i>modname</i> .
DFHIS0003	<i>applid</i> Insufficient storage to satisfy Getmain (code <i>X'code'</i>) in module <i>modname</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHIS0004	<i>applid</i> A possible loop has been detected at offset <i>X'offset'</i> in module <i>modname</i> .
DFHIS0006	<i>applid</i> Insufficient storage to satisfy Getmain (code <i>X'code'</i>) in module <i>modname</i> . MVS code <i>mvscode</i> .
DFHIS0998	<i>date time applid</i> Mirror transaction processing DPL request using IP Interconnectivity has abended with code <i>abcode</i> .
DFHIS1000	<i>date time applid</i> Invalid parameter list passed to IS domain module <i>modname</i> .
DFHIS1001	<i>date time applid</i> Unexpected exception from domain call made by IS domain module <i>modname</i> .
DFHIS1002	<i>date time applid</i> Unable to { <i>acquire</i> / <i>release</i> } IPCONN <i>ipconn</i> . IPCONN not found.
DFHIS1003	<i>date time applid</i> Unable to { <i>acquire</i> / <i>release</i> } IPCONN <i>ipconn</i> . IPCONN state { <i>INSERVICE</i> / <i>OUTSERVICE</i> },{ <i>RELEASED</i> / <i>OBTAINING</i> / <i>ACQUIRED</i> / <i>FREEING</i> } is invalid.
DFHIS1004	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Associated TCPIPService <i>tcpipservice</i> not found.
DFHIS1005	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Associated TCPIPService <i>tcpipservice</i> not open.
DFHIS1006	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . TCPIP not open.
DFHIS1007	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Failure to open session to <i>hostname</i> , port <i>portnumber</i> .
DFHIS1008	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Invalid HTTP response to capability exchange.
DFHIS1009	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Response to capability exchange timed out.
DFHIS1010	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . Invalid capability exchange response received.
DFHIS1011	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> . An { <i>EXCEPTION</i> / <i>DISASTER</i> / <i>INVALID</i> / <i>KERNERROR</i> / <i>PURGED</i> } response to the capability exchange was received, reason={ <i>AUTOINSTALL_FAILED</i> / <i>INVALID_IPCONN_STATE</i> / <i>INVALID_PARTNER_STATE</i> / <i>IPCONN_NOT_FOUND</i> / <i>ISCE_ERROR</i> / <i>ISCE_INVALID_APPLID</i> / <i>ISCE_TIMED_OUT</i> / <i>ISCE_BAD_RECOV</i> / <i>ISCE_BAD_RESPONSE</i> / <i>ISCE_ERROR</i> / <i>ISCE_HTTP_ERROR</i> / <i>ISCE_TIMED_OUT</i> / <i>SESSION_OPEN_FAILED</i> / <i>SHUTDOWN</i> / <i>TCPIP_CLOSED</i> / <i>TCPIPService_MISMATCH</i> / <i>TCPIPService_NOT_FOUND</i> / <i>TCPIPService_NOT_OPEN</i> / <i>NO_IPCONN</i> / <i>ONE_WAY_IPCONN</i> / <i>CAPEX_RACE</i> / <i>SECURITY_VIOLATION</i> / <i>UNKNOWN</i> }.
DFHIS1012	<i>date time applid</i> Invalid capability exchange request received on TCPIPService <i>tcpipservice</i> .
DFHIS1013	<i>date time applid</i> Invalid applid <i>networkid.applid</i> received in capability exchange request on TCPIPService <i>tcpipservice</i> .
DFHIS1014	<i>date time applid</i> Capability exchange request not received on TCPIPService <i>tcpipservice</i> .
DFHIS1015	<i>date time applid</i> Unable to accept connection for IPCONN <i>ipconn</i> . IPCONN client session state is invalid.
DFHIS1016	<i>date time applid</i> Invalid recovery protocol received in capability exchange request on TCPIPService <i>tcpipservice</i> .
DFHIS1017	<i>date time applid</i> IS domain input queue error.
DFHIS1018	<i>date time applid</i> IS domain error queue error.
DFHIS1019	<i>date time applid</i> Bad conversation ID in IPIC HTTP header on IPCONN <i>ipconn</i> .
DFHIS1020	<i>date time applid</i> Acquire for IPCONN <i>ipconn</i> rejected; shutdown in progress.
DFHIS1021	<i>date time applid</i> Session error occurred on <i>sesstype</i> IPIC session in IPCONN <i>ipconn</i> .
DFHIS1022	<i>date time applid</i> Protocol error (code <i>X'errorcode'</i>) occurred on <i>sesstype</i> IPIC session in IPCONN <i>ipconn</i> .
DFHIS1023	<i>date time applid</i> Conversation error (code <i>X'errorcode'</i>) occurred on IPIC session <i>name</i> in IPCONN <i>ipconn</i> .
DFHIS1024	<i>date time applid</i> Mirror attach rejected on IPCONN <i>ipconn</i> . No sessions available.
DFHIS1025	<i>date time applid</i> Failed to attach mirror transaction <i>transid</i> on IPCONN <i>ipconn</i> . Error code is <i>X'errorcode'</i> .
DFHIS1026	<i>date time applid</i> Incorrect TCPIPService <i>tcpipservice</i> used for inbound connection to IPCONN <i>ipconn</i> , which is defined to use TCPIPService <i>ipconn_tcpipservice</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHIS1027	<i>date time applid</i> Security violation has been detected using IPCONN <i>ipconn</i> and transaction id <i>transid</i> by userid <i>userid</i>
DFHIS1028	<i>date time applid</i> A request has been received over IPCONN <i>ipconn</i> to use transaction id <i>transid</i> by userid <i>userid</i> . This userid is not authorized to use the transaction.'
DFHIS1029	<i>date time applid</i> One-way IPCONN <i>ipconn</i> not valid for connection from applid <i>networkid.applid</i> . A callback is expected on host <i>ipaddr</i> , port <i>port</i> .
DFHIS1030	<i>date time applid</i> Recovery value <i>X'ipconn_recovprot'</i> for IPCONN <i>ipconn</i> different from capability response recovery value <i>X'iscer_recovprot'</i> .
DFHIS1031	<i>date time applid</i> Incoming acquire for IPCONN <i>ipconn</i> rejected due to race with concurrent local acquire.
DFHIS2000	<i>date time applid</i> Server session with applid <i>applid</i> on host <i>hostname</i> , port <i>portnumber</i> acquired for IPCONN <i>ipconn</i> .
DFHIS2001	<i>date time applid</i> Client session from applid <i>applid</i> accepted for IPCONN <i>ipconn</i> .
DFHIS2002	<i>date time applid</i> Number of SEND sessions for IPCONN <i>ipconn</i> set to <i>usable</i> . Number requested <i>req</i> . Partner limit <i>max</i> .
DFHIS2003	<i>date time applid</i> Number of RECEIVE sessions for IPCONN <i>ipconn</i> set to <i>usable</i> . Number requested <i>req</i> . Limit <i>max</i> .
DFHIS2006	<i>date time applid</i> Port <i>ipconn_port</i> for IPCONN <i>ipconn</i> different from partner port <i>partner_port</i> .
DFHIS2008	<i>date time applid</i> Receipt of <i>msgtype</i> for task <i>taskno</i> timed out on IPCONN <i>ipconn</i> .
DFHIS2009	<i>date time applid</i> Client session in IPCONN <i>ipconn</i> from applid <i>applid</i> released.
DFHIS2010	<i>date time applid</i> Server session in IPCONN <i>ipconn</i> with applid <i>applid</i> on host <i>hostname</i> , port <i>portnumber</i> released.
DFHIS2011	<i>date time applid</i> {PURGE FORCEPURGE KILL} issued successfully for <i>num_purged</i> tasks using the <i>sesstype</i> session of IPCONN <i>ipconn</i> . There are currently <i>num_active</i> tasks active of which <i>num_purging</i> are being purged.
DFHIS2040	<i>date time applid</i> Unable to acquire IPCONN <i>ipconn</i> due to a security violation
DFHIS3000	<i>date time applid</i> IPCONN <i>ipconn</i> with applid <i>networkid.applid</i> autoinstalled successfully using autoinstall user program <i>aupname</i> and template <i>template</i> after a connection request was received on tcpipservice <i>tcpipservice</i> from host <i>hostname</i> .
DFHIS3001	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> because the TCPIPService has URM(NO).
DFHIS3002	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . Use of autoinstall user program <i>aupname</i> has caused error code <i>code</i> .
DFHIS3003	<i>date time applid</i> IPCONN autoinstall failed due to a severe error in another CICS component.
DFHIS3004	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned invalid value <i>ipconn</i> for use as the IPCONN name.
DFHIS3005	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned <i>ipconn</i> for use as the IPCONN name. This name is already in use.
DFHIS3006	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned <i>template</i> as the autoinstall template. No IPCONN with this name exists.
DFHIS3007	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned <i>template</i> as the autoinstall template. This IPCONN is not in service.
DFHIS3008	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIPService <i>tcpipservice</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned <i>applid</i> for use as the applid. This is already in use.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHIS3009	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIP SERVICE <i>tcipSERVICE</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned <i>sysid</i> for use as the IPCONN name. This is already in use for a CONNECTION with a different applid.
DFHIS3010	<i>date time applid</i> IPCONN autoinstall rejected after a connection request was received on TCPIP SERVICE <i>tcipSERVICE</i> from host <i>hostname</i> . The autoinstall user program <i>aupname</i> returned invalid value <i>port</i> for use as the port number.
DFHIS3011	<i>date time applid</i> Failed to invoke Autoinstall User Program <i>aupname</i> during discard of IPCONN <i>ipconn</i> .
DFHIS3030 I	<i>date time applid</i> IPCONN name { <i>installed</i> <i>deleted</i> }.
DFHIS4000	<i>date time applid</i> Conversation failure on IPCONN <i>ipconn</i> . Sense code (<i>X'sense</i>). Message (<i>msgtext</i>).
DFHIS5000 I	<i>applid</i> Recovery action requested for IP connection <i>name</i> .
DFHIS5001 I	<i>applid</i> IP connection <i>name</i> operating normally following recovery action.
DFHIS5002	<i>date time applid</i> <i>nnnnnnnn</i> queued requests to use IPCONN <i>ipconn</i> have been cancelled. There are <i>nnnnnnnn</i> requests which remain queued.
DFHIS5003	<i>date time applid</i> <i>nnnnnnnn</i> queued requests to use IPCONN <i>ipconn</i> have been cancelled. There are <i>nnnnnnnn</i> requests which remain queued.
DFHIS6000	<i>date time applid</i> IP Interconnectivity Recovery. A process error has occurred while running transaction CISX.
DFHIS6001	<i>date time applid</i> A communications failure has occurred while running transaction CISX.
DFHIS6002	<i>date time applid</i> IP Interconnectivity Recovery. A process error has occurred while attempting to resynchronize a transaction with an XID of <i>XID</i> .
DFHIS6003	<i>date time applid</i> IP Interconnectivity Recovery. A communications error has occurred. The unit of work <i>uowid</i> for XID <i>XID</i> has been committed.
DFHIS6004	<i>date time applid</i> IP Interconnectivity Recovery. A communications error has occurred. The unit of work <i>uowid</i> for XID <i>XID</i> has been backout out.
DFHIS6005	<i>date time applid</i> IP Interconnectivity Recovery. An attempt to resynchronize a unit of work with an XID of <i>XID</i> has failed because the unit of work could not be found.
DFHIS6006	<i>date time applid</i> IP Interconnectivity Recovery. Resynchronization has failed, because of an error in the partner region, for the following local UOW <i>X'localuowid'</i> IPCONN name <i>name</i> transaction <i>transid</i> task number <i>trannum</i> terminal <i>termid</i> user <i>userid</i> .
DFHIS6007	<i>date time applid</i> IP Interconnectivity Recovery. Resynchronization not possible, because the corresponding unit of work could not be found by the partner region, for the following local UOW <i>X'localuowid'</i> associated with IPCONN <i>ipconn</i> .
DFHIS6010	<i>date time applid</i> IP Interconnectivity Recovery. Resynchronization not possible for the following local UOW <i>X'localuowid'</i> IPCONN name <i>name</i> transaction <i>transid</i> task number <i>trannum</i> terminal <i>termid</i> user <i>userid</i> .
DFHKE1798	<i>applid</i> FO TCB FORCED TO TERMINATE.
DFHLD0109 I	<i>applid modname1</i> is unable to locate module <i>modname2</i> in the LPA. DFHRPL or dynamic LIBRARY version of module will be used.
DFHLD0205	<i>applid</i> Bad Loader PLDB for LIBRARY <i>libname</i> recovered from the Global catalog. Corruption suspected.
DFHLD0206	<i>applid</i> Loader SVC <i>svc</i> request failed due to I/O errors on LIBRARY <i>libname</i> .
DFHLD0501 I	<i>date time applid termid transid</i> LIBRARY <i>libname</i> is being installed with status { <i>Enabled</i> <i>Disabled</i> }.
DFHLD0502 I	<i>date time applid termid transid</i> Install of LIBRARY <i>libname</i> has completed successfully. Enablement status is { <i>Enabled</i> <i>Disabled</i> }.
DFHLD0503 W	<i>date time applid termid transid</i> Install of LIBRARY <i>libname</i> has failed to complete successfully, for reason code <i>RSN</i> . Enablement status is <i>Disabled</i> .
DFHLD0504 E	<i>date time applid termid transid</i> Install of LIBRARY <i>libname</i> has failed because a LIBRARY of that name is already installed and enabled.
DFHLD0505 I	<i>date time applid</i> Details for LIBRARY <i>libname</i> , ranking: <i>ranking</i> , critical status: { <i>Critical</i> <i>Noncritical</i> }, enablement status { <i>Enabled</i> <i>Disabled</i> }.
DFHLD0506 I	<i>date time applid</i> Details for LIBRARY <i>libname</i> , data sets 1-8: <i>dsname01</i> , <i>dsname02</i> , <i>dsname03</i> , <i>dsname04</i> , <i>dsname05</i> , <i>dsname06</i> , <i>dsname07</i> , <i>dsname08</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHLD0507 I	<i>date time applid</i> Details for LIBRARY <i>libname</i> , data sets 9-16: <i>dsname09</i> , <i>dsname10</i> , <i>dsname11</i> , <i>dsname12</i> , <i>dsname13</i> , <i>dsname14</i> , <i>dsname15</i> , <i>dsname16</i> .
DFHLD0512 I	<i>date time applid termid tranid</i> LIBRARY <i>libname</i> has been successfully discarded.
DFHLD0513 W	<i>date time applid termid tranid</i> Discard of LIBRARY <i>libname</i> has failed for reason code <i>RSN</i> .
DFHLD0521 I	<i>date time applid termid tranid</i> Ranking of LIBRARY <i>libname</i> changed from <i>oldranking</i> to <i>newranking</i> .
DFHLD0522 I	<i>date time applid termid tranid</i> Critical status of library <i>libname</i> changed from {Critical / Noncritical} to {Critical / Noncritical}.
DFHLD0523 I	<i>date time applid termid tranid</i> LIBRARY <i>libname</i> has been enabled.
DFHLD0524 I	<i>date time applid termid tranid</i> LIBRARY <i>libname</i> has been disabled.
DFHLD0525 W	<i>date time applid termid tranid</i> Attempt to set attributes or status of LIBRARY <i>libname</i> has failed for reason code <i>RSN</i> .
DFHLD0555 I	<i>date time applid</i> Current LIBRARY search order follows.
DFHLD0556 I	<i>date time applid</i> Position in search order: <i>srchpos</i> , LIBRARY: <i>libname</i> .
DFHLD0701	<i>applid</i> LIBRARY <i>libname</i> has a smaller ranking value than DFHRPL. Ranking value is <i>R</i> .
DFHLD0702 D	<i>applid</i> Critical LIBRARY <i>libname</i> could not be installed. Reply 'GO' or 'CANCEL'.
DFHLD0703	<i>applid</i> Noncritical LIBRARY <i>libname</i> could not be installed as enabled. CICS startup continues.
DFHLD0704	<i>applid</i> Reply CANCEL was received.
DFHLD0710	<i>applid</i> Install of LIBRARY <i>libname</i> encountered an error. The LIBRARY is installed but disabled.
DFHLD0711	<i>applid</i> Install of LIBRARY <i>libname</i> encountered an error. The LIBRARY is installed as disabled.
DFHLD0712	<i>applid</i> Attempt to install or enable LIBRARY <i>libname</i> will be delayed because data set <i>dsname</i> is being recalled.
DFHLD0713	<i>applid</i> Attempt to enable LIBRARY <i>libname</i> encountered an error. The LIBRARY is disabled.
DFHLD0715	<i>applid</i> Disable processing for LIBRARY <i>libname</i> encountered an error.
DFHLD0720	<i>applid</i> Dynamic allocation of data set <i>dsname</i> for LIBRARY <i>libname</i> failed. DYNALLOC return codes <i>X'rrrr'</i> , <i>X'cccc'</i> , <i>X'dddd'</i> .
DFHLD0721	<i>applid</i> Dynamic concatenation of data sets for LIBRARY <i>libname</i> failed. DYNALLOC return codes <i>X'rrrr'</i> , <i>X'cccc'</i> , <i>X'dddd'</i> .
DFHLD0722	<i>applid</i> Open of DD for LIBRARY <i>libname</i> failed.
DFHLD0723	<i>applid</i> Dynamic unallocation of data set <i>dsname</i> for LIBRARY <i>libname</i> failed. DYNALLOC return codes <i>X'cccc'</i> , <i>X'rrrr'</i> , <i>X'dddd'</i> .
DFHLD0724	<i>applid</i> Dynamic deconcatenation of data sets for LIBRARY <i>libname</i> failed. DYNALLOC return codes <i>X'rrrr'</i> , <i>X'cccc'</i> , <i>X'dddd'</i> .
DFHLD0725	<i>applid</i> Close of DD for LIBRARY <i>libname</i> failed.
DFHLD0730	<i>applid</i> An MVS ABEND occurred during {Getmain of LIBRARY control area / Dynamic allocation / Dynamic concatenation / Open / Close / Dynamic deconcatenation / Dynamic unallocation / Freemain of LIBRARY control area} for LIBRARY <i>libname</i> .
DFHLG0789	<i>date time applid</i> Deletion of log stream <i>lsn</i> data was suppressed by the Logger Resource Manager Interface. MVS Logger codes: <i>X'ret'</i> , <i>X'rsn'</i> .
DFHME0140	<i>applid</i> CICSplex SM messages cannot be issued because the English message table <i>modname</i> cannot be found.
DFHMN0112 I	<i>date time applid</i> CICS Monitoring compression status has been changed to {NOCOMPRESS / COMPRESS} by USERID <i>userid</i> .
DFHMQ0100 E	<i>date time applid</i> Cannot retrieve data from a START command. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> .
DFHMQ0101 E	<i>date time applid</i> Cannot open the initiation queue. MQCC= <i>mqcc</i> MQRC= <i>mqrc</i> .
DFHMQ0102 E	<i>date time applid</i> Cannot start the CICS transaction <i>tran-id</i> . EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> .
DFHMQ0103 E	<i>date time applid</i> CKTI has read a trigger message with an incorrect MQTM-Strucld of <i>struc-id</i> .
DFHMQ0104 E	<i>date time applid</i> CKTI does not support version <i>version-id</i> .
DFHMQ0105 E	<i>date time applid</i> CKTI cannot start a process type of <i>process-type</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0106 D	<i>date time applid</i> MQGET failure. CKTI will end. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0107 I	<i>date time applid</i> A request to end CKTI has been received. CKTI ended.
DFHMQ0108 D	<i>date time applid</i> Unexpected invocation. CKTI terminated.
DFHMQ0109 D	<i>date time applid</i> MQCLOSE failed. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0110 I	<i>date time applid</i> Queue name = <i>q-name</i> .
DFHMQ0111 D	<i>date time applid</i> CKTI has read a trigger message with an incorrect length of <i>length</i> .
DFHMQ0112 D	<i>date time applid</i> MQOPEN error. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0113 I	<i>date time applid</i> This message cannot be processed.
DFHMQ0114 D	<i>date time applid</i> MQINQ failed. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0116 D	<i>date time applid</i> Cannot open the queue manager. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0117 D	<i>date time applid</i> Cannot query the queue manager. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0118 I	<i>date time applid</i> MsgID= <i>X'msg-id'</i> .
DFHMQ0119 D	<i>date time applid</i> CICS detected an IRC failure. Cannot start transaction <i>tran-id</i> .
DFHMQ0120 D	<i>date time applid</i> MQPUT failed. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0121 D	<i>date time applid</i> No dead-letter queue defined for queue manager.
DFHMQ0122 D	<i>date time applid</i> Cannot close the queue manager. MQCC= <i>mqcc</i> MQRC= <i>mqr</i> .
DFHMQ0123 D	<i>date time applid</i> The dead-letter queue is not of type local.
DFHMQ0124 D	<i>date time applid</i> The dead-letter queue is not of usage normal.
DFHMQ0211 E	<i>date time applid</i> Unable to LINK to program DFHMQPRM. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0212 E	<i>date time applid</i> DFHMQPRM missing in SIT/SIT Override INITPARM.
DFHMQ0213 E	<i>date time applid</i> Queue manager name missing in DFHMQPRM. Command rejected.
DFHMQ0214 E	<i>date time applid</i> Initiation queue name not found. CKTI not started.
DFHMQ0216 E	<i>date time applid</i> Queue manager name invalid. Connection rejected.
DFHMQ0217 E	<i>date time applid</i> Initiation queue name invalid. CKTI not started.
DFHMQ0220 E	<i>date time applid</i> Unable to LINK to program DFHMQCON. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0221 E	<i>date time applid</i> Unable to INQUIRE SYSTEM CICSSTATUS. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0223 E	<i>date time applid</i> Unable to LINK to program DFHMQQCN. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0230 E	<i>date time applid</i> Unable to receive input. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0232 E	<i>date time applid</i> Unable to RETURN TRANSID <i>tran-id</i> IMMEDIATE. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0235 E	<i>date time applid</i> Unrecognizable screen. Re-submit CKQC.
DFHMQ0236 E	<i>date time applid</i> Display functions only supported using panel interface.
DFHMQ0237 E	<i>date time applid</i> Panel interface not supported on console.
DFHMQ0239 E	<i>date time applid</i> Unable to LINK to program DFHMQBAS. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0240 I	<i>date time applid</i> Task not associated with a terminal. Request rejected.
DFHMQ0241 E	<i>date time applid</i> Unable to receive input. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0242 D	<i>date time applid</i> Invalid input. Connect rejected.
DFHMQ0243 D	<i>date time applid</i> Unsupported terminal type. Must be a console or 3270 device.
DFHMQ0244 E	<i>date time applid</i> CICS is being quiesced. Connect rejected.
DFHMQ0300 I	<i>date time applid</i> Already connected to queue manager <i>qmgr-name</i> . Connect rejected.
DFHMQ0301 I	<i>date time applid</i> API exit CSQCAPX found and will be used.
DFHMQ0302 E	<i>date time applid</i> Unable to EXTRACT EXIT DFHMQTRU. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0304 E	<i>date time applid</i> Failed to ENABLE DFHMQTRU. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0305 E	<i>date time applid</i> Unable to INQUIRE MAXTASKS. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0306 E	<i>date time applid</i> Unable to START transaction CKTI. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0307 I	<i>date time applid</i> Successful connection to queue manager <i>ssnm</i> .
DFHMQ0308 I	<i>date time applid</i> Queue manager <i>qmgr-name</i> is stopped. Connect request deferred.
DFHMQ0309 E	<i>date time applid</i> Unable to connect to queue manager <i>qmgr-name</i> . MQCC=mqcc MQRC=mqrc.
DFHMQ0310 I	<i>date time applid</i> Duplicate connect to queue manager <i>qmgr-name</i> . Connect rejected.
DFHMQ0311 E	<i>date time applid</i> Unable to start alert monitor CKAM. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0312 E	<i>date time applid</i> Unable to GETMAIN DFHMQLOC storage. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0313 I	<i>date time applid</i> *UOWID=conn-name.X'uow-id' is in doubt.
DFHMQ0314 I	<i>date time applid</i> UOWIDs highlighted with * will not be automatically resolved.
DFHMQ0315 E	<i>date time applid</i> Unable to LOAD API exit CSQCAPX. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0316 I	<i>date time applid</i> More messages. Check console for full display.
DFHMQ0318 I	<i>date time applid</i> UOWID=conn-name.X'uow-id' created by Transid <i>transid</i> Taskid <i>taskid</i> is in doubt.
DFHMQ0319 E	<i>date time applid</i> Unable to INQUIRE SYSTEM RELEASE. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0321 I	<i>date time applid</i> There is no active connection. Stop connection rejected.
DFHMQ0322 D	<i>date time applid</i> Invalid input. Stop connection rejected.
DFHMQ0323 I	<i>date time applid command</i> received from TERMID= <i>termid</i> TRANID= <i>tranid</i> USERID= <i>userid</i> .
DFHMQ0326 E	<i>date time applid</i> Connection status {Connecting Pending Connected Quiescing Stopping-Force Disconnected Inactive Unknown} is not valid for <i>command</i> Command rejected.
DFHMQ0331 I	<i>date time applid</i> Adapter shutdown completed.
DFHMQ0332 I	<i>date time applid</i> Queue manager <i>qmgr-name</i> is already stopped. MQCC=mqcc MQRC=mqrc.
DFHMQ0333 E	<i>date time applid</i> Unable to disconnect from queue manager <i>qmgr-name</i> . MQCC=mqcc MQRC=mqrc.
DFHMQ0334 I	<i>date time applid</i> Adapter shutdown successful.
DFHMQ0336 I	<i>date time applid command</i> received from a PLT program.
DFHMQ0341 I	<i>date time applid shutdown-type</i> requested by alert monitor CKAM.
DFHMQ0342 I	<i>date time applid request</i> received from alert monitor.
DFHMQ0343 E	<i>date time applid</i> MQOPEN failed. MQCC=mqcc MQRC=mqrc.
DFHMQ0344 E	<i>date time applid</i> MQINQ failed. MQCC=mqcc MQRC=mqrc.
DFHMQ0345 E	<i>date time applid</i> MQCLOSE failed. MQCC=mqcc MQRC=mqrc.
DFHMQ0350 I	<i>date time applid</i> Unable to LOAD API exit CSQCAPX. Program not found.
DFHMQ0351 I	<i>date time applid</i> Unable to LOAD API exit CSQCAPX. Program is disabled.
DFHMQ0360 D	<i>date time applid</i> Unable to RETRIEVE RTRANSID. Monitor terminated. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0361 D	<i>date time applid</i> Unexpected invocation. Monitor terminated.
DFHMQ0362 D	<i>date time applid</i> Unable to EXTRACT EXIT DFHMQTRU. Monitor terminated. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0363 D	<i>date time applid</i> Unable to perform WAIT EXTERNAL. Monitor terminated. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0364 I	<i>date time applid</i> Monitor terminated normally.
DFHMQ0365 E	<i>date time applid</i> Unable to LINK to program DFHMQQCN. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0366 E	<i>date time applid</i> Unable to LINK to program DFHMQDSC. EIBFN=X'eibfn' EIBRESP=eibresp EIBRESP2=eibresp2 EIBRCODE=X'eibrcode'.
DFHMQ0368 E	<i>date time applid</i> Invalid PEB type X'type' at location X'location'. PEB ignored.
DFHMQ0369 E	<i>date time applid</i> More than 99 notify messages outstanding. This message is postponed temporarily.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0380 E	<i>date time applid</i> No active connection. {STARTCKTI / STOPCKTI / RESET / DISPLAY} rejected.
DFHMQ0381 D	<i>date time applid</i> No initiation queue name specified at connect time. {STARTCKTI / STOPCKTI} rejected.
DFHMQ0382 D	<i>date time applid</i> CKTI with the same initiation queue name is being started. {STARTCKTI / STOPCKTI} rejected.
DFHMQ0383 D	<i>date time applid</i> Another CKTI with the same initiation queue name is still running. {STARTCKTI / STOPCKTI} rejected.
DFHMQ0384 D	<i>date time applid</i> Another CKTI with the same initiation queue name is being stopped. {STARTCKTI / STOPCKTI} rejected.
DFHMQ0385 D	<i>date time applid</i> CKTI not found. {STARTCKTI / STOPCKTI} rejected.
DFHMQ0386 I	<i>date time applid</i> {STARTCKTI / STOPCKTI / RESET} initiated from TERMIID= <i>termid</i> TRANID= <i>tranid</i> USERID= <i>userid</i> and is accepted.
DFHMQ0389 I	<i>date time applid</i> Invalid input. Start/Stop CKTI rejected.
DFHMQ0400 I	<i>date time applid</i> UOWID= <i>conn-name.X'uwow-id'</i>
DFHMQ0402 I	<i>date time applid</i> Resolved with COMMIT.
DFHMQ0403 I	<i>date time applid</i> Resolved with BACKOUT.
DFHMQ0404 E	<i>date time applid</i> Resolve failed. MQCC= <i>mqcc</i> MQRC= <i>mqrc</i> .
DFHMQ0405 E	<i>date time applid</i> Execute resolve failed. MQCC= <i>mqcc</i> MQRC= <i>mqrc</i> .
DFHMQ0406 E	<i>date time applid</i> Cannot resolve, syncpoint disposition lost.
DFHMQ0407 E	<i>date time applid</i> Cannot resolve, syncpoint disposition unknown.
DFHMQ0408 I	<i>date time applid</i> Only partial resynchronization achieved. Check above messages.
DFHMQ0409 I	<i>date time applid</i> Resynchronization completed successfully.
DFHMQ0410 I	<i>date time applid</i> CICS immediate shutdown detected. Adapter terminated.
DFHMQ0411 I	<i>date time applid</i> CICS warm shutdown detected. Adapter is quiescing.
DFHMQ0412 I	<i>date time applid</i> CICS abend detected. Adapter terminated.
DFHMQ0414 I	<i>date time applid</i> Abending task ID <i>task-id</i> Abend Code <i>abend-code</i> .
DFHMQ0415 I	<i>date time applid</i> Task ID <i>task-id</i> will continue. Force purge ignored.
DFHMQ0416 I	<i>date time applid</i> Address <i>X'address'</i> is out of range. Area of length <i>length</i> is not traced.
DFHMQ0418 E	<i>date time applid</i> Unable to LOAD program CSQAVICM. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0420 E	<i>date time applid</i> Unable to send map <i>map-id</i> mapset DFHMQ1x. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0421 I	<i>applid</i> Tab cursor was not on a valid object.
DFHMQ0422 E	<i>date time applid</i> Unable to RETURN TRANSID CKBM. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0423 E	<i>date time applid</i> Unable to XCTL to program <i>pgm-name</i> . EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0424 I	<i>applid</i> Invalid key entered.
DFHMQ0425 E	<i>applid</i> No parameter window for this function.
DFHMQ0430 E	<i>date time applid</i> Unknown map name <i>map-id</i> . EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0431 E	<i>applid</i> Invalid action number. Re-enter.
DFHMQ0432 E	<i>applid</i> Invalid task number. Re-enter.
DFHMQ0433 E	<i>date time applid</i> Invalid option. Must be 1, 2, or 3.
DFHMQ0434 E	<i>date time applid</i> Queue manager name missing. Must be entered.
DFHMQ0439 E	<i>date time applid</i> Invalid Stop option. Must be 1 or 2.
DFHMQ0440 E	<i>date time applid</i> Unable to send map <i>map-id</i> mapset DFHMQHx. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0443 E	<i>date time applid</i> Unable to RETURN TRANSID CKRT. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> .
DFHMQ0451 I	<i>date time applid</i> Nothing to reset. Reset completed.
DFHMQ0452 I	<i>date time applid</i> Invalid input. Reset rejected.
DFHMQ0453 I	<i>applid</i> Status of connection to <i>qmgr-name</i> is {Connecting / Pending / Connected / Quiescing / Stopping-Force / Disconnected / Inactive / Unknown}. <i>number</i> tasks are in flight.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0455 E	<i>date time applid</i> Unable to WRITEQ TS. EIBFN= <i>X'eibfn'</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> EIBRCODE= <i>X'eibrcode'</i> . Queue name is <i>q-name</i> .
DFHMQ0456 I	<i>applid</i> No tasks found. Display completed.
DFHMQ0457 I	<i>applid</i> No CKTI found. Display rejected.
DFHMQ0458 E	<i>date time applid</i> Invalid input. Display rejected.
DFHMQ0460 I	<i>applid</i> Bottom of display.
DFHMQ0461 I	<i>applid</i> Top of display.
DFHMQ0462 E	<i>date time applid</i> Invalid input. Request rejected.
DFHMQ0480 E	<i>date time applid</i> MQCC= <i>mqqc</i> MQRC= <i>mqrc</i> QRPL at <i>X'qrpl-address'</i> FRB at <i>X'frb-address'</i> .
DFHMQ0481	<i>date time applid</i> Unexpected error. MQCC= <i>mqqc</i> MQRC= <i>mqrc</i> FRB at <i>X'frb-address'</i> .
DFHMQ0500	{Connecting Pending Connected Quiescing Stopping-Force Disconnected Inactive Unknown }
DFHMQ0501	{Initiation Queue Name:}
DFHMQ0502	{More - + More - More +}
DFHMQ0503	{Off On Yes No }
DFHMQ0504	{In Queue Msg Wait Purged Between Running Normal Shutdown Starting Stopping}
DFHMQ0505	{(Not specified at connect time) }
DFHMQ0506	{Start Task Initiator Stop Task Initiator }
DFHMQ0700 I	<i>date time applid tranid trannum</i> CICS-MQ Bridge initialization in progress.
DFHMQ0702 I	<i>date time applid tranid trannum</i> CICS-MQ bridge monitor initialization complete.
DFHMQ0703 I	<i>date time applid tranid trannum</i> WaitInterval= <i>interval</i> , Auth= <i>auth-option</i> Q= <i>q-name</i> .
DFHMQ0704 E	<i>date time applid tranid trannum</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> returned for EXEC CICS call. EIBFN= <i>eibfn</i> .
DFHMQ0705 E	<i>date time applid tranid trannum</i> Parameter at offset <i>nn</i> in input string is invalid.
DFHMQ0707 I	<i>date time applid tranid trannum</i> CICS-MQ Bridge is not supported on non-z/OS platforms.
DFHMQ0710 E	<i>date time applid tranid trannum</i> MQCC= <i>mqqc</i> MQRC= <i>mqrc</i> returned for <i>mq-call</i> .
DFHMQ0711 E	<i>date time applid tranid trannum</i> Unable to open bridge queue <i>q-name</i> .
DFHMQ0712 I	<i>date time applid tranid trannum</i> CICS-MQ Bridge quiescing.
DFHMQ0713 I	<i>date time applid tranid trannum</i> CICS-MQ Bridge terminated normally.
DFHMQ0714 I	<i>date time applid tranid trannum</i> CICS-MQ Bridge task starting.
DFHMQ0715 E	<i>date time applid tranid trannum</i> Invalid COMMAREA length <i>length</i> in message.
DFHMQ0716 E	<i>date time applid tranid trannum</i> MQCIH required for UOW middle and last messages.
DFHMQ0717 E	<i>date time applid tranid trannum</i> UOW first or only received when UOW middle or last expected.
DFHMQ0718 E	<i>date time applid tranid trannum</i> UOW middle or last received when UOW first or only expected.
DFHMQ0720 E	<i>date time applid tranid trannum</i> Authentication option IDENTIFY or VERIFY_ requires a security manager to be active.
DFHMQ0721 E	<i>date time applid tranid trannum</i> Invalid MQCIH.
DFHMQ0724 E	<i>date time applid tranid trannum</i> Bridge queue <i>q-name</i> is not defined as local.
DFHMQ0725 I	<i>date time applid tranid trannum</i> Messages on bridge queue are not persistent by default.
DFHMQ0729 I	<i>date time applid tranid trannum</i> No dead-letter queue defined to queue manager.
DFHMQ0730 I	<i>date time applid tranid trannum</i> Unable to open dead-letter queue. MQRC= <i>mqrc</i> .
DFHMQ0731 I	<i>date time applid tranid trannum</i> Unable to inquire on dead-letter queue. MQRC= <i>mqrc</i> .
DFHMQ0732 I	<i>date time applid tranid trannum</i> Unable to put message to dead-letter queue. MQRC= <i>mqrc</i> .
DFHMQ0733 I	<i>date time applid tranid trannum</i> Dead-letter queue not defined with USAGE(NORMAL).
DFHMQ0734 I	<i>date time applid tranid trannum</i> Dead-letter queue max message length <i>length</i> is too small.
DFHMQ0735 I	<i>date time applid tranid trannum</i> CICS or queue manager quiesced before bridge task started.
DFHMQ0736 I	<i>date time applid tranid trannum</i> Bridge quiesced before task started.
DFHMQ0737 E	<i>date time applid tranid trannum</i> CICS or queue manager quiesced, bridge task backed out.
DFHMQ0738 E	<i>date time applid tranid trannum</i> CICS-MQ Bridge quiesced, task backed out.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0739 E	<i>date time applid tranid trannum</i> Bridge terminated, timeout interval expired before middle or lastUOW message received.
DFHMQ0740 E	<i>date time applid tranid trannum</i> Client application requested backout.
DFHMQ0745 E	<i>date time applid tranid trannum</i> Unable to put message to reply queue. MQRC= <i>mqr</i> c.
DFHMQ0746 E	<i>date time applid tranid trannum</i> Invalid CCSID. <i>ccsid1</i> expected but <i>ccsid2</i> received.
DFHMQ0747 E	<i>date time applid tranid trannum</i> Invalid encoding. <i>encoding1</i> expected but <i>encoding2</i> received.
DFHMQ0748 E	<i>date time applid tranid trannum</i> Message removed from the request queue during backout processing.
DFHMQ0749 E	<i>date time applid tranid trannum</i> Authentication error. MQCC= <i>mqqc</i> MQRC= <i>mqr</i> c Userid= <i>user-id</i> .
DFHMQ0750 E	<i>date time applid tranid trannum</i> CICS-MQ Bridge internal error.
DFHMQ0751 E	<i>date time applid tranid trannum</i> EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> .Unable to LINK to program <i>program-name</i> .
DFHMQ0753 E	<i>date time applid tranid trannum</i> Message has been processed previously and returned to the queue using backout.
DFHMQ0754 E	<i>date time applid tranid trannum</i> Bridge task abend <i>abend-code</i> in program <i>program-name</i> .
DFHMQ0755 E	<i>date time applid tranid trannum</i> Bridge queue is not shareable.
DFHMQ0756 E	<i>date time applid tranid trannum</i> Dead-letter queue not defined as local.
DFHMQ0757 E	<i>date time applid tranid trannum</i> Unable to open reply-to queue. MQRC= <i>mqr</i> c.
DFHMQ0758 E	<i>date time applid tranid trannum</i> Unable to START bridge task. EIBRESP= <i>eibresp</i> EIBRESP2= <i>eibresp2</i> . Userid <i>userid</i> is not authorized.
DFHMQ0759 E	<i>date time applid tranid trannum</i> Transaction <i>transid</i> is transid not defined to CICS.
DFHMQ0760 I	<i>date time applid tranid trannum</i> MsgId= <i>msgid</i> .
DFHMQ0761 I	<i>date time applid tranid trannum</i> CorrelId= <i>CorrelId</i> .
DFHMQ0762 I	<i>date time applid tranid trannum</i> Queue name= <i>q-name</i> .
DFHMQ0763 I	<i>date time applid tranid trannum</i> Queue manager= <i>queue-manager-name</i> .
DFHMQ0764 E	<i>date time applid tranid trannum</i> Invalid userid. <i>user-id1</i> expected but <i>user-id2</i> received.
DFHMQ0766 I	<i>date time applid tranid trannum</i> Bridge queue not defined with INDXTYPE(CORRELID).
DFHMQ0767 I	<i>date time applid tranid trannum</i> Unable to open backout-requeue queue. MQRC= <i>mqr</i> c.
DFHMQ0768 E	<i>date time applid tranid trannum</i> Backout-requeue queue not defined as local.
DFHMQ0769 I	<i>date time applid tranid trannum</i> Unable to inquire on backout-requeue queue. MQRC= <i>mqr</i> c.
DFHMQ0770 I	<i>date time applid tranid trannum</i> Backout-requeue queue not defined with USAGE(NORMAL).
DFHMQ0771 I	<i>date time applid tranid trannum</i> Unable to put message to backout-requeue queue. MQRC= <i>mqr</i> c.
DFHMQ0772 E	<i>date time applid tranid trannum</i> Invalid FacilityLike value <i>xxx</i> in message.
DFHMQ0773 E	<i>date time applid tranid trannum</i> Invalid or expired Facility token in message.
DFHMQ0774 E	<i>date time applid tranid trannum</i> Unable to start transaction on CICS system <i>sys-name</i> .
DFHMQ0775 I	<i>date time applid tranid trannum</i> Unable to start transaction on this CICS system.
DFHMQ0776 E	<i>date time applid tranid trannum</i> Invalid FacilityKeepTime value <i>xxx</i> in message.
DFHMQ0777 E	<i>date time applid tranid trannum</i> Link3270 error. RC= <i>code</i> .
DFHMQ0778 E	<i>date time applid tranid trannum</i> Abend <i>abend-code</i> in transaction <i>tran-id</i> .
DFHMQ0779 E	<i>date time applid tranid trannum</i> Mapset does not match. <i>mapset-id1</i> expected but <i>mapset-id2</i> received.
DFHMQ0780 E	<i>date time applid tranid trannum</i> Map name does not match. <i>map-id1</i> expected but <i>map-id2</i> received.
DFHMQ0781 E	<i>date time applid tranid trannum</i> Invalid bridge vector.
DFHMQ0782 E	<i>date time applid tranid trannum</i> File DFHBRNSF is not available.
DFHMQ0783 I	<i>date time applid tranid trannum</i> Msg=BOTH, PassTktA= <i>applid</i> .
DFHMQ0784 E	<i>date time applid tranid trannum</i> Input= <i>parm_string</i> .
DFHMQ0785 E	<i>date time applid tranid trannum</i> Link3270 routing failed - not supported by CICS system.
DFHMQ0786 E	<i>date time applid tranid trannum</i> Link3270 routing failed - connection error.
DFHMQ0787 E	<i>date time applid tranid trannum</i> Link3270 routing failed - TERMERR.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHMQ0788 E	<i>date time applid tranid trannum</i> Link3270 routing failed - TRANDEF error.
DFHMQ0789 E	<i>date time applid tranid trannum</i> Link3270 routing failed - URM error. RC= <i>code</i> CompCode= <i>compcode</i> .
DFHMQ0790 E	<i>date time applid tranid trannum</i> Transaction not running.
DFHMQ0791 E	<i>date time applid tranid trannum</i> Invalid header <i>format</i> found in message.
DFHMQ0999I	<i>date time applid tranid tasknum</i> Trace point: <i>trace function</i>
DFHNC0123	IXCARM REQUEST= <i>reqtype</i> failed, return code <i>retcode</i> , reason code <i>rsncode</i> .
DFHPA1946	<i>applid</i> APPLID is already in use by another CICS in the sysplex. CICS is terminated.
DFHPI0115	<i>date time applid tranid</i> The service provider pipeline has returned a response message to the MQ transport, but the inbound request did not expect a response. The response message is ignored.
DFHPI0403	<i>date time applid tranid</i> The CICS pipeline HTTP transport mechanism failed to receive a response because <i>{the socket receive was timed out}</i> . The RESPWAIT interval was exceeded.
DFHPI0511	<i>date time applid tranid</i> The CICS Pipeline Manager has failed to receive a response from the target Secure Token Service <i>sts_uri</i> . The response message failed to parse.
DFHPI0512	<i>date time applid tranid</i> The CICS Pipeline Manager has received a fault from the target Secure Token Service: <i>sts_uri</i> . The fault had a fault code of <i>fault_code</i> .
DFHPI0513	<i>date time applid tranid</i> The CICS Pipeline Manager has failed to find the required credentials in a response from the Secure Token Service: <i>sts_uri</i> .
DFHPI0602	<i>date time applid</i> The CICS SOAP handler failed to parse a message. The parser error code is <i>errcode</i> . The DFHPIEP return code is <i>retcode</i> . The error was found at offset <i>offset</i> into the message.
DFHPI0721 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for pipeline at offset <i>X'offset'</i> . The value <i>attribvalue</i> for attribute <i>attribname</i> is not valid.
DFHPI0722 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for the pipeline. The WSSE_Handler configuration has values specified for mode and trust that are not valid in this pipeline.
DFHPI0723 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for the pipeline. The value for the algorithm specified for the <i>element</i> is not supported.
DFHPI0724 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for the pipeline. The WSSE_Handler configuration has both <authentication> and <sts_authentication> elements specified. You must only specify one of these elements.
DFHPI0725 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for the pipeline. The element <i>element</i> must be specified.
DFHPI0726 E	<i>date time applid userid</i> PIPELINE <i>pipeline</i> encountered an error in the configuration file <i>filename</i> for the pipeline. The element <i>element</i> is a duplicate or unrecognized element.
DFHPI0731	<i>date time applid</i> An attempt to register unit of work - <i>X'uowid'</i> with a remote WSAT coordinating transaction has failed.
DFHPI0996	<i>date time applid</i> The Outbound Router program, DFHPIRT, has received a non-NORMAL response while attempting to read a container. The resulting error code is <i>X'code'</i> and the container name is <i>container_name</i> .
DFHPI0997	<i>date time applid tranid pipeline</i> The CICS pipeline manager has encountered an error: <i>{PIPELINE not found PIPELINE not active PIPELINE mode mismatch unhandled node failure context switch failed request stream creation failure request stream transport error target program unavailable channel error channel not found URI not found invalid URI authorization failure program abend unidentified problem RESPWAIT timeout has occurred no request message}</i> .
DFHPI1007	<i>date time applid trannum</i> SOAP message processing failed because of incorrect input <i>{XML_FORMAT_ERROR UNEXPECTED_CONTENT HEADER_FORMAT_ERROR UNDEFINED_ELEMENT UNDEFINED_NAME_SPACE ARRAY_OVERFLOW NAME_TOO_LONG PREFIX_TOO_LONG NAME_SPACE_TOO_LONG UNEXPECTED_XOP_INCLUDE XOP_INCLUDE_ERROR}</i> <i>error_qualifier</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI1008	<i>date time applid trannum</i> SOAP message generation failed because of incorrect input ({ <i>ARRAY_CONTAINER_TOO_SMALL</i> <i>INPUT_STRUCTURE_TOO_SMALL</i> <i>INPUT_ARRAY_TOO_LARGE</i> <i>INPUT_ARRAY_TOO_SMALL</i> <i>CONTAINER_NOT_FOUND</i> <i>CONTAINER_NOT_BIT</i> }) <i>error_qualifier</i>).
DFHPI1009	<i>date time applid trannum</i> SOAP message processing failed. A conversion error ({ <i>UNKNOWN_CONVERSION</i> <i>INPUT_TOO_LONG</i> <i>OUTPUT_OVERFLOW</i> <i>NEGATIVE_UNSIGNED</i> <i>NO_FRACTION_DIGITS</i> <i>FRACTION_TOO_LONG</i> <i>INVALID_CHARACTER</i> <i>ODD_HEX_DIGITS</i> <i>INVALID_BASE64</i> <i>NOT_PURE_DBCS</i> <i>INVALID_FIELD_SIZE</i> <i>EXPONENT_OVERFLOW</i> <i>EXPONENT_UNDERFLOW</i> }) occurred when converting field <i>fieldname</i> .
DFHPI1010	<i>date time applid trannum</i> SOAP message generation failed. A conversion error ({ <i>UNKNOWN_CONVERSION</i> <i>NEGATIVE_UNSIGNED</i> <i>INVALID_CHARACTER</i> <i>INVALID_PACKED_DEC</i> <i>INVALID_ZONED_DEC</i> <i>INCOMPLETE_DBCS</i> <i>ODD_DBCS_BYTES</i> <i>INVALID_FIELD_SIZE</i> <i>EXPONENT_OVERFLOW</i> <i>EXPONENT_UNDERFLOW</i> }) occurred when converting field <i>fieldname</i> .
DFHPI1100 E	<i>date time applid userid</i> PIPELINE pipeline encountered an error while processing an inbound MIME message. The problem with the MIME message is: { <i>it contained an invalid character</i> <i>it had an invalid header</i> <i>it had an invalid MIME header</i> <i>it had a boundary error</i> <i>it did not contain a root part</i> <i>it used an unsupported encoding</i> <i>it caused an unexpected response</i> }.
DFHPI1101 E	<i>date time applid userid</i> PIPELINE pipeline encountered an error while processing an inbound MIME message in compatibility mode. The problem with the MIME message was it contained: { <i>a body that could not be parsed</i> <i>an include for which there was no attachment</i> }.
DFHPI1102 E	<i>date time applid userid</i> PIPELINE pipeline encountered an error while processing an outbound MIME message in compatibility mode. Generation of the MIME message failed because: { <i>it contained a body that could not be parsed</i> <i>a container had an invalid ccid</i> <i>a container had the wrong type</i> }.
DFHPI1103 E	<i>date time applid userid</i> PIPELINE pipeline encountered an error while processing an outbound message in MIME compatibility mode. The problem with the MIME message was { <i>it contained a body that could not be parsed</i> <i>it had an include for which there was no attachment</i> <i>it caused an unexpected exception</i> }.
DFHPI9000 E	ResourceBundle not found issuing message: <i>value</i> .
DFHPI9001 E	Message not found issuing message: <i>value</i> .
DFHPI9002 E	A WSDL operation name is too long to be supported by CICS <i>value</i> .
DFHPI9003 E	A WSDL part name is too long to be supported by CICS: <i>value</i> .
DFHPI9004 E	The WSDL specifies a style value of document and contains a part name that refers to an XML type. Document style WSDL must only refer to XML elements.
DFHPI9010 E	Simple data type <i>type</i> is not atomic. List and union data types are not supported.
DFHPI9011 E	Unsupported super type <i>super_type</i> found for type <i>base_type</i> .
DFHPI9012 E	Schema wild cards (<any> tags) are not supported.
DFHPI9013 E	Schema model groups with maxOccurs or minOccurs not equal to 1 are not supported. Problem found for type: <i>value</i> .
DFHPI9014 E	No model group found for model group definition <i>definition</i> .
DFHPI9015 E	A schema particle with unrecognized content has been found <i>value</i> .
DFHPI9016 E	Required schema element <i>element</i> cannot be found.
DFHPI9017 E	Unsupported attribute <i>attribute</i> found for schema element <i>element</i> .
DFHPI9018 E	Schema element <i>element</i> is missing a type definition.
DFHPI9019 E	Schema type <i>type</i> is not supported.
DFHPI9020 W	Schema attribute <i>attribute</i> has been found and ignored for type <i>type</i> .
DFHPI9021 E	A schema type with unrecognized content has been found: <i>value</i> .
DFHPI9022 W	Schema type <i>type</i> is being restricted to a total of <i>value</i> digits in the response message of operation <i>operation</i> .
DFHPI9023 W	Schema type <i>type</i> is being restricted to a total of <i>value</i> digits for operation <i>operation</i> .
DFHPI9024 E	Recursion within type <i>type</i> is not supported.
DFHPI9025 E	Required schema type <i>type</i> cannot be found.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI9026 E	URI <i>uri</i> cannot be resolved. Consider checking that the HTTP Proxy is correct.
DFHPI9027 E	The XML parser has found an error: <i>value</i> at line <i>line</i> and column <i>column</i> in document <i>document</i> .
DFHPI9028 E	The length of schema element <i>element</i> is set to <i>value</i> characters. CICS only supports up to <i>value2</i> characters.
DFHPI9029 E	Implicit padding (slack bytes) are not supported for PL/I. Please change the language structure to ensure that all slack bytes are explicitly referenced and that top level structures start on a double-word boundary. Slack bytes are needed near or around field <i>field</i> .
DFHPI9030 E	Implicit padding (slack bytes) are not supported for PL/I. Please change the language structure to ensure that all slack bytes are explicitly referenced and that top level structures start on a double-word boundary. Slack bytes are needed near or around structure <i>structure</i> .
DFHPI9031 E	A structure or array is unexpectedly empty.
DFHPI9032 W	Schema attribute wild cards (<anyAttribute> tags) are not supported.
DFHPI9500 E	An internal error has occurred. Please contact IBM Support.
DFHPI9501 E	The HTTPPROXY parameter is invalid. The correct format is proxy.hostname.com:8080 or similar.
DFHPI9502 E	One or more incorrect parameters have been specified.
DFHPI9503 E	Required parameter <i>parameter</i> is missing.
DFHPI9504 E	Parameter <i>parameter</i> has been specified but is not valid for program <i>program</i> .
DFHPI9505 E	Invalid value specified for the LANG parameter. Valid values are COBOL, PLI-ENTERPRISE, PLI-OTHER, C or CPP.
DFHPI9506 E	Parameter <i>parameter</i> exceeds the maximum valid length of <i>value</i> characters.
DFHPI9507 W	Parameter <i>parameter</i> is not set therefore parameter <i>parameter2</i> is ignored.
DFHPI9509 E	Parameter <i>parameter</i> contains invalid characters.
DFHPI9510 W	Invalid value specified for the PGMINT parameter. Valid values are CHANNEL or COMMAREA. The default value of CHANNEL is assumed.
DFHPI9511 W	Parameter PGMINT is set to CHANNEL but parameter CONTID is not set. The default value of <i>value</i> is assumed.
DFHPI9512 W	Parameter CONTID is set but not needed for PGMINT=COMMAREA. Parameter CONTID is ignored.
DFHPI9513 W	The value of parameter WSBIND is missing a file extension, .wsbind is assumed.
DFHPI9514 W	The value of parameter WSBIND specified a file extension other than
DFHPI9515 E	PDS library <i>library</i> cannot be found.
DFHPI9516 E	PDS library <i>library</i> exists but cannot be read.
DFHPI9517 E	PDS library <i>library</i> exists but cannot be written to.
DFHPI9518 W	PDS library <i>library</i> specifies a record length less than 80 characters, output may be truncated.
DFHPI9519 E	Codepage <i>codepage</i> is not recognized.
DFHPI9520 E	Parameter RESPMEM and parameter REQMEM must supply different values.
DFHPI9521 E	The record format of PDS member <i>member</i> must be FB and have a record length of 80.
DFHPI9522 E	File <i>file</i> cannot be read.
DFHPI9523 E	An unexpected error occurred whilst processing file <i>file</i> . The problem is: <i>value</i> .
DFHPI9524 E	File <i>file</i> cannot be written to.
DFHPI9525 E	Cannot write a file because directory <i>directory</i> does not exist.
DFHPI9526 E	Cannot write a file because directory <i>directory</i> is not writable.
DFHPI9527 E	Cannot write to the log file, <i>file</i> , is not writable.
DFHPI9528 E	Cannot find or read file <i>file</i> .
DFHPI9529 W	Characters beyond column <i>column</i> have been truncated for line <i>line</i> .
DFHPI9530 I	Parameter <i>parameter</i> is not recognized and has been ignored.
DFHPI9531 E	Parameter STRUCTURE must only contain (or) characters in the first or last position.
DFHPI9532 E	Parameter STRUCTURE must be of the form STRUCTURE=(request_structure_name, response_structure_name).
DFHPI9533 E	Parameter <i>parameter</i> contains an invalid character <i>character</i> at position <i>position</i> in value <i>value</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI9534 E	Non-unique operation signature found: <i>value</i> .
DFHPI9535 E	WSDL operation <i>operation</i> has an operation signature greater than <i>value</i> characters long and therefore is not supported by CICS.
DFHPI9536 E	User Defined Type <i>type</i> cannot be found.
DFHPI9537 W	Compiler directive <i>directive</i> has been ignored.
DFHPI9538 E	The required struct entry cannot be found.
DFHPI9539 E	An invalid character <i>character</i> has been found.
DFHPI9540 E	Unsupported keyword <i>keyword</i> has been found.
DFHPI9541 E	Fixed point decimal types are not supported.
DFHPI9542 E	Unsupported macro <i>macro</i> has been found.
DFHPI9543 E	Constant <i>constant</i> is not supported in array dimension.
DFHPI9544 W	Unsupported keyword <i>keyword</i> has been found and ignored.
DFHPI9545 W	Assignment operator detected and ignored.
DFHPI9546 W	Initialization operator detected and ignored.
DFHPI9547 E	Top level variables are not supported: <i>value</i> .
DFHPI9548 E	Top-level structure <i>structure</i> must be named <i>value</i> .
DFHPI9549 E	A type definition has been found with no instance and no label.
DFHPI9550 E	Duplicate type name <i>name</i> found.
DFHPI9551 E	Structure <i>structure</i> cannot be found.
DFHPI9552 E	Value <i>value</i> is not a valid integer.
DFHPI9553 E	PICTURE <i>picture</i> is not supported for BINARY or DISPLAY types.
DFHPI9554 E	PICTURE <i>picture</i> is not supported.
DFHPI9555 E	Top level structure found within the main structure.
DFHPI9556 E	An unexpected error occurred whilst writing to file <i>file</i> . The problem is: <i>value</i> .
DFHPI9557 E	ERRORS and WARNINGS have been generated processing file <i>file</i> .
DFHPI9558 E	ERRORS have been generated processing file <i>file</i> .
DFHPI9559 W	Illegal character <i>character</i> has been found at the start of a name and replaced with X.
DFHPI9560 W	Illegal character <i>character</i> has been found in a name and replaced with X.
DFHPI9561 I	Identifier <i>identifier</i> has generated a name-clash for operation <i>operation</i> . Subsequent declarations have been renamed to ensure their uniqueness.
DFHPI9562 E	Parameter PGMINT is specified with value COMMAREA but there is too much data required for a COMMAREA.
DFHPI9563 E	Unsupported PL/I source code detected in line <i>line</i> .
DFHPI9564 W	A terminating ; is missing, it is assumed to be at the end of the file.
DFHPI9565 E	ALIGNED and UNALIGNED keywords are not supported for an entire structure.
DFHPI9566 E	The FIXED and FLOAT attributes are both missing: <i>value</i> .
DFHPI9567 E	Too many digits have been specified for a packed decimal field <i>value</i> .
DFHPI9568 E	The UNSIGNED attribute is not supported unless PLI-ENTERPRISE is specified: <i>value</i> .
DFHPI9569 E	Unsupported PL/I source code detected after line <i>line</i> .
DFHPI9570 E	FIXED BINARY types with length greater than 31 are not supported unless PLI-ENTERPRISE is specified: <i>value</i> .
DFHPI9571 W	ORDINAL references are always treated as SIGNED FIXED BINARY (7) data types. If this is incorrect then please replace the ordinal reference with an equivalent FIXED BINARY variable: <i>value</i> .
DFHPI9572 E	ORDINAL types are only supported if PLI-ENTERPRISE is specified <i>value</i> .
DFHPI9573 E	BIT fields are only supported if they are in multiples of 8 <i>value</i> .
DFHPI9574 E	Lengths less than one are not supported for array data types <i>dataType</i> .
DFHPI9575 E	The length of a PICTURE cannot be found: <i>value</i> .
DFHPI9576 E	FIXED BINARY data types with a scaling factor of the form (p,q) with q not equal to 0 are not supported: <i>value</i> .
DFHPI9577 E	Precision factor <i>factor</i> is out of supported range <i>value</i> .
DFHPI9578 E	FIXED DECIMAL data types with a scaling factor of the form (p,q) with q greater than p are not supported: <i>value</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI9579 E	FIXED DECIMAL data types with a scaling factor of the form (p,q) with q less than 0 are not supported: <i>value</i> .
DFHPI9580 I	PDS member <i>member</i> has been replaced.
DFHPI9581 E	An unexpected exception occurred when writing to the PDS.
DFHPI9582 I	File <i>file</i> has been replaced.
DFHPI9583 E	The supplied WSDL contains an element with different minOccurs and maxOccurs values. This is only supported when PGMINT is set to CHANNEL.
DFHPI9584 E	The WSDL file contains at least one request message but the REQMEM parameter has not been set.
DFHPI9585 E	The WSDL file contains at least one response message but the RESPMEM parameter has not been set.
DFHPI9586 W	A reserved word <i>word</i> has been detected in the WSDL, it has been changed to <i>value</i> .
DFHPI9587 I	Program <i>program</i> has completed SUCCESSFULLY.
DFHPI9588 E	WSDL binding <i>binding</i> has no operation elements in the WSDL.
DFHPI9589 E	The supplied WSDL requires too much data for a CICS Commarea. The PGMINT parameter must be set to CHANNEL.
DFHPI9590 E	A style attribute has not been specified for WSDL operation <i>operation</i> .
DFHPI9591 E	No input message has been found for WSDL operation <i>operation</i> .
DFHPI9592 W	An expected soapAction attribute is missing for WSDL operation <i>operation</i> .
DFHPI9593 W	An unexpected soapAction attribute has been found for WSDL operation <i>operation</i> . This can only be used with SOAP version 1.1.
DFHPI9594 E	An unexpected soapAction attribute has been found for WSDL operation <i>operation</i> . This can only be used with SOAP version 1.1.
DFHPI9595 E	The WSDL binding contains a mixture of rpc and document style attributes. This is not supported.
DFHPI9596 E	The WSDL Binding for operation <i>operation</i> is missing an input message.
DFHPI9597 E	The WSDL file specifies a 'use' attribute value of <i>value</i> . Only literal WSDL is supported.
DFHPI9598 E	WSDL binding <i>binding</i> references more than one transport protocol. Only one protocol is supported.
DFHPI9599 E	WSDL binding <i>binding</i> is not associated with a transport protocol.
DFHPI9600 E	The WSDL file contains multiple binding elements. The BINDING parameter must be set to specify which one to use.
DFHPI9601 E	Binding element <i>element</i> cannot be found in the WSDL file. Only one of the following values may be specified: <i>value</i> .
DFHPI9602 E	WSDL binding <i>binding</i> is not a SOAP binding.
DFHPI9603 E	Multiple WSDL service elements exist for a single binding element. Only one is supported unless the 'WSDL-SERVICE' parameter is set.
DFHPI9604 E	File <i>file</i> does not contain valid WSDL.
DFHPI9605 E	The value of the XML encoding tag must match that of the underlying file system. For example, the value UTF-8 may be appropriate.
DFHPI9606 E	The value of the XML encoding tag must match that of the underlying file system. For example, the value EBCDIC-CP-US may be appropriate.
DFHPI9607 E	An unexpected error occurred whilst processing WSDL operation <i>operation</i> . The problem is: <i>value</i> .
DFHPI9608 W	WARNINGS have been generated processing file <i>file</i> .
DFHPI9609 I	Parameter <i>parameter</i> has value <i>value</i> .
DFHPI9610 W	Platform <i>platform</i> is not a supported platform for this API.
DFHPI9611 W	All content after the first ';' for line <i>line</i> is ignored.
DFHPI9612 E	Provider mode Web services with more than one operation must specify 'PGMINT=CHANNEL'.
DFHPI9613 E	Mapping level <i>level</i> is not recognized.
DFHPI9614 I	Mapping level <i>old</i> has been requested. The most current mapping level available is <i>new</i> .
DFHPI9615 E	The version of Java in use is <i>current</i> . The minimum version of Java required is <i>required</i> .
DFHPI9616 W	National characters in COBOL are assumed to be DBCS characters <i>line</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI9617 E	The supplied WSDL contains an element with unknown length content which should be stored in a separate CONTAINER. This is only supported when PGMINT is set to CHANNEL.
DFHPI9618 E	The <i>keyword</i> keyword has been specified. This requires the use of LANG=PLI-ENTERPRISE.
DFHPI9619 E	Parameter <i>parameter</i> has been specified. It is not supported at mapping level <i>level</i> .
DFHPI9620 E	CCSID <i>CCSID</i> is not recognized.
DFHPI9621 W	CCSID <i>CCSID</i> is not recognized as an EBCDIC CCSID. Use of this CCSID may cause problems when the Web service is executed.
DFHPI9622 E	Invalid value specified for the <i>parameter</i> parameter. The length specified must be a positive integer between <i>min</i> and <i>max</i> .
DFHPI9623 E	Invalid value specified for the CHAR-VARYING parameter. Valid values are: NULL, NO or YES.
DFHPI9624 E	Invalid value specified for the FLOAT parameter. Valid values are IEEE, HEX or HEXADEC.
DFHPI9625 E	Invalid value specified for the CHAR-VARYING parameter. Valid values are: NULL or NO.
DFHPI9626 W	Parameter <i>parameter</i> has been specified but is not valid when parameter <i>parameter2</i> is set. The parameter is ignored.
DFHPI9627 E	Minimum runtime level <i>level</i> is not recognized.
DFHPI9628 E	Parameter <i>parameter</i> has been specified but it is not compatible with the specified minimum runtime level.
DFHPI9629 I	The minimum runtime level required for this Web service is <i>level</i> .
DFHPI9630 W	The minimum runtime level required for this Web service is greater than the mapping level due to the use of the <i>parameter</i> parameter.
DFHPI9631 E	Field <i>field</i> requires a character array length of <i>length</i> but the largest length that can be used in <i>language</i> is <i>maxlength</i> .
DFHPI9632 E	URI <i>uri</i> is invalid. The reported problem is: <i>problem</i> .
DFHPI9633 E	Invalid value specified for the SOAPVER parameter. Valid values are: 1.1, 1.2 or ALL.
DFHPI9634 E	WSDL service element <i>service</i> cannot be found in the WSDL document.
DFHPI9635 E	WSDL reusable binding <i>binding</i> may only be used if the WSDL-SERVICE parameter is specified.
DFHPI9636 E	WSDL operation <i>operation</i> cannot be found.
DFHPI9637 W	One or more WSDL operations have not been processed for a provider mode Web service.
DFHPI9638 W	The minimum runtime level required for this Web service is greater than the mapping level due to the use of WSDL 2.0
DFHPI9639 E	WSDL 2.0 has been used but it is not compatible with the specified minimum runtime level.
DFHPI9640 I	This Web service should be installed into a PIPELINE that uses SOAP version <i>soapver</i> .
DFHPI9641 E	Unsupported message content model <i>contentModel</i> found whilst processing operation <i>operation</i> .
DFHPI9642 E	WSDL Message Exchange Pattern <i>mep</i> is unsupported. This pattern is specified for operation <i>operation</i> .
DFHPI9643 I	This Web service requires a capability implied by URI <i>uri</i> . It must be installed into an appropriate PIPELINE.
DFHPI9644 I	This Web service supports a capability implied by URI <i>uri</i> .
DFHPI9645 I	Operation <i>operation</i> requires a capability implied by URI <i>uri</i> . It must be installed into an appropriate PIPELINE.
DFHPI9646 I	Operation <i>operation</i> supports a capability implied by URI <i>uri</i> .
DFHPI9647 I	The request message for operation <i>operation</i> requires a capability implied by URI <i>uri</i> . It must be installed into an appropriate PIPELINE.
DFHPI9648 I	The request message for operation <i>operation</i> supports a capability implied by URI <i>uri</i> .
DFHPI9649 I	The response message for operation <i>operation</i> requires a capability implied by URI <i>uri</i> . It must be installed into an appropriate PIPELINE.
DFHPI9650 I	The response message for operation <i>operation</i> supports a capability implied by URI <i>uri</i> .
DFHPI9651 E	The value of parameter <i>parameter1</i> is incompatible with the value of parameter <i>parameter2</i> .
DFHPI9652 W	A required but unsupported WSDL extensibility element has been detected. The element is of type <i>type</i> .

Table 40. new and changed messages I (continued)

Message number	Message text
DFHPI9653 W	An unresolved PolicyReference element has been found and ignored. The URI associated with this PolicyReference is <i>uri</i> .
DFHPI9654 W	An unsupported Policy element has been found. The element is of type <i>type</i> in namespace <i>namespace</i> .
DFHPI9655 E	The supplied WSDL file contains a message exchange pattern of in-opt-out. This is only supported when PGMINT is set to CHANNEL.
DFHPI9656 E	The WSDL file does not contain any binding elements. There must be at least one WSDL binding.
DFHPI9657 W	The WSDL file contains <i>elementType</i> elements but the <i>parameter</i> parameter has not been specified. These elements are ignored.
DFHPI9658 E	Directory <i>directory</i> cannot be read.
DFHPI9659 E	Directory <i>directory</i> is not a valid directory.
DFHPI9660 I	WS-Policy file <i>file</i> has been processed.
DFHPI9661 E	File <i>file</i> is not a CICS WS-Policy file.
DFHPI9662 E	An exception was thrown whilst processing WS-Policy file <i>file</i> . The exception message is: <i>exception</i> .
DFHPI9663 E	Operation <i>Operation</i> specified a SOAP MEP of <i>specified_MEP</i> . The only SOAP MEP supported is <i>supported_MEP</i> .
DFHRD0126 I	<i>date time applid terminal userid tranid</i> INSTALL IPCONN(<i>ipconn-name</i>)
DFHRD0127 I	<i>date time applid terminal userid tranid</i> INSTALL LIBRARY(<i>library-name</i>)
DFHSI8445	<i>applid</i> An attempt to getmain storage intended for the Language Interface work area failed.
DFHSJ0206	<i>date time applid</i> The runtime options specified in DFHJVMRO are too long. The Language Environment enclave cannot be initialized. The JVM was not started.
DFHSJ0521	<i>date time applid</i> Option TMPPREFIX found in JVM profile <i>jvmprof</i> should only be used under guidance from IBM.
DFHSJ0522	<i>date time applid</i> Deprecated option TMSUFFIX found in JVM profile <i>jvmprof</i> . Value will be added to <i>ibm.jvm.shareable.application.class.path</i> after the CICS-supplied jar files.
DFHSJ0523	<i>date time applid</i> Deprecated option CLASSPATH found in JVM profile <i>jvmprof</i> . Use CLASSPATH_SUFFIX instead.
DFHSJ0524	<i>date time applid</i> Obsolete JVM option <i>option</i> found in JVM profile <i>profile</i> . Specify REUSE=YES or REUSE=NO. The JVM cannot be started.
DFHSJ0525	<i>date time applid</i> Obsolete JVM option Xresettable found in JVM profile <i>profile</i> has been ignored.
DFHSJ0526	<i>date time applid</i> Obsolete option <i>option</i> found in JVM properties file <i>jvmprops</i> has been ignored.
DFHSJ0527	<i>date time applid</i> Obsolete option <i>option</i> found in JVM profile <i>jvmprof</i> has been ignored.
DFHSJ0528	<i>date time applid</i> Deprecated option MAX_RESETS_TO_GC found in JVM Profile <i>JVMprof</i> . Use GC_HEAP_THRESHOLD instead.
DFHSJ0529	<i>date time applid</i> Value <i>value</i> for GC_HEAP_THRESHOLD found in JVM Profile <i>JVMprof</i> must be between 50 and 100.
DFHSJ0530	<i>date time applid</i> Value <i>value</i> for IDLE_TIMEOUT found in JVM profile <i>profile</i> must be between 0 and 10080.
DFHSJ0531	<i>date time applid</i> JAVA_HOME directory <i>directory</i> specified in JVM profile <i>jvmprof</i> failed to open. The JVM cannot be started. Runtime error message is <i>errmsg</i> .
DFHSJ0532	<i>date time applid</i> Insufficient permission to access the JAVA_HOME directory <i>directory</i> specified in the JVM profile <i>jvmprof</i> . The JVM cannot be started.
DFHSJ0533	<i>date time applid</i> JAVA_HOME directory <i>directory</i> specified in JVM profile <i>jvmprof</i> does not contain a valid Java installation. The JVM cannot be started.
DFHSJ0534	<i>date time applid</i> Deprecated option CICS_DIRECTORY found in JVM profile <i>jvmprof</i> . Use CICS_HOME instead. Value will be treated as CICS_HOME.
DFHSJ0535	<i>date time applid</i> CICS_HOME directory <i>directory</i> specified in JVM profile <i>jvmprof</i> failed to open. The JVM cannot be started. Runtime error message is <i>errmsg</i> .
DFHSJ0536	<i>date time applid</i> Insufficient permission to access the CICS_HOME directory <i>directory</i> specified in JVM profile <i>jvmprof</i> . The JVM cannot be started.
DFHSJ0537	<i>date time applid</i> Incorrect CICS version in CICS_HOME directory <i>directory</i> specified in JVM profile <i>jvmprof</i> . The JVM cannot be started.

Table 40. new and changed messages I (continued)

Message number	Message text
DFHSJ0538	<i>date time applid</i> Deprecated option LIBPATH found in JVM profile <i>jvmprof</i> . Use LIBPATH_SUFFIX instead.
DFHSJ0539	<i>date time applid</i> Deprecated option <i>option</i> found in JVM profile <i>profile</i> . Use <i>option2</i> instead.
DFHSJ0709	<i>date time applid</i> The runtime options specified in DFHJVMRO are too long. The Language Environment enclave cannot be initialized. The master JVM was not started.
DFHSM0601 I	<i>applid</i> Limit of above the bar storage available is <i>gdsalimitgdsaunits{NOLIMIT I }</i> from <i>gdsaloc</i> .
DFHSM0602	<i>applid</i> Insufficient storage to allocate the minimum above the bar memory object.
DFHSM0603	<i>applid</i> Insufficient storage to allocate the recommended 2GB above the bar memory object.
DFHSM0606	<i>applid</i> The amount of MVS above the bar storage available to CICS is critically low.
DFHSM0607	<i>applid</i> The amount of MVS above the bar storage available to CICS is no longer critically low.
DFHSO0128 A	<i>applid</i> Information to specify a bind to an LDAP server cannot be obtained from the PROXY segment of CRLPROFILE <i>profile</i> .
DFHSO0129 A	<i>applid</i> The LDAP server whose name was obtained from CRLPROFILE is inactive. Certificate revocation checks have been disabled.
DFHSO0131	<i>date time applid</i> The TCPIPService <i>tcipSERVICE</i> cannot be opened on the IP address <i>ipaddress</i> because the maximum number of ports has been reached.
DFHSO0132	An invalid function has been passed to DFHSOLX.
DFHTC1600	<i>applid</i> The value for SYSIDNT, <i>sysid1</i> , does not match the one specified in the last cold or initial start, <i>sysid2</i> . CICS normal operation may be affected.
DFHTD0247	<i>applid</i> NOSPACE condition on a PUT to the intrapartition data set (DD name <i>ddname</i>). The data set is full.
DFHTD0386	<i>applid</i> The high RBA value of the primary extent for intrapartition data set (DD name <i>ddname</i>) is <i>X'highrba'</i> . This exceeds the maximum allowable value of 2GB, and will be capped to a value of <i>X'80000000'</i> minus the CI size of the data set.
DFHTI0100	<i>applid</i> This is the Beta version of CICS TS which expires on <i>date</i> .
DFHTI0101	<i>applid</i> CICS failed to initialize. Beta version of CICS TS expired on <i>date</i> .
DFHWB0154 E	<i>date time applid client_ip_addr tcipSERVICE</i> The request receiver SOCB notify gate is unable to obtain storage.
DFHWB0756	<i>date time applid tranid</i> The host on the received HTTP request is invalid. Client IP address: <i>clientaddr</i> . TCPIPService: <i>tcipSERVICE</i>
DFHWB0757	<i>date time applid tranid</i> A precondition specified by an If-Modified-Since header has failed. Client IP address: <i>clientaddr</i> . TCPIPService: <i>tcipSERVICE</i> .
DFHWB0758	<i>date time applid tranid</i> An attempt to access static data <i>data</i> has failed because the transaction user does not have READ access to the resource. Client IP address: <i>clientaddr</i> TCPIPService: <i>tcipSERVICE</i> .
DFHWB0759	<i>date time applid tranid</i> An attempt to access static data <i>data</i> has failed because the resource is not found. Client IP address: <i>clientaddr</i> TCPIPService: <i>tcipSERVICE</i> .
DFHWB0760	<i>date time applid tranid</i> An attempt to read HFS file <i>filename</i> has failed. Client IP address: <i>clientaddr</i> . TCPIPService: <i>tcipSERVICE</i> .
DFHWB0761	<i>date time applid tranid</i> An attempt to send a static response has failed due to an internal error. Client IP address <i>clientaddr</i> TCPIPService: <i>tcipSERVICE</i> .
DFHWB0762	<i>date time applid tranid</i> The received HTTP request specifies the OPTIONS method but cannot be handled by CICS. Status code <i>statuscode</i> . Host IP address: <i>hostaddr</i> . Client IP address: <i>clientaddr</i> . TCPIPService: <i>tcipSERVICE</i> .
DFHWB1560	<i>date time applid userid</i> URIMAP <i>urimap</i> has been created.
DFHWB1570	<i>date time applid userid</i> URIMAP <i>urimap</i> was successfully discarded.
DFHXQ0123	IXCARM REQUEST= <i>reqtype</i> failed, return code <i>retcode</i> , reason code <i>rsncode</i> .
DFHXS1116	<i>date time applid tranid</i> Security violation by user <i>userid</i> { at IP address <i>location</i> }for HFS file <i>hfsfile</i> . USS codes are (<i>X'ussvalue'</i> , <i>X'ussreturn'</i> , <i>X'ussreason'</i>).
DFHZC6312 E	<i>date time applid</i> Install for connection <i>cccc</i> failed. An IPCONN with this name already exists and its applid is not <i>netname</i> .

New abend codes

This section lists new abend codes for CICS TS Version 3.2.

Table 41. new and changed abends I

abend number	abend text
AALY	An error (INVALID, DISASTER or unexpected EXCEPTION response) has occurred on a call to the ISC/IP Domain. The domain that detected the original error provides a trace entry and possibly a system dump (depending on the options specified in the dump table).
AALZ	An error (INVALID, DISASTER or unexpected EXCEPTION response) has occurred on a call to the Document Handler. The domain that detected the original error provides a trace entry and possibly a system dump (depending on the options specified in the dump table).
AAM3	An error (INVALID, DISASTER or unexpected EXCEPTION response) has occurred on a call to the Loader Domain. The domain that detected the original error provides a trace entry and possibly a system dump (depending on the options specified in the dump table).
AEZY	CODEPAGEERR condition not handled.
	<p>This is one of a number of abends issued by the EXEC interface program. Because of their similar characteristics these abends are described as a group.</p>
AFCI	<p>See the description of abend AEIA for further details.</p> <p>The transaction issued a file request resulting in a call to the main file control program (DFHFCFR). During the processing of the request the transaction was purged. That is, the transaction was the subject of an explicit PURGE or FORCEPURGE request, was timed out, or was selected by CICS for termination in an attempt to alleviate an SOS condition.</p>
AFDI	A call to directory domain failed when trying to locate an fct entry.
AFDJ	A call to lock manager failed when trying to locate an fct entry.
AIPA	IP interconnectivity program DFHISCOP has been initiated invalidly, probably by entering a transaction id that refers to it, for example CISC or CISS, at a terminal. This program must only be initiated by CICS internal processes.
AIPB	IP interconnectivity receiver program DFHISRRP has been initiated invalidly, probably by entering a transaction id that refers to it, for example CISR, at a terminal. This program must only be initiated by CICS internal processes.
AIPC	IP interconnectivity error and message program DFHISEMP has been initiated invalidly, probably by entering a transaction id that refers to it, for example CISE, at a terminal. This program must only be initiated by CICS internal processes.
AIPD	IP interconnectivity program DFHISCOP has been initiated with invalid attach parameters by CICS internal processes. This could be the result of a configuration error or a storage overwrite.
	<p>DFHISCOP should be defined as the initial program for the IS domain connectivity transactions; these are CISC and the transactions for TCPIPSERVICES with protocol IPIC, CISS by default. This error could occur if DFHISCOP is defined as the initial program for some other CICS internal transaction.</p>
AIPE	IP interconnectivity program DFHISCOP received an INVALID, DISASTER, or EXCEPTION response from a call to the intersystems communication (IS) domain to acquire or release an IPCONN.
	<p>The domain that detected the original error provides an exception trace, a console message and, possibly, a system dump.</p>
AIPF	IP interconnectivity program DFHISCOP received an PURGED response from a call to the intersystems communication (IS) domain to acquire or release an IPCONN.
	<p>The domain that detected the original error provides an exception trace, a console message and, possibly, a system dump.</p>

Table 41. new and changed abends I (continued)

abend number	abend text
AIPG	IP interconnectivity long-running request/response receiver program received an INVALID, DISASTER, or EXCEPTION response from its PROCESS_INPUT call to the intersystems communication (IS) domain. The domain that detected the original error provides an exception trace, a console message and, possibly, a system dump.
AIPH	IP interconnectivity long-running error and message program received an INVALID, DISASTER, or EXCEPTION response from its PROCESS_ERROR call to the intersystems communication (IS) domain. The domain that detected the original error provides an exception trace, a console message and, possibly, a system dump.
AIPI	IP interconnectivity program DFHISREX has been initiated invalidly, probably by entering a transaction id that refers to it, CISX, at a terminal. This program must only be initiated by CICS internal processes.
AIPJ	The IS attach client module DFHISXM received an INVALID, DISASTER, or unexpected EXCEPTION response from its INITIALIZE_RECEIVER call to module DFHISIS. The call was issued during initialization of a transaction that was started by a transaction attach message received on an IP connection. The call was made as part of processing to associate the transaction with its intended user. The attempt to associate the intended user with the transaction has failed. The userid for the intended user of the transaction may not be correctly defined.
AIPK	Security attributes defined for the IPCONN may not be consistent with the security parameters received in the transaction attach message. The IS attach client module DFHISXM received a PURGED response from its INITIALIZE_RECEIVER call to module DFHISIS.
AIPL	The IS attach client module DFHISXM received an INVALID, DISASTER, or unexpected EXCEPTION response from its BIND_RECEIVER call to module DFHISIS.
AITJ	A mirror transaction processing a request from a client connected using IP interconnectivity has failed while trying to receive data from, or send data to, a client. This could be a read time out, or a more serious error in the flows that prevented CICS from correctly processing the data.
AITK	The ISCINVREQ condition has been raised. This can happen when the resource proves to be on yet another remote system, that is, when daisy-chaining is active.
AITL	The IPIC client sent a CCSID that was not recognized.
AKEX	A program check has been detected by the kernel (KE) domain while executing under a TCB that is not enabled for EXEC CICS commands. This is probably because of an attempt to execute a CICS command in an environment where this is not possible.
AMQA	DFHMQCON had enabled DFHMQTRU with a global work area smaller than that needed by DFHMQTRU. This could be due to a mismatch of version level between DFHMQCON and DFHMQTRU.
AMQB	DFHMQCON had enabled DFHMQTRU with a task local work area smaller than that needed by DFHMQTRU. This could be due to a mismatch of version level between DFHMQCON and DFHMQTRU.
AMQC	Unrecognizable WMQ API call. All supported API calls are documented in the <i>WebSphere MQ Application Programming Reference</i> manual.
AMQD	Unrecognizable RMI API call. The CICS-MQ task related user exit (TRUE) was invoked with an unrecognizable request type.
AMQE	An attempt to EXEC CICS LOAD the data conversion service module CSQAVICM was unsuccessful.
AMQF	An internal logic error has been detected in the CICS bridge monitor.
AMQG	The CICS DPL bridge program has detected an error in a request message for this unit of work.
AMQH	The CICS bridge monitor or DPL bridge program abended due to an unexpected return code from an EXEC CICS API call.

Table 41. new and changed abends I (continued)

abend number	abend text
AMQI	The CICS bridge monitor or DPL bridge program abended due to an unexpected return code from an MQ API call.
AMQJ	The CICS DPL bridge program abended before processing any messages for the unit of work.
AMQK	The CICS DPL bridge program abended during error processing.
AMQL	DFHMQCON issued a call to CICS enqueue domain to create an enqueue pool for use in later CICS-MQ adapter processing, but the call to enqueue domain failed.
APGA	An error has occurred obtaining a lock within the Program Manager domain.
APGB	An error has occurred releasing a lock within the Program Manager domain.
APGC	A transaction has tried to allocate an excessive amount of storage for containers. A transaction must not allocate more than 10% of the storage available for holding containers above the bar.
ASJA	An error has occurred obtaining a lock within the Java domain.
ASJB	An error has occurred releasing a lock within the Java domain.
ASJC	The CICS_HOME directory is inaccessible, does not exist, or contains a version of CICS Java support which is not the same as this release of CICS.
ASJK	An attempt was made to attach transaction CJGC, but the transaction was not attached internally by CICS.
	The CICS system transaction CJGC provides support for initiating Garbage Collection in a JVM. It can only be attached internally by CICS.
ASJL	An attempt was made to attach a transaction specifying DFHSJGC as the program to be given control, but the transaction id was not CJGC.
	DFHSJGC is for use by CICS system transaction CJGC, which provides support for initiating Garbage Collection in a JVM.
ASJM	An attempt was made to attach transaction CJPI, but the transaction was not attached internally by CICS.
	The CICS system transaction CJPI provides support for initializing new JVMs. It can only be attached internally by CICS.
ASJN	An attempt was made to attach a transaction specifying DFHSJPI as the program to be given control, but the transaction id was not CJPI.
	DFHSJPI is for use by CICS system transaction CJPI, which provides support for initializing new JVMs.
ASJR	An attempt was made to start a JVM in resettable mode by specifying [-]Xresettable=YES or REUSE=RESET.
ATSU	A DISASTER response caused by an IOERR was received from a request to the Temporary Storage (TS) Domain.
AWC9	CICS detected an error during transaction initialization for a CICS IPCONN acquire server-side transaction.
AWSY	A problem was encountered in the DFHPIRT outbound router program. This usually implies that one of the containers used by DFHPIRT was not populated correctly.

Part 6. Appendixes

Bibliography

The CICS Transaction Server for z/OS library

The published information for CICS Transaction Server for z/OS is delivered in the following forms:

The CICS Transaction Server for z/OS Information Center

The CICS Transaction Server for z/OS Information Center is the primary source of user information for CICS Transaction Server. The Information Center contains:

- Information for CICS Transaction Server in HTML format.
- Licensed and unlicensed CICS Transaction Server books provided as Adobe Portable Document Format (PDF) files. You can use these files to print hardcopy of the books. For more information, see “PDF-only books.”
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One copy of the CICS Information Center, on a CD-ROM, is provided automatically with the product. Further copies can be ordered, at no additional charge, by specifying the Information Center feature number, 7014.

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The following essential publications, in hardcopy form, are provided automatically with the product. For more information, see “The entitlement set.”

The entitlement set

The entitlement set comprises the following hardcopy books, which are provided automatically when you order CICS Transaction Server for z/OS, Version 3 Release 2:

Memo to Licensees, GI10-2559
CICS Transaction Server for z/OS Program Directory, GI13-0515
CICS Transaction Server for z/OS Release Guide, GC34-6811
CICS Transaction Server for z/OS Installation Guide, GC34-6812
CICS Transaction Server for z/OS Licensed Program Specification, GC34-6608

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CICS Transaction Server for z/OS Release Guide
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CICS Transaction Server for z/OS Release Guide, GC34-6811
CICS Transaction Server for z/OS Migration from CICS TS Version 3.1, GC34-6858

CICS Transaction Server for z/OS Migration from CICS TS Version 1.3,
GC34-6855

CICS Transaction Server for z/OS Migration from CICS TS Version 2.2,
GC34-6856

CICS Transaction Server for z/OS Installation Guide, GC34-6812

Administration

CICS System Definition Guide, SC34-6813

CICS Customization Guide, SC34-6814

CICS Resource Definition Guide, SC34-6815

CICS Operations and Utilities Guide, SC34-6816

CICS Supplied Transactions, SC34-6817

Programming

CICS Application Programming Guide, SC34-6818

CICS Application Programming Reference, SC34-6819

CICS System Programming Reference, SC34-6820

CICS Front End Programming Interface User's Guide, SC34-6821

CICS C++ OO Class Libraries, SC34-6822

CICS Distributed Transaction Programming Guide, SC34-6823

CICS Business Transaction Services, SC34-6824

Java Applications in CICS, SC34-6825

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CICS Problem Determination Guide, SC34-6826

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CICS Diagnosis Reference, GC34-6862

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CICS Supplementary Data Areas, GC34-6864-00

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CICS Intercommunication Guide, SC34-6829

CICS External Interfaces Guide, SC34-6830

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CICS Recovery and Restart Guide, SC34-6832

CICS Performance Guide, SC34-6833

CICS IMS Database Control Guide, SC34-6834

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CICS Shared Data Tables Guide, SC34-6836

CICS DB2 Guide, SC34-6837

CICS Debugging Tools Interfaces Reference, GC34-6865

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CICSplex SM User Interface Guide, SC34-6840

CICSplex SM Web User Interface Guide, SC34-6841

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CICSplex SM Administration, SC34-6842

CICSplex SM Operations Views Reference, SC34-6843

CICSplex SM Monitor Views Reference, SC34-6844

CICSplex SM Managing Workloads, SC34-6845

CICSplex SM Managing Resource Usage, SC34-6846

CICSplex SM Managing Business Applications, SC34-6847

Programming

CICSplex SM Application Programming Guide, SC34-6848

CICSplex SM Application Programming Reference, SC34-6849

Diagnosis

CICSplex SM Resource Tables Reference, SC34-6850
CICSplex SM Messages and Codes, GC34-6851
CICSplex SM Problem Determination, GC34-6852

CICS family books

Communication

CICS Family: Interproduct Communication, SC34-6853
CICS Family: Communicating from CICS on zSeries, SC34-6854

Licensed publications

The following licensed publications are not included in the unlicensed version of the Information Center:

CICS Diagnosis Reference, GC34-6862
CICS Data Areas, GC34-6863-00
CICS Supplementary Data Areas, GC34-6864-00
CICS Debugging Tools Interfaces Reference, GC34-6865

Other CICS books

The following publications contain further information about CICS, but are not provided as part of CICS Transaction Server for z/OS, Version 3 Release 2.

<i>Designing and Programming CICS Applications</i>	SR23-9692
<i>CICS Application Migration Aid Guide</i>	SC33-0768
<i>CICS Family: API Structure</i>	SC33-1007
<i>CICS Family: Client/Server Programming</i>	SC33-1435
<i>CICS Transaction Gateway for z/OS Administration</i>	SC34-5528
<i>CICS Family: General Information</i>	GC33-0155
<i>CICS 4.1 Sample Applications Guide</i>	SC33-1173
<i>CICS/ESA 3.3 XRF Guide</i>	SC33-0661

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Subsequent updates will probably be available in softcopy before they are available in hardcopy. This means that at any time from the availability of a release, softcopy versions should be regarded as the most up-to-date.

For CICS Transaction Server books, these softcopy updates appear regularly on the *Transaction Processing and Data Collection Kit* CD-ROM, SK2T-0730-xx. Each reissue of the collection kit is indicated by an updated order number suffix (the -xx part). For example, collection kit SK2T-0730-06 is more up-to-date than SK2T-0730-05. The collection kit is also clearly dated on the cover.

Updates to the softcopy are clearly marked by revision codes (usually a # character) to the left of the changes.

Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

You can perform most tasks required to set up, run, and maintain your CICS system in one of these ways:

- using a 3270 emulator logged on to CICS
- using a 3270 emulator logged on to TSO
- using a 3270 emulator as an MVS system console

IBM Personal Communications provides 3270 emulation with accessibility features for people with disabilities. You can use this product to provide the accessibility features you need in your CICS system.

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Migration from CICS TS Version 2.2
Version 3 Release 2**

Publication No. GC34-6856-04

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