IBM Common Services Library for z/OS
Version 1 Release 1

User's Guide

IBM
About this information

IBM® Common Services Library for z/OS® provides a framework, and a set of base services, required by some z/OS tools.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform these tasks:

- Plan for the installation of Common Services Library
- Use Common Services Library with other z/OS products

Always check the IMS™ Tools Product Documentation page for the most current version of this information:

http://www.ibm.com/software/data/db2imstools/imstools-library.html

How to read syntax diagrams

The following rules apply to the syntax diagrams that are used in this information:

- Read the syntax diagrams from left to right, from top to bottom, following the path of the line. The following conventions are used:
  - The >>--- symbol indicates the beginning of a syntax diagram.
  - The ---> symbol indicates that the syntax diagram is continued on the next line.
  - The >--- symbol indicates that a syntax diagram is continued from the previous line.
  - The --->< symbol indicates the end of a syntax diagram.
- Required items appear on the horizontal line (the main path).

```
>>>required_item-----------------------------------------------
```

- Optional items appear below the main path.

```
>>>required_item--------------------------optional_item---------------------------
```

If an optional item appears above the main path, that item has no effect on the execution of the syntax element and is used only for readability.

```
>>>required_item--------------------------optional_item---------------------------
```

- If you can choose from two or more items, they appear vertically, in a stack. If you must choose one of the items, one item of the stack appears on the main path.

```
>>>required_item--------------------------required_choice1--------------------------required_choice2---------------------------
```
If choosing one of the items is optional, the entire stack appears below the main path.

►►required_item►◄
  optional_choice1
  optional_choice2

If one of the items is the default, it appears above the main path, and the remaining choices are shown below.

►►required_item►◄
  default_choice
  optional_choice
  optional_choice

• An arrow returning to the left, above the main line, indicates an item that can be repeated.

►►required_item►◄
  repeatable_item

If the repeat arrow contains a comma, you must separate repeated items with a comma.

►►required_item►◄
  repeatable_item

A repeat arrow above a stack indicates that you can repeat the items in the stack.

• Keywords, and their minimum abbreviations if applicable, appear in uppercase. They must be spelled exactly as shown. Variables appear in all lowercase italic letters (for example, column-name). They represent user-supplied names or values.

• Separate keywords and parameters by at least one space if no intervening punctuation is shown in the diagram.

• Enter punctuation marks, parentheses, arithmetic operators, and other symbols exactly as shown in the diagram.

• Footnotes are shown by a number in parentheses; for example, (1).
Common Services Library overview

Common Services Library consists of a framework of code used and required by some z/OS applications. It also includes a server that some Eclipse-based plug-ins use to communicate with z/OS-based products, and a utility named Scrub that removes sensitive information from IMS log records.

What does Common Services Library do?

Common Services Library provides functionality that supports select IBM products. Rather than including this common functionality separately in each product, Common Services Library can be shared between products.

Common Services Library components

The components of Common Services Library are the Common Services Library server and the Scrub utility.

Infrastructure

Infrastructure includes a framework, and a set of base services, for z/OS tools to use. A product that requires the framework lists Common Services Library as a prerequisite. For information about how to configure a product to use the Common Services Library infrastructure, refer to the documentation for that product.

Common Services Library server

The Common Services Library server provides connectivity between select Eclipse-based plug-ins and their corresponding z/OS-based products. A product that requires Common Services Library server lists Common Services Library as a prerequisite. For information about how to configure a product to use the Common Services Library infrastructure, refer to the documentation for that product.

Scrub utility

The Scrub utility is a z/OS batch program that removes sensitive information from IMS logs.

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:


Product documentation and updates

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM My Notifications service.
Information on the web

The IMS Tools Product Documentation web page provides current product documentation that you can view, print, and download. To locate publications with the most up-to-date information, refer to the following web page:

http://www.ibm.com/software/data/db2imstools/imstools-library.html

You can also access documentation for many IMS Tools from IBM Knowledge Center:

http://www.ibm.com/support/knowledgecenter

IBM Redbooks® publications that cover IMS Tools are available from the following web page:

http://www.redbooks.ibm.com

The Data Management Tools Solutions website shows how IBM solutions can help IT organizations maximize their investment in IMS databases while staying ahead of today’s top data management challenges:


Receiving documentation updates automatically

To automatically receive emails that notify you when new technote documents are released, when existing product documentation is updated, and when new product documentation is available, you can register with the IBM My Notifications service. You can customize the service so that you receive information about only those IBM products that you specify.

To register with the My Notifications service:
1. Go to http://www.ibm.com/support/mysupport
2. Enter your IBM ID and password, or create one by clicking register now.
3. When the My Notifications page is displayed, click Subscribe to select those products that you want to receive information updates about. The IMS Tools option is located under Software > Information Management.
4. Click Continue to specify the types of updates that you want to receive.
5. Click Submit to save your profile.

How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other IBM product documentation, use one of the following options:

- Use the online reader comment form, which is located at http://www.ibm.com/software/data/rcf/
- Send your comments by email to comments@us.ibm.com. Include the name of the book, the part number of the book, the version of the product that you are using, and, if applicable, the specific location of the text you are commenting on, for example, a page number or table number.
Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility features in this product enable users to perform the following activities:

• Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
• Operate specific or equivalent features by using only the keyboard. Refer to the following publications for information about accessing ISPF interfaces:
  – z/OS ISPF User’s Guide, Volume 1
  – z/OS TSO/E Primer
  – z/OS TSO/E User’s Guide

These guides describe how to use the ISPF interface, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

Installing IBM Common Services Library for z/OS

To install Common Services Library, follow the instruction in the Common Services Library Program Directory, GI10-9011-00.
IBM Common Services Library server

The purpose of the Common Services Library server is to enable communication between Eclipse-based plug-ins and their corresponding z/OS-based products.

The following figure shows how plug-ins communicate with their corresponding z/OS-based products through the Common Services Library server.

To configure and customize the server, refer to the documentation for the product that uses the server.

Plug-ins that use Common Services Library server

Several Eclipse-based plug-ins use the Common Services Library server to communicate with z/OS-based IBM products.

For example, IBM Transaction Analysis Workbench for z/OS (Transaction Analysis Workbench) is a tool for analyzing problems with the performance or behavior of transactions on z/OS. The Transaction Analysis Workbench plug-in is aimed at “first responders”, such as help desk staff, who record the details of problems reported by users of z/OS-based transactions.
Another example is the IBM IMS Configuration Manager for z/OS plug-in. You can use this plug-in to view the topology of your IMS systems, view resources, and submit IMS commands to those systems.

![Image of Transaction Analysis Workbench plug-in: creating a session and selecting a template]

Figure 2. Transaction Analysis Workbench plug-in: creating a session and selecting a template

![Image of IMS Configuration Manager plug-in: comparing parameters across an enterprise using the plug-in comparator]

Figure 3. IMS Configuration Manger plug-in: comparing parameters across an enterprise using the plug-in comparator
Scrub utility

Scrub utility (also known as Scrub) is a tool that removes sensitive data from IMS log records.

Scrubbing sensitive data from IMS log records

To remove from IMS log records any sensitive or confidential user data, such as customer business information, use the Scrub utility (FUNSCRUB). Use Scrub when you need to send IMS logs to an external organization; for example, before sending IMS logs to IBM for problem determination.

About this task

Scrub processes IMS logs created by any in-support version of IMS. You cannot use Scrub to process Common Queue Server (CQS) logs.

Scrub overwrites the contents of user data fields in a specific set of IMS log record types. For fields shorter than 10 bytes, Scrub overwrites the contents with null bytes (hexadecimal zero). For longer fields, Scrub overwrites the contents with -CLEARED- followed by null bytes.

Scrubbed log records remain structurally intact and the same length.

Procedure

To run Scrub, create and submit JCL.

Example

The following JCL scrubs records within the specified time range in an IMS version 14 log.

```
//JOBNAME JOB ,NOTIFY=&SYSUID,CLASS=A,MSGCLASS=T
//SCRUB EXEC PGM=FUNSCRUB,PARM='V141' 1
//STEPLIB DD DISP=SHR,DSN=HLQ1.SFUNLINK
//SYSPRINT DD SYSOUT=*
//LOGINFO DD SYSOUT=*
//SYSUT1 DD DISP=SHR,DSN=IMS.SLDS 2
//SYSUT2 DD DISP=(NEW,CATLG),DSN=IMS.SLDS.SCRUBBED, 3
// UNIT=SYSDA,SPACE=(CYL,(100,100),RLSE)
//SYSIN DD * 4
SCRUB
CODES(01-FF)
START 2017-01-26-10.30.00.00
STOP 2017-01-26-10.45.00.00
ZONE(LOCAL)
/*
```

Figure 4. JCL to scrub sensitive data from an IMS log

1 The EXEC statement for Scrub accepts an optional PARM parameter. The PARM parameter specifies the release of IMS that created the IMS log to be scrubbed. If you omit the PARM parameter, you must specify the IMS version as a runtime setting in the global options module.
The SYSUT1 DD statement specifies the input IMS log.

The SYSUT2 DD statement specifies the output (scrubbed) IMS log.

The SYSIN DD statement specifies the Scrub commands.

This example contains optional commands that you can use to restrict the records processed by Scrub. To scrub all possible records in the input IMS log, specify the single command SCRUB with no other commands.

**What to do next**

Review the log information report. By default, Scrub writes this report to a LOGINFO output data set.

**Related concepts:**

“Global options module (FUNGLOBL)” on page 12

The global options module provides a way for you to specify Scrub utility runtime settings such as the IMS version.

**Related tasks:**

“Setting the IMS version as a global option” on page 13

This task shows you how to set a default value for the IMS version.

**Related reference:**

“Scrub commands” on page 13

The SYSIN data set of a Scrub job must contain either a SCRUB command or a REPORT command. SYSIN may also contain other commands.

**IMS log record types that are scrubbed**

Scrub overwrites the contents of user data fields in these IMS log record types.

<table>
<thead>
<tr>
<th>IMS log record type (hexadecimal)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Input message</td>
</tr>
<tr>
<td>03</td>
<td>Output message</td>
</tr>
<tr>
<td>26</td>
<td>I/O toleration buffer was created</td>
</tr>
<tr>
<td>4002</td>
<td>Checkpoint Message Queue</td>
</tr>
<tr>
<td>4026</td>
<td>Checkpoint I/O toleration buffer</td>
</tr>
<tr>
<td>4082</td>
<td>Checkpoint EMHB</td>
</tr>
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<td>4086</td>
<td>Checkpoint DMHR</td>
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<td>48</td>
<td>OLDS control information</td>
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<td>50</td>
<td>Database update</td>
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<td>FP input message</td>
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<td>FP output message</td>
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<td>5950</td>
<td>FP database update</td>
</tr>
<tr>
<td>5951</td>
<td>FP database update – non-recoverable</td>
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<tr>
<td>5952</td>
<td>FP database update</td>
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<td>5953</td>
<td>FP database update – utilities</td>
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<td>5954</td>
<td>FP database update – DEDB</td>
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<td>FP database update – Resync</td>
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<td>FP database update – DMAC</td>
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<td>67ED</td>
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<td>67EF</td>
<td>SB Compare Option</td>
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<td>67FB</td>
<td>Invalid AWE</td>
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<tr>
<td>67FC</td>
<td>Buffer ‘ALL’ invalid</td>
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<td>67FD</td>
<td>SNAP Trace</td>
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<tr>
<td>67FF</td>
<td>Exception Condition SNAP</td>
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<tr>
<td>9904</td>
<td>Data capture</td>
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</table>

### Scrub JCL reference

The JCL to run Scrub must contain specific statements, such as a SYSIN DD statement for the data set containing Scrub commands.

#### EXEC statement

The EXEC statement that runs the Scrub program accepts an optional PARM parameter. The PARM parameter specifies the release of IMS that created the input IMS log. If you omit the PARM parameter, you must specify the IMS version as a runtime option in the global options module. Scrub validates the PARM parameter against the log file and outputs an information message if the IMS version of each does not match.

The PARM parameter takes the form `PARM='Vnrr'` where `nrr` is the three-digit IMS version and release number.

The following example shows an EXEC statement that can be used to scrub a log created using IMS Version 14 Release 1:

```
//SCRUB EXEC PGM=FUNSCRUB,PARM='V141'
```

#### Required DD statements

The JCL to run Scrub must contain DD statements with the following ddnames:

**SYSIN**

Input data set containing Scrub commands. For example:
```
//SYSIN DD *
SCRUB
/*
```

**SYSPRINT**

Output data set where Scrub echoes the input commands and writes messages.

**SYSUT1**

Input IMS log.

#### Optional DD statements

The JCL to run Scrub can optionally contain DD statements with the following ddnames:
LOGINFO
Output log information report written by the SCRUB or REPORT command.

LOGINFO is the default ddname for the log information report.

To output the log information report to a different ddname, use the OUTPUT parameter of the SCRUB or REPORT parameter.

If you do not explicitly specify a LOGINFO DD statement, Scrub dynamically allocates this ddname to SYSOUT=*.

SYSUT2
Output IMS log (scrubbed).

If you omit this DD statement, Scrub continues, and writes the log information report as if you had specified an output IMS log.

If you omit the DCB attributes (RECFM, LRECL and BLKSIZE) for the output IMS log, Scrub uses the DCB attributes of the input IMS log specified by SYSUT1.

Return codes
0  Request completed successfully.
4  Request completed with a warning. See warning message in SYSPRINT.
8  Request failed. See error message in SYSPRINT.

Related concepts:
"Global options module (FUNGLOBL)" on page 12
The global options module provides a way for you to specify Scrub utility runtime settings such as the IMS version.

Related tasks:
"Setting the IMS version as a global option" on page 13
This task shows you how to set a default value for the IMS version.

Scrub log information report
The SCRUB and REPORT commands produce a log information report that identifies the types of log record in the input IMS log, with statistics for each type.
Example

VIRUMBO  IMS V141  Common Services Library Scrub Utility - Log Information
Log data From 2015-02-11 15.55.11.912529 To 2015-02-11 15.56.01.08355B  Duration 0.50

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<th>Avg len</th>
<th>Max len</th>
<th>Byte/Sec</th>
<th>MB</th>
<th>%</th>
<th>Count</th>
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<td>2</td>
<td>1,069</td>
<td>117,345</td>
<td>5.7</td>
<td>8.4</td>
<td>27,774</td>
<td>27,728</td>
<td></td>
</tr>
<tr>
<td>6701</td>
<td>11,612</td>
<td>232</td>
<td>9</td>
<td>1,056</td>
<td>217,628</td>
<td>10.6</td>
<td>15.6</td>
<td>11,612</td>
<td>11,612</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>312,319</td>
<td>6,246</td>
<td>2</td>
<td>4,140</td>
<td>1,389,076</td>
<td>67.8</td>
<td>100.0</td>
<td>312,319</td>
<td>55,923</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5. Example log information report produced by the SCRUB command

The columns under the 0ut heading appear in reports produced by the SCRUB command, but not in reports produced by the REPORT command. The columns under 0ut show how many records were copied to the output IMS log (specified by the SYSUT2 DD statement), and how many of those records were scrubbed.

Tip: To produce a report with 0ut columns without writing a scrubbed IMS log, use a SCRUB command but omit the SYSUT2 DD statement.

For each record type, the report shows record count, length, rates per second, and volumes. Selected record types are broken down further to provide additional information about transaction arrival and processing throughput. For additional information on each record type, refer to the appropriate IMS documentation.

Additional information for record types 01 and 03: message arrival rates

The following message arrival rate information appears indented under the rows for log record types 01 and 03:

IN  Transaction processed on this system
MSC FE  MSC transaction processed on a remote system
MSC BE  Remote MSC transaction processed on this system
CQS PUT  Input transaction put onto the shared queue
CQS RD  Input transaction read off the shared queue for processing on this system
OUT  Output message
CONT
Continuation record (MSGFFRST=0)

Additional information for record types 07 and 08: scheduling and transaction processing rates

The following scheduling and transaction processing rate information appears indented under the rows for log record types 07 and 08:

MPP Message processing region
QUICK Message processing region quick reschedule
BMP Batch message processing (message and non-message driven)
IFP Fast Path
JMP Java™ message processing region
JBP Java batch processing region
AER Application Execution Region
DBCTL CICS® DBCTL
ODBM Open Database
TRACK Tracking thread
CPI-C APPC region

For 07 only:

DBCTL Includes DBCTL and ODBM (DLRDBT=1 for both and therefore indistinguishable)
FALSE False schedule (DLRFALSE=1)
ABEND Transactions that abended (DLRAB=1)

Additional information for record type 31: transaction processing rates

The following transaction processing rate information appears indented under the rows for log record type 31:

DLI I/O PCB GU to start transaction processing
COMMS Output message sent

Global options module (FUNGLOBL)

The global options module provides a way for you to specify Scrub utility runtime settings such as the IMS version.
The advantage of using the global options module is that when you need to update the IMS version, you can change it in a single place, instead of in multiple JCL members.

If a PARM parameter is included on the EXEC statement for a Scrub utility job step, the PARM parameter overrides the global runtime settings. This feature is useful if you need to run the Scrub utility for a specific JCL member to a different IMS version from the version specified in the global options module.

**Setting the IMS version as a global option**

This task shows you how to set a default value for the IMS version.

**About this task**

If you have to maintain many JCL members that refer to the Scrub utility, and you need to update the IMS version for all of them, you might find it easier to specify the IMS version in the global options module.

**Procedure**

1. In the sample library SFUNSAMP, edit FUNGLOBL to set IMSLEVEL to the IMS version you want; for example, IMSLEVEL=V141.
2. Customize the sample JCL code in FUNASMGL to assemble and link FUNGLOBL into the appropriate STEPLIB.
3. Test the Scrub utility, and check the output messages for indications that a global option is in effect, and that the IMS level is correct.

**Related reference:**

“Messages” on page 16

Use the information in these messages to help you diagnose and solve problems running Scrub.

**Scrub commands**

The SYSIN data set of a Scrub job must contain either a SCRUNB command or a REPORT command. SYSIN may also contain other commands.

**SCRUB command**

The SCRUNB command reads records from the IMS log specified by the ddname SYSUT1, scrubs them, and then writes them to SYSUT2.

SCRUNB also produces a log information report. The report provides details about each record type in the input IMS log, and how many records were scrubbed and copied to the output IMS log.

If you omit SYSUT2, SCRUNB produces the report as if it had written to an output IMS log.

To filter the time range of records that SCRUNB reads from the input IMS log, use the START and STOP commands.

To filter the types of record that SCRUNB writes to the output IMS log, use the CODES command.
The SYSIN data set of a Scrub job must contain either a SCRUB command or a REPORT command. Do not specify both a SCRUB command and a REPORT command in the same SYSIN data set.

Syntax

```
SCRUB
  OUTPUT(LOGINFO)
  OUTPUT(report-ddname)
```

Parameters

**OUTPUT**(report-ddname)

Specifies the ddname for the log information report.

If you omit this parameter, Scrub writes the log information report to the destination specified by the LOGINFO ddname.

If you do not specify a LOGINFO DD statement, Scrub dynamically allocates this ddname to SYSOUT=*.

**REPORT** command

The REPORT command produces a log information report. The report provides details about each record type in the input IMS log.

The report produced by the REPORT command does not contain the Out columns in the similar report produced by the SCRUB command.

To filter the time range of records that REPORT reads from the input IMS log, use the START and STOP commands.

The SYSIN data set of a Scrub job must contain either a SCRUB command or a REPORT command. Do not specify both a SCRUB command and a REPORT command in the same SYSIN data set.

Syntax

```
REPORT
  OUTPUT(LOGINFO)
  OUTPUT(report-ddname)
```

Parameters

**OUTPUT**(report-ddname)

Specifies the ddname for the log information report.

If you omit this parameter, Scrub writes the log information report to the destination specified by the LOGINFO ddname.

If you do not specify a LOGINFO DD statement, Scrub dynamically allocates this ddname to SYSOUT=*.
CODES command

The optional CODES command restricts which log record types the SCRUB command writes to the output IMS log.

CODES does not affect which record types are scrubbed.

Syntax

```
CODES(00-FF),
CODES(type)
```

You can specify individual log record types and ranges of log record types, in any combination.

Each type can be either a 2-digit hexadecimal value (a log record type, such as 01) or a 4-digit hexadecimal value (a log record type followed by a subtype, such as 5901).

Examples

If you omit the CODES command, the SCRUB command writes all log record types, as if you had specified the following CODES command:

```
CODES(00-FF)
```

The following example excludes user log records from the output IMS log:

```
CODES(00-99)
```

A SYSIN data set can contain multiple CODES commands. The following single command:

```
CODES(01,03,40-45,67FF,50,5901-59FF)
```

is equivalent to the following commands:

```
CODES(01)
CODES(03)
CODES(40-45)
CODES(67FF)
CODES(50)
CODES(5901-59FF)
```

START and STOP commands

The optional START and STOP commands restrict the time range of records that the SCRUB and REPORT commands read from the input IMS log.

By default, SCRUB and REPORT read all records from the input IMS log.

Scrub interprets the start and stop times according to the time zone specified by the ZONE command. If you omit the ZONE command, or specify the default value
ZONE (LOCAL), Scrub interprets the start and stop times according to the local time zone of the system on which Scrub is running.

**Syntax**

```
START yyyymm-dd-hh:mm
STOP  .ss .th
```

**Example**

The following example selects records for 26 January 2017 from 10:30 a.m. to 2:30 p.m.:

START 2017-01-26-10.30
STOP 2017-01-26-14.30

**ZONE command**

The optional ZONE command specifies the time zone where the input IMS log was created. Use ZONE to process IMS logs that were created in a different time zone to the system on which you are running Scrub.

The log record time stamp is a (GMT) STCK value in the log record suffix. Scrub converts this time stamp to local time by applying the ZONE specification.

Note that when LOCAL is specified (the default), then the system leap second offset (CVTLSO) is also applied.

**Syntax**

```
ZONE(LOCAL)
ZONE( GMT + hhmm )
```

**Messages**

Use the information in these messages to help you diagnose and solve problems running Scrub.

**Message format**

Scrub message identifiers have the following format:

```
FUNnnnnnx
```

where:

- **FUN** Indicates that the message was issued by Common Services Library.
nnnn Is the message identification number.

x Indicates the severity of the message:

I Indicates that the message is informational only.
W Indicates that the message is a warning to alert you to a possible error condition.
E Indicates that an error occurred, which might or might not require operator intervention.
S Severe. Scrub processing is suspended until you have taken action.
C An internal scrub error. Scrub immediately stops processing. Contact IBM Software Support.

Each message also includes the following information:

**Explanation**
Describes what the message text means, why the message occurred, and what its variables represent.

**System action**
Describes what the system will do in response to the event that triggered this message.

**User response**
Describes whether a response is necessary, what the appropriate response is, and how the response will affect the system or program.

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUN5000E</td>
<td>Command input error: Command=command</td>
</tr>
<tr>
<td><strong>Explanation:</strong></td>
<td>Invalid command input from SYSIN specified.</td>
</tr>
<tr>
<td><strong>System action:</strong></td>
<td>Scrub immediately stops processing.</td>
</tr>
<tr>
<td><strong>User response:</strong></td>
<td>Specify correct command input and retry request.</td>
</tr>
<tr>
<td>FUN5003W</td>
<td>SYSUT2 output file was not specified, reporting continues</td>
</tr>
<tr>
<td><strong>Explanation:</strong></td>
<td>SYSUT2 output DD was not specified in the JCL.</td>
</tr>
<tr>
<td><strong>System action:</strong></td>
<td>Scrub continues processing and produces only the log information report output.</td>
</tr>
<tr>
<td><strong>User response:</strong></td>
<td>None.</td>
</tr>
<tr>
<td>FUN5001E</td>
<td>No action commands were specified</td>
</tr>
<tr>
<td><strong>Explanation:</strong></td>
<td>No valid action commands were specified in the command input. SYSIN specifies commands for the scrub and report requests. SYSIN specifies commands for the scrub and report requests.</td>
</tr>
<tr>
<td><strong>System action:</strong></td>
<td>Scrub immediately stops processing.</td>
</tr>
<tr>
<td><strong>User response:</strong></td>
<td>Specify correct command input and retry request.</td>
</tr>
<tr>
<td>FUN5004I</td>
<td>Log input processing started: Time=time stamp, LSN=log sequence number</td>
</tr>
<tr>
<td><strong>Explanation:</strong></td>
<td>The first log record in the input file has been read. Record processing does not commence until the start time (if specified) is reached. The log record suffix (STCK time stamp and LSN) are formatted to help identify the start of this log file.</td>
</tr>
<tr>
<td><strong>System action:</strong></td>
<td>Processing continues.</td>
</tr>
<tr>
<td><strong>User response:</strong></td>
<td>None. Informational message only.</td>
</tr>
<tr>
<td>FUN5005I</td>
<td>Start time has been reached: Time=time stamp, LSN=log sequence number</td>
</tr>
<tr>
<td><strong>Explanation:</strong></td>
<td>The first log record after the required start time has been read and is about to be processed. The log record suffix (STCK time stamp and LSN) are formatted to help identify the first record.</td>
</tr>
<tr>
<td><strong>System action:</strong></td>
<td>Processing continues.</td>
</tr>
<tr>
<td><strong>User response:</strong></td>
<td>None. Informational message only.</td>
</tr>
</tbody>
</table>
### FUN5006I Log input processing ended: Time=timestamp, LSN=log sequence number

**Explanation:** The last log record in the input file has been read. The log record suffix (STCK time stamp and LSN) are formatted to help identify the end of this log file.

**System action:** Processing continues.

**User response:** None. Informational message only.

### FUN5007I Records processed: In=number of record input Out=number of records output Scrubbed=number of records scrubbed

**Explanation:** Record processing to the specified output file has completed. The record counts indicate the number of records read in, scrubbed, and written out.

**System action:** Processing continues.

**User response:** None. Informational message only.

### FUN5008I Global module FUNGLOBL was found in STEPLIB

**Explanation:** During initial processing the global runtime options module was found in the STEPLIB dataset.

**System action:** Processing continues.

**User response:** None. Informational message only.

### FUN5009I Utility options used: IMS level=IMS version

**Explanation:** This message provides a summary of the runtime options that are in effect for this execution of the utility.

**System action:** Processing continues.

**User response:** None. Informational message only.

### FUN5010E Utility runtime option is invalid: IMS level=IMS version

**Explanation:** A runtime option contains an invalid value. The name of the option is provided along with the value that is invalid.

**System action:** Utility execution ends.

**User response:** Correct the specification of the invalid runtime option.

### FUN5011E Execution cannot continue: Runtime options missing or incorrect, RSN=reason code

**Explanation:** Utility execution cannot continue because the runtime options are missing or invalid. The message provides a reason code to indicate the type of problem.

- **rsn=0201** At least one of the runtime options needed for execution has not been defined in either the global module or the PARM parameter of the job.

- **rsn=0202** At least one of the runtime options specified in the global module, or the PARM parameter of the job, is invalid.

- **rsn=0203** The IMS level of the secondary log data set (SLDS) being scrubbed does not match the IMS level specified in the runtime options. A previous message has been issued to identify the IMS level mismatch.

### FUN5012E Error detected: runtime IMS level=IMS runtime level, does not match log record IMS level=IMS log record level, LSN=log sequence number

**Explanation:** During the scrub process, an IMS log record containing the IMS level that created the secondary log data set (SLDS) was found. The IMS level that created the SLDS does not match the IMS level runtime option. Both levels are shown in the message.

**System action:** Utility execution ends.

**User response:** Correct the specification of the IMS level in the global option or job parameter.

### FUN5013E SYSPRINT DD is missing

**Explanation:** SYSPRINT DD was not specified in the JCL. SYSPRINT contains the system messages and runtime event log.

**System action:** The Scrub utility immediately stops processing with return code 16. This message is written to the JOBLOG because no message output file is available.

**User response:** Specify SYSPRINT DD in the JCL then retry request.

### FUN5014I Scrub utility processing has completed: RC=return code

**Explanation:** The Scrub utility has completed processing. The specified return code indicates how the job completed:

- **0** Processing completed successfully
4    Processing completed with some warnings
8    An unrecoverable error has prematurely stopped processing

**System action:** Scrub utility completes processing.

**User response:** None. Informational message only.
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