z/OS
Version 2 Release 4

DFSMSrmm Diagnosis Guide



SC23-6876-40

Note

Before using this information and the product it supports, read the information in “Notices” on page 97.

This edition applies to Version 2 Release 4 of z/OS (5650-ZOS) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Contents

Figures vii

Tables ix

About this document xi
- Required product knowledge xi
- Referenced documents xi
- z/OS information xii
- Notational conventions xii
  - How to read syntax diagrams xii
  - How to abbreviate commands and operands xv
  - How to use continuation characters xv
  - Delimiters xv
  - Character sets xv

How to send your comments to IBM xvii
- If you have a technical problem xvii

Summary of changes xix
- Changes for SC23-6874-03 z/OS Version 2 Release 4 xix
- Summary of changes for z/OS Version 2 Release 3 xix
- Summary of changes for z/OS Version 2 Release 2 xix

Chapter 1. Obtaining diagnostic information 1
- How the DFSMSrmm ISPF dialog provides help when errors occur 1
- Obtaining TRACE command output 2
  - Ways in which you can activate tracing 3
  - Setting specific TRACE options within the DFSMSrmm ISPF dialog 4
  - Displaying TRACE options 5
- Capturing log data to diagnose errors 6
  - Steps for using the TRACE command and the ISPF log to diagnose errors 6
  - Steps for saving the contents of the log data set 7
- Obtaining dumps to help you analyze and diagnose problems 7
  - Obtaining abend dumps for a DFSMSrmm utility error 7
  - Obtaining abend dumps for a DFSMSrmm ISPF dialog error 7
  - Obtaining dumps to analyze DFSMSrmm waits or loops 8
  - Finding the module name in a dump 8
- Using messages and codes to diagnose DFSMSrmm errors 9
  - DFSMSrmm message format 9
  - Message types 11
- Checking for output in the DFSMSrmm web service log 12
- Using the Apache Tomcat logger 12
- Using the DFSMSrmm CIM logger 12

Chapter 2. Eliminating common sources of error 15
- When you want to remove virtual volumes and VTS library is no longer available 15
- When DFSMSrmm messages do not appear 16
- When inventory management fails 16
- When response time is too long 16

When you run out of scratch volumes....16
Obtaining volume information....17
Changing actions for volumes in system-managed tape libraries....20
When volumes expire prematurely....20
When volumes move to the wrong storage location....21
When volumes do not move to storage locations....22
When you lose a volume....23
When users are not notified automatically....23
When errors occur in the DFSMSrmm control data set....23
When there is not enough available storage to list all the volumes....24
When there is not enough available storage to list all the volumes with the DFSMSrmm web service....25
When the DFSMSrmm WebSphere web service does not respond....25
When the DFSMSrmm Tomcat web service does not respond....27
When the DFSMSrmm CIM provider does not return output....27
When an SMI-S client cannot correctly process entries of tape libraries from the DFSMSrmm CIM agent....28
When common system abends occur....29

Chapter 3. Diagnosing errors using the Problem Determination Aid Facility....31
Viewing PDA data with the ISPF browse function....31
Formatting PDA data with the DFSMShsm ARCPRPDO (PDA trace formatter) program....31
Specifying formatting options....33
Specifying selection options....33
Recommendations for using PDA formatter....35
Copying PDA trace data sets to tape....35

Chapter 4. Using the DFSMSrmm IPCS verb exit routine....37
DFSMSrmm IPCS verb exit EXEC parameters....37

Chapter 5. Building a keyword string....39
Finding the component identification keyword....40
Finding the release level....40
Determining the type-of-failure....41
Building an abend keyword....41
DFSMSrmm ISPF dialog abends....42
Building keywords for DFSMSrmm abends outside the DFSMSrmm ISPF dialog....44
Building keywords for wait/loop problems....45
Developing the message keyword....46
Developing keywords for incorrect output....46
Defining keywords for performance problems....47
Forming keywords for documentation problems....48
Building keywords for module-related errors....48
Using the ISPF log to find the module name....48
Finding the failing module name for an abend type-of-failure....49
Building keywords for wait and loop types-of-failure....49
Building keywords for message types-of-failure....49
Building modifier keyword strings....49

Chapter 6. Searching the IBM Software support database....51

Chapter 7. Contacting the IBM Software Support Center....53

Appendix A. Keyword worksheet....55
Problem description (including symptoms not described by keywords)....55
IBM licensed program information....55

Base z/OS system information 55
Keywords 55
Search arguments used 55
Information provided by IBM Support Center 55

Appendix B. DFSMSrmm trace command suffixes 57

Appendix C. DFSMSrmm system and user completion codes 59
System completion codes 59
User completion codes 60

Appendix D. Modifier keywords 91

Appendix E. Accessibility 93
Accessibility features 93
Consult assistive technologies 93
Keyboard navigation of the user interface 93
Dotted decimal syntax diagrams 93

Notices 97
Terms and conditions for product documentation 98
IBM Online Privacy Statement 99
Policy for unsupported hardware 99
Minimum supported hardware 100
Programming interface information 100
Trademarks 100

Index 101

Figures

1. How a short message appears on an ISPF panel..... 1

2. How a long message appears on an ISPF panel.....1

3. Sample DFSMSrmm ISPF dialog help panel.....2

4. TRACE command syntax diagram.....3

5. Activating trace with the RMMISPF EXEC.....4

6. Requesting tracing within the DFSMSrmm ISPF dialog..... 4

7. Requesting a trace of volume processing.....4

8. Specifying multiple operands with the trace command.....5

9. Requesting a display of active TRACE options..... 5

10. Sample trace settings..... 5

11. Entering the TRACE command.....6

12. Sample trace output for a SEARCHVOLUME request.....6

13. ISPF LOG with DFSMSrmm data.....7

14. Finding the address of the error..... 8

15. Finding the module name..... 8

16. Sample dump output.....9

17. Sample IPCS output..... 9

18. Using the NOEJECT operand..... 15

19. Sample JCL for EDGHSKP.....16

20. Obtaining volume status information..... 18

21. JCL for printing and formatting trace records..... 32

22. Trace record output..... 32

23. Copying PDA trace data set to tape.....35

24. Copying trace records from multiple PDA data sets....36

25. Invoking the DFSMSrmm RMMDATA verb exit routine....37

26. Sample ISPF abend panel....42

27. Sample TSO abend message....43

28. Sample TSO abend message additional information....43

29. Sample abend output....45

30. Finding the PSW in the SYSUDUMP....46

31. Identifying a wait state....46

32. Sample dump containing a module name....49

Tables

1. Character sets..... xv

2. Special characters used in syntax..... xv

3. How DFSMSrmm matches data set names to data set masks..... 21

4. DFSMSrmm Movement Priority Default Values..... 22

5. Type-of-failure keywords.....41

6. DFSMSrmm trace command suffixes..... 57

7. Function modifier keywords..... 91

About this document

This document is intended for system programmers who must report and resolve failures in DFSMSrmm. It contains information to help you:

- Obtain information to diagnose DFSMSrmm problems
- Resolve problems you encounter while running DFSMSrmm
- Use the Problem Determination Aid (PDA) facility
- Build keyword strings that describe DFSMSrmm failures as precisely as possible
- Search IBM Software Support databases to determine:
  - Whether an authorized program analysis report (APAR) already exists for the problem
  - Whether a solution for the problem is available

You can contact the IBM Support Center to perform the search for you or to help you:

- Develop a more effective keyword string
- Gather additional failure-related information
- Submit adequate information with an APAR, if necessary

For information about accessibility features of z/OS, for users who have a physical disability, see Appendix E, “Accessibility,” on page 93.

Required product knowledge

To use this document effectively, you should be familiar with:

- IBM® support and how it is structured
- Basic dump analysis
- Diagnostic techniques

Referenced documents

These documents have additional information about DFSMSrmm:

Document Title	Order Number
z/OS DFSMSrmm Application Programming Interface	SC23-6872
z/OS DFSMSrmm Managing and Using Removable Media	SC23-6873
z/OS DFSMSrmm Implementation and Customization Guide	SC23-6874
z/OS DFSMSrmm Reporting	SC23-6875

This document refers to the following publications:

Document Title	Order Number
EREP User's Guide	GC35-0151
z/OS DFSMSdfp Diagnosis	SC23-6863
z/OS DFSMShsm Diagnosis	GC52-1387
z/OS ISPF Messages and Codes	SC19-3622

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Document Title	Order Number
z/OS MVS Diagnosis: Tools and Service Aids	GA32-0905
z/OS MVS IPCS Commands	SA23-1382
z/OS MVS IPCS User's Guide	SA23-1384
z/OS MVS System Messages, Vol 1 (ABA-AOM)	SA38-0668
z/OS MVS System Messages, Vol 2 (ARC-ASA)	SA38-0669
z/OS MVS System Messages, Vol 3 (ASB-BPX)	SA38-0670
z/OS MVS System Messages, Vol 4 (CBD-DMO)	SA38-0671
z/OS MVS System Messages, Vol 5 (EDG-GLZ)	SA38-0672
z/OS MVS System Messages, Vol 6 (GOS-IEA)	SA38-0673
z/OS MVS System Messages, Vol 7 (IEB-IEE)	SA38-0674
z/OS MVS System Messages, Vol 8 (IEF-IGD)	SA38-0675
z/OS MVS System Messages, Vol 9 (IGF-IWM)	SA38-0676
z/OS MVS System Messages, Vol 10 (IXC-IZP)	SA38-0677

z/OS information

This information explains how z/OS references information in other documents and on the web.

When possible, this information uses cross document links that go directly to the topic in reference using shortened versions of the document title. For complete titles and order numbers of the documents for all products that are part of z/OS, see *z/OS Information Roadmap*.

To find the complete z/OS® library, go to IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSLTBW/welcome).

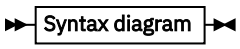
Notational conventions

This section explains the notational conventions used in this document.

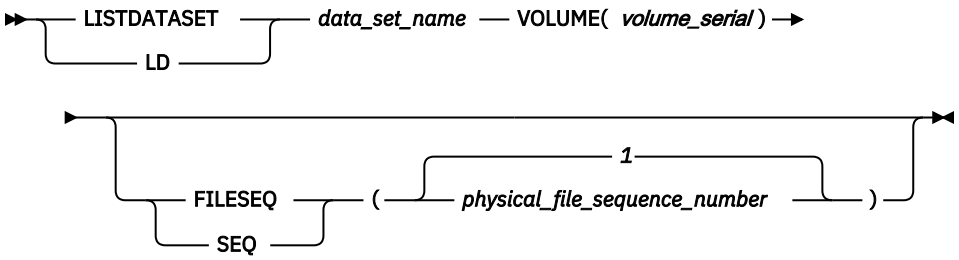
How to read syntax diagrams

Throughout this library, diagrams are used to illustrate the programming syntax. Keyword parameters are parameters that follow the positional parameters. Unless otherwise stated, keyword parameters can be coded in any order. The following list tells you how to interpret the syntax diagrams:

- Read the diagrams from left-to-right, top-to-bottom, following the main path line. Each diagram begins on the left with double arrowheads and ends on the right with two arrowheads facing each other.



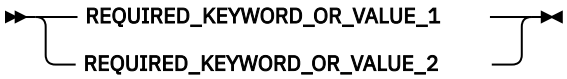
- If a diagram is longer than one line, each line to be continued ends with a single arrowhead and the next line begins with a single arrowhead.



- Required keywords and values appear on the main path line. You must code required keywords and values.



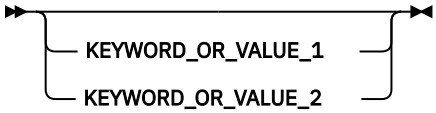
  If several mutually exclusive required keywords or values exist, they are stacked vertically in alphanumeric order.



- Optional keywords and values appear below the main path line. You can choose not to code optional keywords and values.



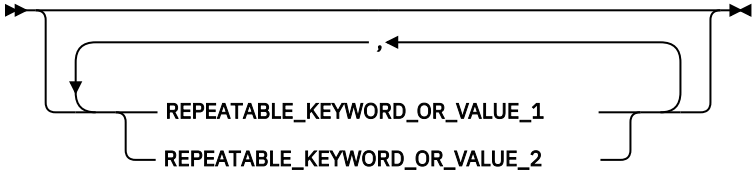
  If several mutually exclusive optional keywords or values exist, they are stacked vertically in alphanumeric order below the main path line.



- An arrow returning to the left above a keyword or value on the main path line means that the keyword or value can be repeated. The comma means that each keyword or value must be separated from the next by a comma.



- An arrow returning to the left above a group of keywords or values means more than one can be selected, or a single one can be repeated.

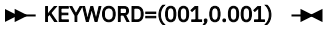


- A word in all uppercase is a keyword or value you must spell exactly as shown. In this example, you must code ***KEYWORD***.

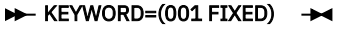


  If a keyword or value can be abbreviated, the abbreviation is discussed in the text associated with the syntax diagram.

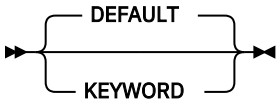
- If a diagram shows a character that is not alphanumeric (such as parentheses, periods, commas, and equal signs), you must code the character as part of the syntax. In this example, you must code ***KEYWORD=(001,0.001)***.

- If a diagram shows a blank space, you must code the blank space as part of the syntax. In this example, you must code ***KEYWORD=(001 FIXED)***.

- Default keywords and values appear above the main path line. If you omit the keyword or value entirely, the default is used.

- A word in all lowercase italics is a *variable*. Where you see a variable in the syntax, you must replace it with one of its allowable names or values, as defined in the text.

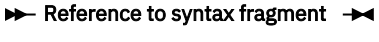
  Notes:

  1 An example of a syntax note.

- References to syntax notes appear as numbers enclosed in parentheses above the line. Do not code the parentheses or the number.

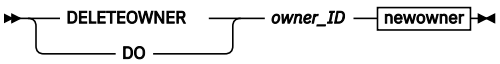
- Some diagrams contain *syntax fragments*, which serve to break up diagrams that are too long, too complex, or too repetitious. Syntax fragment names are in mixed case and are shown in the diagram and in the heading of the fragment. The fragment is placed below the main diagram.

  Syntax fragment

The following is an example of a syntax diagram.



newowner



Notes:

1 Must be specified if the owner owns one or more volumes.

The possible valid versions of the RMM DELETEOWNER command are:

```
RMM DELETEOWNER owner
RMM DO          owner
RMM DELETEOWNER owner NEWOWNER(new_owner)
RMM DO          owner NEWOWNER(new_owner)
```

How to abbreviate commands and operands

The TSO abbreviation convention applies for all DFSMSrmm commands and operands. The TSO abbreviation convention requires you to specify as much of the command name or operand as is necessary to distinguish it from the other command names or operands.

Some DFSMSrmm keyword operands allow unique abbreviations. All unique abbreviations are shown in the command syntax diagrams.

How to use continuation characters

The symbol **-** is used as the continuation character in this document. You can use either **-** or **+**.

-
Do not ignore leading blanks on the continuation statement

+
Ignore leading blanks on the continuation statement

Delimiters

When you type a command, you must separate the command name from the first operand by one or more blanks. You must separate operands by one or more blanks or a comma. Do not use a semicolon as a delimiter because any character you enter after a semicolon is ignored.

Character sets

To code job control statements, use characters from the character sets in Table 1 on page xv. Table 2 on page xv lists the special characters that have syntactical functions in job control statements.

Table 1. Character sets

Character Set	Contents	
Alphanumeric	Alphabetic Numeric	Capital A through Z 0 through 9
National (See note)	“At” sign Dollar sign Pound sign	@ (Characters that can be $ represented by hexadecimal # values X'7C', X'5B', and X'7B')
Special	Comma Period Slash Apostrophe Left parenthesis Right parenthesis Asterisk Ampersand Plus sign Hyphen Equal sign Blank	, . / ' ( ) * & + - =
EBCDIC text	EBCDIC printable character set	Characters that can be represented by hexadecimal X'40' through X'FE'

Note: The system recognizes the following hexadecimal representations of the U.S. National characters; @ as X'7C'; $ as X'5B'; and # as X'7B'. In countries other than the U.S., the U.S. National characters represented on terminal keyboards might generate a different hexadecimal representation and cause an error. For example, in some countries the $ character may generate a X'4A'.

Table 2. Special characters used in syntax

Character	Syntactical Function
,	To separate parameters and subparameters

Table 2. Special characters used in syntax (continued)	
Character	**Syntactical Function**
=	To separate a keyword from its value, for example, BURST=YES
(b)	To enclose subparameter list or the member name of a PDS or PDSE
&	To identify a symbolic parameter, for example, &LIB
&&	To identify a temporary data set name, for example, &&TEMPDS, and, to identify an in-stream or sysout data set name, for example, &&PAYOUT
.	To separate parts of a qualified data set name, for example, A.B.C., or parts of certain parameters or subparameters, for example, nodename.userid
*	To refer to an earlier statement, for example, OUTPUT=*.name, or, in certain statements, to indicate special functions: //label CNTL * //ddname DD * RESTART=* on the JOB statement
'	To enclose specified parameter values which contain special characters
(blank)	To delimit fields

How to send your comments to IBM

We invite you to submit comments about the z/OS product documentation. Your valuable feedback helps to ensure accurate and high-quality information.

Important: If your comment regards a technical question or problem, see instead "If you have a technical problem" on page xvii.

Submit your feedback by using the appropriate method for your type of comment or question:

Feedback on z/OS function
If your comment or question is about z/OS itself, submit a request through the IBM RFE Community (www.ibm.com/developerworks/rfe/).

Feedback on IBM Knowledge Center function
If your comment or question is about the IBM Knowledge Center functionality, for example search capabilities or how to arrange the browser view, send a detailed email to IBM Knowledge Center Support at ibmkc@us.ibm.com.

Feedback on the z/OS product documentation and content
If your comment is about the information that is provided in the z/OS product documentation library, send a detailed email to mhvrcfs@us.ibm.com. We welcome any feedback that you have, including comments on the clarity, accuracy, or completeness of the information.

To help us better process your submission, include the following information:

- Your name, company/university/institution name, and email address
- The following deliverable title and order number: z/OS DFSMSrmm Diagnosis Guide, SC23-6876-40
- The section title of the specific information to which your comment relates
- The text of your comment.

When you send comments to IBM, you grant IBM a nonexclusive authority to use or distribute the comments in any way appropriate without incurring any obligation to you.

IBM or any other organizations use the personal information that you supply to contact you only about the issues that you submit.

If you have a technical problem

If you have a technical problem or question, do not use the feedback methods that are provided for sending documentation comments. Instead, take one or more of the following actions:

- Go to the IBM Support Portal (support.ibm.com).
- Contact your IBM service representative.
- Call IBM technical support.

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Summary of changes

This information includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations for the current edition are indicated by a vertical line to the left of the change.

Changes for SC23-6874-03 z/OS Version 2 Release 4

There have been no changes made to this manual for z/OS Version 2 Release 4 (V2R4).

Summary of changes for z/OS Version 2 Release 3

This edition contains for Version 2 Release 3 (V2R3).

New information

This edition includes the following new information:

- "Obtaining volume information" on page 17 contains new EDM volume information.
- "U0001" on page 60 contains new user completion code U1650 description.

Summary of changes for z/OS Version 2 Release 2

This edition contains updates for Version 2 Release 2 (V2R2).

Changed information

This edition includes the following topics that contain changed information:

- "Obtaining volume information" on page 17 has been updated to show current output.
- "Finding the release level" on page 40 has been updated with current FMIDs.
- Chapter 7, "Contacting the IBM Software Support Center," on page 53 has been updated with information on problems with conversion.

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Chapter 1. Obtaining diagnostic information

DFSMSrmm is a z/OS feature. This topic helps you obtain information to diagnose DFSMSrmm problems as described in the topics.

- "How the DFSMSrmm ISPF dialog provides help when errors occur" on page 1
- "Obtaining TRACE command output" on page 2
- "Capturing log data to diagnose errors" on page 6
- "Obtaining dumps to help you analyze and diagnose problems" on page 7
- "Using messages and codes to diagnose DFSMSrmm errors" on page 9
- "Checking for output in the DFSMSrmm web service log" on page 12
- "Using the DFSMSrmm CIM logger" on page 12

How the DFSMSrmm ISPF dialog provides help when errors occur

When an error occurs while you are using the DFSMSrmm Interactive System Productivity Facility (ISPF) dialog, a short message describing the error appears at the top right corner of the current panel, as shown in Figure 1 on page 1.

```
   Panel  Help  Scroll
------------------------------------------------------------------------------
 EDGPT010                    DFSMSrmm Volume Search          Incorrect Volser
 Command ===>

                                                                  More:     +
 Volume  . . . .  VOL11?     May be generic.  Leave blank for all volumes.

 Owner . . . . .             Owned by a specific user. Default is your userid

 .
 .
 .
```

Figure 1. How a short message appears on an ISPF panel

Press **PF1** or enter the **HELP** command. DFSMSrmm displays a long message that provides additional information describing the error as shown in Figure 2 on page 1.

```
   Panel  Help  Scroll
------------------------------------------------------------------------------
 EDGPT010                    DFSMSrmm Volume Search          Incorrect Volser
 Command ===>
 Enter 1 to 6 alphanumeric, national, or special characters.

                                                                  More:     +
 Volume  . . . . VOL11?      May be generic.  Leave blank for all volumes.

 Owner . . . . .             Owned by a specific user. Default is your userid

 .
 .
 .
```

Figure 2. How a long message appears on an ISPF panel

If you need more information about the error, press PF1 or enter the HELP command. DFSMSrmm displays the dialog help panel associated with the currently displayed dialog panel, as shown in Figure 3 on page 2.

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```
HELP----------------------- DFSMSrmm Volume Search -----------------------HELP
COMMAND ===>


   Use the DFSMSrmm Volume Search panel to generate a list of volumes defined
   to DFSMSrmm that match the criteria you specify.

   Use ENTER to see the following topics in sequence or choose them by number.

     1    Volume search - Overview      29    In container
     2    Volume                        30    Volume type
     3    Owner                         31    Medinf
     4    Job name                      32    Media type
     5    Limit                         33    Label
     6    Media name                    34    Label version
     7    Vendor                        35    VOL1 volser
     8    Pool                          36    Density
     9    Status                        37    Format
    10    Dates                         38    Worm
    11    Actions and Release           39    Compaction
    12    Release Options               40    Attributes
    13    System use                    41    Destination
    14    Since                         42    Required
    15    Retention                     43    Move mode
    16    Original EXPDT                44    Intransit
    17    Retention Method              45    Volume set
    18    RetainBy                      46    Set retained
    19    Hold                          47    Force
    20    Clist                         48    Line commands
    21    Home                          49    Volume list
    22    Location                      50    Volume list sort order
   Use ENTER to continue, END to exit Help.
```

Figure 3. Sample DFSMSrmm ISPF dialog help panel

While you are in the DFSMSrmm ISPF dialog, you might see ISPF messages that begin with prefixes ISP or ISR. Refer to *z/OS ISPF Messages and Codes* for information about the ISPF error.

Obtaining TRACE command output

When reporting problems to the IBM Support Center, you might be asked to provide trace output for all or part of the DFSMSrmm ISPF dialog. With tracing on, you see the REXX procedure statements as they are processed and the RMM TSO subcommands that the DFSMSrmm ISPF dialog is building. Use the trace output to help determine if the error occurred within the REXX procedure or as a result of an error in the RMM TSO subcommand issued by the DFSMSrmm ISPF dialog.

You can trace the processing of a DFSMSrmm function by using the TRACE command as described in Figure 4 on page 3. You specify the TRACE command by coding it in the DFSMSrmm ISPF dialog. You can use ALL to request both function and EXEC tracing. Specify DATASET to trace DFSMSrmm data set related processing. You can trace the processing of the RMMISPF EXEC by using the TRACE command with an EXEC name suffix. See Appendix B, “DFSMSrmm trace command suffixes,” on page 57 for a list of EXEC name suffixes you can use with the trace command.

Figure 4 on page 3 shows the TRACE command and the keywords you can use with the command.

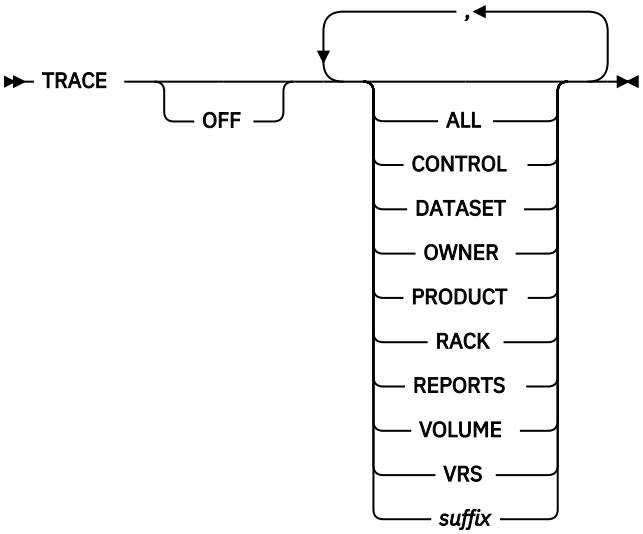


Figure 4. TRACE command syntax diagram

TRACE
Use with any operand to turn tracing on. Use it without an operand to display the active trace options.

OFF
This turns tracing off.

You can use OFF with a keyword or suffix to selectively turn off tracing. The trace command function keywords describe DFSMSrmm functions. You can specify any of the following: CONTROL, DATASET, OWNER, PRODUCT, RACK, VOLUME, and VRS. To turn off tracing for a DFSMSrmm EXEC, use a suffix.

ALL
This traces all DFSMSrmm function and DFSMSrmm EXEC processing.

CONTROL
To trace LISTCONTROL information about DFSMSrmm installation options.

DATASET
To trace data set related processing within DFSMSrmm.

OWNER
To trace owner information related processing within DFSMSrmm.

PRODUCT
To trace product information related processing within DFSMSrmm.

RACK
To trace rack number or bin number related processing within DFSMSrmm.

VOLUME
To trace volume related processing within DFSMSrmm.

VRS
To trace vital record specification related processing within DFSMSrmm.

suffix
Specify a *suffix* which is a DFSMSrmm EXEC name without the EDGR prefix. *Suffix* can be up to four alphanumeric characters.

Related Reading: For a list of DFSMSrmm EXECs and the suffixes you can use with the TRACE command, see Appendix B, “DFSMSrmm trace command suffixes,” on page 57.

Ways in which you can activate tracing

You can activate tracing when you are starting the DFSMSrmm ISPF dialog using the RMMISPF EXEC or while you are in the DFSMSrmm ISPF dialog.

Activating tracing when you are starting the DFSMSrmm ISPF dialog

You can use any of the TRACE command operands described in “Obtaining TRACE command output” on page 2 to trace processing of the RMMISPF EXEC. When you start the DFSMSrmm ISPF dialog, enter the TRACE command as shown in Figure 5 on page 4.

```
  Menu  Utilities  Compilers  Options  Status  Help
--------------------------------------------------------------------------------
ISR@PRIM                  ISPF Primary Option Menu
Option ===> TSO %RMMISPF TRACE(ISPF)

0  Settings      Terminal and user parameters           User ID . : MAZTST1
1  View          Display source data or listings        Time. . . : 01:56
2  Edit          Create or change source data           Terminal. : 3278
3  Utilities     Perform utility functions              Screen. . : 1
4  Foreground    Interactive language processing        Language. : ENGLISH
5  Batch         Submit job for language processing     Appl ID . : ISR
6  Command       Enter TSO or Workstation commands      TSO logon : IEFPROC
7  Dialog Test   Perform dialog testing                 TSO prefix: MAZTST1
8  LM Facility   Library administrator functions        System ID : SYSTEM1
9  IBM Products  IBM program development products       MVS acct. : *
10 SCLM          SW Configuration Library Manager       Release . : ISPF 4.2


Enter X to Terminate using log/list defaults
```

Figure 5. Activating trace with the RMMISPF EXEC

Tracing from within the DFSMSrmm ISPF dialog

You can activate tracing when you are in the DFSMSrmm ISPF dialog from the command line of any DFSMSrmm ISPF dialog panel. Enter the TRACE command as shown in Figure 6 on page 4.

```
  Panel  Help
--------------------------------------------------------------------------------
EDGP@OPT                DFSMSrmm Dialog Options Menu
Option ===>   TRACE

1  USER      - Specify processing options
2  SORT      - Specify list sort options
3  REPORT    - Specify report options

Enter selected option or END command.  For more info., enter HELP or PF1.
```

Figure 6. Requesting tracing within the DFSMSrmm ISPF dialog

Setting specific TRACE options within the DFSMSrmm ISPF dialog

To obtain a trace of all activities for volumes, enter the TRACE command with the VOLUME option as shown in Figure 7 on page 4.

```
  Panel  Help
--------------------------------------------------------------------------------
EDGP@OPT                DFSMSrmm Dialog Options Menu
Option ===>   TRACE VOLUME

1  USER      - Specify processing options
2  SORT      - Specify list sort options
3  REPORT    - Specify report options

Enter selected option or END command.  For more info., enter HELP or PF1.
```

Figure 7. Requesting a trace of volume processing

You can use multiple operands to activate tracing for more than one function or EXEC. For example, Figure 8 on page 5 shows how you can trace:

- All data set activities
- Volume activities
- A DFSMSrmm EXEC named EDGRPDIS
- Owner activities

```
  Panel  Help
------------------------------------------------------------------------------
EDGP@OPT                DFSMSrmm Dialog Options Menu
Option ===>   TRACE DATASET VOLUME PDIS OWNER
```

Figure 8. Specifying multiple operands with the trace command

Displaying TRACE options

To display active TRACE options, enter the TRACE command as shown in Figure 9 on page 5.

```
  Panel  Help
------------------------------------------------------------------------------
EDGP@OPT                DFSMSrmm Dialog Options Menu
Option ===>   TRACE

1  USER      - Specify processing options
2  SORT      - Specify list sort options
3  REPORT    - Specify report options

Enter selected option or END command.  For more info., enter HELP or PF1.
```

Figure 9. Requesting a display of active TRACE options

Figure 10 on page 5 shows the items traced by the command `TRACE DATASET VOLUME PDIS OWNER`.

- EDGRD* - All data set related processing
- EDGRT* - All volume related processing
- EDGRPDIS - The EDGRPDIS EXEC
- EDGROWNR - All owner related processing

```
DFSMSrmm Current TRACE settings:
  EDGRD*
  EDGRT*
  EDGRPDIS
  EDGROWNR
***
```

Figure 10. Sample trace settings

Capturing log data to diagnose errors

ISPF adds entries to the ISPF log to record when certain functions are called and when TSO commands are issued. You can use information in the ISPF log to diagnose errors in DFSMSrmm.

If the ISPF log is empty, your user profile is not set for logging error data, inter-module trace data, or trace-point trace data. Use the ISPF PARMS application to change your log defaults. Then attempt to re-create the failure.

Steps for using the TRACE command and the ISPF log to diagnose errors

This sample procedure describes how to use the TRACE command and the ISPF log to diagnose an error that occurred while DFSMSrmm was processing a volume search request.

1. Ensure that ISPF is logging data by following these steps.
   a. In the ISPF Primary Option Menu, go to Settings.
   b. Click the **Log/List action bar** to display several choices.
   c. Select **Log Data set** defaults.
   d. Set the size of the LOG data set's primary and secondary pages to be 1 or greater. This ensures that you will run with an ISPF log data set.
   e. Exit ISPF.
2. Start DFSMSrmm by using the RMMISPF EXEC. Enter %RMMISPF at the TSO ready prompt.
3. DFSMSrmm displays the DFSMSrmm primary option menu as shown in Figure 11 on page 6. Enter the command TRACE VOLUME on the ISPF command line.

```
  Panel  Help
------------------------------------------------------------------------------
EDG@PRIM              REMOVABLE MEDIA MANAGER (DFSMSrmm)
Option ===>  TRACE VOLUME
```

Figure 11. Entering the TRACE command

4. You know you are done when you see trace messages displayed on your terminal as your request is processing, as shown in Figure 12 on page 6. Inspect the return codes and reason codes that are displayed, as well as the REXX error messages that are issued when the error occurred, to help you determine the cause of the error.

```
    71 *-*     sysauth.edgdate = edgdfmt
       >>>       "JULIAN"
    72 *-*     command
       >>>   "RMM SEARCHVOLUME VOLUME(*)"
  +++ RC(12) +++
    73 *-*     svrc = rc
       >>>       "12"
    74 *-*     Select
    76 *-*     When svrc = 0
       >>>       "0"
    79 *-*     When svrc = 4
       >>>       "0"
    95 *-*     When svrc = 8
       >>>       "0"
    98 *-*     When svrc = 12
       >>>       "1"
       *-*      then
    99 *-*      Select
   101 *-* When edg@rc = 8
       >>>        "0"
   104 *-*      When edg@rc = 10
       >>>        "0"
   107 *-*      When edg@rc = 12
***
```

Figure 12. Sample trace output for a SEARCHVOLUME request

Steps for saving the contents of the log data set

When your request has been processed, use the sample procedure to save the contents of the ISPF log data set for problem determination.

1. After you have entered the ISPF dialog, enter 0 from the Option line on the ISPF Primary Option Menu. The ISPF Settings panel appears.
2. Use the Log/List action bar on the ISPF Settings panel to display several choices.
3. Select 1 to display the Log Data Set Defaults panel.
4. Select 4 (Keep data set and allocate new data set) option on the Log Data Set Defaults panel.
5. You can then save or rename the ISPF LOG data set you have created.

Result: Figure 13 on page 7 shows an ISPF LOG with DFSMSrmm data.

```
TIME              *** ISPF TRANSACTION LOG ***                      USERID: STSGGT    DATE: 140926   PAGE: 1
  01:47   START OF ISPF LOG - - -  - SESSION # 2004 ------------------------------------------------------------
  01:51      EDIT    - SAVE       - STSGGT.RMMRPT.EXEC(MAIN) - MEMBER SAVED
  01:52      TSO     - COMMAND  -  - RMMISPF
  01:52      TSO     - COMMAND  -  - %EDGRTVOL SEARCH
  01:52      TSO     - COMMAND  -  - %EDGRTSCH VOLUME(111*)
  01:53      TSO     - COMMAND  -  - %EDGRTSCH OWNER(*) VOLUME(111*)
  01:53    END OF ISPF LOG - - - - - SESSION # 2004 ------------------------------------------------------------
```

Figure 13. ISPF LOG with DFSMSrmm data

Keep the ISPF LOG and trace output containing return and reason codes and messages. Refer to this information when contacting your IBM Support Center.

Obtaining dumps to help you analyze and diagnose problems

This topic describes how to obtain dumps for various situations and use them to diagnose problems in DFSMSrmm.

For information on dump documentation and analysis, refer to:

Publication Title	Order Number
z/OS MVS Diagnosis: Tools and Service Aids	GA32-0905
z/OS MVS IPCS Commands	SA23-1382
z/OS MVS IPCS User's Guide	SA23-1384

Obtaining abend dumps for a DFSMSrmm utility error

If an abend occurs when you are running a DFSMSrmm utility, obtain a dump to help with problem determination. To capture pertinent information, include a SYSUDUMP DD statement in your JCL. For example, this JCL statement routes the dump output to the SYSOUT class specified on the JOB statement:

```
//SYSUDUMP DD SYSOUT=*
```

Obtaining abend dumps for a DFSMSrmm ISPF dialog error

If an abend occurs while you are running the DFSMSrmm ISPF dialog, you can obtain further diagnostic information using these techniques:

- Run with write-to-programmer message turned on in your TSO/E profile. This allows you to see the message identifier and an online symptom dump for error messages issued from components other than the DFSMSrmm ISPF dialog.

  To run with write-to-programmer message turned on in your TSO/E profile, issue the command:

  ```
  TSO PROFILE WTPMSG
  ```

To turn off the write-to-programmer message in your TSO/E profile, issue the command:

```
TSO PROFILE NOWTPMSG
```

- Allocate a SYSUDUMP data set on TSO before invoking the DFSMSrmm ISPF dialog. For example, to dump to a new data set called UDUMP, specify:

```
ALLOC DD(SYSUDUMP) DS(UDUMP) MOD SPACE(5,5) CYLINDERS CATALOG
```

Obtaining dumps to analyze DFSMSrmm waits or loops

If the problem you encounter is with a specific user, obtain a supervisor call (SVC) dump of both the user and the DFSMSrmm address spaces.

Finding the module name in a dump

You can use a dump to identify the name of the module in control when a failure occurred.

1. Find the program status word (PSW) in the dump. The instruction address is the last 31 bits of the PSW. In Figure 14 on page 8 the last 31 bits of the PSW, 000085C4, are the instruction address.

```
JOB S1REP001         STEP AUDREPT         TIME 123515   DATE 14286    ID = 000    CPUID = FF0158243090   PAGE 00000001
COMPLETION CODE      SYSTEM = 0C4      REASON CODE = 00000010

  PSW AT ENTRY TO ABEND   078D2000  000085C4  ILC  04  INTC  0010

PSW LOAD MODULE = EDGAUD    ADDRESS = 000085C4  OFFSET = 00000214

 ASCB: 00F97280
         +0000  ASCB..... ASCB      FWDP..... 00FBBD00  BWDP..... 00FBDB00  CMSF..... 00F51180  SVRB..... 008FF960
         +0014  SYNC..... 000036F9  IOSP..... 00000000  TNEW..... 008E3D90  CPUS..... 00000001  ASID..... 0010
         +0026  R026..... 0000      LL5...... 00        HLHI..... 01        DPHI..... 00        DP..... 85
         +002C  TRQP..... 80FD51E1  LDA...... 7FF15EB0  RSMF..... 00        R035..... 0000      TRQI..... 41
         +0038  CSCB..... 05395960  TSB...... 00000000  EJST..... 0000000A  50995600
         +0048  EWST..... A6686CCD  5A1FFD11            JSTL..... 000007D3  ECB...... 808FFE58  UBET..... A6684BE2
         +005C  TLCH..... 00000000  DUMP..... 008FF418  AFFN..... FFFF      RCTF..... 00        FLG1..... 00
         +0068  TMCH..... 00000000  ASXB..... 008FE038  SWCT..... A8D6      DSP1..... 00        FLG2..... 00
         +0074  RSV...... 0000      SRBS..... 0000      LLSQ..... 00000000  RCTP..... 008FE240  LOCK..... 00000000
         +0084  LSQH..... 00000000  QECB..... 00000000  MECB..... 40000000  OUCB..... 01C746F8  OUXB..... 01C70C28
         +0098  FMCT..... 0000      LEVL..... 03        FL2A..... 00        XMPQ..... 00000000  IQEA..... 00000000
         +00A4  RTMC..... 00000000  MCC...... 00000000  JBNI..... 00FA0DC4  JBNS..... 00FA0B18  SRQ1..... 00
```

Figure 14. Finding the address of the error

2. Obtain the abend address by subtracting the instruction length code (ILC) from the instruction address.

```
                000085C4       instruction address
                -      4       instruction length code

                ________
                000085C0       abend address
```

3. Go to the abend address and scan backward until you find the module name in the comment section or eyecatcher of the dump. The module name is EDG*name* where EDG is the DFSMSrmm identifier and *name* is the module name suffix. In Figure 15 on page 8, the module name is EDGAUD.

```
000083A0 00000000 00000000 00000000 00000000 47F0F138 2BC5C4C7 C1E4C440 4040F1F0   *.................01..EDGAUD   10*
000083C0 61F0F561 F9F2E5F0 F1D9F0F1 D4F0F040 D1C4E9F1 F1F5F040 D5D6D5C5 40404040   */05/92V01R02M00 JDZ11B4 NONE    *
000083E0 C1D3D340 D9C9C7C8 E3E240D9 C5E2C5D9 E5C5C440 40404040 40404040 40404040   *ALL RIGHTS RESERVED             *
00008400 40404040 40404040 40404040 F5F6F9F5 60C4C6F1 404DC35D 40C3D6D7 E8D9C9C7   *          5647-A01 ©   COPYRIG*
00008420 C8E340C9 C2D440C3 D6D9D74B 40F1F9F7 F96B40F1 F9F9F340 D3C9C3C5 D5E2C5C4   *HT IBM CORP. 1979, 2000 LICENSED*
00008440 40D4C1E3 C5D9C9C1 D3406040 D7D9D6C7 D9C1D440 D7D9D6D7 C5D9E3E8 40D6C640   * MATERIAL - PROGRAM PROPERTY OF *
00008460 C9C2D440 E4E240C7 96A58599 95948595 A340E4A2 8599A240 D985A2A3 998983A3   *IBM US GOVERNMENT USERS RESTRICT*
00008480 858440D9 898788A3 A2406040 40404040 E4A28540 84A49793 898381A3 89969540   *ED RIGHTS -     USE DUPLICATION *
000084A0 96994084 89A28393 96A2A499 85409985 A2A39989 83A38584 4082A840 C7E2C140   *OR DISCLOSURE RESTRICTED BY GSA *
000084C0 C1C4D740 E2838885 84A49385 40C39695 A3998183 A340A689 A38840C9 C2D440C3   *ADP SCHEDULE CONTRACT WITH IBM C*
000084E0 9699974B 40000000 90ECD00C 18CF41AC 0FA04120 A4105020 D00850D0 200418D2   *ORP. .....}.........U.&}.&}...K*
00008500 58910000 4510C15C 8F0097F0 0A139110 A4D04780 A1400700 4510C170 8F009850   *.J....A*..P0..J.U}... ....A...Q.*
00008520 0A139110 A5304780 A1740700 4100C184 47F0C18C 40404040 40404040 1B110A08   *..J.V.........AD.0A........ ....*
00008540 5000A3E0 4100C19C 47F0C1A4 4040404  40404040 1B110A08 5000A3E4 4100C1B4   *&T\..A..0AU....... ....&TU..A.*
00008560 47F0C1BC 40404040 40404040 1B110A08 5000A3E8 4100C1CC 47F0C1D4 40404040   *.0A........ ....&TY..A..0AM....*
00008580 C1D9E240 1B110A08 5000A3EC 4100C1E4 47F0C1EC 40404040 40404040 1B110A08   *... ....&T...AU.0A........ ....*
000085A0 5000A3F0 4100C1FC 47F0C204 E2D6D9E3 40404040 1B110A08 5000A3F4 4110A73A   *&T0..A..0B.SORT    ....&T4..X.*
000085C0 4100A748 0A1812FF 4770C29C D407A748 A7484780 C29C0700 4510C230 800098B0   *..X.......B.M.X.X...B.....B...Q.*
000085E0 0A139110 A5904780 A1E44130 00044140 A9504110 A56058F1 00300CEF D2474000   *..J.V....U..... Z&.V-.1....K. .*
```

Figure 15. Finding the module name

If your dump is in one of the system dump data sets, display the titles of the dump data sets to find the dump number.

1. Enter the system command:

```
DISPLAY DUMP,TITLE
```

2. Then enter the system command:

```
DISPLAY DUMP,ERRDATA,DSN=xx
```

where xx is the dump number to display this output as shown in Figure 16 on page 9:

```
DUMP03 TITLE=EDGQMGR TRAPPED ABEND S0C4 U0000 AT 82C48534 IN
            MODULE EDGQMGR , OFFSET 00029C.
   DUMP TAKEN TIME=08.36.51 DATE=140926
   ERRORID=SEQ00196 CPU0000 ASID002A TIME=08.36.51
   SYSTEM ABEND CODE=0C4  REASON CODE=0010
   MODULE=EDGQMGR  CSECT=********
   PSW AT TIME OF ERROR=070C0000 82C48534 ILC=6 INT=10
   TRANSLATION EXCEPTION ADDR=C3C5C542
   ABENDING PROGRAM ADDR=02C48298 RECOVERY ROUTINE=********
   GPR 0-3   00000000  00000002  00004080  02BD7008
   GPR 4-7   02CAC000  02C12EA0  02C287F8  02CB9FE8
   GPR 8-11  02C00A98  00008540  00008540  00F97678
   GPR12-15  82C48298  02C12EA0  0000002A  C3C5C540
```

Figure 16. Sample dump output

3. Inspect the title to obtain the module name, CSECT name, PSW, and, in some cases the offset.

You can also use IPCS output to obtain the module and offset. In Figure 17 on page 9, the module name is EDGBKUP and the offset is +0560.

```
CPU STATUS:

 PSW=078C2000 84FD2830 (RUNNING IN PRIMARY, KEY 8, AMODE 31, DAT ON)
     DISABLED FOR PER
   ASID(X'0407') 04FD2830. EDGBKUP+0560 IN EXTENDED CSA
  ASCB1031 AT FBB380, JOB(DFRMM), FOR THE HOME ASID
  ASXB1031 AT 8FE038 FOR THE HOME ASID. NO BLOCK IS DISPATCHED
  HOME ASID: 0407 PRIMARY ASID: 0407 SECONDARY ASID: 0407
```

Figure 17. Sample IPCS output

Using messages and codes to diagnose DFSMSrmm errors

DFSMSrmm can issue several types of messages when a problem occurs. Other system components also issue messages that can help you diagnose a problem affecting DFSMSrmm. For example, if you encounter errors while opening a data set, you might see messages with the prefixes IEC or ICH, depending on the component detecting the error, as well as a DFSMSrmm message informing you that the open request failed.

See Appendix C, “DFSMSrmm system and user completion codes,” on page 59 for system completion codes and user completion codes issued during DFSMSrmm processing.

DFSMSrmm message format

The DFSMSrmm error message is displayed using this format:

EDG*cnnnx*

where:

- EDG is the DFSMSrmm identifier.
- *c* is an alphanumeric identifier assigned to a component of DFSMSrmm. The message component identifiers are assigned as follows:

C value	Component
0	Subsystem initialization
1	Subsystem interface
2	Subsystem main task
3	TSO subcommands
4	Open/Close/End-of-Volume exits
5	Report programs
6	Batch programs and utilities
7	Conversion programs
8	DFSMShsm interface
9	Common routines, such as PARSE

- *nnn* is a 3 digit message number.
- *x* indicates the severity of the error. *x* can be:

Severity Identifier	Explanation
A	**Action**: The operator must perform a specific action.
D	**Decision**: The operator must choose between alternatives.
E	**Eventual action**: The operator must perform an action when time is available.
I	**Informational**: No operator action required. Information for the system programmer.
S	**Severe error**: Information for a system programmer.
W	**Warning**: The system enters a wait state until the operator performs a required action.

Example: This is an example of a message issued by DFSMSrmm.

EDG0103D DFSMSrmm SUBSYSTEM INTERFACE IS INACTIVE - ENTER "IGNORE", "CANCEL" OR "RETRY"

Explanation

During initialization, the subsystem interface was not activated. The operator can reply to ignore the message and continue, cancel the DFSMSrmm subsystem, or retry subsystem interface initialization.

System action

If the reply is "IGNORE", DFSMSrmm initialization continues and DFSMSrmm TSO subcommands and other subsystem functions operate. DFSMSrmm might not be able to intercept all WTO messages required for mount message and VTS export or import interception, unless some other subsystem has requested WTO broadcasting. If the reply is "CANCEL", DFSMSrmm ends and no DFSMSrmm subsystem functions are operable. If the reply is "RETRY", subsystem interface initialization is retried.

Operator response

Reply as directed by the installation documentation or the system programmer.

System programmer response

Determine the cause of the initialization failure. Tape volume security and integrity might be compromised if tape volumes are mounted without DFSMSrmm being active.

Source:
DFSMSrmm

Module:
EDGMAIN, EDGMAIN, EDGMTAB

Routing code:
1, 3

Descriptor code:
2

Message types

There are several types of messages you can receive that can help you to identify a problem. Check each of thse types of messages.

- Batch messages

  These messages are in the batch job's SYSMSG output at the beginning of the message file which is produced by the system each time a job is initiated.

- Batch utility messages

  These are DFSMSrmm messages that have been directed to a DFSMSrmm message file such as the SYSPRINT or MESSAGE data set.

  Related Reading: For information on which message file you should check for diagnostic information, see *z/OS DFSMSrmm Implementation and Customization Guide*.

- Console messages

  These messages are seen on a console by an operator or a terminal user. These are also recorded in the SYSLOG file.

- DFSMSrmm ISPF dialog messages

  These messages are issued by ISPF from the DFSMSrmm ISPF dialog and are displayed as short or long messages.

  The DFSMSrmm ISPF dialog message is displayed using this format.

  EDG*fidn*

  where:

  – EDG is the DFSMSrmm identifier.
  – *f* is a character selected by DFSMSrmm.
  – *id* is an ISPF message member identifier.
  – *n* is a numeric suffix from 0 to 9.

- SYSLOG messages

  These are a history of the messages directed to consoles or to the logs on the system for problem determination. The SYSLOG is a data set maintained by the job entry subsystem that can be closed, spooled for printing, or archived as necessary. You can view the SYSLOG online, using a product like Spool Display and Search Facility (SDSF).

Checking for output in the DFSMSrmm web service log

If a command issued via the DFSMSrmm Web service results in an error, the formatted error information is returned to you in the returned XML stream. If the DFSMSrmm Web service cannot return the XML stream, the information is written in the file system file, /usr/RmmJApiLogfile. You see this file on your system only if there is a problem with the DFSMSrmm Web service returning the output in an XML stream.

If the DFSMSrmm Web service is found and accessed correctly, but still does not return data, check file, /usr/RmmJApiLogfile, to determine the problem. See Chapter 2, “Eliminating common sources of error,” on page 15 for additional information.

Using the Apache Tomcat logger

The Apache Tomcat web server has a built-in logger facility. Depending on the log-level, informations warnings and errors are logged into a file in the Tomcat installation directory:

```
$CATALINA_HOME/logs/catalina.YYYY-MM-DD.log
```

(where YYYY-MM-DD is the current timestamp). See the Tomcat FAQ (wiki.apache.org/tomcat/FAQ) for details about the usage of the Tomcat logger.

Using the DFSMSrmm CIM logger

The DFSMSrmm CIM logger is a fully-controllable logging facility that uses the Jakarta log4j package. This logger logs events during a CIM request based on your specified severity level. The severity levels are:

- DEBUG
- INFO
- WARNING
- ERROR
- FATAL

The DFSMSrmm CIM logger is designed so that all incoming entries are appended to the log file, even if the CIM provider is stopped and restarted, and no previous entries are overwritten. Also, the DFSMSrmm CIM logger creates a backup file whenever the log file exceeds the limit specified by the keyword, log4j.appender.R.MaxFileSize.

All logger settings for the DFSMSrmm CIM provider are found in the configuration file, rmmlog.properties.

The keywords to use with the DFSMSrmm CIM logger are:

log4j.rootCategory = *threshold level*, R
Specifies the severity level of events that should be logged. Events with a severity level equal to or greater (more severe) than this threshold are logged. Events with a severity level less than this threshold are not logged.

DEBUG
This is the lowest logging level. If this is selected, the complete path is logged.

INFO
This is the default. If this is selected, successful operations are logged, such as the DFSMSrmm CIM provider is initialized.

WARNING
If this is selected, recoverable malfunctions are logged, such as the DFSMSrmm Web service is offline.

ERROR
If this is selected, real errors are logged, such as timeout situations from the DFSMSrmm Web service or XML validation errors.

FATAL
If this is selected, fatal errors are logged, such as well-formedness errors of the XML response, or if DFSMSrmm terminates with an error message suffix of "S".

, R
, R refers to the DFSMSrmm CIM logger name and is referenced in the configuration file. Do not change this.

log4j.appender.R.File = *rmmcim.log*
Specifies the name of the DFSMSrmm CIM logger file. In this example, *rmmcim.log* is the DFSMSrmm CIM logger name that is located in the project root directory.

log4j.appender.R = *org.apache.log4j.RollingFileAppender*
This is the default. Logging is done into a file. All incoming entries are appended to the log file, even if the DFSMSrmm CIM provider is stopped and restarted. No previous entries are overwritten. Backup files of this log are created when the defined size is exceeded (see the log4j.appender.R.MaxFileSize keyword).

log4j.appender.R.MaxFileSize = *500KB*
Specifies the file size threshold before a backup file is created. The backup file is automatically named as the log file, but with the suffix *.1* added. A second backup file is created when the log file exceeds the limit again. Now, the first backup file created is renamed to *xyz.2*, and the second backup file is named, *xyz.1*. Backup files are created as often as specified in the log4j.appender.R.MaxBackupIndex keyword.

log4j.appender.R.MaxBackupIndex = *9*
Specifies the number of backup files to be created. In this example, the log4j.appender.R.MaxBackupIndex keyword equals 9. This means that the 10th attempt for a backup file results in discarding of the 9th backup file (oldest).

At the end of the configuration file, line formatting is defined.

log4j.appender.R.layout=*org.apache.log4j.PatternLayout*

log4j.appender.R.layout.ConversionPattern=*%d [%-25F:%5L %-20M] %-5p - %m%n*

These two settings specify the line format for each log entry. You can use the current setting, however, you can also change it to meet your needs. The current format looks like this:

```
<----- Timestamp ------>[<------- File Name ----->:Line#<--- Method Name --->]<Level>- Log Message
```

Do not to confuse the log file, *rmmcim.log*, with the logger configuration file, *rmmlog.properties*, when you delete the log file to start from scratch. The log file, *rmmcim.log*, can be deleted any time and is always rebuilt at the next CIM-provider request. Deletion of the configuration file, *rmmlog.properties*, results in an error.

For additional information on the features and capabilities of the log4j package, see Apache Log4j (logging.apache.org/log4j).

Chapter 2. Eliminating common sources of error

This topic provides suggestions to help you eliminate common sources of error you might encounter while using DFSMSrmm.

- "When you want to remove virtual volumes and VTS library is no longer available" on page 15
- "When DFSMSrmm messages do not appear" on page 16
- "When inventory management fails" on page 16
- "When response time is too long" on page 16
- "When you run out of scratch volumes" on page 16
- "When volumes expire prematurely" on page 20
- "When volumes move to the wrong storage location" on page 21
- "When volumes do not move to storage locations" on page 22
- "When you lose a volume" on page 23
- "When users are not notified automatically" on page 23
- "When errors occur in the DFSMSrmm control data set" on page 23
- "When there is not enough available storage to list all the volumes" on page 24
- "When there is not enough available storage to list all the volumes with the DFSMSrmm web service" on page 25
- "When the DFSMSrmm WebSphere web service does not respond" on page 25
- "When the DFSMSrmm Tomcat web service does not respond" on page 27
- "When the DFSMSrmm CIM provider does not return output" on page 27
- "When an SMI-S client cannot correctly process entries of tape libraries from the DFSMSrmm CIM agent " on page 28
- "When common system abends occur" on page 29

If you cannot resolve a problem, see Chapter 5, "Building a keyword string," on page 39 for instructions on building a keyword string that you can use to search the IBM Software Support database.

When you want to remove virtual volumes and VTS library is no longer available

When you want to delete the DFSMSrmm entries for logical volumes that have been deleted from the TCDB, or the VTS library is no longer available, use the NOEJECT operand. Using the NOEJECT operand leaves the library and TCDB alone and only deletes the volume record from the DFSMSrmm control data set. If you attempt to delete the entries with RMM DV FORCE, you receive a message that the VOLCAT could not be updated.

```
RMM DV xxxxxx FORCE NOEJECT
```

Figure 18. Using the NOEJECT operand

Note: If you do not specify NOEJECT, the DELETEVOLUME commands fails because the volume is no longer defined in the TCDB.

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When DFSMSrmm messages do not appear

If you have customized the DFSMSrmm messages table, check the message table to make sure that your changes do not prevent messages from being issued.

Related Reading: For information about customizing messages to help you determine where an error might have occurred, see the *z/OS DFSMSrmm Implementation and Customization Guide*.

When inventory management fails

If you are experiencing problems during inventory management, you can perform one of these tasks:

- Determine if the data sets used by inventory management are Resource Access Control Facility (RACF®, a component of the Security Server for z/OS) protected. If so, ensure that the RACF user ID that runs inventory management has the authority to write to the data sets.
- Preallocate data sets as described in the *z/OS DFSMSrmm Implementation and Customization Guide* before you use the inventory management functions. For example, if you want to obtain an extract report and retain messages issued during inventory management, you must preallocate a REPTEXT file and a MESSAGE file, used in the sample JCL for EDGHSKP in Figure 19 on page 16. EDGJHKPA Sample JCL for Allocating the Data Sets Required for Inventory Management is a DFSMSrmm sample provided in SAMPLIB and can be used as an example to preallocate a REPTEXT file and a MESSAGE file.

```
//HSKP      EXEC PGM=EDGHSKP,PARM='RPTEXT'
//SYSPRINT  DD   SYSOUT=*
//MESSAGE   DD   DSN=DFSMSRMM.MESSAGE.DATASET,DISP=SHR
//REPTEXT   DD   DSN=DFSMSRMM.EXTRACT.DATASET,DISP=SHR
```

Figure 19. Sample JCL for EDGHSKP

.

- Check the system log for error messages when the job message log or DFSMSrmm MESSAGE file does not contain enough information to identify the error. Because DFSMSrmm inventory management runs in the DFSMSrmm subsystem address space, error messages might have been written to the system log.
- Check if you are using the OPTION command operands: VRSDROP, VRSMIN, VRSRETAIN, or EXPDTDROP with the action of FAIL. If so, inventory management processing stops, if the appropriate limit was triggered. The EDG2310I message and other messages in the DFSMSrmm MESSAGE file will show details in this case.

When response time is too long

If you experience long DFSMSrmm command response time when DFSMSrmm is performing a search, check the MAXHOLD operand in PARMLIB member EDGRMMxx. The MAXHOLD operand defines the number of records the subsystem scans while holding a reserve on the DFSMSrmm control data set.

Recommendation: Use the default MAXHOLD value described in *z/OS DFSMSrmm Implementation and Customization Guide*.

It might take DFSMSrmm longer to respond when you issue DFSMSrmm subcommands if DFSMSrmm inventory management is in process, or if the DFSMSrmm control data set is being backed up. You can minimize impact on your users by scheduling inventory management processing during non-peak hours.

When you run out of scratch volumes

If you are running out of scratch volumes, you can perform any of these tasks to solve the problem:

- Check the default retention period and other retention periods set for volumes. If it is too high, change the retention period to make volumes available for reuse sooner. Check your vital record specifications to make sure that the retention policies you have defined are acceptable. Change your retention policies as needed.
- DFSMSrmm does not make volumes available until you have confirmed that release actions have taken place. If the release actions are not confirmed, DFSMSrmm does not process volumes.

  Create a list of all volumes that are pending release by issuing this RMM SEARCHVOLUME subcommand.

  ```
  RMM SEARCHVOLUME VOLUME(*) LIMIT(*) STATUS(RELEASE) OWNER(*) ACTION(INIT,ERASE,REPLACE,NOTIFY)
  ```

  Perform the release actions as required and confirm to DFSMSrmm that the actions have taken place. If the NOTIFY action is outstanding that action must be confirmed before any others can be processed. Volumes that have no pending release actions or just the SCRATCH release action can be released in a single run of expiration processing.

  Do not confirm the SCRATCH release action unless the volumes are in a VLPOOL with the AUTOSCRATCH(NO) attribute, otherwise TCDB, catalog and RACF updates will be skipped by DFSMSrmm.
- Check that volumes residing in system-managed tape libraries are returning to scratch status in a timely manner. “Changing actions for volumes in system-managed tape libraries” on page 20 provides information about returning volumes in system-managed tape libraries to scratch status.
- Confirm that volumes were returned from loan locations. DFSMSrmm does not automatically manage the movement of these volumes. Use the DFSMSrmm ISPF dialog or the RMM CHANGEVOLUME TSO subcommand to clear the LOANLOCATION field. Use the RMM SEARCHVOLUME TSO subcommand with the LOANLOC operand to create a list of volumes in loan locations.
- List your vital record specifications, using the DFSMSrmm ISPF dialog or the RMM LISTVRS TSO subcommand, and delete any unnecessary vital record specifications.
- Check your installation's requirements for scratch volumes. Add more volumes, if needed, to your inventory to satisfy the demand.
- To quickly return a subset of volumes to scratch status you can use the EXPROC SYSIN command with the EXPROC parameter of the EDGHSKP utility. For example, if a particular library is low on scratch volumes, you can run EXPROC just for volumes in that location.

Obtaining volume information

To determine if a volume has returned to scratch status, obtain volume information using the DFSMSrmm ISPF dialog or DFSMSrmm TSO subcommands. For example, to request information for the encrypted volume with serial number JJC024, issue the command:

```
    RMM LISTVOLUME JJC024 ALL
```

Figure 20 on page 18 shows the type of volume information that DFSMSrmm displays.

```
Volume information:
Volume = JJC024   VOL1  =          Rack  = JJC024    Owner   = RMMUSER
  Type = PHYSICAL         Stacked count  = 0         Jobname = D016216J
  Worldwide ID =                                    WORM    = N
Creation:  Date = 02/16/2012  Time = 07:23:23  System ID = W98MVS2
Assign:    Date = 02/16/2012  Time = 07:23:23  System ID = W98MVS2
                                               User ID   =
Expiration date = 09/02/2016(KeptByCatlg) Original      =
Expiration time = 08:06:38   Datasets Kept By Catlg: 234 on Volume Set
         set by = OCE_JFCB
Retention date  =            Set retained  = NO
Retention method= EXPDT
         set by = OCE_DEF
       retain by = SET
Data set name = RMMUSER.TEST.CBR
Volume status:   EDM = N   Hold = N   File 1 Data set seq = 1
Status = USER      Availability =                  Label = SL
Current label version =           Required label version =
Media information:
Density = IDRC  Type = EETC      Format = EEFMT4    Compaction = YES
Special attributes   = NONE      Vendor =
Encryption Key Labels:                                          Method:
1=wcc1                                                          LABEL
2=wcc2                                                          LABEL
Action on release:
Scratch immediate  = N  Expiry date ignore = N
Scratch = Y  Replace = N  Return = N  Init = N  Erase = N  Notify = N
Actions pending:
Scratch = N  Replace = N  Return = N  Init = N  Erase = N  Notify = N
Storage group  =
Loan location  =           Account = T,H,IOM,,,SYSPROG
Old loan loc   =
Description    =
Security class =           Description =

Access information:
Owner access = ALTER   Volume access = NONE
VM use = N   MVS use = Y   IRMM use = N
Access list:

Last Change information:
Date             = 02/16/2012  Time = 08:50:39  System  = EZU0000
User change date = 02/16/2012  Time = 08:31:00  User ID = D008210

Statistics:
Number of data sets = 2       Data set recording= ON
Volume usage(MB)= 6           Use count         = 3
Physical(KB)    = 3           Compression       = 3.00
Capacity(MB)    = 59232       Percent full      = 0
Date last read  = 02/16/2012  Date last written = 02/16/2012
Drive last used = 0FA0        Write mount count = 2
Volume sequence = 1           Media name        = 3480
Previous volume =             Next volume       = JJC025
Product number  =             Level             = V  R  M
Feature code    =
Error counts:
Temporary read = 0      Temporary write = 0
Permanent read = 0      Permanent write = 0

Store information:
Movement tracking date =                 Intransit = N
In container           =                 Move mode = AUTO

Location:    Current      Destination  Old          Required     Home
Name       = ATL15393                                          ATL15393
Type       = AUTO                                              AUTO
Bin number =
Media name =
Priority   =
```

Figure 20. Obtaining volume status information

Checking volume status

Check the Status field in the volume information as shown in Figure 20 on page 18. If the Status field is scratch, then DFSMSrmm has released the volume and returned it to scratch status.

Checking volume availability

Check the Availability field as shown in Figure 20 on page 18.

If availability field is blank

- Check when the DFSMSrmm EDGHSKP inventory management utility was last run. For volumes managed by the VRSEL retention method, DFSMSrmm does not mark a volume pending release if the last change date is more recent than the time of the last VRSEL processing. The last change date might have changed for one of these reasons.
  - The volume is used or updated outside of EDGHSKP processing
  - A move is confirmed since the last VRSEL processing
- Check the volume expiration date, the volume retention method, and if you have specified that DFSMSrmm should ignore the expiration date for the volume. Look at the volume Action on Release: Expiry date ignore setting. If the expiration date is not ignored based on the retention policies you defined, DFSMSrmm keeps the volume until the expiration date is reached, even though the volume is no longer covered by a vital record specification.

  The default expiration date set by DFSMSrmm is the creation date plus the EDGRMMxx PARMLIB member RETPD value. You can override the default by using the RMM CHANGEVOLUME subcommand with the EXPDT or RETPD operands.

  A very common error occurs when you are using expiration dates that have special meaning. Examples of these dates include EXPDT=99000 and EXPDT=98001. DFSMSrmm requires the use of the DFSMSrmm EDG_EXIT100 exit to clear the expiration date field in the JFCB (JFCBXPDT) and assign a vital record specification management value for these dates. With the DFSMSrmm EDG_EXIT100 exit, the volume expiration date is set to the creation date plus the EDGRMM*xx* parmlib member RETPD operand value. If EDG_EXIT100 does not clear JFCBXPDT, the EXPDT date is passed to DFSMSrmm. DFSMSrmm translates EXPDT=99000 to an expiration date of 1999/000, which causes DFSMSrmm to consider the volume to be already expired. The same result occurs if EXPDT=98001 is used. To avoid premature expiration of volumes, check the EDG_EXIT100 exit to ensure that it correctly clears the expiration date field. If you did not intend to use an expiration date that has a special meaning, use the RMM CHANGEVOLUME subcommand to specify the correct expiration date.

  When the RETAINBY(SET) option is used for VRSEL managed volumes, a volume that is not VRS retained and whose volume expiration date has been reached can be retained because another volume in the set is still required to be retained.

  You can use the DFSMSrmm dialog to view the vital record status for volumes and data sets. Volume search results lists include 'VRS' in the status column and set retention state in the 'S R' column. Data set search results lists show the vital record state in the 'V R' column. Select/display the data set details to view the matching VRS information and the VRS retention date. Move the cursor to the 'VRS name' and press enter to see a list of the VRSes, enabling you to look at the matching VRS details. You can also use the RMM LISTDATASET command or the Vital Records Retention Report produced by EDGHSKP VRSEL processing to determine which data set and vital record specification are involved.

  Related Reading: For information on the EDGUX100 exit, see *z/OS DFSMSrmm Implementation and Customization Guide*.

If the value Vital Record is displayed in the availability field

The volume has not been returned to scratch because a data set on the volume is still retained by a vital record specification. A volume with multiple data sets can be covered by more than one vital record specification.

If the value Pending Release is displayed in the availability field

1. Check the Actions pending field for any actions marked Y. DFSMSrmm cannot return the volume to scratch status until all other release actions have been completed.
2. Check the Store Information Intransit field. If Intransit is Y, the volume is moving from one location to another. The volume must return to a library location or its home location before DFSMSrmm can return the volume to scratch status.
3. Use the RMM CHANGEVOLUME CONFIRMMOVE command when the pending volume move has been completed.

4. Run DFSMSrmm inventory management to complete the volume's move to its home location.

If Intransit is N, the destination field is blank and the volume is in a library location or its home location, then the volume should return to scratch during the next EDGHSKP EXPROC processing.

If Intransit is N, and the volume that is in an automated tape library dataserver and has a destination to a location outside the automated tape library dataserver, you can either cancel the move, or eject the volume and confirm the movement.

If the volume is system-managed, DFSMSrmm will not change the status of the volume from master to scratch if the update to the TCDB fails. The system running inventory management processing must have access to the TCDB. Check for error messages in the DFSMSrmm MESSAGE file.

If your installation uses the DFSMSrmm EDG_EXIT200 exit, check this exit because it could prevent the volume from returning to scratch. You can determine whether there is any active exit for EDG_EXIT200 by checking the messages in the MESSAGE file.

If the value Open is displayed in the availability field

When the volume retention method is VRSEL, a data set on the volume might have been open during vital record processing. DFSMSrmm retains the volume under the OPEN vital record specification or to a vital record specification that matches the data set name mask. The data set might have been open because a job was in progress or it was left open because the job failed.

For information on determining the status of the volume, see "If the value Vital Record is displayed in the availability field" on page 19 and "If availability field is blank" on page 19.

If the value On Loan is displayed in the availability field

The volume is in a loan location and cannot be returned to scratch status until it returns to its home location.

Changing actions for volumes in system-managed tape libraries

DFSMSrmm allows you to return volumes to scratch status in any library location or in the volume's home location, as long as the volumes are not to be moved. If you have volumes that are in a system-managed tape library that are marked to be moved, you can return the volume to scratch status without moving the volume. For these volumes that reside in a system-managed tape library, cancel the move.

1. To identify volumes in a system-managed tape library that must be moved before returning to scratch status, issue the command:

```
RMM SEARCHVOLUME VOLUME(*) LIMIT(*) LOCATION(ATL1) -
      STATUS(RELEASE) DESTINATION(*) OWNER(*)
```

2. To cancel the volume move and change the home location, issue the command:

```
RMM CHANGEVOLUME volser LOCATION(ATL1)
```

3. Run expiration processing to return the volumes to scratch status. You cannot return volumes in loan locations directly to scratch.

Related Reading: For information about returning volumes to scratch status, see *z/OS DFSMSrmm Implementation and Customization Guide*.

When volumes expire prematurely

If your volumes are expiring and being returned to scratch status sooner than you expect, perform these tasks.

- Ensure that the default retention period is not too low.
- Ensure that vital record specifications are correctly specified and that you have defined all necessary ones.

- List the data sets and the vital record specifications that DFSMSrmm matches to the data sets.

Recommendation: You might have to define additional vital record specifications with more specific data set names to ensure that the volumes are correctly retained.

Create an ACTIVITY report using the EDGHSKP utility to determine why a data set is not retained by a vital record specification. If you cannot resolve the problem after checking the retention period and vital record specifications, run the EDGAUD utility to produce a report on the history of volume movement.

Related Reading: For information about the ACTIVITY report and how to obtain an audit trail report using EDGAUD, see *z/OS DFSMSrmm Reporting*.

When volumes move to the wrong storage location

Use Table 3 on page 21 to determine why DFSMSrmm applied a vital record specification to a data set.

Table 3. How DFSMSrmm matches data set names to data set masks

Order (OLD)	Order (NEW)	Description	Command Example
1	1	A reserved name, ABEND, DELETED, or OPEN, matches a data set before any other data set mask.	`RMM ADDVRS DSNAME('ABEND') - LASTREFERENCEDAYS COUNT(1)` `RMM ADDVRS DSNAME('OPEN') - LASTREFERENCEDAYS COUNT(2)`
2	7	A management class name matches the management class value after ABEND, DELETED, or OPEN and before any other data set mask. The management class value is set using the RMM EDGUX100 installation exit and matches management calls names set using ACS routines.	`RMM ADDVRS DSNAME('M99000') WHILECATALOG`
3	2	A fully qualified data set name matches a data set name before any mask containing %, ¬, or *.	`RMM ADDVRS DSNAME('PRITCHAR.BACKUP.DATA')`
4	3	Any data set name mask that includes a % or a ¬ matches a data set name before masks containing an *. % and ¬ are treated equally.	`RMM ADDVRS DSNAME('PRITCHAR.%.DATA')` `RMM ADDVRS DSNAME('PRITCHAR.¬.DATA')`
5	4	Any data set name mask that includes single *'s preceded or followed by any character is the next best match.	`RMM ADDVRS DSNAME('PRITCHAR.*BACK.DATA')`
6	5	Any data set name mask that includes an * is the next best match.	`RMM ADDVRS DSNAME('PRITCHAR.*.DATA')`

7	6	A data set name mask that includes ** anywhere in the mask is the next best match. When matching the data set mask to the data set name, the mask where the non-generic characters occur earlier in the mask is most specific.	`RMM ADDVRS DSNAME('PRITCHAR.**')`
			`RMM ADDVRS DSNAME('**.PRITCHAR')`
			`RMM ADDVRS DSNAME('*.**')`

8	8	A vital record specification management value set by using the DFSMSrmm EDGUX100 exit.	`RMM ADDVRS DSNAME('D99000') WHILECATALOG`
9	9	A data set name mask of ** indicates the policy applies to all data sets not managed by any other vital record specification.	`RMM ADDVRS DSNAME('**')`

If volumes are moving to the wrong storage location, check the vital record specifications that you have defined. For example, if you expected volumes to move to the LOCAL storage location, but DFSMSrmm moves them to the REMOTE storage location, check these conditions:

- A vital record specification was defined with the wrong location. For example, LOCATION(LOCAL) is specified with the RMM ADDVRS subcommand instead of LOCATION(REMOTE).

- More than one vital record specification was defined for a volume or a data set. Use the EDGHSKP VRSEL report in the REPORT file, the DFSMSrmm ISPF dialog, or the RMM LISTDATASET subcommand to identify the vital record specification that is retaining a data set.

  Possible solutions include:

  – Deleting a matching vital record specification so a less specific vital record specification is used
  – Changing LOCDEF priority so that one vital record specification is dominant and is used before others

To resolve any movement conflicts that arise when a volume matches more than one vital record specification, DFSMSrmm uses the location priority value. Priority values are purely relative and do not have any further significance. If there are two or more vital record specifications with conflicting move requirements that apply to a volume, DFSMSrmm uses the location priority to resolve any conflict. The lower priority numbers take precedence. For example, a volume would move to a location with a priority value 100 before moving to a location with a priority value of 200.

You can set a priority value with the PRIORITY operand of the LOCDEF command to define the relative importance of locations.

You can define the PRIORITY operand on RMM ADDVRS subcommand to override default or assigned priorities at the data set level. When you do not set a priority value, DFSMSrmm uses the priority shown in Table 4 on page 22.

Table 4. DFSMSrmm Movement Priority Default Values

Priority Number	Location Name or Location Type
100	REMOTE DFSMSrmm built-in storage location name
200	DISTANT DFSMSrmm built-in storage location name
300	LOCAL DFSMSrmm built-in storage location
2000	Installation defined storage locations
4800	AUTO automated tape libraries
4900	MANUAL manual tape libraries
5000	SHELF location name

Use the RMM LISTVRS subcommand to list the details for vital record specifications that need to be changed. If volumes have already moved to incorrect locations, delete the existing vital record specification and add a vital record specification that contains the correct location information.

Related Reading: For information on using the RMM DELETEVRS TSO subcommand and the RMM ADDVRS TSO subcommand to make the changes, see *z/OS DFSMSrmm Managing and Using Removable Media*.

When volumes do not move to storage locations

If volumes are not moving to the storage locations, follow these recommendations:

- Define vital record specifications for the data set or volume.
- Check for the LOCATION(HOME) operand value on the RMM ADDVRS subcommand. The volume is returned to a shelf location, automated tape library, or manual tape library based on the operand value.
- Use the DFSMSrmm ISPF dialog or RMM ADDRACK subcommand to add them. There could be insufficient shelf locations defined in the storage location.

```
RMM ADDRACK * COUNT(1000) LOCATION(REMOTE)
```

  You can also check the inventory management MESSAGE file for messages indicating that there is a shortage of empty bins in a storage location.

When you lose a volume

If you physically lose a volume or remove a volume from the DFSMSrmm control data set by using the wrong command, use the utility EDGAUD to create an audit trail report. The report shows the locations where a volume has been moved and its last known location. The report also identifies the user ID that issued a command that might have changed the status of the volume.

Related Reading: For information on how to obtain an audit trail report using EDGAUD, see *z/OS DFSMSrmm Reporting*.

When users are not notified automatically

If users are not being notified when their volumes have reached their expiration date, ensure that these tasks were completed.

- You specified `NOTIFY(Y)` in the EDGRMMxx PARMLIB member.
- You specified owner information that contains a valid user ID and node name, or a valid Internet e-mail address.
- If you specified an Internet e-mail address, you must have an SMTP server configured and started. The default SMTP server is SMTP on the current JES node. To configure any other SMTP server for use, refer to the ADDOWNER command for the restricted owner called 'SMTP'. This can be found in *z/OS DFSMSrmm Managing and Using Removable Media*.
- You specified Notify Owner as a release action.
- You are running DFSMSrmm under the JES2 or JES3 subsystem and not the master subsystem.

Related Reading: For information on how to set up notification to users, see the *z/OS DFSMSrmm Implementation and Customization Guide*.

When errors occur in the DFSMSrmm control data set

If you are running multiple z/OS systems and sharing the control data set and journal, ensure that you have specified a unique SYSID for each system.

If you suspect that there is an error in the DFSMSrmm control data set, you can use the DFSMSrmm EDGUTIL utility to verify the contents of the DFSMSrmm control data set. Then use the DFSMSrmm ISPF dialog or the RMM TSO subcommands to correct the control data set. To find and correct errors in the control data set, perform these steps:

1. Run the utility EDGUTIL with the VERIFY parameter to check the contents of the control data set. For example, EDGUTIL checks to see that a volume is associated with a rack number and that the rack number exists. If the rack number does not exist, then EDGUTIL writes a message to the SYSPRINT data set.
2. Inspect the SYSPRINT data set to determine which records you need to correct.
3. Correct DFSMSrmm control data set records using the RMM TSO subcommands by deleting incorrect information and adding correct information.

Related Reading: For information on the RMM TSO subcommands, see *z/OS DFSMSrmm Managing and Using Removable Media*.

For example, if the EDGUTIL utility detects that a volume resides in a rack number but the rack number does not exist, you can follow these steps to correct the problem.

1. Use the RMM SEARCHDATASET subcommand with the CLIST operand to create a list of data sets.

```
RMM SEARCHDATASET VOLUME(volser) CLIST('RMM LISTDATASET ')
```

Save the output from the request to use when you issue the RMM ADDDATASET subcommands as described in step "5" on page 24.

2. Use the RMM DELETEVOLUME subcommand to remove the volume from DFSMSrmm. Use the REMOVE operand to delete a scratch volume from the control data set. Use the RMM DELETEVOLUME subcommand with the FORCE operand to delete a master volume from the control data set.

   You can also change volume information by using the RMM CHANGEVOLUME FORCE command. To use the FORCE operand, you must have CONTROL access to STGADMIN.EDG.MASTER security resource and UPDATE access to STGADMIN.EDG.FORCE security resource.
3. Before adding the volume to DFSMSrmm, use the RMM ADDRACK subcommand to add the rack number.
4. Use the RMM ADDVOLUME subcommand to add the volume to the DFSMSrmm control data set with the correct rack number.
5. If the volume had any data sets on it, you should issue one RMM ADDDATASET subcommand for each data set.

If you still have a problem with your control data set, report the problem and all the messages produced by EDGUTIL to the IBM Support Center.

You can also restore your DFSMSrmm control data set with a backup copy of the control data set and journal.

Related Reading: Before attempting the restore, see *z/OS DFSMSrmm Implementation and Customization Guide*.

When there is not enough available storage to list all the volumes

When you request information using the DFSMSrmm commands using REXX EXECs or using the DFSMSrmm ISPF dialog, there might not be enough storage available to list all the volumes that match your criteria. This problem can occur when you use any SEARCH command, but is most likely to occur when you use the RMM SEARCHVOLUME subcommand.

For example, if you want to obtain information about all the volumes in MASTER status for any owner, issue this command to obtain a list of volumes:

```
RMM SEARCHVOLUME VOLUME(*) LIMIT(*) STATUS(MASTER) OWNER(*)
```

You can also use the SEARCHVOLUME dialog to obtain the information. If you issued the request using the DFSMSrmm ISPF dialog, DFSMSrmm issues the message:

```
 "More volumes may exist".
```

When you press PF1 for more help, DFSMSrmm issues the message:

```
"There is not enough storage available to list all the volumes".
```

In this example, DFSMSrmm cannot list all the volumes and issues return code 4 and reason code 10 due to a TSO restriction resulting from the use of storage below 16 MB. The actual number of records that DFSMSrmm returns is dependent on the amount of storage that is available to TSO for storing REXX variables and maintaining the index of variables. You can use the VARSTORAGE(HIGH) option of the TSO PROFILE to enable TSO to use storage above 16MB. Although this option does allow more storage to be used, and DFSMSrmm does still attempt to handle out-of-storage conditions, when you issue the RMM SEARCH subcommands and very large lists are required, you may encounter various storage related problems. For additional information about the TSO PROFILE VARSTORAGE option, see *z/OS TSO/E Command Reference*.

If you experience this situation, you can issue RMM SEARCH requests using the CONTINUE operand with the LIMIT operand set to a number that keeps the number of returned resources within the storage restriction. After you issue the first request, issue another request to obtain the next set of resources

using the returned continue information, staying within the storage limits. For example, you can obtain the next range by noting the continue information returned. Then issue a new SEARCH request, specifying CONTINUE(*continue_information*).

For the first command specify you want to continue:

```
RMM SEARCHVOLUME VOLUME(*) CONTINUE STATUS(MASTER) OWNER(*)
```

then note the *continue_information* issued at the end of the volume list by message EDG3025I (for example, `EDG3025I VOLUME('A16011')`) and issue the next command:

```
RMM SEARCHVOLUME VOLUME(*) CONTINUE(A16011) STATUS(MASTER) OWNER(*)
```

Repeat this until all volumes are returned.

Related reading: For information about using the RMM TSO subcommands and the DFSMSrmm ISPF dialog, see *z/OS DFSMSrmm Managing and Using Removable Media*.

When there is not enough available storage to list all the volumes with the DFSMSrmm web service

Your storage limit depends on your environment. If you exceed the storage capabilities of your environment, you see an OutOfMemory Exception. The amount of data returned by the DFSMSrmm web service is limited to one megabyte (1MB). This is the default. If this storage limit is reached, you see this information in the returned XML stream:

```
<INFO>
<RTNC>4</RTNC>
<RSNC>10</RSNC>
<MSGT>EDG3921I INSUFFICIENT STORAGE FOR SEARCH PROCESSING </MSGT>
</INFO>
```

If you reach this storage limit, you can either:

- Change the issued command to return less data. For example, issue *sv owner(a*)* instead of *sv owner(*)*.
- Raise the storage limit, if your environment allows it. To do this, set the system property, RMM_XML_MAX_SIZE, to overwrite the default of 1MB.

For Websphere:

The system property, RMM_XML_MAX_SIZE, is defined in the Java Virtual Machine (JVM) settings on your Websphere Application Server. In WebSphere Application Server for z/OS, Version 5.0.2, the JVM settings are found under Servers -> Application Servers -> *your server name* -> Process Definition -> Servant -> Java Virtual Machine -> Custom Properties. Enter the name, RMM_XML_MAX_SIZE, and the value, 2000000, to set the limit to 2 MB. If you are running a different version of WebSphere Application Server for z/OS and cannot find the JVM settings, use the Help function to determine the procedure to change your server's JVM settings.

For Tomcat:

To change the variable RMM_XML_MAX_SIZE to 2MB in a Tomcat environment, issue this before Tomcat is started:

```
export JAVA_OPTS='-DRMM_XML_MAX_SIZE=2000000'
```

When the DFSMSrmm WebSphere web service does not respond

If your client application does not receive valid DFSMSrmm data from the DFSMSrmm Web service, do these steps:

- Ensure that the DFSMSrmm Web service is correctly installed and started on your WebSphere Application Server (WAS).

- Ensure that the correct TCP/IP address for your WebSphere Application Server is specified in your client application.
- Check that your application can communicate with the DFSMSrmm Web service using the debug method available in the DFSMSrmm Web service. To do this, add this method to your client code:

```
public synchronized java.lang.String runCommandXml() throws Exception
{
  String targetObjectURI = "urn:RmmJApi";
  String SOAPActionURI = "";

  if(getURL() == null)
  {
    throw new SOAPException(Constants.FAULT_CODE_CLIENT,
    "A URL must be specified via RmmJApiProxy.setEndPoint(URL).");
  }

  call.setMethodName("runCommandXml");
  call.setEncodingStyleURI(Constants.NS_URI_SOAP_ENC);
  call.setTargetObjectURI(targetObjectURI);
  Vector params = new Vector();
  call.setParams(params);
  Response resp = call.invoke(getURL(), SOAPActionURI);


  if (resp.generatedFault())
  {
    Fault fault = resp.getFault();
    call.setFullTargetObjectURI(targetObjectURI);
    throw new SOAPException(fault.getFaultCode(), fault.getFaultString());
  }
  else
  {
    Parameter refValue = resp.getReturnValue();
    return ((java.lang.String)refValue.getValue());
  }
}
```

Now, you can call the method, runCommandXml(), without passing a command string.

If the DFSMSrmm Web service is found, the current date and time is returned in string format. If you do not get a response, the DFSMSrmm Web service is not available at the specified TCP/IP address.

- If you can communicate with the DFSMSrmm Web service, but you cannot receive DFSMSrmm data, ensure that the Java part of the DFSMSrmm Web service finds the C++ DLL, which is needed to access DFSMSrmm. To do this, use the debug method available in the DFSMSrmm Web service by adding this method to your client code:

```
public synchronized int returnInt() throws Exception
{
  String targetObjectURI = "urn:RmmJApi";
  String SOAPActionURI = "";

  if(getURL() == null)
  {
    throw new SOAPException(Constants.FAULT_CODE_CLIENT,
    "A URL must be specified via RmmJApiProxy.setEndPoint(URL).");
  }

  call.setMethodName("returnInt");
  call.setEncodingStyleURI(Constants.NS_URI_SOAP_ENC);
  call.setTargetObjectURI(targetObjectURI);
  Vector params = new Vector();
  call.setParams(params);
  Response resp = call.invoke(getURL(), SOAPActionURI);

  if (resp.generatedFault())
  {
    Fault fault = resp.getFault();
    call.setFullTargetObjectURI(targetObjectURI);
    throw new SOAPException(fault.getFaultCode(), fault.getFaultString());
  }
  else
  {
    Parameter refValue = resp.getReturnValue();
    return ((java.lang.Integer)refValue.getValue()).intValue();
```

```
    }
}
```

Now, you can call the method, returnInt(). If the C++ DLL is found, the current release level is returned as an integer (currently '110').

If you do not get this response, the DFSMSrmm Web service has not found the required C++ DLL. To correct this, do these steps:

- Ensure that the part, EDGXHCLL, is available in the dataset, SYS1.SIEALNKE.
- Ensure that the required link is installed in the WebSphere Application Server library path. If the link is not there, you must create it. To create the link, state "ln -e EDGXHCLL libEDGXHCLL.so" in the WebSphere Application Server library path.

When the DFSMSrmm Tomcat web service does not respond

When the DFSMSrmm Tomcat web service does not respond:

- Ensure the environmental variable CATALINA_HOME is set to the Tomcat installation directory.
- Ensure the web service is properly deployed to the Tomcat installation directory: $CATALINA_HOME/webapps. After the first start of the service, the sub-directory $CATALINA_HOME/webapps/RmmWebService must have been created.
- The server must be started. You can check this by opening its start page (http://tomcat_domain_name:8080) in your browser. If its not yet started, invoke: $CATALINA_HOME/bin/startup.sh from the OMVS shell.
- Ensure you have implemented one of the security schemes, as described in the Tomcat readme file:

  ```
  /usr/lpp/dfsms/rmm/rmmtc.txt
  ```

  You will get an "Unauthorized" message, if you attempt to issue methods against the web service with unauthorized user credentials. To access the "Tomcat Manager" page from your browser, you need to setup a "manager" role. The userid, that requests that page, must be mapped to this role.
- The TSO userid, from where the Tomcat server is started, must have appropriate RMM authorizations, set in SAF/RACF, in order to get data from RMM.
- To test the network connectivity, without requesting data from RMM, you can use the Java sample client in debug mode (-d option). Please refer to the web service readme file:

  ```
  /usr/lpp/dfsms/rmm/rmmwebs.txt
  ```

  to see how to invoke the sample client in debug mode.
- Ensure this external link is set somewhere in the LIBPATH:

  ```
  ln -e EDGXHCLL libEDGXHCLL.so
  ```

When the DFSMSrmm CIM provider does not return output

If you request DFSMSrmm data from a CIM client and no data is returned, check these items:

- If message BPXP015I HFS PROGRAM */bin/printenv* IS NOT MARKED PROGRAM CONTROLLED appears on your z/OS console, set the program control flag ON by issuing this command from the OMVS shell:

  ```
  extattr +p /bin/printenv
  ```

If the CIM provider uses the DFSMSrmm Web service API:

- Ensure that the DFSMSrmm Web service is up and running. Having the DFSMSrmm Web service up and running is required in order for the DFSMSrmm CIM provider to work.

- If the DFSMSrmm CIM provider does not show data, start a DFSMSrmm Web service client. Collect data from the DFSMSrmm Web service client to ensure that the underlying DFSMSrmm Web service is working correctly.
- When using the WebSphere Application server, ensure that the DFSMSrmm Web service default user ID has the sufficient RACF authorizations needed to access DFSMSrmm.
- When using Tomcat, ensure that the user credentials, provided in *rmmcust.properties* as TOMCAT_USER_NAME and TOMCAT_USER_PASSWORD, are set correctly and authorized to use the Tomcat server (see Tomcat readme file *rmmtc.txt*).
- If the DFSMSrmm Web service is working correctly, open the options file, *rmmcust.properties*, and check these settings:
  - Timeout value. Ensure that the timeout value is not too low. A slow network connection or a large data request can cause the DFSMSrmm Web service to time-out. For example, the WEB_SERVICE_TIMEOUT = 10000 setting allows 10 seconds (10 000 milliseconds) to wait.
  - If your DFSMSrmm Web service destination URLs are stored in the option file, WEB_SERVICE_REGISTRY = FILE, ensure that your WEB_SERVICE_LOCATIONS points to valid URLs for your Web servers. Ensure that this line is not commented out (// at the beginning of the line).
  - If your DFSMSrmm Web service is published in a UDDI, WEB_SERVICE_REGISTRY = UDDI, ensure that the UDDI registry URLS are correct for UDDI_INQUIRY_URL. The Web services need to be published to the registry, and the registry must be up and running. The UDDI search string, UDDI_SEARCH_STRING, must match the published names of your Web services. The names must start with that string and are case-sensitive.
  - Ensure that the operands, as specified in the appropriate instance of class IBMrmm_SearchOperands, do not limit your search requests. For example, defining the instance IBMrmm_SearchOperands, Resource="IBMrmm_PhysicalVolume" Operands="Owner(*) Volume(A*) Limit(100)", limits a subsequent search of IBMrmm_PhysicalVolume objects to those that start with an "A" in their volser.
  - If the data is behind a firewall, make sure that you have logged in before connecting the DFSMSrmm Web service.
  - Finally, open the DFSMSrmm CIM provider log, *rmmcim.log*, for additional information. See “Using the DFSMSrmm CIM logger” on page 12 for additional information on working with the DFSMSrmm CIM logger.

If the CIM provider uses the direct HLL API (WEB_SERVICE_REGISTRY = NONE):

- Ensure that this symbolic link is set within the $LIBPATH of OMVS:

```
ln -e EDGXHCLL libEDGXHCLL.so
```

- Ensure rmmjapi.jar is added to your CLASSPATH variable.

Refer to rmmcim.txt for additional troubleshooting hints. You might also want to start the CIM server with tracing ON to obtain more debugging information. See the CIM server documentation on how to enable the trace mode.

When an SMI-S client cannot correctly process entries of tape libraries from the DFSMSrmm CIM agent

If you request either DFSMSrmm tape libraries or their contents from a SMI-S CIM client and no data is returned, check these items:

- SLP regestration should be initiated. While building the OpenPegasus package on your own, ensure the PEGASUS_ENABLE_SLP environment variable is set to true. On z/OS, the following console message should accompany the start of cimserver:

```
CFZ00001I: PGS18204: SLP Registration Initiated
```

Both on z/OS and Linux, you can issue the following command within z/OS USS to enquire the configuration status of SLP registration:

```
cimconfig -g slp -c
```

If the answer is false, issue the following command:

```
cimconfig -p -s slp=true
```

and restart the CIM server.

- Log file rmmcim.log should not contain any error messages reporting incorrect requests to the DFSMSrmm CIM agent. If any messages occur, correct the error on the client side. For example, if the format of the compound key for Tag attribute of IBMRMM_Location class is violated, then the following message is issued:

  ```
  EDGC0031I: Key "Tag" is not of the required format "LocationName+LocationType+CdsID"
  ```

  Displaying the messages obtained from CIM server on the CIM client side simplifies the tracking of the requests processed.
- If errors occur in communication between clients and OpenPegasus CIMOM, the analysis of the errors is outside DFSMSrmm capability. Before using a client, check out if the client has any limitations on exploiting OpenPegasus.

When common system abends occur

There are abends or performance problems not caused by failures in DFSMSrmm. For example, your batch job might end abnormally because of system errors beyond your control. Abends can also result from using inadequate or incorrect storage parameters. See your system programmer for assistance in diagnosing these errors.

This topic lists abends you might encounter when running DFSMSrmm, and suggests ways of correcting the problem. Not every possible problem can be listed, but the list includes those most commonly reported to IBM personnel.

These are common system abend codes that might appear when abends result from errors in storage parameters.

106
Sufficient storage was unavailable to load a module. Ensure that the value for REGION is sufficient.

804
The amount of storage requested exceeded that available. Ensure that the value for REGION is sufficient.

878
The amount of storage requested exceeded that available. Ensure that the value for REGION is sufficient.

80A
This abend occurs when a DFSMSrmm job requires more storage than has been allocated. Ensure that the value for REGION is sufficient.

D37
An output data set is specified with insufficient primary SPACE allocation and no secondary allocation. If this abend occurs during inventory management for the temporary data set allocated with the *ddname* SRTINOUT, the DFSMSrmm control data set control record might be incorrect. Run the EDGUTIL utility with the VERIFY parameter to check the consistency of the control data set and control record. Increase the primary allocation or include a value for secondary allocation.

E37

An output data set is allocated on a primary volume that has either insufficient storage or excessive fragmentation, and no secondary volume is specified. Allocate the data set on a volume with more space or perform space management on the primary volume.

Chapter 3. Diagnosing errors using the Problem Determination Aid Facility

During DFSMSrmm processing, the problem determination aid (PDA) facility gathers diagnostic information about DFSMSrmm's processing, stores this information in a circular file within storage, and periodically writes it to a circular file on DASD.

A circular file appends data until full; then, starting at the beginning of the file, subsequent incoming data overwrites the data already there. The circular DASD file consists of two data sets, EDGPDOX and EDGPDOY. EDGPDOX is the active data set.

Related Reading: For detailed information on using the problem determination aid or calculating the PDA log data set sizes, refer to *z/OS DFSMSrmm Implementation and Customization Guide*.

There are several reasons why you will at times want to collect and save PDA trace data. These reasons are most common:

- A trace showing DFSMSrmm's operating history can pinpoint the activity at the time the problem first occurs. This information can be helpful because the time difference between when a problem first occurs and when it is first detected.
- A trace can locate points of contention when two separate tasks conflict with one another.
- A trace can help you to determine if a suspected DFSMSrmm problem really exists, or if it is an operational error.
- You can use traces to supplement dumps when you contact your IBM support group.

Two very useful functions can help you to extract the exact information you need from the PDA files. By using either or both of the ISPF browse function and DFSMShsm ARCPRPDO (PDA trace formatter) program, you might be able to solve your problem without assistance from IBM support.

Viewing PDA data with the ISPF browse function

Use the ISPF browse function to perform these tasks:

- Browse large amounts of raw data
- Prepare IDCAMS (access method services) print output
- Look at PDA trace data within a dump

Formatting PDA data with the DFSMShsm ARCPRPDO (PDA trace formatter) program

The DFSMShsm ARCPRPDO trace formatter facility takes the raw trace data and organizes, reduces, and prints user-selected trace information. This is especially useful when you need specific data. You are authorized to use ARCPRPDO even if you are not licensed to use DFSMShsm.

Related Reading: For details about ARCPRPDO, see *z/OS DFSMShsm Diagnosis*.

Use the trace formatter facility to perform these tasks:

- Translate trace records into a readable format
- Edit raw trace data
- Select records based on your specific criteria

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The ARCPRPDO (PDA trace formatter) program has a number of options that can assist you in collecting data from the DFSMSrmm log data sets EDGPDOY, EDGPDOX, or a copy of either. To process the most recent PDA log entries, issue the command:

```
F DFRMM,PDALOG=SWAP
```

Then process the data that was placed in the EDGPDOY data set.

You can browse EDGPDOX while DFSMSrmm is running (disposition of the data set must be in shared mode).

If you need to format EDGPDOX while DFSMSrmm is running, turn PDA tracing off with the MODIFY command:

```
F DFRMM,PDA=OFF
```

Format the data in EDGPDOX with ARCPRPDO or copy the data for later processing, and then restore PDA tracing by issuing the MODIFY command

```
F DFRMM,PDA=ON
```

The formatter can be used to collect and print data based on your criteria.

Example: The sample job shown in Figure 21 on page 32 prints and formats trace records for CSECTs EDGCMIX and EDGQMGR as shown in Figure 22 on page 32.

```
//STEP0001 EXEC PGM=ARCPRPDO
//SYSPRINT   DD SYSOUT=*
//ARCMSG     DD SYSOUT=*
//ARCPDO     DD DSN=?UID..?HOSTID..RMMPDOY,DISP=SHR
//ARCPRINT   DD SYSOUT=*
//SYSIN      DD *
 COMPACT
 FORMAT
 MODULE(CMIX,QMGR)
```

Figure 21. JCL for printing and formatting trace records

```
TIME   USECS   ID AS/TCB         MOD   LOGIC CALLER  ARCPRPDO LEVEL=        -
09203----------------------------------------------------------------------------
060349.710320  08 D19E68          CMIX  XRET
  ASID/JOB=       +0  002DD1D6 C2D5C1D4 C5F1              | ..JOBNAME1       |
  DATA=           +0  C5C4C76D C5E7C9E3 F1F0F040 40404040 | EDG_EXIT100      |
  DATA=           +0  C3C1D3D3 4040                       | CALL             |
  DATA=           +0  00000001 00000000 00000000 00000000 | ................ |
                  +10 00000000 009BC170 C5C4C7E4 E7F1F0F0 | ......A.EDGUX100 |
                  +20 AAAAAAAA AAAAAAAA AAAAAAAA AAAAAAAA | ................ |
                  +30 AAAAAAAA AAAAAAAA AAAAAAAA AAAAAAAA | ................ |
                  +40 AAAAAAAA AAAAAAAA AAAAAAAA AAAAAAAA | ................ |
                  +50 AAAAAAAA AAAAAAAA AAAAAAAA AAAAAAAA | ................ |
                  +60 AAAAAAAA AAAAAAAA                   | ........         |
  EXTERNALNAME=   +0  C3E2E5C4 E8D5C5E7                   | CSVDYNEX         |
09203----------------------------------------------------------------------------
060349.710368  02 009BC1          QMGR  ****
  TEXT=           +0  E2E3C1D9 E3C9D5C7 40                | STARTING         |
  DATA=           +0  E3D2D57E F0F0F9F0 F0F0F0F5          | TKN=00900005     |
  DATA=           +0  E3C3D9C5 00000000 09528288 009E6868 | TCRE......bh.... |
                  +10 0B0F7FE0 809FD840 00014E28 00000000 | ..".\..Q ..+.... |
  DATA=           +0  E7D9D8C5 0B0F7FC0 0B0F8008 09837350 | XRQE.."{.....c.& |
                  +10 009E6868 88000000 00000001 0000002D | ....h........... |
  DATA=           +0  0B0F7FE0                            | ..".\            |
  DATA=           +0  E2E2D6C2 001C0065 00014E28 00000014 | SSOB......+..... |
                  +10 0B0F801C 03BC0000 E2C5F0F1 00000FFF | ........SE01.... |
                  +20 D9D4D4E4 E2C5D940 D1D6C2D5 C1D4C5F1 | RMMUSER JOBNAME1 |
                  +30 D9D4D4E4 E2C5D940 E2E8E2F1 40404040 | RMMUSER SYS1     |
                  +40 00000000 00000000 0F008000 000000CD | ................ |
09203----------------------------------------------------------------------------
```

Figure 22. Trace record output

In Figure 22 on page 32:

AS/TCB value

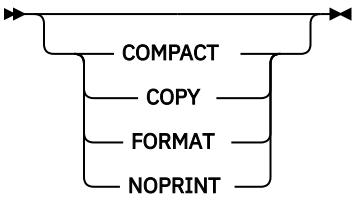
The "D1" in "D19E68" in the first (CMIX) trace record indicates that this trace record is from a JOB. The "00" in "009BC1" in the second (QMGR) trace record indicates that this trace record is from the RMM address space. Other possible values include "E2", for STC, and "E3", for the TSU address space.

ASID/JOB=
shows the two-byte ASID ("002D") and the eight-character job name "D1D6 C2D5C1D4 C5F1" (JOBNAME1).

Related Reading: For additional information on options and examples, see *z/OS DFSMShsm Diagnosis*.

Specifying formatting options

The trace formatting options tell ARCPRPDO what to do with the collected data. All the formatting options are optional. The formatting options are:



COPY
This option routes trace data that matches your selection criteria to the data set specified for your ARCOUT DD. This new data set may now act as the raw data for subsequent search runs.

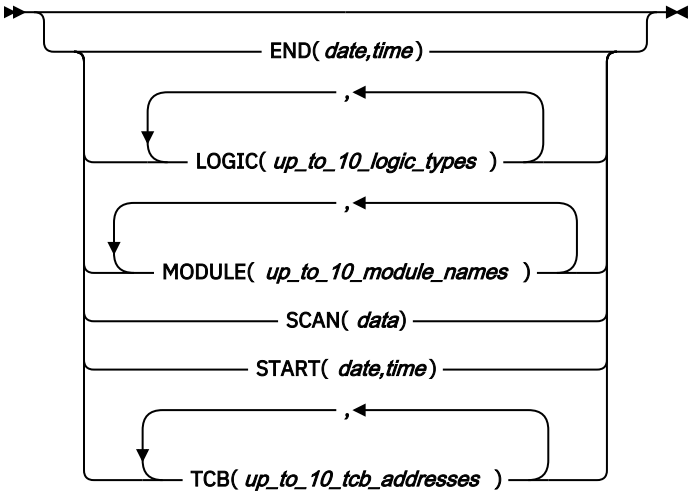
COMPACT
This option formats the trace entries into single-line output, if possible. The compact option is the default option and does not need to be specified.

FORMAT
This option formats each trace keyword on a separate line. The keyword itself is printed at the start of each line.

NOPRINT
This option prevents any selected records from being written to the ARCPRINT DD. NOPRINT is intended to be used with the copy option. An ARCPRINT DD statement is still required when you select the NOPRINT option, as it contains messages and other information.

Specifying selection options

Use these selection options to define and narrow your trace data search for DFSMSrmm. You specify the options using JCL as shown in Figure 23 on page 35.



END(*date,time*)
END is specified as *yyddd,hhmmss*) and selects records until the date, and optionally time, are reached. A comma separates the date and time. The end date must be the same as, or after, the start date. If the start and end dates are the same, the end time must be the same as, or after, the start

time. If the END option is not specified, the default end date is 99366. If an end time is not specified, the default is 235959.

With both START and END options:

yy
Must be a number from 00 through 99

ddd
Must be a number from 001 through 366

hh
Must be a number from 00 though 23

mm
Must be a number from 00 through 59

ss
Must be a number from 00 through 59

LOGIC(*up_to_10_logic_types*)
The LOGIC option looks at the logic fields of the trace entries and selects only those that match one of the logic types you select. You can specify up to 10 logic types in this option. Each type must contain four characters, with each type separated by a comma in the case of multiple entries. Three especially useful ones are MESG, TIME, and ENTR. Logic types are displayed under the LOGIC column in the trace output display.

MODULE(*up_to_10_module_names*)
The MODULE option selects all trace records that have been requested by the module you specify. For example, if you specify MODULE(MAIN), all the trace records requested by EDGMAIN are selected. You can specify up to ten module names for this option. Each name can contain up to five characters, with each name separated by a comma. Whenever you specify a module name of less than five characters, DFSMSrmm pads the name to equal five characters.

Example: The module name DFSMSrmm traces actually starts on the fourth character of the true name as illustrated in this example.

```
ACTUAL MODULE NAME = EDGMAIN
TRACED MODULE NAME = MAIN
```

SCAN(*data*)
The SCAN option selects records that contain any reference to data you specify in the data field. The data can match parameters, such as data set names or a key to a data set record. When you specify SCAN(DSN), for example, you get all of the DSN records plus any other records where the DSN has been traced as another type of parameter.

START(*date,time*)
START is specified as *yyddd,hhmmss*) and allows you to select records for output starting from the specified date until the end of the data, or until an end date is reached, as specified by the END option. *yyddd* is in Julian date format. You can also specify a start time separated from the date by a comma. If the START option is not specified, the default start date is 00001. If a start time in not specified, the default is 000000.

TCB(*up_to_10_tcb_addresses*)
The TCB option selects records that match any of the TCB addresses you select. Up to 10 TCB addresses can be specified in this option. The TCB addresses are identified under the AS/TCB column in the trace output display.

Each address must contain six characters, and each address must be separated by a comma. Actually, only bytes two and three of the actual TCB address are used in the trace address field, and these are placed in byte positions one and two.

Example: Byte zero of the TCB trace entry is used for address space identification. X'00' is used for the DFSMSrmm primary address space, as illustrated in this example.

```
ACTUAL TCB ADDRESS = 00F823C0
TRACED TCB ADDRESS = xxF823  (xx is an address space identifier)
```

Recommendations for using PDA formatter

Use these techniques to collect data from trace data sets.

- Use COMPACT LOGIC(MESG) options to get an initial sense of the messages issued at the time of the error. This action can help you to locate TCB or module information for subsequent searches. Logic types are listed in the output display under the LOGIC column.
- Use FORMAT TCB(*tcb_address*) for task-specific errors such as migration or backup.
- Use COMPACT SCAN(*dsn*) with the actual data set name for errors related to single data set processing, such as a missing data set.
- Use FORMAT START(*date, time*) END(*date, time*) for deadlocks or problems involving multiple processing units.
- Use COMPACT MODULE(*module_name*) for EDG0200I or EDG0208I errors, abends, or related problems.

Copying PDA trace data sets to tape

The JCL examples in this topic show how to copy certain data sets onto a tape so that they can be submitted to IBM as Authorized Program Analysis Report (APAR) documentation. The tapes that you use for this purpose must be standard label tapes. Because of numerous variations in hardware and software, these JCL jobs are shown only as examples; they might not work in all environments. Replace the data set names, relative file numbers, tape volume serial number, and unit types that are consistent with your naming conventions.

When you create your JCL, do not use the high-level qualifiers SYS1, RMM, or DFRMM in the data set names specified in the SYSUT2 DD cards because these are reserved names in the system where your tape is read.

Recommendation: Use the APAR number as the high-level qualifier, followed by a qualifier that describes the content of the data set.

Example: Figure 23 on page 35 shows the JCL for copying the PDA trace data set to tape.

```
//PDACOPY JOB MSGCLASS=A
//S1 EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=A
//SYSIN DD DUMMY
//SYSUT1 DD DSN=RMM.PDOY,DISP=SHR
//SYSUT2 DD DSN=OY99999.PDOY,LABEL=(1,SL),VOL=SER=TAPE01,
//          DISP=(NEW,KEEP),UNIT=TAPE
```

Figure 23. Copying PDA trace data set to tape

Example: Frequently, only several minutes or an hour of the PDA trace is required. To reduce the amount of data to be copied, use the DFSMSrmm trace formatter program, ARCPRPDO, to copy all trace entries that were created during the time span of interest. Figure 24 on page 36 shows an example to copy the trace records created from Julian date 92.277 at 23:50:05 (5 seconds and 50 minutes past 11 p.m.) through 92.278 at 00:10:00 (10 minutes past midnight). Also, if the required time span is included in several PDA data sets, the data sets can be concatenated in chronological order in the JCL.

```
//PDACOPY  JOB  MSGCLASS=A
//S1       EXEC PGM=ARCPRPDO
//ARCMSG   DD   SYSOUT=*
//ARCPRINT DD   SYSOUT=*
//ARCPDO   DD   DSN=RMM.PDOY,DISP=SHR
//ARCOUT   DD   DSN=OY99999.PDOY,LABEL=(1,SL),VOL=SER=TAPE01,
//     DISP=(NEW,KEEP),UNIT=TAPE
//SYSIN    DD   *
   COPY
   NOPRINT
   START(92277,235005)
     END(92278,001000)
```

Figure 24. Copying trace records from multiple PDA data sets

Chapter 4. Using the DFSMSrmm IPCS verb exit routine

You can invoke the DFSMSrmm IPCS verb exit routine by using the IPCS VERBEXIT subcommand to obtain diagnostic information. The DFSMSrmm verb exit routine dumps or interprets most DFSMSrmm control blocks including VSAM and buffer-related information. Full DFSMSrmm diagnostic information is available only when an SVC dump includes the DFSMSrmm address space. If the dump does not include the DFSMSrmm address space, the DFSMSrmm verb exit routine interprets only limited information.

Related Reading: See *z/OS MVS IPCS Commands* for more information about using IPCS.

DFSMSrmm IPCS verb exit EXEC parameters

The DFSMSrmm IPCS Verb exit routine supports these EXEC parameters:

HELP
Specify to produce the help information available in the verb exit.

MINOPT
Specify to produce minimum information which includes startup information. No information about any requests is produced.

The DFSMSrmm IPCS verb exit routine can be used to override IPCS session parameters like PRINT and TERMINAL. You can override the session parameters by appending them to the IPCS VERBEXIT subcommand.

PRINT | NOPRINT
Specify to control the production of the IPCSPRNT PRINT file.

TERMINAL | NOTERMINAL
Specify to control the production of the IPCS terminal output.

Example: Use this subcommand to request minimum IPCS output that is displayed at the terminal and is also printed.

```
VERBX RMMDATA 'MINOPT' TERM PRINT
```

Figure 25. Invoking the DFSMSrmm RMMDATA verb exit routine

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Chapter 5. Building a keyword string

This topic provides you with the tasks you need to build a keyword string. A keyword describes a part of a failure. You use a completed keyword string to search the IBM Software Support database for a possible resolution to the failure. When you perform a software database search or contact the IBM Support Center for help, identify the failure using all keywords that apply. See Appendix A, "Keyword worksheet," on page 55 for a worksheet you can use to document problem related information including the keyword string.

The tasks you perform are described in these topics.

- "Finding the component identification keyword" on page 40
- "Finding the release level" on page 40
- "Determining the type-of-failure" on page 41
- "Building keywords for module-related errors" on page 48
- "Building modifier keyword strings" on page 49

These keywords are required for every keyword string you build:

- Component identification
- Release level
- Type-of-failure

These keywords are optional. However, you should include them in your keyword string whenever possible:

- Module keyword or control section (CSECT)
- Modifier keywords
  - Function (when possible)
  - Subfunction (if applicable)
  - Other significant failure-related modifiers

Each keyword you add makes the search argument more specific. The more precise the keyword string, the more selective the search, yielding fewer matches in the Software Support database. If you do not find a similar problem in the database, you can broaden the scope of the search by deleting keywords, beginning at the end of the string.

Here is a sample completed keyword string for an abend:

Sample keyword string: 5695DF186 R220 ABEND001 EDGRDSN

where:

5695DF186
Is the component keyword.

R220
Is the release level keyword.

ABEND001
Is the type-of-failure keyword with the abend code appended.

EDGRDSN
Is the module keyword.

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Finding the component identification keyword

The DFSMSrmm component identifier is the first keyword in the search argument. The number identifies DFSMSrmm within the IBM Software Support database.

1. The component identification keyword is nine characters long. For DFSMSrmm, the keyword is 5695DF186.

   Keyword string so far: 5695DF186

2. Continue with "Finding the release level" on page 40 to determine the current release level keyword for DFSMSrmm.

Finding the release level

The release level keyword, used with the component identification keyword, narrows the search. The release level keyword consists of the prefix R, followed by the last three characters of the Function Modification Identifier (FMID) indicated at the start of a module. The FMID used in these examples is the DFSMS V2R2 DFSMSrmm FMID HDZ2220. The Kanji FMID is JDZ222K.

1. Use one of these techniques to obtain the DFSMSrmm release level keyword:
   - Find the FMID that identifies a release of DFSMSrmm listed in the *z/OS Program Directory* that is shipped with the product tape.
   - Use SMP/E to obtain the release level keyword:
     a. List the consolidated software inventory, using these SMP/E control statements. Be sure to include the period at the end of the control statements.

        ```
        SET BDY (tgtzone).
        LIST MOD (name) XREF.
        ```

     b. In the NAME column of the consolidated software inventory, locate the name of the module causing the problem.
     c. In the entry for the module, find the FMID field. Append the three low-order digits in the FMID field to the keyword prefix R.
   - Locate the module in the dump by scanning the comment or eyecatcher portion in the address range that is associated with the failure-related module. The first part of the module contains the components:
     – Copyright statement
     – Module name
     – FMID
     – Service level, which is the program temporary fix (PTF) number or Authorized Program Analysis Report (APAR) number of the module

     In the copyright area, find the FMID field. Append the three low order digits in the FMID field to the keyword prefix R.
2. Add the release level to your keyword string:

   Keyword string so far: 5695DF186 R220

3. Continue with "Determining the type-of-failure" on page 41 to determine the type of failure.

Determining the type-of-failure

The type-of-failure keyword is used to identify an external symptom of a failure. This is a required keyword. Use Table 5 on page 41 to determine the type-of-failure keyword that best describes your problem.

Table 5. Type-of-failure keywords

Keyword	Description	Procedure
Abend	Abnormal termination indicated by: • An ISPF abend panel • A system message identifying an abend • SYS1.LOGREC messages	Go to "Building an abend keyword" on page 41.
Wait/Loop	Program unexpectedly suspended: • No program response • Repeating messages • Repeating sequence of DFSMSrmm ISPF panels	Go to "Building keywords for wait/loop problems" on page 45.
Message	Error indicated by: • System message • DFSMSrmm ISPF dialog message	Go to "Developing the message keyword" on page 46.
Incorrect Output	Error indicated by: • Incorrect or missing output • Incorrect DFSMSrmm ISPF panel flow or information	Go to "Developing keywords for incorrect output" on page 46.
Performance	Performance is less than what is expected	Go to "Defining keywords for performance problems" on page 47.
Documentation	Incorrect or incomplete documentation	Go to "Forming keywords for documentation problems" on page 48.

Building an abend keyword

This topic describes how to build an abend keyword for an abend occurring while you are using the DFSMSrmm ISPF dialog, or when you are running DFSMSrmm outside the dialog by using the RMM TSO subcommands.

You can identify an abend using any one of these methods:

- A program's printed system output
- A system message's text
- An ISPF abend panel
- A TSO message identifying an abend condition
- A SYS1.LOGREC record

Also, when DFSMSrmm abnormally ends, the system produces one or more of these outputs:

- DFSMSrmm ISPF dialog abend panel

- SVC Dump
- SYSABEND, SYSMDUMP, or SYSUDUMP

This topic explains how to gather the information to add to your keyword string as follows:

- For the DFSMSrmm ISPF dialog:

  ABENDXXX (required)
  RC (optional)
- For the rest of DFSMSrmm:

  ABENDXXX (required)
  MODULE (optional)
  OFFSET (optional)

DFSMSrmm ISPF dialog abends

This topic describes how to build the abend keyword using information from an ISPF abend panel or a TSO message.

ISPF abend panel

Figure 26 on page 42 shows a sample ISPF abend panel, which is displayed when an abend occurs in ISPF or in the DFSMSrmm ISPF dialog.

```
----------------------ERROR RECOVERY------------------------------

COMMAND ===>

    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    * *                                                           * *
    * *      ISPF PROCESSOR ENDED ABNORMALLY                      * *
    * *                                                           * *
    * *                                                           * *
    * *                                                           * *
    * *                                                           * *
    * *           Task ABEND code 0C1                             * *
    * *                                                           * *
    * *                                                           * *
    * *                                                           * *
    * *                                                           * *
    * *   Press ENTER to display primary option menu.             * *
    * *   Enter HELP command for list of common ABEND CODES.      * *
    * *                                                           * *
    * *                                                           * *
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Figure 26. Sample ISPF abend panel

When an ISPF abend panel appears, follow these steps to build the abend keyword:

1. Record the abend code in this format:

   ABEND*nnn*

   where:

   nnn
   Is the task abend code.

   For example, if the ISPF abend panel contains information as shown in "ISPF abend panel" on page 42:

   ```
   Task ABEND code 0C1
   ```

   your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 ABEND0C1

2. If a return code accompanies the message, include the return code in your keyword string as a modifier keyword. Append the code to the keyword prefix **RC**. For example, if the return code is 04, your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 ABEND0C1 RC4

3. Go to "Building keywords for module-related errors" on page 48 to build the next keyword in the string. Otherwise, continue to "TSO messages" on page 43.

TSO messages

When the DFSMSrmm ISPF dialog ends abnormally and ISPF is in TEST/TRACE mode, the system issues a TSO message to indicate the failure. This is not a DFSMSrmm ISPF dialog message. Figure 27 on page 43 shows a sample TSO message that identifies an abend condition:

```
* SPF  SUBTASK ABEND *
ISPF      ENDED DUE TO ERROR+
READY
```

Figure 27. Sample TSO abend message

A plus sign at the end of the message indicates that additional information is available. Enter a question mark for more information about the error. The question mark must be the next command entered from the terminal, or the supplemental information is lost. Figure 28 on page 43 shows the additional of information that appears when the plus sign is present at the end of the message.

```
 SYSTEM ABEND CODE 0C4 REASON CODE 0004
```

Figure 28. Sample TSO abend message additional information

1. Record the abend code in this format:

   ABEND*nnn*

   where:

nnn
Is the program interruption code related to the abend message.

For example, if the abend occurred because of a protection exception, your keyword string would look like this:

Keyword string so far: 5695DF186 R220 ABEND0C4

2. Go to "Building keywords for module-related errors" on page 48 to build the next keyword.

Building keywords for DFSMSrmm abends outside the DFSMSrmm ISPF dialog

Use this topic when you suspect that an abend has occurred somewhere other than the DFSMSrmm ISPF dialog.

Follow these steps to build the abend keyword:

1. Obtain a system dump.
   - Use the SUMDUMP printed from the SYS1.DUMPxx data set.
   - Obtain a system storage dump that contains the Link Pack Area (LPA), the nucleus and the user's program. Determine the system abend code by using either the symptom dump summary information in the system job log or the system storage dump.

     Related Reading: For information about obtaining and using symptom dump summary information, see *z/OS DFSMSdfp Diagnosis*.
2. Record the abend code in this format:

   ABEND*nnn*

   where:

   nnn
   Is the program interrupt code.

   For example, if the abend output contains this:

   ```
   Program interrupt code 00000001
   ```

   your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 ABEND0C1

3. Record the module name that appears in the abend output, along with the offsets indicated. Record the offset using this format:

   0FFSETX'nnnn'

   where:

   nnnn
   Is 1 to 4 hex digits containing no leading zeros.

   For example, if the abend output contains information as shown in Figure 29 on page 45, add the module name EDGINERS and offset X'1400' to the keyword string:

```
SYSTEM COMPLETION CODE=0C7  REASON CODE=00000007
 TIME=09.48.34  SEQ=00065  CPU=0000  ASID=0020
 PSW AT TIME OF ERROR  078D1000   85494740  ILC 6  INTC 07
   ACTIVE LOAD MODULE           ADDRESS=05493340  OFFSET=00001400
   NAME=EDGINERS
   DATA AT PSW  0549473A - F9335000  CB6C4780  A850D208
   GPR  0-3  00000E15  00000008  0000000A  05496BB0
   GPR  4-7  05496BB0  0548A080  000580F8  00000004
   GPR  8-11 854962AA  0548A008  05493F08  00FBE2C0
   GPR 12-15 85493340  00057CF0  854962E4  05494730
 END OF SYMPTOM DUMP
```

Figure 29. Sample abend output

Completed keyword string: 5695DF186 R220 ABEND0C7 EDGINERS OFFSET X'1400'

4. Go to Chapter 6, “Searching the IBM Software support database,” on page 51.

Building keywords for wait/loop problems

Use this topic to develop the WAIT or LOOP keyword in your keyword string. These conditions are symptoms of a wait or loop:

- Suspended activity while waiting for some condition to be satisfied
- Endless instruction loop
- Repeating messages
- Repeating sequence of panels
- No system response
- System abends

In DFSMSrmm, no program response indicates a wait condition. For example, a DFSMSrmm ISPF dialog panel might remain on the screen indefinitely after you have requested processing.

Recommendations: If you think that DFSMSrmm is not responding because it is processing a large amount of data, check these conditions:

- Ensure the MAXHOLD value has been correctly entered. You use the MAXHOLD value to specify the number of records the subsystem scans while holding a reserve on the DFSMSrmm control data set. If you use a large MAXHOLD number, the subsystem could hold a reserve of the control data set for a long time which impacts performance.
- Limit the number of list entries when you request a search by making your selection criteria more specific.

You can view the ISPF log to check for symptoms of a module loop if you are in the DFSMSrmm ISPF dialog. In your DFSMSrmm ISPF dialog user profile, specify that you want the DFSMSrmm ISPF dialog to record inter-module trace data.

This topic explains how to gather the information you need to add to your keyword string:

- For DFSMSrmm ISPF dialog:

  WAIT/LOOP (required)

- For the rest of the DFSMSrmm components:

  WAIT/LOOP (required)
  MODULE (optional)
  OFFSET (optional)

If you have obtained a dump, you can locate this information:

1. Find the program status word (PSW) in the dump as shown in Figure 30 on page 46 .

```
JOB S1REP001         STEP AUDREPT         TIME 123515   DATE 14286    ID = 000    CPUID = FF0158243090   PAGE
00000001
COMPLETION CODE      SYSTEM = 0C4      REASON CODE = 00000010

  PSW AT ENTRY TO ABEND   078D2000  000085C4  ILC  04  INTC  0010
```

Figure 30. Finding the PSW in the SYSUDUMP

2. Check whether the WAIT state bit (bit 14) of the PSW is on or off. In Figure 31 on page 46, the WAIT state bit is off.

```
  PSW AT ENTRY TO ABEND   078D2000  000085C4

  Bits                 12 13 14 15
                        1  1  0  1
```

Figure 31. Identifying a wait state

3. Determine which keyword you should use, **LOOP** or **WAIT**. If the WAIT state bit is off, use the keyword **LOOP**.

   Keyword string so far: 5695DF186 R220 LOOP

   If you have identified the failure as a wait condition, use `WAIT` as your type-of-failure keyword:

   Keyword string so far: 5695DF186 R220 WAIT

4. Go to "Building modifier keyword strings" on page 49 to build the next keyword in the string if the wait or loop occurred in the DFSMSrmm ISPF dialog.
5. Go to "Building keywords for module-related errors" on page 48 for information on adding the module and offset keywords to your string.

Developing the message keyword

This topic explains how to develop the message keyword in your keyword string. A message can indicate these types of failures:

A program or operation failure
Missing data or incorrect data
A data failure (catalog, user data)

You can add the message number and associated return and reason codes to your keyword string as follows:

MSGXXXXXXXX (required)
RC (optional for return code)
RC (optional for reason code)

To develop the message keyword for your keyword string, follow these steps:

1. Use **MSG** as your type-of-failure keyword, followed by the message identifier. For example, if the message identifier is EDG6646I, your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 MSGEDG6646I

2. If the message has a return code and reason code associated with it, append the return code to the keyword prefix **RC** and the reason code to the prefix **RC**. For example, if the return code is 12 and the reason code is 183, your keyword string would look like this:

   Completed keyword string: 5695DF186 R220 MSGEDG6646I RC12 RC183

3. Go to Chapter 6, "Searching the IBM Software support database," on page 51.

Developing keywords for incorrect output

Use this topic to develop the INCORROUT keyword when any of these conditions occur:

Expected output is not produced

Output is different than expected
Output should not be generated
DFSMSrmm ISPF dialog panel information or flow is erroneous

This topic explains how to gather the information you need in order to add to your keyword string:

INCORROUT (required)
MSG (optional)

Incorrect output can be the result of an earlier failure. This can be difficult to analyze because the component affected might not be the one that caused the problem. Review previous messages, abend codes, console logs, or other program responses. They might indicate the source of the failure.

Accumulate as much of this information as possible. The information can help you isolate or resolve your problem, and the IBM Support Center will request this information if you need to provide trap or trace information:

- When did you first notice the problem?
- How did you identify the problem?
- Were any system changes or maintenance recently applied, for example, a new device, software product, APAR, or PTF?
- Does the problem occur with a specific data set or device, at a particular time of day, or with any other unique condition?
- Does the problem occur in batch or TSO mode?
- Is the problem continuous or intermittent?
- Can you re-create the problem?

Before reporting a DFSMSrmm ISPF dialog panel problem, be sure that the incorrect output is not the result of a customized panel or message. If the panel was customized, retry the operation using the IBM-supplied copy. If the failure still occurs, continue with these steps.

To build the incorrect output keyword, perform these steps:

1. Use **INCORROUT** for your type-of-failure keyword.

   Keyword string so far: 5695DF186 R220 INCORROUT
2. If a message accompanied the failure, append the message identifier to the prefix **MSG**, and add that keyword to the keyword string. For example:

   Keyword string so far: 5695DF186 R220 INCORROUT MSGEDG7017I
3. For problems related to the DFSMSrmm ISPF dialog go to “Building modifier keyword strings” on page 49. Otherwise, go to Chapter 6, “Searching the IBM Software support database,” on page 51.

Defining keywords for performance problems

Performance is largely determined by a combination of throughput, response time, and availability. This topic helps you to define the performance keyword when you suspect that a DFSMSrmm component is causing poor system performance. It explains how to gather the information for all components to add to your keyword string:

PERFM (required).

Many performance problems are related to system tuning. Modifications to your system or its environment can also affect system performance.

Use the performance keyword only when you cannot correct the performance problem by system tuning.

1. Record this information:

   Actual performance
   Expected performance

Source of the expected performance criteria, and the order number and page number of the source document

2. Use **PERFM** as your type-of-failure keyword. Your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 PERFM

3. For problems related to the DFSMSrmm ISPF dialog, go to "Building modifier keyword strings" on page 49. Otherwise, go to Chapter 6, "Searching the IBM Software support database," on page 51.

Forming keywords for documentation problems

Use this topic when you encounter incorrect or missing information in a DFSMSrmm publication.

This topic explains how to gather the information for all components to add to your keyword string.

DOC (required)
Document Number (optional)
Message Number (optional)

For a minor publication error, submit a Reader's Comment Form from the back of the publication in error. If the error is serious and of general concern to other users:

1. Record the document page in error. You should describe the error and the problem it caused.
2. Use DOC as your type-of-failure keyword, followed by the order number of the publication. Omit the hyphen and level number.

   For example, if the order number is SC26-7333-00, your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 DOC SC267333

3. For documentation problems related to a message, append the message identifier to the keyword prefix **MSG**, and add it to the keyword string as a modifier keyword.

   For example, if the message is EDG5306E, your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 DOC SC267333 MSGEDG5306E

4. For problems related to the DFSMSrmm ISPF dialog, go to "Building modifier keyword strings" on page 49. Otherwise, go to Chapter 6, "Searching the IBM Software support database," on page 51.

Building keywords for module-related errors

Use this topic to build the module keyword for your keyword string. The module keyword identifies the failure-related control section (CSECT). A load module has one or more individually replaceable CSECTs.

The CSECT name describes the area of suspected failure more precisely than does the load module name. However, you can specify either or both names to vary the keyword string when you search the IBM Software Support database.

If ABEND is the type of failure, follow one of these procedures to find the module name.

Using the ISPF log to find the module name

If the problem is in the DFSMSrmm ISPF dialog, use the ISPF log to determine the failing module name by performing these steps:

1. Examine the ISPF log to locate an entry that indicates the abend.
2. If the entry contains a module name, for example EDGRDDIS, record the module name for your module keyword and continue with "Building modifier keyword strings" on page 49. Your keyword string would look like this:

   Keyword string so far: 5695DF186 R220 ABEND0C1 EDGRDDIS

   If you cannot determine the module name from the ISPF log, continue with "Building modifier keyword strings" on page 49.

Finding the failing module name for an abend type-of-failure

To find the failing module name for an abend type-of-failure, perform these steps:

1. If the system issued a message identifying an abend condition, the module name might appear in the message text. If it does, use the entire module name as the module keyword. Go to "Building modifier keyword strings" on page 49.
2. If an environmental error record editing and printing program (EREP) software record exists for the failure, use it to identify the failing module name and offset information. Give the entire module name as the module keyword. Go to "Building modifier keyword strings" on page 49. See *EREP User's Guide* for information about EREP software records.
3. Scan the dump as shown in Figure 32 on page 49 for the failing module name.

```
SYSTEM COMPLETION CODE=0C7  REASON CODE=00000007
 TIME=09.48.34  SEQ=00065  CPU=0000  ASID=0020
 PSW AT TIME OF ERROR  078D1000   85494740  ILC 6  INTC 07
   ACTIVE LOAD MODULE           ADDRESS=05493340  OFFSET=00001400
   NAME=EDGINERS
   DATA AT PSW  0549473A - F9335000  CB6C4780  A850D208
   GPR  0-3  00000E15  00000008  0000000A  05496BB0
   GPR  4-7  05496BB0  0548A080  000580F8  00000004
   GPR  8-11 854962AA  0548A008  05493F08  00FBE2C0
   GPR 12-15 85493340  00057CF0  854962E4  05494730
 END OF SYMPTOM DUMP
```

Figure 32. Sample dump containing a module name

4. Use the entire module name as the module keyword. In Figure 32 on page 49, the module name is EDGINERS.
5. Use Interactive Problem Control System (IPCS) to format any dumps written as described in Chapter 4, "Using the DFSMSrmm IPCS verb exit routine," on page 37.
6. See *z/OS MVS IPCS User's Guide* for more information.
7. Go to "Building modifier keyword strings" on page 49.

Building keywords for wait and loop types-of-failure

To obtain a system dump that includes the system trace table, perform these steps:

1. Use the system trace table to get the name of the module. If the problem is a loop, you might need a generalized trace facility (GTF) trace.
2. Go to "Building modifier keyword strings" on page 49.

Building keywords for message types-of-failure

If the message was issued at the wrong time or under the wrong conditions, specify the name of the detecting module as the module keyword.

Go to "Building modifier keyword strings" on page 49.

Building modifier keyword strings

Use this topic to help you build modifier keywords to add to your keyword string. The modifier keywords are optional, but can help restrict the scope of a software database search to a manageable number of matches. You can specify modifier keywords in any order.

You can often identify the failing function when you determine the type of failure. You might find a failure-related general register or a control block that contains incorrect data every time the failure occurs. You can identify the probable failing component from a failure-related indication, such as a message or unique

abend code. Select a modifier keyword that describes a failure-related function from Table 7 on page 91.

1. Examine the list of function modifier keywords to see if any modifier keywords describe an aspect of the failure. Add appropriate modifier keywords to your keyword string.
2. For incorrect output or performance types of failure, the system might not provide enough information to identify a failure-related module. If, however, you can identify a failure-related function or other modifier, use it as the modifier keyword.
3. After completing your keyword string, go to Chapter 6, “Searching the IBM Software support database,” on page 51 for information on searching the IBM Software Support Database.
4. If you cannot relate an ISPF log entry to the failure (incorrect output, wait or loop type of failures), choose the appropriate modifier keyword from Table 7 on page 91 . For example, if the failure is related to a problem with the DFSMSrmm control data set, add CDS to your keyword string.

   Complete your keyword string.

   Completed keyword string: 5695DF186 R220 CDS

   You might also find it helpful to use the HIPER/Y or P/E keywords in your keyword string. Use HIPER/Y when you want to search for all HIPER APARs that are high impact or pervasive APARs. Use P/E in your keyword string when you want to search for all P/E APARs. You can also add a data range in your keyword string to narrow the search based on the date. This example shows a keyword string example that will display HIPER DFSMSrmm 2.2.0 APARs that closed between October 1, 2014 and a current date in January 2015.

   ```
   HIPER/Y 5650DF186 R220 CL14/10/.-CL15/01/.
   ```

5. Go to Chapter 6, “Searching the IBM Software support database,” on page 51.

Chapter 6. Searching the IBM Software support database

You are now ready to search the IBM Software Support database, using the keyword string you compiled earlier as a search argument:

1. Search the IBM Software Support database by using a search tool, such as Info Access, or by calling the IBM Support Center for help.

   The IBM Support Center might have the correction if the problem has been reported before. This correction could be a PTF, an APAR fix, or a bypass of the problem.
2. If you find a set of APAR closing descriptions in the IBM Software Support database, compare them with your problem.
3. If you find an APAR that matches your problem, apply the PTF, the APAR fix, or the bypass described in the APAR to correct your problem.
4. If you cannot find an appropriate APAR, try varying your search argument. For example:
   - Drop one keyword at a time, starting at the end of your keyword string.
   - If your type-of-failure keyword is LOOP, WAIT, or PERFM, try searching with one or two of the other three keywords. Sometimes what seems like a WAIT state might actually be a loop or a performance problem.
   - Try dropping the release level keyword from your keyword string. The problem might have been reported for an earlier release.
   - If more than one type-of-failure keyword applies (for example, an abend and a message both occur), try all combinations of those keywords.
5. If you were unable to find the solution to your problem, see Chapter 7, “Contacting the IBM Software Support Center,” on page 53.

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Chapter 7. Contacting the IBM Software Support Center

If you need to contact the IBM Software Support Center for help, you should supply this information:

- Customer number
- Processor number (type, model, serial)
- Component ID (DFSMSrmm)
- Current release level
- Current service level (list of APARs and PTFs applied)
- The keyword string or strings that you have built

If you need to submit an APAR, the IBM Software Support Center will give you assistance in completing it. The IBM Software Support Center will ask you to describe your DFSMSrmm environment. Include applicable items from this list:

- JCL listings
- Storage dump (at time of failure)
- Link-edit map
- Console printout
- Other relevant supporting material

DFSMSrmm includes the EDGIPDA utility that is provided for IBM Software Support problem determination use only.

When you submit any of the requested documentation on tape, write it on a standard label tape. Also provide a hardcopy of the DCB information for each data set and the JCL used to create the tape.

Here is some additional information you can provide to help in problem determination:

Symptom	Information
Problems with the DFSMSrmm Web service	Check to see if the file, /usr/RmmJApiLogfile, is available on your system. If yes, be prepared to send it to IBM.
CIM provider returns no data	To have sufficient log entries available for problem diagnosis, set the logging level to INFO (log4j.rootCategory = INFO, R within rmmlog.properties), and rerun the CIM-provider request. Be prepared to send the log file, rmmcim.log, to IBM.
Volume record not updated	• Was the volume being read or written? • Was the volume defined through the DFSMSrmm ISPF dialog or TSO subcommands? • Which file on the tape was not updated?
Problems with one of the DFSMSrmm SEARCH commands	• What search parameters did you specify? • Were you using the DFSMSrmm ISPF dialog or TSO subcommands?
EDGUTIL VERIFY produces errors	Send a list of all the messages produced by EDGUTIL.
Abends that occur in batch jobs	Rerun the job with a SYSUDUMP DD statement and send the dump output.

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Symptom	Information
Problems encountered in the DFSMSrmm ISPF dialog	Provide the panel ID where the message appeared. You can obtain the panel ID by issuing the ISPF PANELID command and the message ID by issuing the ISPF MSGID command.
Problems with conversion	Beginning with z/OS release V2R1, the conversion tools for DFSMSrmm will no longer be supported by IBM and all related materials have been removed from SYS1.SAMPLIB and SYS1.LINKLIB. All conversion programs and samples are still available to clients who intend to migrate to DFSMSrmm through the IBM Software Migration Project Office (SMPO) (www.ibm.com/software/solutions/softwaremigration). Depending on your current software release levels, these samples, provided As-Is, will be completely functional. Should your software release levels be incompatible with the As-Is samples, you are free to modify them for your own use or engage the services of the SMPO. The SMPO can be contracted to provide sample updates, as well as full DFSMSrmm migration services. The appropriate contacts are listed under Storage Management. If needed, the conversion documentation that had been available in EDGCMM01 and EDGCMM0S is available on z/OS downloads (www.ibm.com/systems/z/os/zos/downloads) as the "Data Extraction Programs Users Guide for Conversion to DFSMSrmm.pdf".

Appendix A. Keyword worksheet

Date:	**Time:**	**IBM Problem Number:**

Problem description (including symptoms not described by keywords)

IBM licensed program information

Product Name:	**FMID:**		
Modification:	Feature:	Order Number:	PUT Tape Level:

Base z/OS system information

Name:	**FMID:**	**PUT Tape Level:**

Keywords

Type-of-Failure:	**Component ID:**
Module Name:	Modifiers:
Release Level:	

Search arguments used

Information provided by IBM Support Center

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Appendix B. DFSMSrmm trace command suffixes

Table 6 on page 57 lists the trace command suffixes that you can specify to obtain information while you are in the DFSMSrmm ISPF dialog.

Table 6. DFSMSrmm trace command suffixes

To Trace	Specify Suffix
Input verification functions	ADDQ
All control functions	CNTL
Dataset, adding functions	DADD
Date functions	DATE
Dataset, changing functions	DCHA
Dataset, deleting functions	DDEL
Dataset, listing functions	DDIS
Dataset, searching	DSCH
All dataset functions	DSN
Exit functions	EXIT
Report definition and tool criteria management functions	GCON
ICETOOL Report Generator functions	GICE
Report definition functions	GRD
Report management functions	GREP
Report tool functions	GRT
Report type functions	GRTD
Access functions	ISPF
Search results line command processing	LCMD
Option functions	OPT
All owner functions	OWNR
Product, adding functions	PADD
Product, volume adding functions	PADV
Product, changing functions	PCHA
Product, deleting functions	PDEL
Product, listing functions	PDIS
Product, volume deleting functions	PDLV
All product functions	PP
Product, searching functions	PSCH
All rack and bin functions	RACK

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Table 6. DFSMSrmm trace command suffixes (continued)

To Trace	Specify Suffix
Rack and bin, adding functions	RADD
Rack and bin, deleting functions	RDEL
Rack and bin, listing functions	RDIS
Rack and bin, searching functions	RSCH
Save functions	SAVE
Volume, adding functions	TADD
Volume, changing functions	TCHA
Volume, confirmation functions	TCON
Volume, listing functions	TDIS
Duplicate volume processing	TDUP
Volume, releasing functions	TREL
Volume, requesting functions	TREQ
Volume, searching functions	TSCH
Select primary command	TSEL
All volume functions	TVOL
VRS, adding functions	VADD
VRS, changing functions	VCHA
VRS, deleting functions	VDEL
VRS, listing functions	VDIS
All VRS functions	VRS
VRS, searching functions	VSCH

Appendix C. DFSMSrmm system and user completion codes

System completion codes

These are the system completion codes issued during DFSMSrmm processing.

F13

Explanation

At OPEN time for tape data sets, DFSMSrmm fails to update the DFSMSrmm control data set with information about tape usage or the operator mounted a volume that is not acceptable to DFSMSrmm. DFSMSrmm issues an error message describing the reason why the volume cannot be used.

DFSMSrmm issues this code for one of these reasons:

- An error occurred performing I/O to the DFSMSrmm control data set and the operator replied CANCEL to message EDG4001D.
- The DFSMSrmm journal file is locked and the operator replied CANCEL to message EDG4000D.
- The DFSMSrmm subsystem is not active and the operator replied CANCEL to message EDG4012D.
- The current volume was not acceptable to DFSMSrmm, and DFSMSrmm could find no other acceptable volume.

If DFSMSrmm returns a reason code or user completion code, this is an indication that a DFSMSrmm subsystem routine failed.

System action

The current OPEN request fails because no volume is available to satisfy the request.

Operator response

None.

Programmer response

When DFSMSrmm issues message EDG4000D or EDG4001D, refer to the suggested actions for the messages. When DFSMSrmm issues message EDG4012D, ensure that the DFRMM procedure is active and specify the correct volume and tape data set information for specific tape mount request.

Module

EDGOCEOV, EDGOCEXT, EDGOECM

F14

Explanation

DFSMSrmm fails to update the DFSMSrmm control data set with information about tape usage because the DFSMSrmm subsystem is not active. DFSMSrmm issues an error message to describe the problem. If a reason code or user completion code is provided, this is an indication that the DFSMSrmm subsystem routine failed.

System action

The CLOSE or End-Of-Volume processing fails. Processing depends on the application error recovery processing.

Operator response

Refer to the action described for the associated error message.

System programmer response

Refer to the action described for the associated error message.

Module

EDGOCEOV, EDGOCEXT

F37

Explanation

An error occurred during validation of a tape volume, or during updating of the DFSMSrmm control data set. DFSMSrmm issues an error message describing the error. DFSMSrmm issues F37 at End-Of-Volume, when validating the new volume for a multivolume tape data set or when recording the use of the previous volume.

DFSMSrmm issues F37 for one of these reasons:

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- An error occurred performing I/O to the DFSMSrmm control data set and the operator replied CANCEL to message EDG4001D.
- The DFSMSrmm journal file is locked and the operator replied CANCEL to message EDG4000D.
- The DFSMSrmm subsystem is not active and the operator replied CANCEL to message EDG4012D.
- The current volume was not acceptable to DFSMSrmm and DFSMSrmm could find no other acceptable volume.

If a reason code or user completion code is provided, this indicates that the DFSMSrmm subsystem routine failed. DFSMSrmm issues this code because either the DFSMSrmm subsystem is not active and the operator replied CANCEL to message EDG4012D or because the current volume was not acceptable to DFSMSrmm and DFSMSrmm could find no other acceptable volume.

System action

The current EOV request fails.

Operator response

None.

Programmer response

When DFSMSrmm issues message EDG4000D or EDG4001D, refer to the suggested actions described for the messages. When DFSMSrmm issues message EDG4012D, ensure that the DFRMM procedure is active and specify the correct volume and tape data set information for specific tape mount requests. If a tape volume is rejected because it violates DFSMSrmm tape usage rules, correct your JCL and rerun the job.

Module

EDGOCEOV, EDGOECM

User completion codes

These are the user completion codes issued during DFSMSrmm processing.

U0001

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a GET DIRECT request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO, EDGSOCE

U0002

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a GET DIRECT request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGSOCE

U0003

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a GET KEY GREATER THAN request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0004

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a GET KEY GREATER OR EQUAL request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0005

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a request to gain exclusive use of the control data set.

System action

Processing fails.

Operator response

None

System programmer response

An associated error message is issued with details of the error. Refer to that message for corrective actions.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO, EDGSOCE

U0006

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a LOGICAL ADD request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO, EDGSOCE

U0007

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a CHANGE request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO, EDGSOCE

U0008

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a LOGICAL DELETE request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO, EDGSOCE

U0009

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a SEARCH request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0010

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a SEARCH NEXT request.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0011

Explanation

An error occurred processing OWNER information in the DFSMSrmm control data set.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0012

Explanation

An error occurred processing PRODUCT information in the DFSMSrmm control data set.

System action

Processing fails.

Operator response

None

System programmer response

A possible error exists in the logic of the DFSMSrmm control data set. Use the utility EDGUTIL to verify the contents of the DFSMSrmm control data set.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0013

Explanation

An error occurred performing I/O to the DFSMSrmm control data set during a request to release exclusive use of the control data set.

System action

The current processing fails.

Operator response

None

System programmer response

DFSMSrmm issues an error message describing the error. Refer to that message for corrective actions.

Programmer response

Report this error to the system programmer.

Module

EDGMTSO

U0014

Explanation

A search request specifying a generic name fails.

System action

The current request fails. The reason code is the return code from an internal DFSMSrmm service routine.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMTSO

U0015

Explanation

A volume is being added or changed and information about it should be in the volume catalog. The DFSMSrmm request to retrieve information from the volume catalog has failed.

System action

The current request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMTSO

U0016

Explanation

A volume is being added or changed that has outstanding actions or moves against it. DFSMSrmm was unable to update the control data set with the specified actions.

System action

The current request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMTSO

U0030

Explanation

A logic error occurred in DFSMSrmm Open/Close/EOV processing.

System action

The current Open/Close/EOV request processing fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSOCS

U0093

Explanation

An error occurred in TPUT handling while parsing parameters.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARS

U0100

Explanation

An error occurred establishing a recovery environment for a DFSMSrmm program. At the time of the abend, Register 15 contains the ESTAE macro return code.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGINERS, EDGPARM

U0100

Explanation

An error occurred performing RACROUTE RACHECK.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0100

Explanation

During subsystem interface initialization, a system function failed to complete successfully.

System action

Initialization stops. The reason code is the return code from the system function that failed.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSSSI

U01nn

Explanation

The DFSMSrmm subsystem encounters an error and cannot recover. DFSMSrmm issues an error message to describe the failure. *nn* in the completion code is the code returned from the failing service routine used.

System action

The DFSMSrmm subsystem stops.

Operator response

Report this error to the system programmer.

System programmer response

Determine the cause of the error and correct it if possible. If the error cannot be corrected, report this error to the IBM Support Center.

Module

EDGQMGR

U0101

Explanation

The DFSMSrmm subsystem inventory management processing encounters an error and cannot continue. A request to perform I/O to the DFSMSrmm control data set has failed. The abend reason code is the return code from the DFSMSrmm I/O request.

System action

The DFSMSrmm inventory management request fails.

Operator response

Report this error to the system programmer.

System programmer response

Determine the cause of the error and correct it if possible. If the error cannot be corrected, report this error to the IBM Support Center.

Module

EDGMHKP

U0110

Explanation

An error occurred performing a RACROUTE RACDEF-DELETE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0111

Explanation

An error occurred performing a RACROUTE RACDEF-DELETE when a related delete had already been successful.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0120

Explanation

An error occurred performing a RACROUTE RACDEF-ADDVOL.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0124

Explanation

An error occurred when attaching the DFSMSrmm subtasks. The completion code is accompanied by a reason code, which is the return code from the ATTACH macro.

System action

The DFSMSrmm subsystem stops.

Operator response

Report this error to the system programmer.

System programmer response

If recovery is not possible, report this error to the IBM Support Center.

Module

EDGAMGR

U0125

Explanation

An error occurred while checking the device type of the data set allocated during inventory management. The completion code is accompanied by a reason code, which is the return code from the DEVTYPE macro.

System action

The DFSMSrmm subsystem stops.

Operator response

Report the error to the system programmer.

System programmer response

If recovery is not possible, report this error to the IBM Support Center.

Module

EDGAMGR

U0126

Explanation

An error occurred when deallocating the data set allocated during inventory management. The completion code is accompanied by a reason code, which is the return code from SVC 99.

System action

The DFSMSrmm subsystem stops.

Operator response

Report the error to the system programmer.

System programmer response

If recovery is not possible, report this error to the IBM Support Center.

Module

EDGAMGR

U0130

Explanation

An error occurred performing a RACROUTE RACDEF-DEFINE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0150

Explanation

An error occurred performing a RACROUTE RACXTRT - EXTRACT.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0160

Explanation

An error occurred performing an ICHEINTY DELETE ACCESS LIST.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0170

Explanation

An error occurred performing a RACROUTE RACXTRT - REPLACE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0180

Explanation

A logic error occurred in DFSMSrmm RACF processing.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0200

Explanation

An error occurred performing a RACROUTE RACHECK.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0200

Explanation

The DEVTYPE macro returned an unacceptable return code when checking for the PARMLIB DD.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0200

Explanation

During subsystem interface initialization, a system function failed to complete successfully.

System action

Initialization stops. The reason code is the return code from the system function that failed.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSSSI

U02nn

Explanation

The DFSMSrmm subsystem encounters an error and cannot recover. DFSMSrmm issues an error message to describe the failure. *nn* in the completion code is the code returned from the failing service routine used.

System action

The DFSMSrmm subsystem stops.

Operator response

Report this error to the system programmer.

System programmer response

Determine the cause of the error and correct it if possible. If it is not possible to correct the error, contact the IBM Support Center.

Module

EDGQMGR

U0220

Explanation

An error occurred performing a RACROUTE RACDEF - ADDVOL.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0230

Explanation

An error occurred performing a RACROUTE RACDEF - DEFINE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0300

Explanation

An error occurred performing a RACROUTE RACHECK.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0300

Explanation

The PARMLIB DD is allocated to a non-DASD device type.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Provide a parmlib data set to DFSMSrmm that resides on a DASD device.

Module

EDGPARM

U0300

Explanation

During subsystem interface initialization, DFSMSrmm could not issue a message. The DFSMSrmm message processing routine returned an error indication.

System action

Initialization stops. The reason code is the return code from the DFSMSrmm message routine that failed. An error message is issued by the message routine.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSSSI

U03nn

Explanation

The DFSMSrmm subsystem encounters an error and cannot recover. DFSMSrmm issues an error message to describe the failure. *nn* in the completion code is the code returned from the failing service routine used.

System action

The DFSMSrmm subsystem stops.

Operator response

Report this error to the system programmer.

System programmer response

Determine the cause of the error and correct it if possible. If it is not possible to correct the error, contact the IBM Support Center.

Module

EDGQMGR

U0301

Explanation

An error occurred while issuing a message to the TSO terminal.

System action

Processing ends.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0302

Explanation

The DFSMSrmm subsystem issued an unexpected return code and reason code.

System action

Processing ends.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0303

Explanation

An error occurred while using the TSO service routine IKJCT441 to set the variable that contains the command failure reason code.

System action

Processing ends.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0304

Explanation

An error occurred while using the TSO service routine IKJCT441 to set the variable that contains the command error information message text.

System action

Processing ends.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0305

Explanation

An error occurred determining the validity of an SMS location or DFSMS Storage Group.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0306

Explanation

An error occurred determining if the SMS subsystem was active.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSO

U0307

Explanation

An error occurred during CLIST processing.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGTSOCL

U0350

Explanation

An error occurred performing a RACROUTE RACXTRT - EXTRACT.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0360

Explanation

An error occurred performing an ICHEINTY DELETE ACCESS LIST.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0370

Explanation

An error occurred performing a RACROUTE RACXTRT - REPLACE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0380

Explanation

An error occurred performing a RACROUTE DEFINE for a tape data set. DFSMSrmm tried to create the first entry in the TVTOC for a tape volume. TAPEVOL class and TAPEDSN option are in use and neither ADSP nor PROTECT=YES is specified in the JCL.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0400

Explanation

An error occurred performing a RACROUTE RACHECK.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0400

Explanation

An attempt to obtain the Job File Control Block (JFCB) for the PARMLIB DD failed.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U04nn

Explanation

The DFSMSrmm subsystem encounters an error and cannot recover. DFSMSrmm issues an error message to describe the failure. *nn* in the completion code is the code returned from the failing service routine used.

System action

The DFSMSrmm subsystem stops.

Operator response

Report this error to the system programmer.

System programmer response

Determine the cause of the error and correct it if possible. If it is not possible to correct the error, report this error to the IBM Support Center.

Module

EDGQMGR

U0410

Explanation

An error occurred performing a RACROUTE RACDEF - DELETE.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0500

Explanation

An error occurred performing a catalog LOCATE request.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0500

Explanation

DFSMSrmm failed to open the data set referred to by the PARMLIB DD.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0510

Explanation

An error occurred performing a catalog DELETE request.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0520

Explanation

An error occurred performing a catalog ALTER request.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGRACF

U0600

Explanation

The DFSMSrmm subsystem did not find the parmlib member to be used for the PARMLIB DD.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0630

Explanation

A processing error has occurred in DFSMSrmm utility EDGUPDT or EDGBKUP. An internal error has occurred. The reason code in register 15 uniquely identifies the error.

System action

The current processing fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center. You need the completion code and reason code, and any system dump that has been created.

Module

EDGUPDT, EDGBKUP

U0640

Explanation

A processing error has occurred in DFSMSrmm utility EDGINERS. An internal processing error has occurred. The reason code in register 15 uniquely identifies the error.

System action

The current processing fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center. You need the completion code and reason code, and any system dump that has been created.

Module

EDGINERS

U0650

Explanation

An error occurred determining if the SMS subsystem was active. You have tried to use the VOLCAT processing option for the EDGUTIL utility and SMS must be active if that option is used.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGUTIL

U0651

Explanation

An error occurred determining if a volume location name is valid on the current system. You are using the VOLCAT processing option for the EDGUTIL utility and for each volume that is in a system-managed tape library. DFSMSrmm validates the location name prior to checking that the DFSMSrmm location name value matches that recorded in the volume catalog.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGUTIL

U0652

Explanation

The utility, EDGUTIL, failed to add a message to the SYSPRINT file.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0653

Explanation

An error occurred releasing a control data set record.

System action

Processing fails. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0654

Explanation

An error occurred updating the control data set control record.

System action

Processing fails. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0655

Explanation

An error occurred sorting data set records.

System action

Processing fails. The system writes a dump.

Operator response

Report the error to the system programmer.

System programmer response

Correct the error that caused the SORT program to fail. Use the //SORTDIAG DD statement to trigger sort messages to the //SYSOUT file. These DD statements must be added to the job step executing the EDGBKUP or EDGUTIL utility.

If the failure is not sort related, report the problem to the IBM Support Center. Provide the system dump written as a result of the ABEND U0655.

Module

EDGBKUP or EDGUTIL

U0656

Explanation

An error occurred locating the UCB address of the control data set.

System action

IEFDDSRV processing has failed. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGBKUP, EDGMAIN , EDGUTIL

U0657

Explanation

EDGUTIL detected an invalid VRS record type.

System action

The current request fails, and EDGUTIL ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0658

Explanation

An internal error occurred in the DFSMSrmm utility EDGUTIL.

System action

The current request fails, and EDGUTIL ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0659

Explanation

Library communication failed.

System action

The current request fails, and EDGUTIL ends. An explanatory message, EDG6847E, is issued to the SYSPRINT file.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0660

Explanation

Filter processing failed.

System action

The current request fails, and EDGUTIL ends. An explanatory message, EDG6848E, is issued to the SYSPRINT file.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGUTIL

U0661

Explanation

An error occurred locating the TIOT address of the JOURNAL file.

System action

GETDSAB processing has failed. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGBKUP. The GETDSAB return code is included in Register 15.

U0662

Explanation

An error occurred in dynamic allocation of a temporary data set. The reason code is the return code from the DYNALLOC macro.

System action

DFSMSrmm writes a dump and recovery processing begins.

Operator response

Report this error to the system programmer.

System programmer response

Review the return codes from DYNALLOC and take appropriate actions.

Module

EDGBKUP

U0700

Explanation

The DFSMSrmm subsystem could not issue a message because of an error in the message processing routine.

System action

DFSMSrmm issues a WTO message and subsystem processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0800

Explanation

An error occurred during LOCDEF validation.

System action

Processing ends. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0801

Explanation

An error occurred in dynamic allocation of a temporary data set. The reason code is the return code from the DYNALLOC macro.

System action

DFSMSrmm writes a dump and recovery processing begins.

Operator response

Report this error to the system programmer.

System programmer response

Review the return codes from DYNALLOC and take appropriate actions.

Module

EDGCNVRP

U0802

Explanation

An error occurred obtaining information from the Job File Control Block (JFCB) of a temporary data set. The reason code is the return code from the RDJFCB macro.

System action

DFSMSrmm writes a dump and recovery processing begins.

Operator response

Report this error to the system programmer.

System programmer response

Review the return codes from RDJFCB and take appropriate actions.

Module

EDGCNVRP

U0803

Explanation

An error occurred in dynamic allocation of a temporary data set when attempting to deallocate the data set. The reason code is the return code from the DYNALLOC macro.

System action

DFSMSrmm writes a dump and recovery processing begins.

Operator response

Report this error to the system programmer.

System programmer response

Review the return codes from DYNALLOC and take appropriate actions.

Module

EDGCNVRP

U0804

Explanation

DFSMSrmm is processing a request to call a DFSMSrmm installation exit. An internal error has occurred. The reason code in register 15 uniquely identifies the error.

System action

The current processing fails.

Operator response

Report this error to the system programmer.

System programmer response

Report the error to the IBM Support Center. You need the completion code and reason code, and any system dump that has been created.

Module

EDGCMIX

U0810

Explanation

An error occurred processing a request from an OAM installation exit. The error is a result of processing in DFSMSrmm, not in the data passed to EDGLCSUX.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGLCSUX

U0811

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected Register 15 value on return from a subsystem request.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGLCSUX

U0812

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected Register 0 value on return from a subsystem request.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGLCSUX

U0813

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected return code from the DFSMSrmm common message routine.

System action

Processing ends. The system writes a dump.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGLCSUX

U0841

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected return code from the IDENTIFY macro.

System action

Processing ends. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGLCSUX

U0842

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected return code from the ATTACH macro.

System action

Processing ends. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGLCSUX

U0862

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected return code from the DETACH macro.

System action

Processing ends. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGLCSUX

U0879

Explanation

An error occurred processing a request from an OAM installation exit. The error is an unexpected return code from the STATUS macro.

System action

Processing ends. The system writes a dump.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGLCSUX

U0900

Explanation

DFSMSrmm is processing PRTITION or OPENRULE information. An internal error has occurred.

System action

The current parmlib processing fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARM

U0901

Explanation

The message EDG9001E was not found in the DFSMSrmm message table. EDG9001E is required to issue information for an error in message processing. The number of the message that was issued at the time of the abend is in Register 0.

System action

The current message processing fails. Each DFSMSrmm task schedules error recovery processing that can involve stopping the subsystem if the error is severe.

Operator response

Report this error to the system programmer.

System programmer response

This error is probably an error in EDGMTAB, the DFSMSrmm message table. Ensure that any updates to EDGMTAB have been made correctly.

Module

EDGCMSG

U0950

Explanation

An attempt to issue a message by the DFSMSrmm subsystem failed because of an error in the message processing routine. The associated message is either EDG2050I or EDG2051I.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGLOCV

U0998

Explanation

An attempt to release control of the DFSMSrmm control data set failed. Previous error messages explain the error that was encountered.

System action

The DFSMSrmm error recovery routines are run. The most probable result is that the DFSMSrmm subsystem will shut down until the error can be corrected.

Operator response

Report this error to the system programmer.

System programmer response

Correct the error and restart the DFSMSrmm subsystem. To correct the error, refer to the explanations and actions for the messages that have been issued.

Module

EDGMFIO

U0999

Explanation

This code can be issued by both EDGVRECR and EDGDFHSM.

Explanation

When the code is issued by EDGVRECR, an error is encountered in issuing a message.

Explanation

When the code is issued by EDGDFHSM, an unexpected return code was received in response to a DFSMSrmm subsystem request.

System action

The current VRSEL inventory management requests fails.

System action

DFSMSrmm writes a dump and current processing fails.

Operator response

None.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Programmer response

Ensure that the EDGMTAB message table is correctly installed. If EDGMTAB is correctly installed contact IBM for program support.

Programmer response

The volume being returned to DFSMSrmm from DFSMShsm might not have been correctly processed. If necessary, use the DFSMSrmm ISPF dialog or RMM TSO subcommand to correctly process information about the volume.

Module

EDGVRECR

Module

EDGDFHSM

U1000

Explanation

An error occurred in cross memory communication from the DFSMSrmm subsystem. DFSMSrmm could not issue a message because of an error in the DFSMSrmm message routine.

System action

Processing continues

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSXMC

U10nn

Explanation

An error occurred in STACK processing while parsing parameters for a request to set up an out file for the terminal. *nn* in the completion code is the return code from IKJSTCK.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARS

U1097

Explanation

An internal VSAM control block error was detected during DFSMSrmm VSAM buffer processing.

System action

The current request fails.

Operator response

Report this error to the system programmer.

System programmer response

Save any dumps written as a result of the abend. Report this error to the IBM Support Center. If the problem persists, restart the DFSMSrmm procedure to attempt recovery.

Module

EDGMVSM

U11nn

Explanation

An error occurred in STACK processing while parsing parameters for a request to close all input and output files used during parsing. *nn* in the completion code is the return code from IKJSTCK.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARS

U12nn

Explanation

An error occurred in STACK processing while parsing parameters when opening the PARMLIB member. *nn* in the completion code is the return code from IKJSTCK.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

If the DFSMSrmm parmlib data set is defined correctly, report this error to the IBM Support Center.

Module

EDGPARS

U13nn

Explanation

An error occurred in STACK processing while parsing parameters when opening the PARMLIB sequential file. *nn* in the completion code is the return code from IKJSTCK.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

If the DFSMSrmm parmlib data set is defined correctly, report this error to the IBM Support Center.

Module

EDGPARS

U14nn

Explanation

An error occurred in GETLINE processing while parsing parameters. *nn* in the completion code is the return code from GETLINE.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARS

U15nn

Explanation

An error occurred in PUTLINE processing while parsing parameters. *nn* in the completion code is the return code from PUTLINE.

System action

The current parse request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGPARS

U1600

Explanation

DFSMSrmm is processing a call to the installation exit, EDGUX100. The volume currently being opened should not be controlled by DFSMSrmm. DFSMSrmm checks that the request is valid, but some part of the validity checking process fails.

System action

The current open request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGIX100

U1601

Explanation

DFSMSrmm is processing a call to the installation exit, EDGUX100. Prior to calling the installation exit, DFSMSrmm tries to retrieve existing information it has for the mounted or requested volume. The call to the module that retrieves the information fails.

System action

The current open request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGIX100

U1602

Explanation

DFSMSrmm is processing a call to the installation exit EDGUX100. Prior to calling the installation exit, DFSMSrmm attempts to retrieve existing information it has for the mounted or requested volume. The UCBSCAN macro it uses to find information in UCBs has failed.

System action

The current request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center. From the summary dump, have available the general purpose

registers which are required for problem determination.

Module

EDGBLDUX

U1603

Explanation

DFSMSrmm is preparing a call to the installation exit, EDGUX100. An internal error has occurred while determining which OPENRULE entry should be used.

System action

The current OPEN/CLOSE/EOV request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGIX100

U1650

Explanation

A request to an internal service to get a tape device information is processed. A logical error occurred in the processing. It was caused by an activate of a dynamic configuration change performed around the time.

System action

The system writes a dump that accompanies with the EDG2800E message.

Operator response

Report the error to the system programmer.

System programmer response

Report the error to the IBM Support Center. Issue MODIFY DFRMM,M=xx to refresh DFSMSrmm subsystem to match it to the changed I/O configuration.

Module

EDGBLDUX

U2100

Explanation

Initialization must be performed prior to accessing the DFSMSrmm control data set.

System action

The request fails. The function being tried is indicated in the abend reason code.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMFIO

U2101

Explanation

RACF tape-related security profiles could not be created, updated, or deleted as a result of an update to the DFSMSrmm control data set and the current settings for installation options. DFSMSrmm issues a message to identify the error.

System action

Processing ends. The abend reason code is the RACROUTE reason code.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMFIO

U2130

Explanation

The DFSMSrmm subsystem could not issue a message because of an error in the message processing routine. The associated message is EDG2130I.

System action

Processing ends.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMFCNV

U2200

Explanation

An unexpected return code was received while performing I/O to the control data set. The subtask is unable to continue processing. Message EDG2201E has been issued to give error information.

System action

DFSMSrmm detects the abend and requests an SVC dump. The current inventory management request fails.

Operator response

Report this error to the system programmer.

System programmer response

If no other diagnostic information is available to resolve the problem, report this error to the IBM Support Center.

Programmer response

Follow the actions identified for EDG2201E.

Module

EDGVRECI

U2201

Explanation

An error is encountered in vital record processing. The error can be one of these:

- The SORT program return code is greater than 0. DFSMSrmm also issues message EDG2220E to the MESSAGE file.
- Location and library name validation failed with a return code greater than 8. DFSMSrmm also issues message EDG2222E to the MESSAGE file.

System action

The current VRSEL inventory management requests fails.

Operator response

None.

System programmer response

If the problem occurred performing a sort, correct the error that caused the SORT program to fail. Use the // SORTDIAG DD statement to trigger sort messages to the //SYSOUT file. These DD statements must be added to the DFRMM started procedure.

If the failure occurred during location and library name validation, follow the actions described for message EDG2222E. If the problem cannot be resolved by following the message actions, report the problem to the IBM Support Center. Provide the system dump written as a result of the ABEND U2201.

Module

EDGVRECM

U2220

Explanation

An error is encountered dynamically allocating a required file. DFSMSrmm issues message EDG2223E which contains the DYNALLOC return and reason code. Message EDG2223E is found in the message data set.

System action

The current VRSEL inventory management requests fails.

Operator response

None.

Programmer response

Follow the actions identified for EDG2223E. For an explanation of the DYNALLOC codes, refer to *z/OS MVS Programming: Authorized Assembler Services Guide*.

Module

EDGVRECI

U2222

Explanation

An internal error occurred in DFSMSrmm.

System action

The current requests fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

None.

U2223

Explanation

Vital record processing has ended early via the F DFRMM,CANCEL operator command.

System action

The current VRSEL inventory management request fails. An explanatory message, EDG2319I, is issued to the MESSAGE file. DFSMSrmm detects the abend. Expiration processing and any other requested inventory management functions end.

Operator response

None.

System programmer response

None.

Module

EDGVREC

U2224

Explanation

An internal error related to partitioning or openrule entries has occurred.

System action

The current OPEN/CLOSE/EOV or OAM request fails.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGSUSE

U2410

Explanation

An unexpected return code was received while performing I/O to the control data set. The subtask is unable to continue processing.

System action

An explanatory message, EDG2440I, is issued. DFSMSrmm detects the abend and the system writes an SVC dump. Expiration processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

If you are unable to resolve the problem using the available diagnostic information, report this error to the IBM Support Center.

Module

EDGMUPD

U2420

Explanation

An unexpected return code was received from the installation exit common processing routine.

System action

DFSMSrmm detects the abend and writes an SVC dump. Expiration processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

Report this error to the IBM Support Center.

Module

EDGMUPD

U2430

Explanation

An unexpected return code was received performing a function for a volume in a volume catalog. The subtask is unable to continue processing.

System action

An explanatory message, number EDG2433I, is issued. DFSMSrmm detects the abend and writes an SVC dump. Expiration processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

Refer to the actions for message EDG2433I.

Module

EDGMUPD

U2440

Explanation

An unexpected return code was received while updating action status information for a volume in the DFSMSrmm control data set. The subtask is unable to continue processing.

System action

An explanatory message, one of EDG2430I, EDG2431I, or EDG2432I is issued. DFSMSrmm detects the abend and writes an SVC dump. Expiration processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

Refer to the actions for any accompanying message. If reporting the problem to the IBM Support Center, have available the summary dump information.

Module

EDGMUPD

U2450

Explanation

An unexpected return code was received while validating software level, location name for a volume, or obtaining volume information from the volume catalog. The subtask is unable to continue processing.

System action

An explanatory message, number EDG2441I, is issued. DFSMSrmm detects the abend and writes an SVC dump. Expiration processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

Refer to the actions for message EDG2441I.

Module

EDGMUPD

U2460

Explanation

An unexpected return code was received while performing storage location management processing. The subtask is unable to continue processing.

System action

DFSMSrmm issues message EDG2442E. DFSMSrmm detects the abend and writes an SVC dump. Storage location management processing and any other requested inventory management functions end.

Operator response

Report this error to the system programmer.

System programmer response

If no other diagnostic information is available to resolve the problem, then inform the Software Support Center.

Module

EDGMUPD

U2603

Explanation

An unexpected return code was received from the external sort. The subtask is unable to continue processing.

System action

DFSMSrmm detects the abnormal end (abend) and writes an SVC dump. All inventory management functions end.

Operator response

None.

System programmer response

When your external SORT program is DFSORT, use the SORTDIAG DD statement to trigger sort messages to the SYSOUT file. These DD statements must be added to the DFRMM started procedure and should be coded as follows:

```
//SORTDIAG DD
DUMMY

//SYSOUT   DD SYSOUT=*
```

Refer to *z/OS DFSORT Messages, Codes and Diagnosis Guide* for information about using the SORTDIAG DD and *z/OS DFSORT Application Programming Guide* for information about obtaining DFSORT messages.

To resolve the problem, change DFSORT options using the DFSPARM DD statement. Refer to *z/OS DFSORT Application Programming Guide* for details about DFSORT options and how to use the DFSPARM DD. If the problem can not be resolved and no other diagnostic information is available to resolve the problem, report the error to the IBM Support Center.

Programmer response

Correct the error that caused the SORT program to fail and resubmit the job. If the problem occurs again, report this error to the system programmer.

Module

EDGXRPTX

U3000

Explanation

A DFSMSrmm OPEN/CLOSE/EOV routine was invoked for an undetermined OPEN/CLOSE/EOV exit.

System action

Processing fails.

Operator response

None

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEXT or EDGOCEOV

U3001

Explanation

A DFSMSrmm OPEN/CLOSE/EOV routine was invoked for an undetermined OPEN/CLOSE/EOV exit.

System action

The current request fails.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEOV

U3002

Explanation

DFSMSrmm returned an unsupported return code value to the module for label anomaly processing.

System action

The current request fails.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEOV

U3003

Explanation

DFSMSrmm returned an unsupported return code value to the module for file validation processing.

System action

The current request fails.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEOV

U3004

Explanation

An error occurred during O/C/EOV processing.

System action

The current request fails.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEOV

U3005

Explanation

DFSMSrmm does not support the request.

System action

The current request fails.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEOV

U3006

Explanation

DFSMSrmm issues a message but message processing fails. DFSMSrmm returns the return code and reason code from the message processing routine in register 2 and register 3.

System action

DFSMSrmm writes a system dump and fails the current request.

Operator response

None.

System programmer response

A logic error occurred during OPEN/CLOSE/EOV processing. Report this error to the IBM Support Center.

Programmer response

Report this error to the system programmer.

Module

EDGOCEXT

Appendix D. Modifier keywords

Use this topic to help you build modifier keywords to add to your keyword string. The modifier keywords are optional, but can help restrict the scope of a software database search to a manageable number of matches. You can specify modifier keywords in any order. Select a modifier keyword that describes a failure-related function from Table 7 on page 91.

Table 7. Function modifier keywords

Keyword	Failing Function
API	DFSMSrmm application programming interface
AUDIT	Audit function of EDGAUD
BACKUP	Control data set backup performed by the DFSMSrmm EDGBKUP utility
CATSYNCH	Catalog synchronize
CATSYNCHVERIFY	Catalog synchronize verify processing performed by the DFSMSrmm inventory management EDGHSKP utility
CDS	DFSMSrmm control data set
DIALOG	DFSMSrmm dialog
DSTORE	Storage location management processing performed by the DFSMSrmm inventory management EDGHSKP utility
DSTOREBYLOC	Storage location management processing only for defined locations
DUPVOL	Duplicate volume support
EDGTVEXT	DFSMShsm interface
EXPROC	Expiration processing performed by the DFSMSrmm inventory management EDGHSKP utility
EXTENDEDBIN	Extended bin support
EXTRACT	Report extract data set
HSKPBACKUP	Control data set backup performed by the DFSMSrmm inventory management EDGHSKP utility
INERSERASE	Erase function of EDGINERS
INERSINIT	Initialize function of EDGINERS
INSEQUENCE	Assigning volumes to bins in sequence during storage location management processing
JOURNAL	DFSMSrmm journal data set
MOVEBY	Moving volumes by set or volume
REASSIGN	Reassign locations and bins for moving volumes during storage location management processing

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Table 7. Function modifier keywords (continued)

Keyword	Failing Function
REPORTGENERATOR	Report Generator functions
RETAINBY	Retaining volumes by set or volume
REUSEBIN	Reusing bins when a volume move is started or after the volume move is confirmed
RPTEXT	Report extract creation performed by the DFSMSrmm inventory management EDGHSKP utility
SECURE	Security report function of EDGAUD
SMSTAPE	Audit of system-managed volumes performed by the DFSMSrmm EDGUTIL utility
TSOCOMMAND	DFSMSrmm TSO commands
UTILCHANGE	Change function of EDGUTIL
UTILCREATE	Create function of EDGUTIL
UTILMEND	Mend function of EDGUTIL
UTILVERIFY	Verify function of EDGUTIL
VRSEL	Vital record processing by EDGHSKP
VRSELNEW	VRS enhancements
VRSELVERIFY	Vital record VERIFY processing by EDGHSKP
VTS	DFSMSrmm virtual tape server support

Appendix E. Accessibility

Accessible publications for this product are offered through IBM Knowledge Center (www.ibm.com/support/knowledgecenter/SSLTBW/welcome).

If you experience difficulty with the accessibility of any z/OS information, send a detailed message to the Contact the z/OS team web page (www.ibm.com/systems/campaignmail/z/zos/contact_z) or use the following mailing address.

IBM Corporation
Attention: MHVRCFS Reader Comments
Department H6MA, Building 707
2455 South Road
Poughkeepsie, NY 12601-5400
United States

Accessibility features

Accessibility features help users who have physical disabilities such as restricted mobility or limited vision use software products successfully. The accessibility features in z/OS can help users do the following tasks:

- Run assistive technology such as screen readers and screen magnifier software.
- Operate specific or equivalent features by using the keyboard.
- Customize display attributes such as color, contrast, and font size.

Consult assistive technologies

Assistive technology products such as screen readers function with the user interfaces found in z/OS. Consult the product information for the specific assistive technology product that is used to access z/OS interfaces.

Keyboard navigation of the user interface

You can access z/OS user interfaces with TSO/E or ISPF. The following information describes how to use TSO/E and ISPF, including the use of keyboard shortcuts and function keys (PF keys). Each guide includes the default settings for the PF keys.

- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*
- *z/OS ISPF User's Guide Vol I*

Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users who access IBM Knowledge Center with a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line because they are considered a single compound syntax element.

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Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that the screen reader is set to read out punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The * symbol is placed next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element *FILE with dotted decimal number 3 is given the format 3 * FILE. Format 3* FILE indicates that syntax element FILE repeats. Format 3* * FILE indicates that syntax element * FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol to provide information about the syntax elements. For example, the lines 5.1*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, it indicates a reference that is defined elsewhere. The string that follows the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you must refer to separate syntax fragment OP1.

The following symbols are used next to the dotted decimal numbers.

? indicates an optional syntax element

The question mark (?) symbol indicates an optional syntax element. A dotted decimal number followed by the question mark symbol (?) indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that the syntax elements NOTIFY and UPDATE are optional. That is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

! indicates a default syntax element

The exclamation mark (!) symbol indicates a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicate that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the dotted decimal number can specify the ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the default option for the FILE keyword. In the example, if you include the FILE keyword, but do not specify an option, the default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, the default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP applies only to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

*** indicates an optional syntax element that is repeatable**

The asterisk or glyph (*) symbol indicates a syntax element that can be repeated zero or more times. A dotted decimal number followed by the * symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1* data area, you know that you can include one data area, more than one data area, or no data area.

If you hear the lines `3* , 3 HOST, 3 STATE`, you know that you can include `HOST, STATE`, both together, or nothing.

Notes:

1. If a dotted decimal number has an asterisk (*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write `HOST STATE`, but you cannot write `HOST HOST`.
3. The * symbol is equivalent to a loopback line in a railroad syntax diagram.

+ indicates a syntax element that must be included

The plus (+) symbol indicates a syntax element that must be included at least once. A dotted decimal number followed by the + symbol indicates that the syntax element must be included one or more times. That is, it must be included at least once and can be repeated. For example, if you hear the line `6.1+ data area`, you must include at least one data area. If you hear the lines `2+, 2 HOST,` and `2 STATE`, you know that you must include `HOST, STATE,` or both. Similar to the * symbol, the + symbol can repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the * symbol, is equivalent to a loopback line in a railroad syntax diagram.

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Index

A

abbreviations
  for commands and operands xv
ABEND
  codes 59
abend dumps
  obtaining for a DFSMSrmm utility 7
  obtaining for DFSMSrmm ISPF dialog error 7
abend type-of-failure
  abend panel 42
  DFSMSrmm ISPF dialog abend 42
  failure symptoms 41
  finding the failing module name 49
  identifying 41
  modifier keywords for DFSMSrmm ISPF dialog 49, 91
accessibility
  contact IBM 93
  features 93
activating tracing 3
adding
  component identification keyword 40
  DFSMSrmm ISPF dialog modifier keywords 49, 91
  module keyword 48
  release level keyword 40
  type-of-failure keyword 41
Apache Tomcat
  logger 12
applying
  APARS 51
  known fixes 51
ARCPRPDO (PDA trace formatter) program 31
assistive technologies 93
audit trail report 21
availability field
  is blank 19
  On Loan is displayed 20
  Pending Release is displayed 19
  value Open displayed in 20
  Vital Record is displayed 19

B

base information 55
batch messages 11
batch utility messages 11
building a keyword string 39

C

capturing log data to diagnose errors 6
changing actions for volumes in system-managed tape libraries 20
changing volume information 24
character set
  chart xv
  use in statement xv
CIM logger
  using 12
CIM provider
  common errors 27, 29
  problem 53
command processing 16
commands
  how to abbreviate xv
common abend codes 29
common errors
  inventory management fails 16
  losing a volume 23
  message do not appear 16
  running out of scratch volumes 16
  users not notified automatically 23
  volumes moving to storage locations 22
  volumes moving to the wrong location 21
completing
  abend keyword 42
  component identification keyword 40
  RC keyword 42
  release level keyword 40
completion codes 59
component identification keyword 40
console messages 11
contact
  z/OS 93
continuation characters xv
conversion tools
  problem 54
correcting common errors 15

D

delimiters xv
detecting a loop in DFSMSrmm ISPF dialog 46
detecting a loop in DFSMSrmm ISPF Dialog 46
determining if a volume has returned to scratch status 17
DFSMSrmm
  system completion codes 59
  user completion codes 59
DFSMSrmm CIM agent
  SMI-S client cannot process entries 28
DFSMSrmm control data set
  correcting errors 23
  verifying contents 23
DFSMSrmm ISPF dialog
  DFSMSrmm ISPF messages 11
  help 1
  setting TRACE options 4
  tracing 4
  tracing from within 4
DFSMSrmm ISPF dialog error
  obtaining abend dumps for 7
DFSMSrmm ISPF dialog wait/loop
  completing loop keyword 46
  completing wait keyword 46

DFSMSrmm ISPF help 1
DFSMSrmm messages
  format 9
  type of 11
DFSMSrmm utility
  obtaining abend dumps for 7
diagnosing errors
  using DFSMSrmm ISPF Dialog help 1
  using PDA trace 31
  using the DFSMSrmm verb exit routine 37
  using the TRACE command 2
  with TRACE command 6
diagnostic aids
  DFSMSrmm ISPF help 1
  dump 8
  ISPF log 6
  messages 9
  TRACE command 2
diagnostic information
  obtaining 1
displaying
  TRACE options 5
DOC keyword prefix 48
documentation type-of-failure
  identifying 48
  modifier keywords for DFSMSrmm ISPF dialog 49, 91
  reader's comment form 48
  recording document number 48
dumps
  for a DFSMSrmm utility error 7
  for analyzing waits and loops 8
  obtaining 7

E

EDG0103D 10
EDGIPDA utility 53
EDGIRIP 37
errors
  automatic notify 23
  check RACF profiles 16
  eliminating common errors 15
  error diagnosis 16
  inventory management failure 16
  losing a volume 23
  messages do not appear 16
  performance 16
  report does not run 16
  running out of scratch volumes 16
  volume movement 21, 22
  volumes expiring prematurely 20

F

F13 59
F14 59
F37 59
failure types
  abend 41
  documentation 48
  incorrect output 46
  message 46
  performance 47
failure types *(continued)*
  wait/loop 45
feedback xvii
finding the module name in a dump 8
FMID (function modifier identification) 40
function modifier keywords 50

H

help panels
  DFSMSrmm ISPF Dialog Help 1
  using 1
HIPER/Y keyword 50

I

IBM Support Center
  assistance xi
  contacting 53
improve performance 16
incorrect output type-of-failure
  failure symptoms 46
  identifying 46
  INCORROUT keyword 46
  modifier keywords for DFSMSrmm ISPF dialog 49, 91
inventory management failure 16
IPCS
  using the verb exit 37
IPCS verb exit
  EXEC parameters 37
ISPF
  abend panel 42
  tracing under 6
  when running TEST/TRACE mode 43
ISPF log
  steps for using 6

K

keyboard
  navigation 93
  PF keys 93
  shortcut keys 93
keyword
  component identification 40
  keyword string 39
  modifier keyword 49, 91
  module keyword 48
  optional keyword list 39
  release level 40
  required keyword list 39
  type-of-failure 41
  worksheet 55
keyword building worksheet 55
keywords
  for message types-of-failure 49
  for wait and loop types-of-failure 49
keywords for DFSMSrmm abends
  building outside DFSMSrmm ISPF dialog 44

L

licensed program information 55

listing volume status information 17
log data set
    saving contents of 7

M

message type-of-failure
    building keyword 49, 91
    using modifier keywords 50
messages
    batch messages 11
    batch utility messages 11
    DFSMSrmm ISPF dialog messages 11
    do not appear 16
    SYSLOG messages 11
module keyword
    building keyword 48
    DFSMSrmm ISPF dialog 48
module name
    finding in a dump 8
    using ISPF log to find 48
moving volumes to the wrong location 21
MSG keyword prefix 46
MSGID command 54

N

navigation
    keyboard 93
notational conventions xii

O

obtaining dumps 7
obtaining information about volumes 24
operands
    how to abbreviate xv
optional keyword
    modifier keywords 49, 91
    MODULE 42
    module keyword 44
    OFFSET 42
    offset keyword 44
    RC 42
optional keyword list 39

P

P/E keyword 50
PDA data
    viewing with ISPF browse 31
PDA trace data sets 31, 35
performance 16
Problem Determination Aid (PDA)
    copying PDA trace data set 35
    EDGIPDA utility 53
    formatting options 33
    formatting options command syntax 33
    JCL examples 32
    overview 31
    recommendations for using 35
    selection options 33
problem diagnosis 15
programming interface information 100

R

RC keyword prefix 42
reader's comment form 48
recommendations
    for collecting trace data 35
    for defining the number of records that should be scanned in the control data set 16
    for using the APAR number in the trace data set names 35
recording
    document number 48
    module offset 44
    return code 42
recording return code 42
release level keyword
    building release level keyword 40
    using FMID 40
removing
    virtual volumes 15
reports, audit trail report 21
required keywords
    component identification 40
    list of 39
    release level keyword 40
    required keywords 41
required product knowledge xi
response time
    is too long 16

S

saving
    contents of log data set 7
scratch volumes 16
searching for HIPER APARs 50
searching IBM Software Support database 51
sending to IBM
    reader comments xvii
setting TRACE options
    DFSMSrmm ISPF dialog 4
shortcut keys 93
SMI-S client
    cannot process entries from DFSMSrmm CIM agent 28
STGADMIN.EDG.FORCE 24
STGADMIN.EDG.MASTER 24
summary of changes xix
symptoms not described by keywords 55
syntax diagrams
    how to read xii
SYSLOG messages 11
system completion codes 59

T

TEST/TRACE mode
    TSO messages for 43
TRACE command
    activating 3
    operands 2
    specifying multiple operands 5

TRACE command *(continued)*
steps for using 6
suffixes 57
TRACE options
displaying 5
tracing
using PDA trace 31
using the TRACE command 2
trademarks 100
TSO messages
when running TEST/TRACE mode 43
type-of-failure keyword
abend 41
documentation 48
incorrect output 46
message 46
performance 47
selecting 41
wait/loop 45

U

U0001 60
U0002 60
U0003 60
U0004 61
U0005 61
U0006 61
U0007 61
U0008 62
U0009 62
U0010 62
U0011 62
U0012 63
U0013 63
U0014 63
U0015 63
U0016 63
U0030 64
U0093 64
U0100 64
U0101 65
U0110 65
U0111 65
U0120 65
U0124 66
U0125 66
U0126 66
U0130 66
U0150 67
U0160 67
U0170 67
U0180 67
U01nn 65
U0200 67, 68
U0220 68
U0230 68
U02nn 68
U0300 68, 69
U0301 69
U0302 69
U0303 70
U0304 70
U0305 70
U0306 70
U0307 70
U0350 71
U0360 71
U0370 71
U0380 71
U03nn 69, 73
U0400 71
U0410 72
U04nn 72
U0500 72
U0510 72
U0520 69, 73
U0600 73
U0630 73
U0640 73
U0650 73
U0651 74
U0652 74
U0653 74
U0654 74
U0655 74
U0656 75
U0657 75
U0658 75
U0659 75
U0660 75
U0661 76
U0662 76
U0700 76
U0800 76
U0801 76
U0802 77
U0803 77
U0804 77
U0810 77
U0811 77
U0812 78
U0813 78
U0841 78
U0842 78
U0862 78
U0879 79
U0900 79
U0901 79
U0950 79
U0998 80
U0999 80
U1000 80
U1097 81
U10nn 80
U11nn 81
U12nn 81
U13nn 81
U14nn 82
U15nn 82
U1600 82
U1601 82
U1602 82
U1603 83
U1650 83
U2100 83
U2101 83
U2130 83

U2200 84
U2201 84
U2220 84
U2222 84
U2223 85
U2224 85
U2410 85
U2420 85
U2430 85
U2440 86
U2450 86
U2460 86
U2603 86
U3000 87
U3001 87
U3002 87
U3003 88
U3004 88
U3005 88
U3006 88
user completion codes 60
user interface
    ISPF 93
    TSO/E 93
using 48
using log data to diagnose errors 6

V

varying search argument 51
verb exit
    IPCS 37
virtual volumes
    removing 15
volume
    changing actions 20
    determining if returned to scratch status 17
    expiring prematurely 20
    moving to the wrong location 21
    obtaining volume status information using the RMM LISTVOLUME subcommand 17
    running out of scratch volumes 16
volumes
    checking availability 18
    checking status 18
    move to the wrong storage location 21
    obtaining volume information 17

W

wait/loop type-of-failure
    completing loop keyword 46
    completing wait keyword 46
    DFSMSrmm ISPF wait/loop 45
    failure symptoms 45
    identifying 45
    modifier keywords for DFSMSrmm ISPF dialog 49, 91
Web service
    common errors 25, 27
    output log 12
    problem 53
worksheet 55
wrong storage location
wrong storage location *(continued)*
    for volumes 21



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