Resource Measurement Facility Reference Summary

Version 2 Release 1
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*Version 2 Release 1*
Release Information

This edition applies to Version 2 Release 1 of z/OS (5650-ZOS) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

The RMF™ Reference Summary provides a quick reference to:
• Operator commands
• Monitor I session options
• Monitor II background session options
• Monitor II display commands
• Monitor III gatherer session options
• Monitor III reporter session commands

For detailed information about using RMF Monitors, see z/OS RMF User’s Guide.

How to read the diagrams

To read a syntax diagram, follow the path of the line, starting from left to right and moving from top to bottom.
• The ➔ symbol indicates the beginning of a syntax diagram.
• The ➔ symbol, at the end of a line, indicates that the syntax diagram continues on the next line.
• The ➔ symbol, at the beginning of a line, indicates that a syntax diagram continues from the previous line.
• The ➔ symbol indicates the end of a syntax diagram.

Syntax items (for example, a keyword or variable) may be:
• Directly on the line (required)
• Above the line (default)
• Below the line (optional)

Symbols

You must code these symbols exactly as they appear in the syntax diagram

#  Number sign
: Colon
, Comma
= Equal Sign
- Hyphen
( ) Parenthesis
. Period

Variables

Highlighted lowercase letters denote variable information that you must substitute with specific information.
Example

(1)

Notes:
1 Here you must code U= as shown and supply an ID for user_id. You may, of course, enter U in lowercase, but you must not change it otherwise.

Repetition

An arrow returning to the left means that the item can be repeated.

Example 1

repeat

A character within the arrow means you must separate repeated items with that character.

Example 2

repeat

A footnote (1) by the arrow references a limit that tells how many times the item can be repeated.

Example 3

Notes:
1 Specify repeat up to 5 times.

Defaults

Defaults are above the line. The system uses the default unless you override it. You can override the default by coding an option from the stack below the line.

Example
Notes:
1 In this example, A is the default. You can override A by choosing B or C.

**Required Choices**
When two or more items are in a stack and one of them is on the line, you **must** specify one item.

**Example**

Notes:
1 Here you must enter either A or B or C.

**Optional Choice**
When an item is below the line, the item is optional. Only one item **may** be chosen.

**Example**

Notes:
1 Here you may enter either A or B or C, or you may omit the field.
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  z/OS V2R1.0 RMF Reference Summary
  SX33-9034-00
• The topic and page number related to your comment
• The text of your comment.

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Chapter 1. Gathering Reference

This chapter contains a summary of the operator commands, the Monitor I session options, and the Monitor III session options.

To Start, Stop and Control Sessions

Three system commands, four session commands, and numerous display commands control RMF processing. The syntax for system and session commands is as follows; see chapters on specific RMF sessions in z/OS RMF User's Guide for detailed descriptions and examples.

**START system command**

Initializes RMF and/or starts a Monitor I session.

```
START RMF
```

**MODIFY system command**

Passes session commands to RMF or requests a display of RMF status.

```
MODIFY RMF, input
```

The following session commands are passed to RMF through the input field of the system MODIFY command.

**START session command**

Starts an RMF session.

```
MODIFY RMF, START session-id
```

**MODIFY session command**

Changes options currently in effect.

```
MODIFY RMF, MODIFY session-id options
```
**STOP session command**

Ends processing of a specified session.

```
MODIFY RMF, STOP session-id
```

**DISPLAY session command**

Displays status information for active non-TSO/E RMF sessions.

```
MODIFY RMF, DISPLAY ALL
```

**STOP system command**

Ends all non-TSO/E RMF sessions.

```
STOP RMF
```

where:

**parm**

Options for a Monitor I session (specify NOZZ if you do not want to start a Monitor I session concurrently with RMF initialization). Options have the form:

```
option[(value)]
```

**input**

Any session command (START, STOP, MODIFY, or DISPLAY).

**session-id**

Session identifier for a particular session. The session identifier is one of the following:

- **ZZ** Monitor I session
- **cc** Monitor II background session (any two characters except ZZ)
- **III** Monitor III data gatherer session

**options**

Session options to be changed. Each option has the form

```
option[(value)]
```

and must be separated by a comma.

**ACTIVE**

Session identifiers of all active non-TSO/E sessions are to be displayed.

**ALL**

Session identifiers and current options of all active non-TSO/E sessions are to be displayed.
Monitor I Session Options

You can specify Monitor I session options in:
- The parm field of the START command
- The PARM field of the EXEC statement in a cataloged procedure
- The RMF Monitor I Parmlib member ERBRMF00

Cache subsystem activity

Channel path activity

Processor activity

Cryptographic processor activity

Device activity

Type:
Enqueue contention activity

Enterprise Disk System statistics

Options:

FICON® director activity

I/O queuing activity

Options:
Time-frame Options

Cycle length

- \texttt{CYCLE\{\textlangle}1000\textrangle\}
- \texttt{CYCLE\{\textlangle}value\textrangle\}

Report interval length

- \texttt{INTERVAL\{\textlangle}30M\textrangle\}
- \texttt{INTERVAL\{\textlangle}nnn\textrangle\}

Duration of session

- \texttt{STOP\{\textlangle}8H\textrangle\}
- \texttt{STOP\{\textlangle}range\textrangle\}
- \texttt{NOSTOP}

Interval synchronization

- \texttt{SYNC\{\textlangle}SMF\textrangle\}
- \texttt{SYNC\{\textlangle}RMF\textcomma\textlangle}mm\textrangle\}
- \texttt{NOSYNC}

Reporting Options

Option list

- \texttt{OPTIONS}
- \texttt{OPTN}
- \texttt{NOOPTIONS}
- \texttt{NOOPTN}

Write SMF record

- \texttt{RECORD}
- \texttt{NORECORD}

Print interval reports
Class for printed reports

Environment Options
User exit

Parmlib member

Notes:
1 Up to five members can be specified.

Monitor III Session Options
Cache subsystem activity

Coupling facility details

Specifies whether detailed data gathering for the activities in the coupling facility should be performed.
Gatherer cycle

\[
\text{CYCLE} = \{1000\} \quad \text{CYCLE} = \{\text{nnnn}\}
\]

Specifies, in milliseconds, the length of a cycle. Valid range is 50 to 9999.

Data set support

\[
\text{DATASET} = \{\text{STOP, NOSWITCH}\}
\]

Suboption:

\[
\text{ADD} = \{\text{data-set-name}\} \quad \text{DEL} = \{\text{data-set-name}\} \\
\text{START} \quad \text{SWITCH} \\
\text{WHOLD} = \{\text{7}\} \\n\text{WHOLD} = \{\text{value}\}
\]

Controls the recording of samples to user-defined data sets.

Hierarchical file system activity

\[
\text{HFSNAME} = \{\text{Suboption}\}
\]

Suboption:

\[
\text{ADD} = \{\text{file-system-name}\} \quad \text{DEL} = \{\text{file-system-name}\}
\]

Specifies data recording of statistics for UNIX HFS names.
I/O subsystem activity

Specifies data recording for I/O subsystem and channel path activity.

Spin locks and suspend locks

Specifies data recording about spin locks and suspend locks.

Master status

Makes the system eligible/uneligible for MASTER status.

Member

Specifies the members of a partitioned data set that contain the options to be used for the session.

Mintime

Specifies interval length in seconds. Valid range is 10 to 999.

OMVS process data

Specifies measurements for OMVS process data.
Print list of options

Specifies if options are to be displayed at operator console.

Resource

Specifies the job entry subsystem resource where parm is the given name if other than JES2 or JES3.

Duration of session

Specifies the duration of the session in minutes (M) or hours (H). Valid range is 1 minute to 168 hours.

Storage group/disk space monitoring

Suboption:

Controls data gathering for storage group space and disk space monitoring:
- You may specify multiple ADD/DEL suboptions.
A storage group name must not be longer than 30 characters, otherwise it is ignored.
You can specify up to 25 storage group names. Additional names are ignored.

**Synchronous write SMF**

Synchronizes interval time with the hour where mm is the number of minutes after the hour at which synchronization will occur.

**Sysout**

Specifies the output class for session messages.

**VSAM RLS activity**

Suboption:

Controls the collection of VSAM RLS activity data.

**Storage buffer**

Specifies in megabytes, the maximum storage buffer size. Valid range is 4 to 999 megabytes.
zFS activity

Specifies data gathering about zFS file system activity.

zIIP exploitation

Specifies whether the Monitor III data gatherer is entitled to execute partially on IBM System z Integrated Information Processors (zIIPs).
Chapter 2. Reporting Reference

This chapter contains a summary of the commands used in a reporting session.

To Start RMF in ISPF or TSO/E

To start RMF and display the RMF Performance Management menu, enter:

**Start RMF**

```
RMF
```

To bypass the RMF Performance Management Menu, enter the RMF command with the appropriate option:

**Start RMF Monitor**

To call the Postprocessor, enter:

```
RMF PP
```

To call Monitor II, enter:

```
RMF MON2
```

To call Monitor III, enter:

```
RMF MON3
```

To call the Monitor III Utility, enter:

```
RMF UTIL
```

**Start RMF Monitor II**

You can also use the following command to start Monitor II:

```
RMFMON
```

Monitor II Display and Background Session

Use the display session syntax in an ISPF or TSO/E session to obtain snapshot reports of specific address spaces or system resources.

Use the background session syntax in a non-interactive session to create a printed report and SMF records.
Report Commands and Options

The general format of a command to request a report is:

**General syntax**

Background session syntax:

```
rep(options)
```

Display session syntax:

```
rep options
```

`rep` is the report name, and `options` are the options for the report.

The legend is described at the end of this information unit.

**AS resource data**

Background session syntax

```
NOARD

ARD(, )
```

Display session syntax

```
ARD(, )
```

**AS resource data for job**

Background session syntax

```
NOARDJ

ARDJ(jobname)
```

Display session syntax

```
ARDJ(jobname)
```
**AS state data**

Background session syntax

![Diagram](ASD-(A,A)-NOASD-ASD-(A,S))

Display session syntax

![Diagram](ASD-(A,c),(A,s))

**AS state data for job**

Background session syntax

![Diagram](NOASDJ-ASDJ-(jobname))

Display session syntax

![Diagram](ASDJ-jobname)

**AS SRM data**

Background session syntax

![Diagram](NOASRM-ASRM-(A,A)-ASRM-(A,C,A,S))

Display session syntax

![Diagram](ASRM-(A,C),(A,S))

**AS SRM data for job**

Background session syntax
Display session syntax

<table>
<thead>
<tr>
<th>NOASRMJ</th>
<th>ASRMJ(eventname)</th>
</tr>
</thead>
</table>

**Channel path activity**
Background session syntax

<table>
<thead>
<tr>
<th>NOCHANNEL</th>
<th>CHANNEL</th>
</tr>
</thead>
</table>

Display session syntax

<table>
<thead>
<tr>
<th>CHANNEL</th>
</tr>
</thead>
</table>

**Device activity**
Background session syntax

<table>
<thead>
<tr>
<th>NODEV</th>
<th>DEV(type)</th>
</tr>
</thead>
</table>

Display session syntax

<table>
<thead>
<tr>
<th>DEV(type)</th>
</tr>
</thead>
</table>

**Specific direct access device**
Background session syntax

<table>
<thead>
<tr>
<th>NODEVV</th>
<th>DEVV(NUMBER(value), VOLSER(value))</th>
</tr>
</thead>
</table>

Display session syntax

<table>
<thead>
<tr>
<th>DEVV(VOLSER(value), NUMBER(value))</th>
</tr>
</thead>
</table>
**HFS statistics**
Display session syntax

```
HFS hfsname
```

**IRLM long lock detection**
Display session syntax

```
ILOCK ALL
```

**I/O queuing**
Background session syntax

```
NOIOQUEUE
IOQUEUE (DASD) (type)
```

Display session syntax

```
IOQUEUE DASD type
```

**Library lists**
Display session syntax

```
LLI LNK LPA APF
```

**Page/Swap data set activity**
Background session syntax

```
NOPGSP
PGSP (PAGE) (SWAP)
```

Display session syntax
Sysplex data server activity

Display session syntax

Enqueue contention activity

Background session syntax

Display session syntax

Reserve activity

Background session syntax

Display session syntax
System paging activity

Background session syntax

Display session syntax

SRM activity

Background session syntax

Display session syntax

User-specified activity

Legend:
c  Class of the address spaces to be included; either A, B, T, AS, or O.
s  Status of the address spaces to be included; either A or I.
d  Domain of the address spaces to be included; either A or a domain number.
hfsname  Name of an hierarchical file system.
jobname  Specific job name.
majornameminorname  Name of resource or group of resource.
nnnn  1-4 digit performance group number.
sname  Subsystem name defined in the ICS definition.
sysname  Name of a specific system in a global resource serialization complex.
**type**

Either a device class, one or more volume serial numbers, one or more device numbers, or one or more SG names.

**volser**

Volume serial number.

**Display Session Commands**

What session commands you use depends on whether you are working with the ISPF interface or the TSO interface. Some commands are valid in both environments.

The legend is described at the end of this information unit.

**TSO Commands**

- Scroll through a table report:

  ```
  v
  ```

- Display the list of reports on the display menu:

  ```
  M
  ```

- Display defaults:

  ```
  MM
  ```

- Print a report:

  ```
  P
  ```

- Request reports repeatedly:

  ```
  T
  ```

  where:

  - `n` is the number of times a report is repeated.
  - `t` is the number of seconds between reports

- Stop the session:

  ```
  Z
  ```

- Set PF key:

  ```
  #rep(options)
  ```
rep is a report name.

**ISPF Commands**

- Cancel the option dialog without saving changes:
  
  ![CANCEL]

- List of Monitor II reporter commands:
  
  ![COMMANDS]

- Find a text string:
  
  ![FIND-xxxxxxx]

  If your search string contains blanks, you must enclose it in quotes.

- Refresh a report after an interval:
  
  ![GO-4nnn]

  where:

  - *nnn* is the number of seconds between refreshes. Valid values are between 1 and 3600s.

  End GO mode by pressing the ATTN or PA1 key.

- Print a report:
  
  ![PRINT]

- Reset all optional values on the option dialog to their defaults:
  
  ![RESET]

- Repeat a previously entered Find command:
  
  ![RFIND]

- Show the report options panel for the current report:
  
  ![RO]

- Sort the report according to column cursor is placed on:
  
  ![SORT-A or D]

  ![SORT-A]

  ![SORT-D]

  **Note:** Numerical columns are sorted in descending order, and columns with character values are sorted in ascending order.
• Specify the system to be monitored:

  ```
  SYSTEM smf-id
  ```

• Stop the session:

  ```
  X
  END
  ```

**Both ISPF and TSO Commands**

• Set delta mode:

  ```
  D
  ```

• Set hardcopy mode:

  ```
  H
  ```

• Recall the previous report:

  ```
  Rrep options
  ```

  where `rep` is the report name.

**Background Session Options**

• Delta reporting:

  ```
  NODELTA
  DELTA
  ```

• Session options Parmlib member:

  ```
  MEMBER (01)
  MEMBER (xx)
  ```

  **Note:** You can specify up to five members.

• Print list of options:

  ```
  OPTIONS
  OPTNS
  NOOPTNS
  NOOPTIONS
  ```
Monitor III Reporter Session

To start a Monitor III session, from TSO or ISPF, enter:

```
RMF MON3
```
Session Commands

- Backward/forward referencing:

  ```
  /SM590000/SM590000
  BREF
  FREF
  /SM590000/SM630000
  ```

- D:

  ```
  DATE
  mm
  / dd
  - yy
  ```

- T:

  ```
  TIME
  hh
  : mm
  : ss
  ```

- R:

  ```
  RANGE
  nnn
  M
  S
  ```

- S:

  ```
  SYSTEM
  systemname
  ```

- Restore options to original values:

  ```
  /SM590000/SM590000
  CANCEL
  /SM590000/SM630000
  ```

- Display RMF commands help panel:

  ```
  /SM590000/SM590000
  COMMANDS
  /SM590000/SM630000
  ```

- Display data from current range:

  ```
  /SM590000/SM590000
  CURRENT
  /SM590000/SM630000
  ```

- Search for character string:

  ```
  /SM590000/SM590000
  FIND string
  /SM590000/SM630000
  ```

- Start GO mode:

  ```
  /SM590000/SM590000
  GO
  /SM590000/SM630000
  ```

- Switch graphic mode on or off:
• Print hardcopy reports and screens:

• Start an Interactive Chart Utility session:

• Display listing of PF keys:

• Reset options to RMF defaults:

• Display last command entered:

• Repeat FIND command:

• Switch between tabular and graphic mode:

• Switch between tabular and graphic mode:

Commands to Request Menus and Option Panels

• Display Color Graphic Options panel:

• Display Job Report panel:

• Display Language Options panel:
Report Commands

Reports can be requested from the command line or from the Primary menu.

Cache details

[CACHDET]
Cache summary

Coupling facility activity

Coupling facility overview

Coupling facility systems

Channel path activity

CPC capacity

Delays

You can specify a class and a selection separated by a comma.

Job variation of delay
Device delays

Device delays - Job report

Device delays for resources

Data index

Data set delays

Data set delays - Job report

Data set delays - Volume report

Enclave activity
Enqueue delays

Enqueue delays - Job report

Resource delays

Group response time

HSM delays

HSM delays - Job report

I/O queuing activity

JES delays

Chapter 2. Reporting Reference 29
JES delays - Job report

Job report

Mount delays - Job report

Message delays - Job report

OMVS process data

Processor delays

Processor delays - Job report

Quiesce delays - Job report

VSAM RLS activity by data set
VSAM LRU statistics

VSAM RLS activity by storage class

Disk space report

Storage space report

Storage delays

Common storage information

Common storage remaining

Frame count information

Storage delays - Job report
Information on storage use

Summarized storage information

Sysplex-wide enqueue delays

Overview of system workload

Response time distribution

Performance summary - Sysplex

Work manager - Sysplex

Overview of system activity

XCF delays
XCF delays - Job report

where:

cfname
Name of a coupling facility.

class
Either All (A), Batch (B), TSO (T), STC (S), ASCH (AS), or O (OMVS). For DELAY, you can also specify E for enclaves.

dsname
Name of a data set.

jobname
Name of job to be reported.

period
Service or report class period.

resource
Name of resource to be reported.

s-class
Service class name.

s/r-class
Service or report class name.

ssid
Cache subsystem identifier.

sstype
Name of a subsystem that schedules enclaves.

stclass
Storage class name.

volser
Volume serial number.

wlm
Name of a workload group, service class, or report class.