CMF® MONITOR

CMFMON User Guide

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2101 CityWest Blvd.
Houston TX 77042-2827

Telephone 713 918 8800 or
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Fax 713 918 8000

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  - — machine type
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  - — system hardware configuration
  - — serial numbers
  - — related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the problem
- commands and options that you used
- messages received (and the time and date that you received them)
  - — product error messages
  - — messages from the operating system, such as `file system full`
  - — messages from related software

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About This Book

This book describes how to use the CMFMON component of CMF MONITOR. This book explains what CMFMON is, tells you how to use CMFMON's online facility to view the data in real time, explains how to record the data to data sets using CMFMON's write facility, and explains how to generate CMFMON batch reports.

It is intended for anyone who has never used CMFMON. If you have used IBM's RMF MONITOR II, you will be familiar with the data provided here and CMFMON offers some additional features that you will probably want to spend a few moments learning.

How This Book Is Organized

This book is organized as follows. In addition, a glossary of terms and an index appear at the end of the book.

Chapter/Appendix	Description
Chapter 1, "Introducing CMFMON,"	introduces the components of CMFMON and describes the data they provide
Chapter 2, "Using CMFMON's Online Facility,"	explains how to use CMFMON's online facility
Chapter 3, "Using the CMFMON Write Facility,"	tells how the CMFMON write facility writes records to SMF or sequential data sets
Chapter 4, "Generating CMFMON Batch Reports,"	explains how to generate CMFMON batch reports with CMFMON
Appendix A, "Report Column Information"	contains tables with information about the columns for generated batch report
Appendix B, "Getting Data You Want"	describes the supplementary data required by CMFMON to view and/or record certain types of data

Chapter/Appendix	Description
Appendix C, “CMF Type 79 API”	describes CMF’s type 79 API
Appendix D, “Quick Reference”	contains a quick reference for CMFMON’s online facility

Related Documentation

BMC Software products are supported by several types of documentation:

- online and printed books
- online Help
- release notes and other notices

Task(s)	Book Title	Book Description
Installing CMF MONITOR	*OS/390 and z/OS Installer Guide* *MAINVIEW Installation Requirements Guide*	Explains how to download product tape components, access AutoCustomization, and perform manual customization steps that are specific to CMF MONITOR.
Using CMF MONITOR Online	*CMF MONITOR Online Getting Started*	Describes allocation of data sets for the CMF MONITOR Extractor.
	CMF MONITOR Online User Guide	Explains how to to compare the data provided by CMF MONITOR Online to that provided by CMFMON.
	CMF MONITOR Customization Guide	Explains how to perform manual customization steps that are specific to CMF MONITOR.
Using CMF MONITOR’s batch reporting components, the Extractor and Analyzer	*CMF MONITOR Batch Reference Guide* *CMF MONITOR Batch User Guide*	Explains which CMF EXTRACTOR samplers are required by CMFMON
MAINVIEW for OS/390 product family	MAINVIEW for OS/390 User Guide, Getting Started with MAINVIEW for OS/390 *Using MAINVIEW* *Quick Start with MAINVIEW*	Other BMC Software products use the CMF Extractor as a base component to gather data for their reports and displays. Explains how to use the MAINVIEW window interface and the CMF MONITOR Online views, as well as how to interpret the information presented.

Online and Printed Books

The books that accompany BMC Software products are available in online format and printed format. If you are a Windows or Unix user, you can view online books with Acrobat Reader from Adobe Systems.

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Online Help

The CMFMON product includes online Help. In the CMF Monitor ISPF interface, you can access Help by pressing **F1** from any ISPF panel.

To access the Messages & Codes application from any CMF MONITOR panel, type `MSG` on the **COMMAND** line.

Release Notes and Other Notices

Printed release notes accompany each BMC Software product. Release notes provide current information such as

- updates to the installation instructions
- last-minute product information

In addition, BMC Software sometimes provides updated product information between releases (in the form of a flash or a technical bulletin, for example). The latest versions of the release notes and other notices are available on the Web at **http://www.bmc.com/support_home**.

Conventions

This section provides examples of the conventions used in this book and explains how to read ISPF panel-flow diagrams and syntax statements.

General Conventions

This book uses the following general conventions:

Item	Example
specific (standard) keyboard key names	Press **Enter**.
field names, text on a panel	Type **the appropriate entry** in the **Command** field.
directories, file names, Web addresses	The BMC Software home page is at **www.bmc.com**.
nonspecific key names, option names	Use the HELP function key. KEEPDICTIONARY option
MVS calls, commands, control statements, keywords, parameters, reserved words	Use the SEARCH command to find a particular object. The product generates the SQL TABLE statement next.

code examples, syntax statements, system messages, screen text	`//STEPLIB DD`
	
	`The table` *`table_name`* `is not available.`

emphasized words, new terms, variables	The instructions that you give to the software are called *commands*. In this message, the variable *file_name* represents the file that caused the error.
single-step procedures	» To enable incremental backups, type **y** and press **Enter** at the next prompt.

This book uses the following types of special text:

Note: Notes contain important information that you should consider.

Warning! Warnings alert you to situations that could cause problems, such as loss of data, if you do not follow instructions carefully.

Syntax Statements

Syntax statements appear in Courier. The following example shows a sample syntax statement:

```
COMMAND KEYWORD1 [KEYWORD2|KEYWORD3] KEYWORD4={YES|NO}
       file_name...
```

The following table explains conventions for syntax statements and provides examples:

Item	Example
Items in italic type represent variables that you must replace with a name or value. Use an underscore for variables with more than one word.	`dtsbackup` *control_directory*
Brackets indicate a group of options. You can choose at least one of the items in the group, but none of them is required. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option.	[*table_name, column_name, field*] [-full, -incremental, -level] (Unix)
Braces enclose a list of required items. You must enter at least one of the items. Do not type the braces when you enter the item.	{*DBD_name* | *table_name*} {-a | -c} (Unix)
A vertical bar means that you can choose only one of the listed items. In the example, you would choose either *commit* or *cancel*.	{commit | cancel} {-commit | -cancel} (Unix)
An ellipsis indicates that you can repeat the previous item or items as many times as necessary.	*column_name* . . .

Chapter 1 Introducing CMFMON

CMFMON is a component of CMF MONITOR that allows you to collect a wide range of information on system hardware and application performance. Depending on your needs, you can use CMFMON's *online facility* to view the data in one or more formatted screens, CMFMON's *write facility* to write the collected data to an SMF or sequential data set, or CMFMON's *batch component* to generate batch reports that use type 79 records.

This chapter describes the data provided by CMFMON and provides an overview of CMFMON's online, write, and batch report components.

Data That CMFMON Provides

CMFMON collects realtime data that helps you pinpoint where problems exist in your system and detect locations of potential trouble. CMFMON also provides the information you need to optimize your use of system resources. Specifically, CMFMON collects long-term resource utilization data related to:

- I/O and device activity
- Address space activity
- System workload
- Resource serialization
- System/hardware activity

This data is presented as SMF type 79 records with various subtypes. The data may be viewed online in real time, written to an SMF or sequential data set for later analysis, or formatted into batch reports.

The first two columns in the following table briefly explain the SMF type 79 records and subtypes collected by CMFMON. The third column associates the subtype with the name of the CMFMON online screen (and the name of the control statement) used to request the data.

Table 1-1 Record 79 Subtypes Provided by CMFMON

Record Subtype	Description	Screen/ Control Statement
79-1	Address space state data	ASD
79-2	Address space resource data	ARD
79-3	Central storage/processor/SRM activity	SRCS
79-4	System paging activity data	SPAG
79-5	Address space SRM data	ASRM
79-6	Enqueue reserve data	SENQR
79-7	Enqueue contention data	SENQ
79-8	Transaction activity data	TRX
79-9	Device activity data	DEV (DEVICE)
79-10	Domain activity data	DDMN
79-11	Page and swap data set activity	PGSPP PGSPS
79-12	Channel path activity	CHANNEL
79-13	I/O queuing activity by logical control unit for the 308x and 4381 processors	IOQUEUE (IOQ)
79-14	I/O queuing activity by logical control unit for the 3090, ES/9000 series processors	IOQUEUE (IOQ)

The data available with CMFMON is supplied by the CX10GVID (for local system data) and the CX10XDGS (for remote system data) application program interfaces (APIs). See the *CMF MONITOR Batch User Guide* for more information on the CMF APIs.

If you are interested in the layout of each type 79 record, see CMFSMF79 in hilevel.BBSAMP.

CMFMON Online Facility

The CMFMON online facility presents data on demand for use in solving immediate problems related to the job and system. A CMFMON online session generates a snapshot report from a single data sample. These snapshots are presented as a series of formatted online screens. Once you have displayed a screen, you can use CMFMON's sophisticated ISPF interface to:

- EXPORT the data into data sets for later use or for downloading to a PC for use in a spreadsheet.
- Access data from a remote system in your sysplex.
- Customize the screen by:

  Reordering fields
  Including and excluding fields
  Sorting the data in a field
  Placing a filter on a field to display only certain values.

These changes may or may not be saved across CMFMON sessions, depending on your preference.

- Display online help on any screen or field on a screen.
- Specify whether you want certain fields to reflect changes between collection intervals **or** total values accumulated across intervals.
- Display detailed data about specific jobs using fast paths.
- Refresh the display continuously in auto-update mode.
- Write CMFMON screen information directly to SYSOUT.

Because CMFMON's interface is an ISPF application, you have full use of all of ISPF's powerful commands. For example, you might want to use the ISPF PRINT command to capture screens or the SPLIT and SWAP commands to run CMFMON in a secondary ISPF session, retaining your primary session for other purposes.

CMFMON and CMF MONITOR Online

If you are familiar with CMF MONITOR Online, think of CMFMON as an alternative way to access the same kind of data. However, while you would probably choose CMF MONITOR Online if you required certain features provided by MainView architecture, such as multi-system support, access to historical data, and so on, you might choose CMFMON's online facility if you needed quick or temporary access to realtime system data. And, while CMF MONITOR Online data is averaged over an interval or over the life of a job, CMFMON data is updated every time you press Enter, to keep you informed of exactly what is changing and where.

CMFMON and RMFMON

If you are familiar with IBM's RMF MONITOR II (RMFMON), you have probably noticed that CMFMON provides all the data that RMFMON provides. In addition, CMFMON offers a special unique screen: the ASL screen. By combining key data elements from the ARD and ASD screens, ASL provides a comprehensive overview of the jobs currently active on your system, enabling you to gauge application performance in a single glance. CMFMON also provides the XDSA (XDS buffer activity) screen, which summarizes the XDS buffer contents by SMF record type and subtype.

To find out how to use CMFMON's online facility, see Chapter 2, "Using CMFMON's Online Facility" on page 2-1. If you just want an overview of the commands available in CMFMON's online facility, take a few moments to browse Appendix D, "Quick Reference" .

CMFMON Write Facility

You can think of CMFMON's write facility as an extension to the CMF Extractor. A CMFMON recording session running independently of the CMF Extractor can collect information on several areas of system activity, including address spaces, channels, system paging, and enqueue contention. A CMFMON recording session running simultaneously with an Extractor session can produce records that overlap some areas of Extractor session measurements, including transactions, I/O devices, I/O queuing, and page/swap data sets.

Whereas the Extractor writes SMF record types 70 through 78, CMFMON's write facility writes SMF type 79 records—and all its subtypes—to either an SMF or a sequential data set. CMFMON also provides the means to more specifically identify the individual resources for which you want to collect performance measurements. Using CMFMON control statements, you specify the type of data you want to collect for given resources, at what interval, and for how long.

Chapter 3, "Using the CMFMON Write Facility" on page 3-1, explains how to code the control statements.

CMFMON Type 79 Batch Reports

All data formatted by CMFMON's online facility is available in batch reports. These reports are nearly identical to the corresponding CMFMON screen, providing a snapshot of your system's performance at a particular time. Batch reports enable you to save data about your system's performance in a format that is available for later analysis. For more information on generating these batch reports, see Chapter 4, "Generating CMFMON Batch Reports" on page 4-1.

Chapter 2 Using CMFMON's Online Facility

This chapter summarizes the kinds of things you can do with CMFMON's online facility, then discusses each topic in more detail. The topics are presented in the order you are likely to use them, so you may want to read this section sequentially, from start to finish.

Note: Be sure to check Appendix B, "Getting Data You Want" , to ensure that all the data you need is available. Some screens are dependent on certain CMF samplers and/or the BBX subsystem.

Tasks to Perform in CMFMON

The following table summarizes the tasks you can perform using CMFMON's flexible online interface:

To do this	See this section
Start and stop a CMFMON session	"Beginning and Ending a CMFMON Session" on page 2-2
Set parameters for CMFMON online	"Setting CMFMON Parameters" on page 2-3
Get help on any field or screen	"Getting Help" on page 2-2
Locate a string in the display	"Locating a String in the Display" on page 2-17
Sort a field in ascending or descending order	"Sorting the Display (SORT)" on page 2-18
Add a filter to a field	"Filtering the Display" on page 2-20
Customize the display	"Customizing the Display (CUST)" on page 2-23
Display deltas/totals	"Displaying Deltas and Totals" on page 2-25
Automatically refresh the screen	"Automatically Updating the Screen" on page 2-27
Display data from a remote system	"Displaying Data from a Remote System" on page 2-28
Export the data to an ISPF data set for later use	"Saving the Data for Later Use (EXPORT)" on page 2-28

Beginning and Ending a CMFMON Session

You can begin a CMFMON online session in one of the following ways:

- If you customized a CLIST during product customization, on any TSO command line, type **CMFMON** and press Enter.
- Access CMFMON from the MAINVIEW Selection Menu by selecting option Z (OS/390, z/OS, and USS), then option 6 (CMFMON).

The Primary Option Menu is displayed, which looks like this:

Figure 2-1 CMFMON Primary Option Menu

```
CMFMON ---------------------- Primary Option Menu ----------------------------
Option  ===>

Address Spaces
 A1  ARD   Address space resource data            CMFMON:      5.4.0
 A2  ASD   Address space state data               Local SYSID: SYSC
 A3  ASRM  Address space SRM data                 System  ===> SYSC
 A4  ASL   Address space list
I/O Subsystem                          Libraries
 I1  CHAN  Channel path activity        L1  APF   APF-authorized libraries
 I2  DEV   Device activity              L2  LNK   Linklist libraries
 I3  IOQ   I/O queueing activity        L3  LPA   PLPA libraries
Workload                               Cross-system Data Server
 W1  TRX   Transaction activity         X1  XDSP  Performance
 W2  DDMN  Domain activity              X2  XDSA  Buffer
Contention                             Storage
 C1  SENQ  Enqueue contention           S1  PGSPP Page data set activity
 C2  SENQR Enqueue reserve              S2  PGSPS Swap data set activity
 C3  ILOCK IRLM Long Lock Detection     S3  SPAG  System paging activity
Miscellaneous                          S4  SRCS  Central storage / CPU / SRM
 M1  PARM  User parameters
 M2  NEW   What's new                                 (c) Copyright 2001
                                                        BMC Software, Inc.
```

To exit a CMFMON online session, in the **Option** field of the Primary Option Menu, type **X** and press Enter.

Getting Help

To make it easier to get the information you need when you need it, all of CMFMON's screens and fields are explained in CMFMON's online help facility, rather than in hardcopy.

To display field help, place the cursor on the field name, on the line beneath the field name, or anywhere in the field itself, and press PF1 (HELP).

To display screen help, place the cursor anywhere outside of a field and press PF1.

Setting CMFMON Parameters

To set parameters for your CMFMON session:

1. From the Primary Option Menu, select Option M1 - PARM.

The following panel is displayed:

Figure 2-2 CMFMON Parameters Panel

```
CMFMON ---------------------- CMFMON Parameters -----------------------------

 COMMAND ===>

 General Values
    ROWS ===> 100      (Enter the maximum number of rows to be stacked when
                        analyzing jobs using ARDJ, ASDJ, and ASRM; when
                        analyzing devices using DEVV; or when analyzing system
                        activity using SPAG and SRCS.)

    SAVE ===> CONFIRM  (Enter YES to save screen customizations across
                        sessions, NO to discard changes, or CONFIRM if you wish
                        to be prompted before the changes are saved.)

    API ===> CMF       (Data collector to use.  Either RMF to call the RMF data
                        collector ERBSMFI, or CMF to call the CMF data collector
                        CX10GVID.)
```

2. In the **ROWS** field, specify the number of data rows you want to retain on respective screens before beginning to discard the oldest rows. Choose a number from 10 to 9999.

The screens affected by the ROWS parameter are:

- ARDJ
- ASDJ
- ASRMJ
- DEVV
- SPAG
- SRCS

Each of these screens adds a successive row of data to the display each time you press Enter. The default ROWS value, 100, means that 100 rows are retained before the first row (the oldest) is dropped from the display. The higher the ROWS value, the more you will have to scroll backwards to see the original row.

Note: CMFMON rows are retained in extended private storage. Common storage is not affected.

3. In the **SAVE** field, specify your preference for how screen customization changes are saved.

CONFIRM Displays a confirmation panel when you exit a screen you have customized.

Note: If you are certain that you want to retain your customization changes across CMFMON sessions, set SAVE to YES as a safety measure. Due to ISPF restrictions, even if you specify CONFIRM, the confirmation panel is displayed only when you use PF3 successively to exit CMFMON; if you use the key combination of =X to exit CMFMON quickly, all customization changes are discarded.

NO Discards changes as soon as you exit the screen.

YES Saves your changes automatically and keeps them for the next time you access CMFMON.

Note: Only changes made on the Screen Customization panel can be saved. Changes made by altering the filter or sort criteria directly on a screen are discarded as soon as another screen is displayed.

4. In the API field, specify **RMF,** if you want CMFMON to use data collected by RMF, or **CMF**, if you want to use the CMF Type 79 API.

   Note: To use the RMF API, you must also delete the alias statement in hilevel.BBLINK that defines ERBSMFI (the RMF API) as an alias of CX10GVID (the CMF API). If you do not, CX10GVID is used regardless of what you specify in the API field.

5. Press PF3 (END) to save your changes and return to the CMFMON Display Menu.

Learning the CMFMON Interface

This section references a commonly used CMFMON screen, ARD, to introduce you to some of CMFMON's key features.

The ARD screen looks like this:

Figure 2-3 Address Space Resource Data (ARD) Screen

```
CMFMON ------- Address Space Resource Data (ARD) ------- ROW 1 TO 16 OF 235
COMMAND ===>                                             SCROLL ===> CSR

                                                        SYSTEM ===> SYSD

CPU 100/ 58  UIC 16  Paging 0      ES Mig Age 67123  Time 08:34:33 Mode TOTAL

 JOBNAME  DEV   FF  PRIV LSQA X LSQA SRM TCB    CPU    EXCP SWAP CSA LPA NVI V&H
          CONN  BEL FF   ESF  M CSF  ABS TIME   TIME   RATE RATE RT  RT  RT  RT

 ________ _____ ___ ____ ____ _ ____ ___ ______ ______ ____ ____ ___ ___ ___ ___
 ------------------------------------------------------------------------------>
 *MASTER* 585.6   0   7    9      54  0.0 117.11 419.26 0.00 0.00 0.0 0.0 0.0 0.0
 PCAUTH   0.000   2   2    2   X  33  0.0  0.031  0.057 0.00 0.00 0.0 0.0 0.0 0.0
 RASP     0.000                X       0.0  0.014  1.057 0.00 0.00 0.0 0.0 0.0 0.0
 TRACE    0.000   0   3    1   X  73  0.0  0.012  0.038 0.00 0.00 0.0 0.0 0.0 0.0
 XCFAS    0.047   0  23   69   X 128  0.0 17.933 19.968 0.00 0.00 0.0 0.0 0.0 0.0
 GRS      0.000   0  21    3   X  25  0.0  0.042  0.235 0.00 0.00 0.0 0.0 0.0 0.0
 SMXC     0.000   0   2    2      14  0.0  0.004  0.030 0.00 0.00 0.0 0.0 0.0 0.0
 SYSBMAS  0.000   0   7   63      14  0.0  0.005  0.030 0.00 0.00 0.0 0.0 0.0 0.0
 DUMPSRV  30.59   0   2    5      28  0.0  2.610  6.014 0.00 0.00 0.0 0.0 0.0 0.0
 CONSOLE  470.7   0   6    5   X  25  0.0 218.62 226.62 0.00 0.00 0.0 0.0 0.0 0.0
 ALLOCAS  0.000   0   2    2   X  17  0.0  0.010  0.035 0.00 0.00 0.0 0.0 0.0 0.0
 SMF      57.22   0   2    3   X  28  0.0  0.525  8.352 0.00 0.00 0.0 0.0 0.0 0.0
 JES2      1027  19  28   14      42  0.0 564.79 643.05 0.00 0.00 0.0 0.0 0.0 0.0
 VLF      0.596   0  23    4   X  22  0.0  5.179  5.546 0.00 0.00 0.0 0.0 0.0 0.0
 LOGROUTE 0.020   0   2    3      17  0.0  0.020  0.054 0.00 0.00 0.0 0.0 0.0 0.0
```

The major components of the CMFMON interface are:

1. The full title of the screen. Example: **Address Space Resource Data (ARD)**

2. The standard COMMAND and SCROLL fields, which you probably already know from ISPF.

3. The SYSTEM field, which allows you to access data from a system other than the current local system. “Displaying Data from a Remote System” on page 2-28 provides more information about accessing remote data.

4. A status line that summarizes various attributes of your system’s performance. In Figure 2-3 on page 2-5, the status line looks like this:

```
CPU 100/ 58  UIC 16  Paging 0      ES Mig Age 67123  Time 08:34:33 Mode TOTAL
```

The data in these fields is updated each time you press Enter.

The following table describes each field on the status line.

Field	Content
CPU	The percentage of the CPU currently being utilized. Depending on your configuration, either one value or two values separated by a slash may be displayed. A detailed explanation of the CPU field in various configurations is provided in the online help.
UIC	The highest unreferenced interval count.

Field	Content
Paging	The current demand paging rate, in seconds, as reported by SRM.
ES Mig Age	The average number of seconds that pages remain in expanded storage before being paged out to auxiliary storage, as calculated by SRM.
Time	The time that the data on the screen was collected.
Mode	Whether you are looking at the screen in DELTA mode or TOTAL mode. See “Displaying Deltas and Totals” on page 2-25 for more information.

In addition, some screens contain one or more of the fields shown in this table:

Field	Content	Appears on
ICS	Name of the currently active IEAICSxx member.	TRX
IPS	Name of the currently active IEAIPSxx member.	DDMN TRX
I%	Percentage of the current CMF or RMF interval that has passed.	DEV IOQUEUE TRX PGSPP PGSPS
Job	Name of the job the data reflects.	ARDJ ASDJ ASRMJ
ASID	Address space identifier of the job the data reflects.	ARDJ ASDJ ASRMJ
SRM Coefficients	Current values for SRM coefficients CPU, I/O, SRB, and MSO.	DDMN

5. Filter areas. The lines beneath each field indicate that you may provide filter criteria to control the data that is displayed. See “Filtering the Display” on page 2-20 for more information.

You may have wondered why some rows on ARD are white (or highlighted, on a monochrome terminal) while others appear in blue (or normal intensity). CMFMON uses color coding to indicate activity: white for resources that are currently in use or address spaces that are swapped in, and blue for resources that are not in use or address spaces that are swapped out.

Moving Around in CMFMON

To examine the status of various aspects of system performance, you will probably use several screens in a single CMFMON session. There are five ways to move from one CMFMON screen to another:

- On the Primary Option Menu, type the number of the screen you want to see in the Option field. See “Example 1” on page 2-8 for more information.

- In the **COMMAND** field of any CMFMON screen, type an equal (=) sign and the name of the screen you want to see. See “Example 2” on page 2-9.

- Use a *fast path* to move between certain screens and their detailed counterparts.

A fast path is a predefined link between one screen and another. It is activated by placing the cursor on a field name and pressing Enter. See “Example 3” on page 2-10.

- From the ASL screen, type **ARD**, **ASD**, or **ASRM** in the **SEL** field next to a job to display more detailed information on that job. See “Example 4” on page 2-11.

- From the Primary Option Menu, type **ARDJ**, **ASDJ**, **ASRMJ**, or **DEVV**, along with a jobname or volser, to display detailed information on the job or device. See “Example 5” on page 2-13.

The following examples illustrate each method.

Note: If you see this message

CSV0031 REQUESTED MODULE ISPTUTOR NOT FOUND

when you try to access a CMFMON screen, see “Ensuring Access to CMFMON Screens” on page 2-32 for some possible solutions.

Example 1

1. From the Primary Option Menu, type **E** in the **Option** field to display the Transaction (TRX) screen. The TRX screen looks like this:

Figure 2-4 Transaction Activity Data (TRX) Screen

```
CMFMON ------------------Transaction Activity Data (TRX) ---------------------
COMMAND ===>                                                 SCROLL ===> CSR
                                                             SYSTEM ===> SYSD
         CPU 107/ 60  UIC 15  Paging 1      ES Mig Age 5169   Time 08:57:15
                 I% 5    ICS= IEAICPST   IPS= IEAIPSPT

SUB  TRXCLASS   USERID     TRXNAME    ACCT PGC    P   P TRAN   AVG TIME
SYS                                   INFO        G   P RATE
____ __________ __________ __________ ____ __  ____ ___ >0____
--------------------------------------------------------------------------------
                                       NO  C      0   0  0.000
                                       NO  C      0   1  0.000
STC                                    NO  C      1   1  0.000
TSO                                    NO  C      2   1  0.000
TSO                                    NO  C      2   2  0.000
TSO                                    NO  C      2   3  0.000
TSO                                    NO  C      2   4  0.000
JES2                                   NO  C      3   1  0.000
JES2                                   NO  C      3   2  0.000
ASCH                                   NO  C      4   1  0.000
ASCH                                   NO  C      4   2  0.000
ASCH                                   NO  C      4   3  0.000
ASCH                                   NO  C      4   4  0.000
STC                          DUMPSRV   NO  C      5   1  0.000
STC                                    NO  C     10   1  0.000
STC                                    NO  C     20   1  0.000
```

Because the TRX screen requires two full samples before it can display any data, you must press Enter once for the numbers to appear.

Example 2

1. In the **COMMAND** field of the TRX screen, type **=ASD** and press Enter to display the ASD screen, which looks like this:

Figure 2-5 Address Space State Data (ASD) Screen

```
CMFMON ----------- Address Space State Data (ASD) --- ROW 1 TO 16 OF 323

COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD
         CPU 112/ 59 UIC 22  Paging 0      ES Mig Age 5169   Time 08:57:36

JOBNAME  DMN    P P C  R  DP   CS   ESF   CS   TAR X  PIN   ES   TX  SWAP   WSM
              G P L  LS PR    F        TAR   WSS M   RT   RT   SC    RV    RV
________ ___ ___ _ __ __ __ ____ _____ ____ _____ _ ____ ____ ____ _____ _____
-------------------------------------------------------------------------------->
*MASTER*   0   0 1 NS    FF   85    77    0     0    0.0  0.0    0     0     0
PCAUTH     1  10 1 NS    EF   54     5    0     0 X  0.0  0.0    0     0     0
RASP       1  10 1 NS    FF   91    54    0     0 X  0.0  0.0    0     0     0
TRACE      1  10 1 NS    EF  102    90    0     0 X  0.0  0.0    0     0     0
XCFAS      1  10 1 NS    FF  174    74    0     0 X  0.0  0.0    0     0     0
GRS        1  10 1 NS    FF  516    33    0     0 X  0.0  0.0    0     0     0
SMXC      10   1 1 NS    FF   16     2    0     0    0.0  0.0    0     0     0
SYSBMAS    1  10 1 NS    EF   22    63    0     0    0.0  0.0    0     0     0
DUMPSRV    5   5 1 NS    A1   30     5    0     0    0.0  0.0    0     0     0
CONSOLE    1  10 1 NS    FF   93    20    0     0 X  0.0  0.0    0     0     0
ALLOCAS    1  10 1 NS    EF   42    20    0     0 X  0.0  0.0    1     0     0
SMF        0   0 1 NS    FF   51    92    0     0 X  0.0  0.0    0     0     0
JES2       1  10 1 NS    EF  434   151    0     0    0.0  0.0    0     0     0
VLF        1  10 1 NS    EF  486  1485    0     0 X  0.0  0.0    0     0     0
SLAMRUN   10   1 1 WM DW FF   32   156  150     0    0.0  0.0  445     0     0
LOGROUTE  10   1 1 NS    A1   19     7    0     0    0.0  0.0    1     0     0
```

2. Press PF3 (END) to return to the Primary Option Menu.

Example 3

1. In the **Option** field, type **6** to display the Device Activity screen, which looks like this:

Figure 2-6 Device Activity (DEV) Screen

```
CMFMON ------------ System Device Data (DEV) ----------- ROW 32 TO 46 OF 161

COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD
        CPU 63/ 35  UIC 6   Paging 0      ES Mig Age 9477   Time 10:16:14
                              Mode TOTAL I% 7

STG      VOLSER DEV DEV  LCU ACTV RESP IOSQ DPB CUB DB  PEND DISC CONN %DEV %D
GRP             CLS NUM      RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
________ ______ DAS ____ ___ ____ ____ ____ ___ ___ ___ ____ ____ ____ ____ ___
---------------------------------------------------------------------------------
         BAB011 DAS 0200 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         XCF002 DAS 0201 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP02 DAS 0202 024  5.6  7.4  0.0 0.0 0.0 0.0  0.1  0.0  7.1  4.0 0.0
         SYSP03 DAS 0203 024  1.4 19.9  0.0 0.0 0.0 0.0  0.2  0.0 19.5  2.9 0.0
         SYSP04 DAS 0204 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP05 DAS 0205 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP06 DAS 0206 024  1.2  1.4  0.0 0.0 0.0 0.0  0.5  0.0  0.8  0.1 0.0
         SYSP07 DAS 0207 024  0.6  1.5  0.0 0.0 0.0 0.0  0.1  0.0  1.1  0.1 0.0
         SYSP08 DAS 0208 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP09 DAS 0209 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         WLM001 DAS 020A 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP0D DAS 020D 024  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
         SYSP10 DAS 0210 024  3.5  4.4  0.0 0.0 0.0 0.0  0.5  0.0  3.6  9.6 8.3
```

2. Place the cursor on any volser and press Enter.

The DEVV (Device Activity for Volser) screen is displayed, which focuses on a single volser.

For example, if you had selected the volser BAB011, the DEVV screen would look like this:

Figure 2-7 Device Activity for Volser (DEVV) Screen

```
CMFMON ----------- System Device Data (DEVV) ----------- ROW 1 TO 1 OF 1

COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD
         CPU 61  UIC 14  Paging 0      ES Mig Age 13773  Mode TOTAL
                           Volser BAB011 Unit 0201

TIME     ACTV RESP IOSQ CUB DPB DB  PEND DISC CONN %DEV %D  I%
         RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
--------------------------------------------------------------------------------
08:35:47  5.6  1.6  0.0 0.0 0.0 0.0  0.5  0.0  0.9  2.1 3.0 1
```

Notice that the name BAB011 appears on the status line in the VOLSER field so you know which volser you are examining.

This connection between DEV and DEVV is called a *fast path*. In CMFMON, fast paths exist between the following screens:

From this screen	A fast path leads to this
ASD	ASDJ
ARD	ARDJ
ASRM	ASRMJ
DEV	DEVV

Note: If you want to get to ASDJ, ARDJ, ASRMJ, or DEVV even more quickly without using a fast path, you can specify any of these screens, with the name of the job or device on which you want to focus, from the Primary Option Menu. See "Example 5" on page 2-13 for more information.

Example 4

1. In the **COMMAND** field of the DEVV screen, type **=ASL** to display this screen:

Figure 2-8 Address Space List (ASL) Screen

```
CMFMON ------------ Address Space List (ASL) ----------- ROW 1 TO 16 OF 278

COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD
   CPU 59  UIC 15  Paging 0      ES Mig Age 75406  Time 09:02:04 Mode TOTAL

SEL  JOBNAME  AST ASID  ASIDX DMN   P P C  R  DP  XDP PAGE CPU  EXCP REAL X A
                                    G P L  LS PR  PR  RATE RATE RATE      M
    _________ ___ _____ _____ ___ ___ _ __ __ ___ ___ _____ _____ _____ ____ _ _
-------------------------------------------------------------------------------
____ *MASTER* STC     1 0001    0   0 1 NS    255 FF  0.00 0.00 0.00  103
____ PCAUTH   STC     2 0002    1   1 1 NS    241 F1  0.00 0.00 0.00   68 X
____ RASP     STC     3 0003    1   1 1 NS    255 FF  0.00 0.00 0.00   99 X
____ TRACE    STC     4 0004    1   1 1 NS    241 F1  0.00 0.00 0.00  152 X
____ XCFAS    STC     5 0005    1   1 1 NS    255 FF  0.00 0.00 0.00  188 X
____ GRS      STC     6 0006    1   1 1 NS    255 FF  0.00 0.00 0.00  508 X
____ SMXC     STC     7 0007   10  10 1 NS    255 FF  0.00 0.00 0.00   19
____ SYSBMAS  STC     8 0008    1   1 1 NS    241 F1  0.00 0.00 0.00   22
____ DUMPSRV  STC     9 0009    2   5 1 NS    167 A7  0.00 0.00 0.00   44
____ CONSOLE  STC    10 000A    1   1 1 NS    255 FF  0.00 0.00 0.00  126 X
____ ANTMAIN  STC    11 000B   10  10 1 NS    255 FF  0.00 0.00 0.00   25 X
____ ALLOCAS  STC    13 000D    1   1 1 NS    241 F1  0.00 0.00 0.00   46 X
____ SMF      STC    14 000E    0   0 1 NS    255 FF  0.00 0.00 0.00  214 X
____ VLF      STC    16 0010    1   1 1 NS    247 F7  0.00 0.00 0.00  638 X
____ LOGROUTE STC    17 0011    1   6 1 NS    161 A1  0.00 0.00 0.00   26
____ CNMPSB22 STC    18 0012    1   6 1 NS    161 A1  0.00 0.00 0.00   35 X
```

ASL merges key data elements from ASD and ARD to create a comprehensive overview of the address spaces active on your system.

By typing **ARD**, **ASD**, or **ASRM** in the **Sel** field, you can get more information on a specific address space's consumption of resources (ARD), its current state (ASD), or its consumption of SRM service units (ASRM).

2. In the **Sel** field of the ASL screen, type **ARD** next to any jobname and press Enter.

ARDJ is now displayed for the job you selected.

If you had selected the job WEC1, for example, ARDJ would look like this:

Figure 2-9 Address Space Resource Data (ARDJ) for WECI

```
CMFMON ------------ Address Space Resource Data (ARDJ)--- ROW 1 TO 1 OF 1
COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD

        CPU 128 UIC 8   Paging 0      ES Mig Age 5313   Mode TOTAL
                           Job WEC1     ASID  6

TIME     DEV   FF  PRIV LSQA LSQA X SRM TCB    CPU    EXCP SWAP CSA LPA NVI V&H
         CONN  BEL FF   CSF  ESF  M ABS TIME   TIME   RATE RATE RT  RT  RT  RT
-------------------------------------------------------------------------------
15:42:30 106.2   0   0    0    0    0.0  4.674 17.853 0.00 0.00 0.0 0.0 0.0 0.0
```

Notice that the jobname and ASID have been added to the status line so you can see which job is reflected by the display.

3. Press Enter a few times and watch how successive lines of data are added to the screen.

Figure 2-10 ARDJ for WECI (Repeated)

```
CMFMON ------------ Address Space Resource Data (ARDJ) -- ROW 1 TO 6 OF 6
COMMAND ===>                                                SCROLL ===> CSR
                                                            SYSTEM ===> SYSD
        CPU 128 UIC 8   Paging 0      ES Mig Age 5313   Mode TOTAL
                           Job WEC1     ASID  6

TIME     DEV   FF  PRIV LSQA LSQA X SRM TCB    CPU    EXCP SWAP CSA LPA NVI V&H
         CONN  BEL FF   CSF  ESF  M ABS TIME   TIME   RATE RATE RT  RT  RT  RT
-------------------------------------------------------------------------------
15:42:30 106.2   0   0    0    0    0.0  4.674 17.853 0.00 0.00 0.0 0.0 0.0 0.0
15:42:33 106.2   0   0    0    0    0.0  4.674 17.854 0.00 0.00 0.0 0.0 0.0 0.0
15:42:34 106.2   0   0    0    0    0.0  4.674 17.854 0.00 0.00 0.0 0.0 0.0 0.0
15:42:36 106.2   0   0    0    0    0.0  4.674 17.854 0.00 0.00 0.0 0.0 0.0 0.0
15:42:37 106.2   0   0    0    0    0.0  4.674 17.854 0.00 0.00 0.0 0.0 0.0 0.0
15:42:38 106.2   0   0    0    0    0.0  4.674 17.854 0.00 0.00 0.0 0.0 0.0 0.0
```

ARDJ keeps track of the number of intervals you request—and the time you requested them—in the **TIME** field (the first column of data in the display).

Example 5

1. Press PF3 twice to return to the Primary Option Menu.

If you know the name of the job or device on which you want to focus, you can specify the jobname or volser as a parameter on the ARDJ, ASDJ, ASRMJ, or DEVV commands. These commands are valid from the Primary Option Menu only.

2. In the **Option** field, type **ARDJ** ***jobname***, where ***jobname*** is the name of your TSO user ID.

ARDJ is displayed for your address space.

Note: You can set up your PF keys to avoid having to return to the Primary Option Menu before using these commands. For example, if you set a PF key to **RETURN;ARDJ** (assuming your stack character is a semicolon), you can then enter a job name in any CMFMON **COMMAND** field, press the PF key, and see ARDJ displayed for that particular job.

For more information on setting up your PF keys, see "Using PF Keys" on page 2-16.

How Often Is Data Updated?

The rate at which CMFMON data is updated varies among screens. Data on most screens is averaged between each pressing of the Enter key. That is, if you press Enter at 14:01 then again at 14:06, you will see the average of the data accumulated between 14:01 and 14:06.

The DEV, DEVV, and IOQUEUE screens, however, work a little differently. These screens depend on data from the CMF Extractor. In total mode, this means that each time you press Enter, the data is averaged over the length of the current CMF interval. For example, if the current interval is four minutes old when you press Enter, you will see data averaged over a length of four minutes. In delta mode, the *difference* in values over one or more sampling cycles is displayed (see "Displaying Deltas and Totals" on page 2-25 for more information).

Scrolling CMFMON Screens

To scroll the contents of a CMFMON screen, use the standard ISPF scroll commands: UP (PF7), DOWN (PF8), LEFT (PF10), and RIGHT (PF11).

When you scroll to the right in CMFMON, all fields to the right of the cursor are scrolled; when you scroll to the left, the fields to the left of the cursor move to the left. In both cases, the screen's *fixed fields* remain at the left margin. Fixed fields give you more control over how fields are presented on the display and make it easier to center important fields towards the middle.

The following examples experiment with scrolling using ASL.

Example 1

1. In the **COMMAND** field, type **=ASL** and press Enter.

The ASL screen is displayed, which looks like this:

Figure 2-11 Address Space List (ASL) Screen

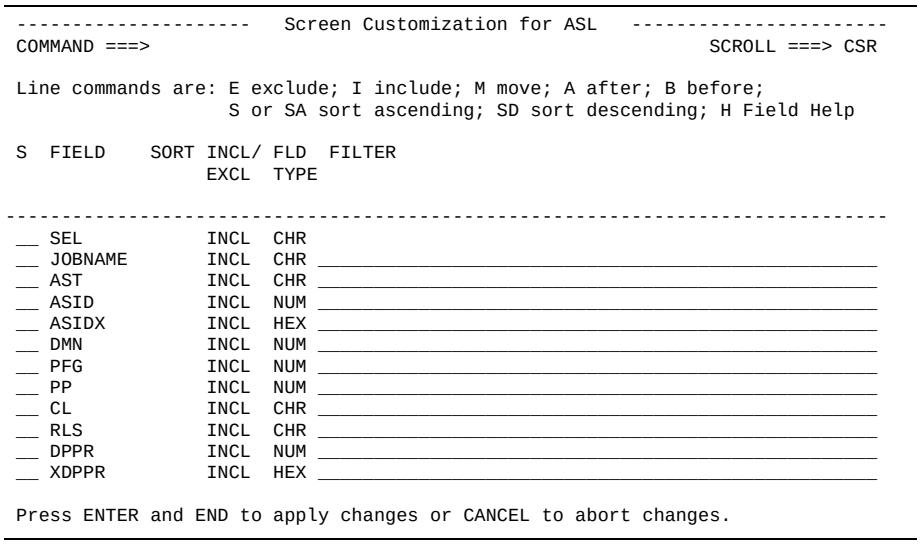
```
CMFMON ------------ Address Space List (ASL) ----------- ROW 1 TO 16 OF 278
COMMAND ===>                                             SCROLL ===> CSR
                                                         SYSTEM ===> SYSD
   CPU 59  UIC 15  Paging 0      ES Mig Age 75406  Time 09:02:04 Mode TOTAL

SEL  JOBNAME  AST ASID  ASIDX DMN   P P C  R  DP  XDP PAGE CPU  EXCP REAL X A
                              G P L  LS PR  PR  RATE RATE RATE      M
     ________ ___ _____ _____ ___ ___ _ __ __ ___ ___ ____ ____ ____ ____ _ _
-------------------------------------------------------------------------------
____ *MASTER* STC     1 0001    0   0 1 NS    255 FF  0.00 0.00 0.00  103   Y
____ PCAUTH   STC     2 0002    1   1 1 NS    241 F1  0.00 0.00 0.00   68 X Y
____ RASP     STC     3 0003    1   1 1 NS    255 FF  0.00 0.00 0.00   99 X Y
____ TRACE    STC     4 0004    1   1 1 NS    241 F1  0.00 0.00 0.00  152 X Y
____ XCFAS    STC     5 0005    1   1 1 NS    255 FF  0.00 0.00 0.00  188 X Y
____ GRS      STC     6 0006    1   1 1 NS    255 FF  0.00 0.00 0.00  508 X Y
____ SMXC     STC     7 0007   10  10 1 NS    255 FF  0.00 0.00 0.00   19   N
____ SYSBMAS  STC     8 0008    1   1 1 NS    241 F1  0.00 0.00 0.00   22   Y
____ DUMPSRV  STC     9 0009    2   5 1 NS    167 A7  0.00 0.00 0.00   44   N
____ CONSOLE  STC    10 000A    1   1 1 NS    255 FF  0.00 0.00 0.00  126 X N
____ ANTMAIN  STC    11 000B   10  10 1 NS    255 FF  0.00 0.00 0.00   25 X Y
____ ALLOCAS  STC    13 000D    1   1 1 NS    241 F1  0.00 0.00 0.00   46 X Y
____ SMF      STC    14 000E    0   0 1 NS    255 FF  0.00 0.00 0.00  214 X Y
____ VLF      STC    16 0010    1   1 1 NS    247 F7  0.00 0.00 0.00  638 X N
____ LOGROUTE STC    17 0011    1   6 1 NS    161 A1  0.00 0.00 0.00   26   N
____ CNMPSB22 STC    18 0012    1   6 1 NS    161 A1  0.00 0.00 0.00   35 X Y
```

2. First, see if ASL has any fixed fields. In the **COMMAND** field, type **CUST**.

The Screen Customization for ASL panel is displayed, which looks like this:

Figure 2-12 Screen Customization for ASL Panel



See how the SEL and JOBNAME fields are highlighted, or appear in a different color? That means they are fixed. Fixed fields are always visible, regardless of how you scroll the display.

Now you can add another field to ASL in order to have extra data to see.

3. Scroll down (PF8) until you see **DCPUTIME** in the **FIELD** column.

4. In the S column next to DCPUTIME, type **I** to add this field to the ASL display.

5. Press PF3 to exit the Screen Customization for ASL panel and return to ASL.

Now that ASL has an extra field, the line separating the field titles from the data has an arrow at the far right, indicating that there is more data than can fit on one screen.

Figure 2-13 ASL Screen

```
CMFMON ------------ Address Space List (ASL) -------------- SCREEN ASL CHANGED
COMMAND ===>                                                 SCROLL ===> CSR
                                                             SYSTEM ===> SYSD
   CPU 44  UIC 19  Paging 12     ES Mig Age 6499   Time 17:10:46 Mode TOTAL

SEL  JOBNAME  AST ASID  ASIDX DMN   P P C  R  DP  XDP PAGE DCPU  CPU  EXCP REAL
                                    G P L  LS PR  PR  RATE TIME  RATE RATE
     _________ ___ _____ _____ ___ ___ _ __ __ ___ ___ _____ _____ _____ _____ _____
-------------------------------------------------------------------------------->
____ *MASTER* STC     1 0001    0   0 1 NS    255 FF  0.00 0.000 0.00 0.00  110
____ PCAUTH   STC     2 0002    1   1 1 NS    241 F1  0.00 0.000 0.00 0.00   69
____ RASP     STC     3 0003    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00   94
____ TRACE    STC     4 0004    1   1 1 NS    241 F1  0.00 0.000 0.00 0.00  128
____ XCFAS    STC     5 0005    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00  288
____ GRS      STC     6 0006    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00  738
____ SMXC     STC     7 0007    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00   24
____ SYSBMAS  STC     8 0008    1   1 1 NS    241 F1  0.00 0.000 0.00 0.00   22
____ DUMPSRV  STC     9 0009    2   5 1 NS    161 A1  0.00 0.000 0.00 0.00   43
____ CONSOLE  STC    10 000A    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00  153
____ ANTMAIN  STC    11 000B    1   1 1 NS    255 FF  0.00 0.000 0.00 0.00   25
____ ALLOCAS  STC    13 000D    1   1 1 NS    241 F1  0.00 0.000 0.00 0.00   59
____ SMF      STC    14 000E    0   0 1 NS    255 FF  0.00 0.000 0.00 0.00   57
____ INIT     STC    15 000F    0   0 1 WM DW 255 FF  0.00 0.000 0.00 0.00   36
____ LOGROUTE STC    17 0011    1   6 1 NS    161 A1  0.00 0.000 0.00 0.00   26
```

6. Place the cursor anywhere in the DMN field and press PF11 (Right).

The screen now looks similar to this:

Figure 2-14 Address Space List (ASL) Screen, Scrolled to the Right

```
CMFMON ------------ Address Space List (ASL) ----------- ROW 1 TO 16 OF 250
COMMAND ===>                                                 SCROLL ===> CSR
                                                             SYSTEM ===> SYSD
   CPU 44  UIC 19  Paging 12     ES Mig Age 6499   Time 17:10:46 Mode TOTAL

SEL  JOBNAME    P P C  R  DP  XDP PAGE DCPU  CPU  EXCP REAL X A
                G P L  LS PR  PR  RATE TIME  RATE RATE      M
     _________ ___ _ __ __ ___ ___ _____ _____ _____ _____ _ _
----------------------------------------------------------------------------<
____ *MASTER*   0 1 NS    255 FF  0.00 0.000 0.00 0.00  110   Y
____ PCAUTH     1 1 NS    241 F1  0.00 0.000 0.00 0.00   69 X Y
____ RASP       1 1 NS    255 FF  0.00 0.000 0.00 0.00   94 X Y
____ TRACE      1 1 NS    241 F1  0.00 0.000 0.00 0.00  128 X Y
____ XCFAS      1 1 NS    255 FF  0.00 0.000 0.00 0.00  288 X Y
____ GRS        1 1 NS    255 FF  0.00 0.000 0.00 0.00  738 X Y
____ SMXC       1 1 NS    255 FF  0.00 0.000 0.00 0.00   24   Y
____ SYSBMAS    1 1 NS    241 F1  0.00 0.000 0.00 0.00   22   Y
____ DUMPSRV    5 1 NS    161 A1  0.00 0.000 0.00 0.00   43   Y
____ CONSOLE    1 1 NS    255 FF  0.00 0.000 0.00 0.00  153 X Y
____ ANTMAIN    1 1 NS    255 FF  0.00 0.000 0.00 0.00   25 X Y
____ ALLOCAS    1 1 NS    241 F1  0.00 0.000 0.00 0.00   59 X Y
____ SMF        0 1 NS    255 FF  0.00 0.000 0.00 0.00   57 X Y
____ INIT       0 1 WM DW 255 FF  0.00 0.000 0.00 0.00   36   N
```

Notice how all the fields to the right of DMN have been scrolled to reveal the hidden field(s) and that the fixed fields, SEL and JOBNAME, remain at the left margin. In addition, the line separating the field titles from the data now has an arrow pointing to the left, indicating that other fields can be displayed by pressing PF10 (Left).

Using PF Keys

Because CMFMON is an ISPF application, the definitions you set for your CMFMON PF keys are completely independent from other applications. To set PF keys for use with CMFMON:

1. Enter the KEYS command from any CMFMON display.

The PF KEY DEFINITIONS AND LABELS screen is displayed.

2. Define your PF keys.

3. Press PF3 (END).

Your PF key settings are saved across invocations of CMFMON. When you exit CMFMON, your ISPF PF key settings are restored.

Note: If you tend to use certain screens frequently, you may find it useful to display them using your PF keys. When defining your PF key, specify your ISPF stack character (usually a semicolon), followed by =*xxxx*, where *xxxx* is the screen name. For example, after defining PF4 as ;=ARD, the ARD screen is displayed simply by pressing PF4.

Locating a String in the Display

To locate a particular string and move it to the top of the display, type:

L ***target***

where ***target*** is a jobname, volser number, or a timestamp, depending on which screen is displayed.

Note: If you change the sort value of a screen, then ***target*** is the field by which the screen is sorted.

This target	Is valid on these screens
Jobname	ARD ASD ASRM ASL
Volser number	DEV
Timestamp	ARDJ ASDJ ASRMJ DEVV SPAG SRCS

Wildcard characters (*, %, ?) are supported.

If the target you specify does not appear on the screen, the message LOCATE ARG NOT FOUND appears in the upper right corner. Some screens do not support the Locate command at all. Issuing Locate from these screens produces the message LOCATE FIELD NOT DEFINED in the upper right corner.

Sorting the Display (SORT)

With the SORT command, you have the power to display the most overutilized or
underutilized resources at a glance.

You can sort a screen by any field you choose using the command:

SORT fieldname A|D

where:

fieldname Is the name of the field by which you want to sort. Enter the field as one word, even if the field name is two or more words. Omit any special characters. Mixed, uppercase, or lowercase are all accepted.

Alternatively, you can type SORT A|D, place the cursor on the field you want to sort, and press Enter.

A|D Is either A, to sort in ascending order, or D, to sort in descending order. The default is ascending.

Note: Sorting is not relevant and thus is not available for these screens:

- ARDJ
- ASDJ
- DDMN
- DEVV
- IOQUEUE
- PGSPP
- PGSPS
- SENQ
- SENQR
- SPAG
- SRCS

Example

This example shows how to sort using the CHANNEL screen as an example.

1. From the Primary Option Menu, type **4** in the **Option** field and press Enter.

By looking at CHANNEL, you can see that the screen is initially sorted by the ID field in ascending order:

Figure 2-15 CHANNEL Screen

```
CMFMON-CHAN                                        Channel Path Activity
COMMAND ===>                                                                                                  SCROLL ===> CSR
                                                                                                              SYSTEM ===> SJSE

       CPU   5/  5 UIC 2090 Paging      0 ES Mig Age    N/A Time 17:42:56

ID  NO    G CHAN          PART  TOTAL BUS   PART  TOTAL PART  TOTAL PART  TOTAL  PART  TOTAL   PART  TOTAL   PART   PART  TOTAL
            TYPE     SHR BUSY  BUSY  BUSY  READ  READ  WRITE WRITE B/SEC B/SEC  M/SEC M/SEC M-SIZE M-SIZE S-FAIL R-FAIL R-FAIL
__ ____ __ ________ ___ _____ _____ _____ _____ _____ _____ _____ _____ _____  _____ _____ ______ ______ ______ ______ ______
>-------------------------------------------------------------------------------------------------------------------------------
      2    CNCSM          0.00  0.00
1A         CNCSM    Y     0.00  0.00
1B         CNCSM    Y     0.00  0.00
26         OSD      Y     0.00  3.43 15.17  0.00  0.00  0.00  0.00
27         OSD      Y     0.00  3.04  8.47  0.00  0.00  0.00  0.00
97         CNC_S    Y     5.26  5.91
98         CNC_S    Y     8.11  8.79
EC         FCV      Y     1.67  2.09 11.28  0.23  0.25  0.18  0.20
F0         FCV      Y     0.00  0.12 10.67  0.00  0.00  0.00  0.00
F1         FCV      Y     0.00  0.13 10.68  0.00  0.00  0.00  0.00
F4         FCV      Y     0.00 10.65 13.56  0.00  1.21  0.00  0.31
F6         FCV      Y     1.36  1.63 10.96  0.06  0.06  0.01  0.03
F8         OSD      Y     0.21  3.23  8.83  0.00  0.04  0.00  0.01
```

2. Press Enter a couple of times to display the data collected so far.

One way to use the CHANNEL screen is to sort the display so that the most active channels are listed at the top, so you always know which channel is the busiest.

3. In the **COMMAND** field, type **SORT totbusy D** and press Enter to sort the field in descending order; to sort in ascending order, type **A** instead.

The screen looks similar to the Figure 2-16 when the **TOT BUSY** field is sorted in descending order:

Figure 2-16 CHANNEL Screen Sorted by the TOT BUSY Field

```
CMFMON-CHAN                                        Channel Path Activity
COMMAND ===>                                                                                                  SCROLL ===> CSR
                                                                                                              SYSTEM ===> SJSE

       CPU   5/  5 UIC 2090 Paging      0 ES Mig Age    N/A Time 17:42:56

ID  NO   G CHAN         PART  TOTAL BUS   PART  TOTAL PART  TOTAL PART  TOTAL  PART  TOTAL   PART  TOTAL   PART   PART  TOTAL
           TYPE     SHR BUSY  BUSY  BUSY  READ  READ  WRITE WRITE B/SEC B/SEC  M/SEC M/SEC M-SIZE M-SIZE S-FAIL R-FAIL R-FAIL
__ ____ __ ________ ___ _____ _____ _____ _____ _____ _____ _____ _____ _____  _____ _____ ______ ______ ______ ______ ______
>-------------------------------------------------------------------------------------------------------------------------------
F4         FCV      Y    0.00 10.65 13.56  0.00  1.21  0.00  0.31
98         CNC_S    Y    8.11  8.79
97         CNC_S    Y    5.26  5.91
26         OSD      Y    0.00  3.43 15.17  0.00  0.00  0.00  0.00
F8         OSD      Y    0.21  3.23  8.83  0.00  0.04  0.00  0.01
27         OSD      Y    0.00  3.04  8.47  0.00  0.00  0.00  0.00
EC         FCV      Y    1.67  2.09 11.28  0.23  0.25  0.18  0.20
F6         FCV      Y    1.36  1.63 10.96  0.06  0.06  0.01  0.03
FA         FCV      Y    0.03  1.64 11.09  0.00  0.08  0.00  0.17
```

Notice that you entered **totbusy** as one word, even though the actual field name is **TOT BUSY**. The SORT command does not accept field names containing embedded blanks.

4. Press Enter a couple of times and watch how different channels move to the top of the **Busy %** field as they become increasingly busy.

Only one field per screen can be sorted. If you enter the SORT command for a second field, the first sort criteria is replaced.

To remove sort criteria from a screen, in the **COMMAND** field, type **NOSORT**. CMFMON returns to its initial sort field—in this case, the ID field.

You can also add or remove sort fields from the Screen Customization panel. See “Customizing the Display (CUST)” on page 2-23 for more information.

Filtering the Display

By placing a filter on a field, you can restrict the displayed data to the particular data that interests you.

To add a filter, choose a field that has underscores beneath its title. Tab to the underscores and type an operand and the filter criteria over them.

Example 1

In the screen below, a filter is added to DEV’s Resp Time field so that only volsers with a response time of greater than 2 seconds are displayed:

Figure 2-17 Setting a Filter for the Resp Time Field

```
CMFMON ------------ System Device Data (DEV) ----------- ROW 32 TO 46 OF 161

 COMMAND ===>                                                SCROLL ===> CSR
                                                             SYSTEM ===> SYSD
         CPU 63  UIC 6   Paging 0      ES Mig Age 9477   Time 10:16:14
                              Mode TOTAL I% 7

 STG      VOLSER DEV DEV  LCU ACTV RESP IOSQ DPB CUB DB  PEND DISC CONN %DEV %D
 GRP             CLS NUM      RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
 ________ ______ ___ ____ ___ ____ >2__ ____ ___ ___ ___ ____ ____ ____ ____ ___
 ---------------------------------------------------------------------------------
          XCF001 DAS 0200 024  0.0  2.1  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          XCF002 DAS 0201 024  0.0  3.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP02 DAS 0202 024  5.6  7.4  0.0 0.0 0.0 0.0  0.1  0.0  7.1  4.0 0.0
          SYSP03 DAS 0203 024  1.4 19.9  0.0 0.0 0.0 0.0  0.2  0.0 19.5  2.9 0.0
          SYSP04 DAS 0204 024  0.0  2.4  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP05 DAS 0205 024  0.0  2.5  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP06 DAS 0206 024  1.2  3.4  0.0 0.0 0.0 0.0  0.5  0.0  0.8  0.1 0.0
          SYSP07 DAS 0207 024  0.6  4.5  0.0 0.0 0.0 0.0  0.1  0.0  1.1  0.1 0.0
          SYSP08 DAS 0208 024  0.0  5.2  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP09 DAS 0209 024  0.0  5.3  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          WLM001 DAS 020A 024  0.0  3.3  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP0D DAS 020D 024  0.0  2.5  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP10 DAS 0210 024  3.5  4.4  0.0 0.0 0.0 0.0  0.5  0.0  3.6  9.6 8.3
          SYSP11 DAS 0211 024  1.0  4.8  0.0 0.0 0.0 0.0  0.7  0.0  3.9  0.4 0.0
```

If you wanted to specify a filter that is equal to 2, type **2**; the default operand is *equals*.

Rules for Setting Filters

Observe the following rules when specifying a filter:

- Use any of the following operands:

>	Greater than
<	Less than
=	Equal to (the default)
¬	Not equal to
>=	Greater than or equal to
<=	Less than or equal to

- Valid wildcard characters are: asterisk (*), percentage (%), and question mark (?).

Asterisk: Use an asterisk at the beginning, middle, or end of a string to indicate the minimum acceptable string.

For example, *XYZ displays anything that ends with the characters XYZ, regardless of what the string begins with. Thus, JOBXYZ is displayed, but not JOBYZ. Likewise, ABC*XYZ displays anything that begins with ABC and ends with XYZ, regardless of how many characters are in between.

Percent: Use a % sign as a positional placeholder to indicate that the position must be occupied by a number.

For example, the filter criteria BAB%% displays all instances of BAB followed by two numbers; that is, BAB30 and BAB42 satisfy the condition, but BAB173 and BAB2A do not.

Question mark: Use a question mark as a positional placeholder to indicate that a given position must be occupied by any character, regardless of its type.

For example, if the filter JOB?A% is placed on the Jobname field, all jobs that have JOB in the first three positions, any character in the fourth, an A in the fifth, and a number in the last position are displayed. Therefore, JOB1A6 and JOB#A7 are displayed, but JOB1Z is not.

- If more than one filter is established for a screen, the filters are ANDed; that is, ***both*** conditions must be satisfied for the data to appear. If you want to use a filter that is wider than a column, you must do so within view customization. See "Customizing the Display (CUST)" on page 2-23 for more information.

Note: If you use a wildcard within a numeric value, that number is treated as a character string.

Example 2

Suppose another filter is added to the example shown in Figure 2-18. This time, a filter is added to the Volser field to limit the display to volsers beginning with the characters BAB.

Figure 2-18 Setting a Filter for the Volser Field

```
CMFMON ------------ System Device Data (DEV) ----------- ROW 32 TO 46 OF 161

 COMMAND ===>                                                SCROLL ===> CSR
                                                             SYSTEM ===> SYSD
         CPU 63  UIC 6   Paging 0      ES Mig Age 9477   Time 10:16:14
                              Mode TOTAL I% 7

 STG      VOLSER DEV DEV  LCU ACTV RESP IOSQ DPB CUB DB  PEND DISC CONN %DEV %D
 GRP             CLS NUM      RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
 ________ BAB*__ ___ ____ ___ ____ >2__ ____ ___ ___ ___ ____ ____ ____ ____ ___
 ---------------------------------------------------------------------------------
          XCF001 DAS 0200 024  2.1  2.5  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          XCF002 DAS 0201 024  0.0  5.2  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP02 DAS 0202 024  5.6  7.4  0.0 0.0 0.0 0.0  0.1  0.0  7.1  4.0 0.0
          SYSP03 DAS 0203 024  1.4 19.9  0.0 0.0 0.0 0.0  0.2  0.0 19.5  2.9 0.0
          SYSP04 DAS 0204 024  0.0 11.2  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP05 DAS 0205 024  0.0  5.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP06 DAS 0206 024  1.2  7.4  0.0 0.0 0.0 0.0  0.5  0.0  0.8  0.1 0.0
          SYSP07 DAS 0207 024  0.6  7.5  0.0 0.0 0.0 0.0  0.1  0.0  1.1  0.1 0.0
          SYSP08 DAS 0208 024  0.0  8.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP09 DAS 0209 024  0.0  6.3  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          WLM001 DAS 020A 024  0.0  4.5  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP0D DAS 020D 024  0.0  5.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SYSP10 DAS 0210 024  3.5  4.4  0.0 0.0 0.0 0.0  0.5  0.0  3.6  9.6 8.3
          SYSP11 DAS 0211 024  1.0  4.8  0.0 0.0 0.0 0.0  0.7  0.0  3.9  0.4 0.0
```

After pressing Enter, the screen looks like this:

Figure 2-19 DEV Screen after Setting Both Filters

```
CMFMON ------------ System Device Data (DEV) ----------- ROW 32 TO 101 OF 161
 COMMAND ===>                                              SCROLL ===> CSR
                                                           SYSTEM ===> SYSD
         CPU 63  UIC 6   Paging 0      ES Mig Age 9477   Time 10:16:14
                              Mode TOTAL I% 7

 STG      VOLSER DEV DEV  LCU ACTV RESP IOSQ DPB CUB DB  PEND DISC CONN %DEV %D
 GRP             CLS NUM      RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
 ________ BAB*__ DAS ____ ___ ____ >2__ ____ ___ ___ ___ ____ ____ ____ ____ ___
 ---------------------------------------------------------------------------------
          BAB301 DAS 0280 029  2.4  6.3  0.0 0.0 0.0 0.0  0.7  2.5  3.0  1.4 0.0
          BAB303 DAS 0293 029  4.0  6.1  0.0 0.0 0.0 0.0  0.5  2.1  3.3  2.2 0.6
          BAB304 DAS 0296 029  3.6  8.7  0.0 0.0 0.0 0.0  1.0  2.1  5.4  2.8 0.0
          BAB309 DAS 0300 02E  7.4  6.0  0.9 0.0 0.0 0.0  0.4  1.3  3.2  3.5 0.0
          BAB310 DAS 0301 02E  2.4  9.1  2.7 0.0 0.0 0.0  0.4  3.0  2.9  1.5 0.0
          BAB311 DAS 0302 02E  9.3  8.6  2.2 0.0 0.0 0.0  0.4  1.0  5.0  5.6 0.0
          BAB312 DAS 0303 02E 23.8 18.9  0.8 0.0 0.0 0.0  0.4  1.2 16.3 42.1 0.0
          BAB313 DAS 0304 02E  5.1 16.9  9.3 0.0 0.0 0.0  0.3  3.8  3.4  3.8 0.0
          BAB314 DAS 0305 02E  2.2  5.6  0.0 0.0 0.0 0.0  0.4  2.0  3.0  1.2 0.0
          BAB315 DAS 0306 02E  5.2 36.6 25.0 0.0 0.0 0.0  0.4  1.9  9.2  5.9 0.0
          BAB316 DAS 0307 02E  7.9  3.2  0.0 0.0 0.0 0.0  0.4  0.8  1.8  2.1 0.0
          BAB317 DAS 0308 02E 15.3  3.9  0.0 0.0 0.0 0.0  0.5  0.6  2.6  5.1 0.0
          BAB318 DAS 0309 02E  1.6  5.2  0.0 0.0 0.0 0.0  0.4  2.9  1.7  0.8 0.0
          BAB319 DAS 030A 02E  4.6  4.4  0.0 0.0 0.0 0.0  0.4  1.7  2.1  1.8 0.0
          BAB320 DAS 030B 02E  6.9 10.4  2.0 0.0 0.0 0.0  0.4  1.7  6.3  5.6 0.0
```

You may notice that a couple of changes have occurred:

- DEV now displays only those volsers that begin with BAB ***and*** that have a response time greater than 2.

- The upper right corner now says ROW 32 TO 101 OF 161. These numbers reflect each row's position in DEV as it appears without any filter conditions. That is, the first row in the filtered display, BAB301, actually appears in row 32 on DEV when it is unfiltered; the last row appears in row 101.

In addition, if a device on any row **before** row 32 becomes eligible for display—that is, its response time becomes greater than 2—that device is inserted **above** row 32. That means it will not be visible until you scroll up (PF7).

- The filters established for both the RespTime and Volser fields remain visible so that you can always see the filters currently in effect.

Customizing the Display (CUST)

To customize your CMFMON display, type **CUST** in the **COMMAND** field on the screen you want to customize.

When you enter CUST from the CHANNEL screen, the Screen Customization panel looks like this:

Figure 2-20 Screen Customization for CHAN Panel

```
CMFMON ----------------- Screen Customization for CHAN ----------------------
COMMAND ===>                                                SCROLL ===> CSR

Line commands are: E exclude; I include; M move; A after; B before;
                   S or SA sort ascending; SD sort descending; H Field Help

S  FIELD    SORT INCL/ FLD  FILTER
                 EXCL  TYPE

--------------------------------------------------------------------------------
__ ID            INCL  HEX _____________________________________________________
__ TYPE          INCL  CHR _____________________________________________________
__ SHR           EXCL  CHR _____________________________________________________
__ PARTBUSY      EXCL  NUM _____________________________________________________
__ TOTBUSY       INCL  NUM _____________________________________________________
__ GBUSY         INCL  CHR
```

The contents of the FIELD column are identical to the fields that appear on the CHANNEL screen. Notice that the first field, ID, is highlighted. This identifies ID as a *fixed field* A fixed field remains at the left margin even when you scroll the screen to the right to see additional columns. That way, you will always be able to relate a jobname (or a channel, device, and so on) to the data displayed.

Note: Fixed fields are established by CMFMON, and may not be included, excluded, or moved. In addition, other fields may not be moved in front of a fixed field. See “Scrolling CMFMON Screens” on page 2-13 for more information on fixed fields.

The following table tells you what you can do with the Screen Customization panel and how to do it.

To take this action	Do this
Sort the data on a screen	In the **S** field, type **SD** to sort in descending order, or type **SA** to sort in ascending order. Notes: • If a sort condition already exists for a screen, an A or a D appears in the SORT field (see Figure 2-20). • A screen can be sorted by only one field at a time. • In the **COMMAND** field, type **NOSORT** to remove sort criteria from a screen.
Include or exclude fields from the display	To *exclude* a field from view, type **E** in the **S** field next to the field. To *include* a previously excluded field, type **I** next to the field.
Reorder fields	In the **S** field next to the field to be moved, type **M** , then type **A** (after) or **B** (before) to indicate where the field should go.
Add a filter	In the **FILTER** field, type the operand and the value (examples: >2, =15, =MAK*). Because filters are disallowed for the SPAG and SRCS screens, input Filter fields do not appear on the corresponding CUST panels.
Remove a filter	Space over the filter in the **FILTER** field.

The changes you make on the Screen Customization panel are saved according to what you specified in the SAVE field on the CMFMON Parameters panel, as shown in this table:

If you specify	The result is
YES	Your changes are automatically saved and will be in effect the next time you access CMFMON.
NO	Your changes are not saved and are in effect only as long as the screen is displayed.
CONFIRM	A confirmation panel is displayed when you use PF3 (END) to exit the screen. Note: If you use =X or some other means to exit CMFMON when SAVE=CONFIRM, your changes are *not* saved.

Note: Only changes made on the Screen Customization panel can be saved. Changes made by altering the filter or sort criteria directly on a screen are discarded as soon as another screen is displayed.

Customization changes are saved in your ISPF PROFILE in a member called CMONPROF. To discard your customized CMFMON screens and restore the original set, delete this member from your profile.

Displaying Deltas and Totals

Seven CMFMON screens contain pairs of fields that present the same data from different points of view: one field in *total* mode and the other in *delta* mode.

Total and delta mode behave slightly differently, depending on the screen at which you are looking. The following table explains these differences.

Screens	In Total Mode	In Delta Mode	Delta Data is Updated
ARD ARDJ ASL	All fields display the ***cumulative*** value with each pressing of the Enter key.	Certain Total fields are replaced by Delta fields, which begin with a D. Delta fields display the ***difference*** in values with each pressing of the Enter key.	Each time you press Enter.

Screens	In Total Mode	In Delta Mode	Delta Data is Updated
DEV DEVV IOQUEUE	All fields display the average value over the current CMF or RMF Extractor ***interval*** (typically 15 minutes).	All fields are considered delta fields, and each displays the difference in values over one or more sampling cycles that occur with each pressing of the Enter key. The delta heading names are the same as in total mode.	At the conclusion of the current CMF or RMF Extractor sampling cycle (typically 1 to 5 seconds).
XDSP	All fields display the ***cumulative*** value from the time the Cross-System Data Server was started.	Delta mode is available only for the Cross-System Callable Services Performance Statistics portion of the XDSP screen. Delta fields display the ***difference*** in values with each pressing of the Enter key.	Each time you press Enter.

To enter delta mode, in the **COMMAND** field, type **DElta**. To enter total mode, type **DElta OFF**.

The default for all screens is total mode. If you are in delta mode when you exit a screen, total mode is immediately restored.

Example

This example uses the ARD screen to illustrate the DElta command.

1. Display the ARD screen.

2. Press Enter a couple of times and notice how ARD's data changes. In particular, notice how the numbers in the CPU TIME field get larger as the total changes over time.

3. In the **COMMAND** field, type **DElta**.

   The screen now looks similar to this:

Figure 2-21 ARD Screen

```
CMFMON ------- Address Space Resource Data (ARD) ------------ DELTA MODE IS ON
COMMAND ===>                                                  SCROLL ===> CSR
                                                              SYSTEM ===> SYSD
   CPU 73  UIC 13  Paging 4      ES Mig Age 9072   Time 14:15:48 Mode DELTA

JOBNAME  DDEV  FF  PRIV LSQA LSQA X DSRM DTCB  DCPU  DELT SWAP LPA CSA NVI V&H
         CONN  BEL FF   CSF  ESF  M ABS  TIME  TIME  EXCP RATE RT  RT  RT  RT
________ _____ ___ ____ ____ ____ _ ____ _____ _____ ____ ____ ___ ___ ___ ___
---------------------------------------------------------------------------------->
*MASTER* 0.279   0   6   74   22     593 0.137 0.556    1 0.00 0.0 0.0 0.0 0.0
PCAUTH   0.000   1   2   61    3  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
RASP     0.000                    X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
TRACE    0.000   0   3   76    2  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
XCFAS    0.000   0  23  136   69  X 8.37 0.005 0.006    0 0.00 0.0 0.0 0.0 0.0
GRS      0.000   0  21   30    3  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
SMXC     0.000   0   2   17    9    0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
SYSBMAS  0.000   0   5   16   10    0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
DUMPSRV  0.000   0   2   42   13    0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
CONSOLE  0.014   1   6   34    8  X 66.0 0.051 0.055    5 0.00 0.0 0.0 0.0 0.0
ANTMAIN  0.000   0   2   23   10  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
ALLOCAS  0.000   0   2   20    3  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
SMF      0.025   0   2   35   10  X 4.83 0.000 0.004    0 0.00 0.0 0.0 0.0 0.0
VLF      0.000   2  24   31   11  X 0.64 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
LOGROUTE 0.000   0   2   24   10    0.00 0.000 0.000    0 0.00 0.0 0.0 0.0 0.0
CNMPSB22 0.000   0   2   27   10  X 0.00 0.000 0.000    0 0.00 0.0 0.0 0.4 0.0
```

Notice that CPU TIME becomes DCPU TIME to indicate that you are in delta mode, and notice that the Mode field on the status line now says DELTA.

Press Enter a few times while keeping an eye on the data in DCPU TIME.

You can see how the values are much smaller now. That is because you are looking at the ***difference*** between collection intervals, rather than the ***total*** value.

4. In the **COMMAND** field, type **DElta OFF** to return to total mode.

Automatically Updating the Screen

To refresh CMFMON's online data automatically, type the following command in the **COMMAND** field:

ASU *xx*

where ***xx*** is a value of 3 through 999 seconds. The default is 15 seconds.

The data on the screen is updated at the interval specified, as if you were pressing the Enter key at the same rate.

To exit automatic screen update (ASU) mode, press the ATTN key or PA1.

Displaying Data from a Remote System

The Cross-System Data Server (XDS) provides access to data from any system(s) within a sysplex. XDS data is displayed in CMFMON's online screens by specifying the ID of the remote system you want to access in the SYSTEM field, shown in the upper right corner of Figure 2-22, and pressing Enter

Figure 2-22 SYSTEM Field in ARD

```
CMFMON ------- Address Space Resource Data (ARD) ------- ROW 1 TO 15 OF 96
COMMAND ===>                                              SCROLL ===> CSR
                                                          SYSTEM ===> SYSD
CPU  74/ 37 UIC 255 Paging      0 ES Mig Age  14286 Time 15:23:10 Mode TOTAL

JOBNAME  DEV    FF PRIV LSQA LSQA X SRM  TCB    CPU   EXCP SWAP LPA CSA NVI V&H
         CONN  BEL   FF  CSF  ESF M ABS  TIME   TIME  RATE RATE  RT  RT  RT  RT
________ _____ ___ ____ ____ ____ _ ___ ______ ______ ____ ____ ___ ___ ___ ___
>-------------------------------------------------------------------------------
*MASTER* 67.12   0   17   60   22   0.0 175.40 549.99 0.00 0.00 0.0 0.0 0.0 0.0
PCAUTH   0.000   0    2   25    3 X 0.0  0.075  0.145 0.00 0.00 0.0 0.0 0.0 0.0
RASP     0.000                  X 0.0  0.032  0.696 0.00 0.00 0.0 0.0 0.0 0.0
TRACE    0.000   0    3   74    2 X 0.0  0.022  0.073 0.00 0.00 0.0 0.0 0.0 0.0
```

To display data from a remote system in CMFMON online screens, the following conditions must exist:

- XDS must be active on the MVS PAS of the local system.
- The MVS PAS of the local system must be connected to a CAS that communicates with a CAS on the remote system in the same XCF group.
- The remote system's CAS must be connected to a PAS on which XDS is active.

For more information on activating XDS on the MVS PAS, see the *CMF MONITOR Customization Guide*. For more information on connecting a local and remote CAS, see the *MAINVIEW Common Customization Guide*.

Saving the Data for Later Use (EXPORT)

CMFMON allows you to save any screen for later use by *exporting* the screen to an ISPF data set. You can then include the data in another report, download the data for use in a PC spreadsheet program, and so on.

To export a screen:

1. In the **COMMAND** field, type **EXPORT**.

The entire display is replaced by the Screen Export Information panel, which looks like this:

Figure 2-23 Screen Export Information for DDMN Panel

```
CMFMON ------------------ Screen Export Information for DDMN  -----------------
COMMAND ===>

ISPF LIBRARY:
   PROJECT ===>
   GROUP   ===>
   TYPE    ===>
   MEMBER  ===>                 (Blank or pattern for member selection list)

OTHER PARTITIONED OR SEQUENTIAL DATA SET:
   DATA SET NAME  ===>
   VOLUME SERIAL  ===>          (If not cataloged)

EXPORT OPTIONS:
        Disposition ===> REPLACE  (REPLACE or APPEND)
  Edit after export ===> NO       (Yes or No)
      Output Format ===> ASIS     (CSV or ASIS)
               Rows ===> ALL      (ALL or FILTERED)

Press ENTER to continue export or END to abort.
```

2. In the **ISPF LIBRARY** field or **OTHER PARTITIONED OR SEQUENTIAL DATA SET** field, type the name of the data set and member to which you want to export the screen.

The EXPORT OPTIONS fields are as follows:

Disposition — Indicates whether you want to replace an existing data set (REPLACE) or append the screen to the bottom of the member (APPEND).

Edit after export — Indicates whether you want to be placed in an edit session for the data set after export:

- If you specify NO, the data is transferred to the specified data set when you press Enter, and you are returned to CMFMON screen that was exported.
- If you specify YES, CMFMON transfers you to the specified data set and member in standard ISPF edit mode using an ISPF edit profile called CDUDAM when you press Enter.

- For performance reasons, CDUDAM sets the RECOVERY parameter to OFF.

Output format — Indicates whether you want the exported data to be in Comma Separated Value (CSV) format or in the format as it appears online (ASIS).

Note: If you have set your ISPF decimal delimiter variable (ZDEC) to a value other than a decimal point (.), then a semicolon (;) is used instead of a comma (,) to separate the values.

Rows — Indicates whether you want to ignore any filters that may be in effect and export all the data (ALL), or just export the data displayed on the screen (FILTERED).

The amount of data that CMFMON exports is determined by the size of the data set to which you export, not the size of your terminal display. For example, suppose you have an 80-byte terminal monitor and must scroll to the right to see all the fields on a particular screen. When you export that screen—for example, to a 121-character data set—CMFMON exports the full 121 characters worth of data, not just the 80 bytes currently visible.

If you are planning to create a data set expressly to export CMFMON screens, BMC Software recommends that the data set be at least 132 characters wide.

3. To return to the CMFMON display, press PF3 to end the session and save the data, or on the **COMMAND** line, type **CANCEL** to quit without saving.

Writing Online Data to SYSOUT

The Report function enables you to write data from the screen to a SYSOUT data set to be printed later. To initiate a report:

1. In the **COMMAND** field, type **REPORT** and press Enter.

The following panel is displayed:

Figure 2-24 Screen Report Information Panel

```
CMFMON --------------- Screen Report Information for ARD--------------------
 COMMAND ===>

 Output Information:
    SYSOUT Class . . . . A
    Lines per Page . . . 60         (from 10 to 99)
    Report Width . . . . 133        (121 or 133)
    ANSI or Machine CC . ANSI       (ANSI or MACHINE)

 Table Formatting Information:
   Rows to be included . ALL        (ALL or FILTERED)

 User Data:
    User Heading . . . .

 Press ENTER to generate report or END to abort.
```

2. Fill in each of the fields in the Screen Report Information panel as follows:

SYSOUT Class	Specifies the JES SYSOUT class of the printed report you wish to use.
Lines per Page	Specifies the number of lines (including the header) to be written to a single page before a new page is initiated.
Report Width	Specifies the width of the report. If there are columns to the left of the screen, they will be included in the report up to the width of the report.
ANSI or Machine CC	Indicates whether ANSI or Machine carriage control characters are to be used.
Rows to be included	Specifies ALL if you want to report on all the data, regardless of the filters in effect. Specifies FILTERS to report on just the data that satisfies the filter criteria
User Heading	Specifies a user title to be included as part of the report heading

3. Once the fields are filled out, press Enter to generate the report.

Ensuring Access to CMFMON Screens

This section helps you diagnose some fairly common situations that may prevent you from displaying CMFMON screens or help panels, and provides solutions.

If You See This Message	Do This
CSV0031 REQUESTED MODULE ISPTUTOR NOT FOUND	If this message appears when you try to access a CMFMON help panel, you are probably running ISPF out of a STEPLIB. CMFMON runs as an ISPF application, allocating its load library with an LLIB parameter. To display its help panels, CMFMON uses the recommended tutorial interface, ISPEXEC SELECT PGM(ISPTUTOR), which resides in the ISPF STEPLIB. When LLIBs are in effect, ISPF does not search STEPLIBs and ISPTUTOR cannot be located. Although ISPF does finally search STEPLIB and display the requested help panel, it does so only after displaying CSV0031. To prevent CSV0031 from displaying, copy ISPTUTOR from your ISPF STEPLIB into hilevel.BBLINK.

Chapter 3 Using the CMFMON Write Facility

This chapter explains how to write type 79 records to a data set using the CMFMON write facility. If you have not already read “CMFMON Write Facility” on page 1-4, you may want to do so now to familiarize yourself with the component.

Setting Up the JCL

You can run a CMFMON recording session as either a started task or a batch job and multiple sessions can run concurrently. To set up a CMFMON recording session:

1. Modify the appropriate JCL, depending on how you want to run CMFMON:

   - Figure 3-1 on page 3-2 contains sample JCL for running CMFMON as a started task. A copy of this JCL is provided in hilevel.UBBSAMP(CMONSTC). If you use this JCL, be sure to copy it to a system procedure library (PROCLIB) first.
   - Figure 3-2 on page 3-2 contains sample JCL for running CMFMON as a batch job. Member CMONJCL in hilevel.UBBSAMP contains a copy.

All control statements must begin in or to the right of column 2.

Figure 3-1 Sample Started Task JCL (CMONSTC)

```
//CMFMON79  PROC  C79=00,
//          RGN=2,
//          RECDSN=,
//          PRTCL=R
//*
//*--------------------------------------------------------------------
//*
//*   REVIEW THE JCL FOR APPLICABILITY TO YOUR INSTALLATION STANDARDS
//*
//*   CHANGE ?HILEVEL TO THE HIGH-LEVEL QUALIFIER YOU CHOSE FOR
//*   YOUR BBLINK DATASET.
//*
//*--------------------------------------------------------------------
//*    PARAMETERS:
//*
//*         C79 - SPECIFIES THE SUFFIX OF THE CMFMONXX CONTROL
//*               STATEMENT MEMBER YOU WANT CMFMON TO USE.
//*               THIS PARAMETER IS MEANINGLESS IF DDNAME SYSINC79
//*               IS USED TO SPECIFY CONTROL CARDS IN THE JCL STREAM.
//*
//*               CMFMON CONTROL STATEMENT MEMBERS ARE STORED IN THE
//*               PARAMETER LIBRARY ALLOCATED BY THE DDNAME PARMLIB.
//*               SEE MEMBER CMFMON00 IN THE UBBPARM DATA SET FOR A
//*               SAMPLE PACKET OF CMFMON CONTROL STATEMENTS.
//*
//*         RGN - SPECIFIES THE REGION SIZE, IN MEGABYTES, TO BE
//*               USED BY CMFMON.
//*
//*      RECDSN - SPECIFIES THE NAME OF THE OUTPUT DATASET.  THIS
//*               DATASET IS ALLOCATED TO DDNAME C79OUT.
//*
//*       PRTCL - SPECIFIES THE SYSOUT CLASS FOR PRINTED OUTPUT
//*
//CMFMON    EXEC PGM=CX10GV79,REGION=&RGN.M,PARM=&C79
//STEPLIB  DD  DISP=SHR,DSN=?HILEVEL.BBLINK
//PARMLIB  DD  DISP=SHR,DSN=?HILEVEL.UBBPARM
//C79OUT   DD  DISP=SHR,DSN=&RECDSN
//CMF79LOG DD  SYSOUT=&PRTCL
//SYSUDUMP DD  SYSOUT=&PRTCL
//*
```

Figure 3-2 Sample Batch JCL (CMONJCL)

```
//JOBCARD JOB
//*
//*--------------------------------------------------------------------
//*
//* SAMPLE JCL FOR EXECUTING CMFMON IN BATCH.
//*
//*   REVIEW THE JCL FOR APPLICABILITY TO YOUR INSTALLATION STANDARDS
//*
//*   CHANGE ?HILEVEL TO THE HIGH-LEVEL QUALIFIER YOU CHOSE FOR
//*   YOUR BBLINK AND UBBPARM DATA SETS.
//*
//*   CHANGE ?RECDSN TO THE NAME OF THE DATASET TO WHICH TYPE 79
//*   RECORDS ARE TO BE WRITTEN.
//*
//*--------------------------------------------------------------------
//*
//CMFMON    EXEC PGM=CX10GV79,REGION=2M
//STEPLIB  DD  DISP=SHR,DSN=?HILEVEL.BBLINK
//C79OUT   DD  DISP=SHR,DSN=?RECDSN
//SYSUDUMP DD  SYSOUT=*
//CMF79LOG DD  SYSOUT=*
//SYSINC79 DD  DISP=SHR,DSN=?HILEVEL.UBBPARM(CMFMON00)
//*
```

Table 3-1 describes JCL statements shown in the figures above.

Table 3-1 Explanation of CMFMON JCL

Job Control Statement	Description
CMFMON EXEC	Specifies the program name (CX10GV79), assigns a region size (2 megabytes), and, in CMONSTC, specifies the suffix of the control statement member used by CMFMON (00). Notes: • The default control statement member is named CMFMON00 and is distributed in hilevel.BBPARM (which was copied to hilevel.UBBPARM after installation). See "Default Control Statement Member" on page 3-25 for a description of this member. If you do not specify the C79 parameter, CMFMON uses the control statements in CMFMON00. • If the C79 parameter identifies a control statement member that cannot be located, CMFMON terminates with an error message. • BMC Software recommends that you begin running with a 2-megabyte region size. Depending on the environment and options you use, you may be able to reduce this size later. For example, if you are not planning to do enqueue sampling, a region size of 1 megabyte will probably suffice.
STEPLIB DD	Defines a PDS that contains the CMFMON load modules. This PDS must be an APF-authorized library.
PARMLIB DD (shown in Figure 3-1 on page 3-2)	Defines a data set containing the control statement member for use with CMFMON. The control statement member must be in the form CMFMON*xx*, where *xx* is a suffix you choose. If you do not want to use a control statement member in the form CMFMON*xx*, use the SYSINC79 DD statement instead of PARMLIB. SYSINC79 is described below.
SYSINC79 DD (shown in Figure 3-2 on page 3-2)	Points to the UBBPARM data set, which contains the default control statement member, CMFMON00. Use this DD statement instead of PARMLIB when you want to: 1) specify in-stream control cards, or 2) use a PDS member named something other than CMFMON*xx.* If both the PARMLIB and the SYSINC79 statements are specified, SYSINC79 is used.
C79OUT DD	Defines the data set to which you want to record type 79 data. This data set must be variable blocked spanned (RECFM=VBS). To record to SMF data sets, remove this DD statement and specify SMF=YES on the RECORD control statement (see page 3-4 for more information). If you specify DISP=MOD, CMFMON writes records to the end of the C79OUT data set. Any other DISP specification causes CMFMON to write its records starting at the beginning of the data set.
CMF79LOG DD	Defines the data set that receives messages produced during a CMFMON recording session.

2. Place the RECORD control statement in one of these locations:

If you place RECORD here	Use this DD statement
In a control statement member named CMFMON*xx*, where *xx* is a suffix you choose	PARMLIB
Directly in the JCL	SYSINC79

If you place RECORD here	Use this DD statement
In a control statement member named something other than CMFMON*xx*	SYSINC79
In a sequential data set	SYSINC79

The RECORD statement sets global parameters for the CMFMON session. It is required and must be defined before any other control statements in the JCL. Only one RECORD statement may be defined for a single job.

Figure 3-3 shows the RECORD control statement and its parameters:

Figure 3-3 RECORD Statement and Parameters

```
RECORD
[,SMF={YES|NO}]
[,INTERVAL={mm|ssS|QTR|HALF|HOUR}]
[,RUNTIME={10|mmmm}]
```

Table 3-2 explains each parameter in Figure 3-3.

Table 3-2 RECORD Parameters

Parameter	Description
SMF=NO	Indicates that you want CMFMON to write records to the data set allocated to the C79OUT DD statement. To write records to SMF data sets, specify SMF=YES. This parameter is optional. If you do not specify it, records are written to the C79OUT data set by default. If you specify both SMF=YES *and* the C79OUT DD statement, CMFMON writes its data to the SMF data sets. If neither is specified, CMFMON issues an error message and terminates.
INTERVAL=*mm*|*ss*S|QTR|HALF|HOUR	Specifies the CMFMON *recording interval*—that is, how often type 79 records are written to the data set—where: ***mm*** Indicates the number of minutes in the recording interval. Maximum value is 60 minutes. Default is 1 minute. ***ss*S** Indicates the number of seconds. Value specified must be followed by an S, to indicate seconds, in lowercase or uppercase. Minimum value is 1 second; maximum is 3600. **QTR** Is 15 minutes. **HALF** Is 30 minutes. **HOUR** Is 60 minutes. If a number is specified alone, without an S after it, the number is interpreted as minutes.
RUNTIME=*mmmm*	Specifies how long CMFMON collects and writes data, where *mmmm* is number of minutes. Default is 10 minutes. Specifying 1440 minutes causes CMFMON to continue running until a STOP command is issued. Minimum value is whatever is specified on the INTERVAL parameter. Maximum is 9999 minutes.

3. In the same CMFMON*xx* control statement member (or on the SYSINC79 DD statement), code the control statements to specify the data you want to collect. (Be sure to check Appendix B, “Getting Data You Want” , to make sure the data you want is available.)
   You must explicitly state the control statement for the data you want to collect. The default is to **not** collect the data.

Note: Although CMFMON’s online facility allows you to view the differences (*deltas*) in fields between collection intervals, this data is not immediately available in the written records. All values are absolute totals or, for the DEVICE, IOQ, PGSPP, PGSPS, and TRX records, the total for the current CMF Extractor recording interval. If you want to calculate the delta values, start with two type 79 records collected at different times, then subtract the earlier data from the later. Note that for DEVICE, IOQ, PGSPP, PGSPS, and TRX, the records must be created during the same CMF Extractor interval. (Field R79IST tells you when the CMF Extractor recording interval began.)

Table 3-3 summarizes the control statements for the data. Pages 3-7 through 3-23 explain each control statement in more detail.

Note: If you must continue a control statement on new line, break the statement anywhere a comma occurs.

Table 3-3 Summary of CMFMON Control Statements

Control Statement	Parameter List	Type of Data Collected	For more information
ARD	[JOBNAME=(job1,job2,...,jobn)] [,CLASS={A|AS|B|O|T}] [,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}] [,STATUS={A|I}] [,RSMDATA={YES|NO}]	Address space resource data SMF79 subtype 2 records	See “ARD” on page 3-7
ASD	[JOBNAME=(job1,job2,...,jobn)] [,CLASS={A|AS|B|O|T}] [,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}] [,STATUS={A|I}]	Address space state data SMF79 subtype 1 records	See “ASD” on page 3-10
ASRM	[JOBNAME=(job1,job2,...,jobn)] [,CLASS={A|AS|B|O|T}] [,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}] [,STATUS={A|I}]	Address space SRM data SMF79 subtype 5 records	See “ASRM” on page 3-11
CHANNEL	None	Channel path activity for all online channel paths SMF79 subtype 12 records	See “CHANNEL” on page 3-12
DDMN	None	SRM domain activity for all domains SMF79 subtype 10 records	See “DDMN” on page 3-13
DEVICE	[CLASS=TAPE|COMM|DASD|GRAPH|UNITR| CHRDR|CTC] [,RANGE=(dev1,dev2,...deva:devb)] [,SG=(sg1,sg2,...sga:sgb)] [,VOLUME=(vol1,vol2,...vola:volb)]	Device activity data SMF79 subtype 9 records	See “DEVICE” on page 3-14
IOQ	[CLASS=TAPE|COMM|DASD|GRAPH|UNITR| CHRDR|CTC] [,RANGE=(lcu1,lcu2,...lcua:lcub)]	I/O queue activity SMF79 subtype 13 and 14 records	See “IOQ” on page 3-16
PGSPP	None	Data set activity for all page data sets in use SMF79 subtype 11 records	See “PGSPP” on page 3-17
PGSPS	None	Data set activity for all swap data sets in use SMF79 subtype 11 records	See “PGSPS” on page 3-18

Table 3-3 Summary of CMFMON Control Statements (continued)

Control Statement	Parameter List	Type of Data Collected	For more information
SENQ	[TYPE=S|D|A|E] [,RESOURCE=majorname| (majorname,minorname)] [,SYSNAME=sysname]	Enqueue conflicts or the status of enqueues for specific resources SMF79 subtype 7 records	See “SENQ” on page 3-19
SENQR	[VOLUME=(vol1, vol2....,voln)]	All active reserve requests SMF79 subtype 6 records	See “SENQR” on page 3-21
SPAG	None	System paging activity SMF79 subtype 4 records	See “SPAG” on page 3-22
SRCS	None	Central storage, processor and SRM activity SMF79 subtype 3 records	See “SRCS” on page 3-23
TRX	[SUBSYS=(sys1,sys2...,sysn)] [,PG=(pg1,pg2...pga:pgb)]	Transaction activity SMF79 subtype 8 records	See “TRX” on page 3-24

Note: The parameters specified on each control statement are ANDed; that is, all conditions must be true before the data is recorded. For example, if you specify ARD JOBNAME=JOBX,STATUS=I, data is collected for JOBX only when the job is swapped in.

The next several pages describe each control statement in greater detail.

ARD

```
ARD
[JOBNAME=(job1,job2,...,jobn)]
[,CLASS=(A|AS|B|O|T)]
[,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}]
[,STATUS=(A|I)]
[,RSMDATA=(YES|NO)]
```

Overview

Collects data on consumption of resources by address spaces. If no operands are specified, data is collected for all active address spaces. Data is recorded in SMF79 subtype 2 records and reflects the activity of jobs since they became active.

Parameters

JOBNAME Up to 32 names of the jobs for which data is to be collected. A jobname is 1 to 8 characters.
Partial names specified with wildcard characters are not supported.

CLASS Indicates the class of job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **AS** Advanced program-to-program communications (APPC) transaction scheduler address spaces (ASCH)
- **B** All batch and started-task address spaces
- **O** All MVS OpenEdition address spaces
- **T** All TSO address spaces

DOMAIN Up to 16 domain numbers or ranges for which data is to be collected, or A for all domains.

STATUS One-character indicator of the status of the job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **I** Swapped-in address spaces only

RSMDATA Indicates whether to collect real storage data for the selected address spaces. The default is YES.
If either RSMDATA=NO or if BBXS is inactive, the fields shown in Table 3-4 contain null data:

Table 3-4 Fields Containing Null Data when BBXS Is Inactive

Field	Description
R792PRFX	Total fixed frames
R792FXBL	Fixed frames below the 16MB line
R792NLQF	Non-LSQA fixed frames
R792LSQA	LSQA fixed frames
R792LSQR	LSQA real storage pages
R792LSQE	LSQA expanded storage pages

Flag R792RSM is set to indicate that these fields are invalid.

If you specify RSMDATA=YES, all RSM data is collected. However, be aware this can cause excessive processor overhead, particularly if data is collected for a large number of address spaces.

Examples

ARD JOBNAME=(MAK1,WEC1),RSMDATA=YES

Data is collected on MAK1 and WEC1 use of resources, including their use of real storage.

ARD CLASS=A,DOMAIN=(1:5,20),STATUS=I

Address space resource data is collected for all swapped-in address spaces in domains 1–5 and 20.

ASD

```
ASD
[JOBNAME=(job1,job2,...,jobn)]
[,CLASS=(A|AS|B|O|T)]
[,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}]
[,STATUS=(A|I)]
```

Overview

Collects general information on the specified address spaces, such as working set size, average page-in rate, and so on. If no operands are specified, data is collected for all active address spaces. Data is recorded in SMF79 subtype 1 records and reflects activity of the jobs since they became active.

Parameters

JOBNAME Up to 32 names of the jobs for which data is to be collected. A jobname is 1 to 8 characters.
Partial names specified with wildcard characters are not supported.

CLASS Indicates the class of job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **AS** Advanced program-to-program communications (APPC) transaction scheduler address spaces (ASCH)
- **B** All batch and started-task address spaces
- **O** All MVS OpenEdition address spaces
- **T** All TSO address spaces

DOMAIN Up to 16 domain numbers or ranges for which data is to be collected, or A for all domains.

STATUS One-character indicator of the status of the job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **I** Swapped-in address spaces only

Example

```
ASD JOBNAME=(MAK1,WEC1)
```

General information is collected for jobs MAK1 and WEC1.

ASRM

```
ASRM
[JOBNAME=(job1,job2,...,jobn)]
[,CLASS=(A|AS|B|O|T)]
[,DOMAIN={A|(dmn1,dmn2,...,dmna:dmnb)}]
[,STATUS=(A|I))
```

Overview

Collects data on the specified address space's consumption of SRM service units. If no operands are specified, data is collected for all active address spaces. Data is recorded in SMF79 subtype 5 records.

Parameters

JOBNAME Up to 32 names of the jobs for which data is to be collected. A jobname is 1 to 8 characters.
Partial names specified with wildcard characters are not supported.

CLASS Indicates the class of job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **AS** Advanced program-to-program communications (APPC) transaction scheduler address spaces (ASCH)
- **B** All batch and started-task address spaces
- **O** All MVS OpenEdition address spaces
- **T** All TSO address spaces

DOMAIN Up to 16 domain numbers or ranges for which data is to be collected, or A for all domains.

STATUS One-character indicator of the status of the job(s) for which data is to be collected. Possible values are:

- **A** All address spaces
- **I** Swapped-in address spaces only

Example

```
ASRM JOBNAME=(EEW1,EEW2),CLASS=T
```

SRM data is collected for TSO jobs EEW1 and EEW2, regardless of their domain or status.

CHANNEL

CHANNEL

Overview

Collects channel path activity data for all online channel paths. Data is recorded in SMF79 subtype 12 records.

Note: Channel path data requires active channel measurement, which is usually provided by Subsystem Services (BBXS). If channel measurement is performed by something other than BBXS, the channel type field (R79CFG2) is empty.

Parameters

None.

Example

CHANNEL

Data is collected on all online channel paths.

DDMN

DDMN

Overview

Collects data on consumption of SRM service units by all domains. Data is recorded in SMF79 subtype 10 records.

Parameters

None.

Example

DDMN

Data is collected on consumption of SRM service units by all domains.

DEVICE

```
DEVICE
[CLASS=TAPE|COMM|DASD|GRAPH|UNITR|CHRDR|CTC]
[,RANGE=(dev1,dev2,...deva:devb)]
[,SG=(sg1,sg2,...sga:sgb)]
[,VOLUME=(vol1,vol2,...vola:volb)]
```

Overview

Collects data on specified devices. If no operands are specified, data is collected for all online devices. Data is recorded in SMF79 subtype 9 records.

Note: Device data is available only when the CMF Extractor is active with the DEVICE statement in CPM mode. CMFMON collects data only for devices that the CMF Extractor is monitoring. When data is returned, it reflects activity that occurred during the current CMF recording interval.

Parameters

CLASS Limits the data collected to devices of the specified type. The default is to collect data for all devices. Possible values are:

- **TAPE** Magnetic tape devices
- **COMM** Communications devices
- **DASD** Direct access storage devices
- **GRAPH** Graphics devices
- **UNITR** Unit record devices
- **CHRDR** Character reader devices
- **CTC** Channel-to-channel adapters

RANGE Up to 32 devices or ranges of devices for which data is collected. The default is to collect data for all devices.

SG Up to 16 storage groups or ranges of storage groups for which data is collected. The default is to collect data for all storage groups.

VOLUME Limits the data collected to devices on which the specified volume(s) is mounted. Up to 32 volumes or ranges of volumes may be specified. The default is to collect data for all volumes.

Examples

DEVICE CLASS=DASD,SG=SGROUP01

Data is collected on the DASD devices in storage group SGROUP01.

DEVICE VOLUME=BAB030

Data is collected on the device on which volume BAB030 is mounted.

DEVICE CLASS=COMM
DEVICE CLASS=CTC

Two records are produced per interval: one for communications devices, and one for channel-to-channel adapters. This is equivalent to specifying CLASS=COMM on the CMF Extractor DEVICE statement.

IOQ

IOQ
[CLASS=TAPE|COMM|DASD|GRAPH|UNITR|CHRDR|CTC]
[,RANGE=(lcu1,lcu2,...lcua:lcub)]

Overview

Collects data on I/O queuing activity for all channel paths on the LCU(s) that have experienced activity during the current CMF recording interval. If no operands are specified, data is collected for all LCUs that have had active channel paths during the current CMF recording interval.

Data is recorded in SMF79 subtype 14 records for 3090 or ES/9000 systems, or in subtype 13 records for 4381 or 308x systems. I/O queueing data is available only when the CMF Extractor is active with the IOQ statement in CPM mode.

Parameters

CLASS Limits the data collected to LCUs that serve the specified device class. The default is to collect data for all LCUs. Possible values are:

- **TAPE** Magnetic tape devices
- **COMM** Communications devices
- **DASD** Direct access storage devices
- **GRAPH** Graphics devices
- **UNITR** Unit record devices
- **CHRDR** Character reader devices
- **CTC** Channel-to-channel adapters

RANGE Up to 32 LCUs or ranges of LCUs for which data is collected. The default is to collect data for all LCUs.

Examples

IOQ RANGE=06A

Collects data on the I/O queues existing for all devices attached to LCU 06A.

IOQ CLASS=TAPE,RANGE=7B1

Collects data on the I/O queues existing for tape devices attached to LCU 7B1.

PGSPP

PGSPP

Overview

Collects data on all page data sets in use. Data is recorded in SMF79 subtype 11 records and reflects activity that occurred during the current CMF recording interval.

Note: Page data set data is available only when the CMF Extractor is active with the ASMDATA statement in CPM mode.

Parameters

None.

Example

PGSPP

Data is collected for all page data set activity.

PGSPS

PGSPS

Overview

Collects data on all swap data sets in use. Data is recorded in SMF79 subtype 11 records and reflects activity that occurred during the current CMF recording interval.

Note: Swap data set data is available only when the CMF Extractor is active with the ASMDATA statement in CPM mode.

Parameters

None.

Examples

PGSPS

Data is collected for all swap data set activity.

SENQ

SENQ
[TYPE=S|D|A|E]
[,RESOURCE=(majorname|(majorname,minorname)]
[,SYSNAME=sysname]

Overview

Collects data on all enqueue conflicts or the status of enqueues for specific resources. The default is to record detail information for all resources experiencing contention. Data is recorded in SMF79 subtype 7 records.

The data collected reflects the resource contention at the time the record is created. Contention that occurs solely between recording intervals is not recorded.

Parameters

TYPE Specifies the enqueue activity to measure and the level of detail recorded. Possible values are:

S Collects summary data for the resource specified on the RESOURCE parameter. If the RESOURCE parameter is omitted, data is collected for all resources experiencing contention. For each resource, the following is recorded:

- Resource major and minor name.
- Scope of the enqueue.
- Number of tasks that own the resource.
- Number of tasks awaiting exclusive ownership of the resource.
- Number of tasks awaiting shared use of the resource.

D Collects detail data for the resource specified on the RESOURCE parameter. If the RESOURCE parameter is omitted, data is collected for all resources experiencing contention. For each resource, the following is recorded:

- Resource major and minor name.
- Scope of the enqueue.
- Name of each job that either owns or awaits use of the resource.

A Collects data on all resources held by jobs on the system specified on the SYSNAME parameter.

E Collects data on all resources held exclusively by jobs on the system specified on the SYSNAME parameter.

RESOURCE Specifies the resource(s) for which summary or detail data is collected. Valid only when TYPE=S or TYPE=D. The maximum length of *majorname* is 8. The maximum length of *minorname* is 44.

Specify *majorname* alone to record all contention for a given majorname (Qname). Specify both *majorname* and *minorname* to record contention for a specific majorname/minorname (Qname/Rname) combination.

When both majorname and minorname are specified, they must be enclosed by parentheses.

SYSNAME Specifies the system for which data is collected when TYPE=A or E.

Examples

SENQ TYPE=A,SYSTEM=SYSB

Collects data for all resources held by SYSB.

SENQ TYPE=D,RESOURCE=(SYSDSN,LGS3.CNTL)

Collects detail data on contention experienced by the data set LGS3.CNTL.

SENQR

SENQR
[VOLUME=(vol1,vol2...,vol*n*)]

Overview

Collects data on active reserve requests for a specified volume. The default is to record reserve activity for all volumes. Data is recorded in SMF79 subtype 6 records.

Specify VOLUME=*vol* to collect reserve data for the specified volume only. The data collected reflects reserves that are active or outstanding at the time the record is created. Reserve activity that occurs solely between recording intervals is not recorded.

Parameters

VOLUME Serial number(s) of the volser(s) for which data is collected. Up to 32 volsers may be specified.

Example

SENQ VOLUME=(MVS800,BAB003)

Collects data on the reserves requested for volsers MVS800 and BAB003.

SPAG

SPAG

Overview

Collects data on system paging, such as the number of LPA and CSA pages swapped in, the total number of pages swapped out, and so on. Data is recorded in SMF79 subtype 4 records.

Parameters

None.

Example

SPAG

Collects data on system paging.

SRCS

SRCS

Overview

Collects data on central storage, processor, and SRM activity. Data is collected in SMF79 subtype 3 records.

This data is available only when the CMF Extractor is active with the CPU statement in CPM mode. If it is not, and you are running in a PR/SM environment, a value of -1 is returned in field R793CPUU.

BBXS must be active to collect this data. If it is not, message CMFMON51 is issued for each CMFMON recording interval during which BBXS is not active.

Parameters

None.

Example

SRCS

Collects data on central storage, processor, and SRM activity.

TRX

```
TRX
[SUBSYS=(sys1,sys2...,sysn)]
[,PG=(pg1,pg2,...pga:pgb)]
```

Overview

Collects data on transactions occurring for a subsystem or performance group. The default is to collect data for all subsystems and performance groups. Data is collected in SMF79 subtype 8 records and reflects activity that occurred during the current CMF recording interval.

Note: Transaction data is available only when the CMF Extractor is active with the WORKLOAD statement in CPM mode.

Parameters

SUBSYS Up to 32 subsystems for which data is to be collected.

PG Up to 32 performance groups or ranges of performance groups for which data is to be collected.

Examples

TRX SUBSYS=BBCS

Collects data on transactions occurring in the subsystem BBCS.

TRX PG=(1:12)

Collects data on transactions occurring in performance groups 1 through 12, inclusive.

TRX PG=227

Collects data on transactions occurring in performance group 227.

Default Control Statement Member

Figure 3-4 shows the default control statement member, CMFMON00. CMFMON00 is shipped in hilevel.UBBPARM and is used when the C79 parameter is omitted or if it is specified as C79=00.

Figure 3-4 Default Control Statement Member, CMFMON00

```
RECORD  INTERVAL=1,RUNTIME=600
ARD  CLASS=T,RSMDATA=NO
ASD  STATUS=I
ASRM
CHANNEL
DDMN
DEVICE CLASS=DASD
IOQ
PGSPP
SENQ  TYPE=S,RESOURCE=SYSDSN
SENQR
SPAG
SRCS
TRX SUBSYS=STC
TRX SUBSYS=TSO
```

Table 3-5 explains each statement:

Table 3-5 CMFMON00 Statements (Part 1 of 2)

Statement	Explanation
RECORD	Sets the global parameters for the recording session. INTERVAL=1Data is recorded to the SMF data set once every minute. RUNTIME=600Session will run for 10 hours (600 minutes). Because the SMF=YES|NO parameter is omitted, data is written to the C79OUT data set by default.
ARD CLASS=T,RSMDATA=NO	Data is collected on consumption of resources by TSO address spaces except for real storage. Note that although RSMDATA=YES is the default, real storage data is very expensive to collect; thus, CMFMON00 sets RSMDATA to NO.
ASD STATUS=I	General information is collected on swapped-in address spaces only.
CHANNEL	Channel path data is collected for all online channel paths.
DDMN	Data on each domain's consumption of SRM service units is collected.
DEVICE CLASS=DASD	Data on DASD devices only is collected.
IOQ	Data on all I/O queueing activity is collected.
PGSPP	Data on page data set usage is collected.
SENQ S,RESOURCE=SYSDSN	Summary data is collected on the standard enqueues used to serialize data sets.

Table 3-5 CMFMON00 Statements (Part 2 of 2)

Statement	Explanation
SENQR	Data on active reserve requests is collected for all volumes.
SPAG	Data on system paging is collected.
SRCS	Data on central storage, processor, and SRM activity is collected.
TRX SUBSYS=STC TRX SUBSYS=TSO	Data on transactions occurring on subsystems STC and TSO is collected.

Chapter 4 Generating CMFMON Batch Reports

This chapter explains how to generate batch reports using type 79 records. These reports allow you to automatically capture and save snapshots of the data shown in the screens discussed in Chapter 2, “Using CMFMON’s Online Facility” on page 2-1.

Defining CMFMON Batch Report JCL

You can select one or more CMFMON reports to be generated and sent to a data set by running a batch job. Control statements are used to specify the reports you want to produce. Keywords on control statements allow you to:

- Filter the data
- Sort the data by a particular column in ascending or descending order
- Create a title for the report
- Customize the order in which the columns appear
- Specify the report mode (TOTAL or DELTA)

In addition, the GLOBAL control statement is used to specify characteristics common to all CMFMON batch reports produced with a set of control statements. This statement can be used to request data from remote systems, control the interval of realtime reports, and add a common heading to all reports. For information on using control statement keywords, see “Keywords for Report Control Statements” on page 4-9.

Batch reports are generated when the JCL is submitted. A sample set of JCL for running your batch job is located in hilevel.UBBSAMP member CMFJMONB, and is shown in Figure 4-1 on page 4-4. You may need to modify this JCL depending on which type of data you want to use for your reports. The three types of data (historical, XDS data buffer, and realtime) are explained in “Input Data for CMFMON Batch Reports” on page 4-2. The two types of data (historical and realtime) are also explained in “Input Data for CMFMON Batch Reports” on page 4-2.

JCL statements point to the type 79 input records for reports, and direct diagnostic and error messages, should your job encounter problems.

Input Data for CMFMON Batch Reports

CMFMON batch reports can be produced using one of the following types of data:

Historical data in data sets

Historical data includes any type of data written out to a data set for later use. To generate reports using historical data from one or more BSAM data sets or a single VSAM data set, specify the data set(s) on the CMF79IN DD statement.

Historical data from the CMF PAS XDS data buffer

You can generate reports that use SMF type 79 data stored in the XDS data buffer. Generating these reports requires the XDS data buffer to be active and collecting type 79 records. In addition, the CMFMON write facility (CX10GV79) must be writing to SMF. See the *CMF MONITOR Batch User Guide*
for information on using the XDS APIs. See Chapter 3, “Using the CMFMON Write Facility” on page 3-1 for information about the CMFMON write facility.

The recent historical data contained in theCMF PAS XDS data buffer might be useful for generating reports about system performance over the course of a day, or for tracking down the cause of a problem that occurred several hours ago.

To use data from the XDS buffer in your batch reports, you must make sure that XDS is collecting type 79 records. A sample member, CMFXDS02, located in hilevel.UBBPARM provides the correct settings for generating CMFMON batch reports with XDS buffer data.

See the *CMF MONITOR Customization Guide* for more information about activating the MVS PAS and the XDS data buffer.

To generate reports using data from the XDS data buffer, *both* of the following conditions must exist:

- The CMF79IN DD statement is omitted from the JCL.
- The GLOBAL control statement **does not** contain the RUNTIME keyword.

Realtime data

The CMFMON batch report JCL invokes the appropriate API to get SMF type 79 records reflecting the current system activity. Reports are produced based on these realtime records. The records are discarded after the report is generated.

To generate reports using realtime data, *both* of the following conditions must exist:

- The CMF79IN DD statement is omitted from the JCL.
- The GLOBAL control statement contains the RUNTIME= keyword which specifies the length of time the CMFMON batch report session is to remain active.

The sample JCL member is located in hilevel.UBBSAMP member CMFJMONB and is discussed in “Using the Sample JCL and Control Statement Members” on page 4-4.

The sample control statement member is located in hilevel.UBBPARM member CMFMNB00 and is discussed in “Using Control Statements” on page 4-5.

Using Data from Remote Systems

CMFMON batch reports can contain data from the local system (the system on which you run the job) or a remote system in your sysplex. To use data from a remote system, you must make sure that the following conditions exist:

- XDS is active on the MVS PAS of the local system.
- The MVS PAS of the local system is connected to a CAS that communicates with a CAS on the remote system.

- The remote system's CAS is connected to a PAS on which XDS is active.

For more information on activating XDS on the MVS PAS, see the *CMF MONITOR Customization Guide*.

For more information on connecting a local and remote CAS, see Chapter 6, "Managing Cross-System Communication" in the *MAINVIEW Administration Guide*.

Using the Sample JCL and Control Statement Members

A set of sample JCL for generating CMFMON batch reports is in hilevel.UBBSAMP data set member CMFJMONB.

A set of sample control statements for generating all available reports is in hilevel.UBBPARM data set member CMFMNB00.

These members are shown in Figure 4-1 below and Figure 4-2 on page 4-6.

The JCL statements shown in this figure are described in Table 4-1 on page 4-5.

Figure 4-1 Sample JCL Member (CMFJMONB)

```
//JOBCARD JOB                                                           00010000
//*                                                                     00020000
//*--------------------------------------------------------------------- 00030000
//*                                                                     00040000
//*   SAMPLE JCL FOR EXECUTING THE CMFMON BATCH.                        00050000
//*                                                                     00060000
//*   REVIEW THE JCL FOR APPLICABILITY TO YOUR INSTALLATION             00070000
//*   STANDARDS                                                         00080000
//*                                                                     00090000
//*   CHANGE ?HILEVEL TO THE HIGH-LEVEL QUALIFIER YOU CHOSE FOR         00090100
//*   YOUR BBLINK AND UBBPARM DATA SETS.                                00090200
//*                                                                     00110102
//*   CHANGE ?RECDSN TO THE NAME OF THE DATASET FROM WHICH SMF          00110103
//*   TYPE-79 RECORDS ARE TO BE READ.                                   00110104
//*                                                                     00120000
//*--------------------------------------------------------------------- 00160000
//*                                                                     00170000
//CMONBAT  EXEC PGM=CMBRPORT,REGION=8M                                  00180003
//*                                                                     00190000
//STEPLIB  DD   DISP=SHR,        - CMF LOAD LIBRARY                     00200000
//         DSN=?HILEVEL.BBLINK                                          00210000
//CMF79IN  DD   DISP=SHR,        - INPUT DATASET                        00250000
//         DSN=?RECDSN                                                  00260000
//SYSIN    DD   DISP=SHR,        - CMFMON BATCH CONTROL STMTS           00290000
//         DSN=?HILEVEL.UBBPARM(CMFMNB00)                               00300000
//SYSPRINT DD   SYSOUT=*         - CONTROL STATEMENT LOG                00370000
//CMF79MSG DD   SYSOUT=*         - MESSAGE LOG                          00370100
//SYSUDUMP DD   SYSOUT=*         - DUMPS                                00410000
//                                                                      00420030
```

Descriptions of Batch Report JCL Statements

All the JCL statements are described in Table 4-1 below.

Table 4-1 JCL Statements for CMFMON Batch Reports

JCL Statement	Description
//CMONBAT EXEC	Required; specifies the program name (CMBRPORT) for CMFMON batch reports.
//STEPLIB DD	Required if hilevel.BBLINK is not in the LINKLIST; specifies a partitioned data set that contains the CMF load modules.
//CMF79IN DD	Optional; defines the input data sets for your CMFMON batch reports. If you want your reports to contain either realtime data or data from the XDS data buffer, you must omit this statement.
//SYSIN DD	Defines the location of the control statements needed to specify the reports to be produced. See “Using Control Statements” on page 4-5 for more information.
//SYSPRINT DD	Defines a print file or an output data set for: • An echo of the input control statements. • Messages generated while control statements are processed. If you define an output data set, it must be allocated with the following characteristics: RECFM=FBA LRECL=133
//CMF79MSG DD	Optional; defines an output data set for messages while formatting reports. If this statement is not specified, the data set is dynamically allocated to the sysout class specified by the SYSOUT parameter of the GLOBAL control statement.
//SYSUDUMP DD	Defines an output data set for dumps.

Using Control Statements

Control statements must follow the SYSIN DD statement specified in the JCL or reside in a member of a partitioned data set specified on the SYSIN DD statement. Figure 4-2 on page 4-6 shows a sample set of control statements used for generating CMFMON batch reports.

The control statements shown in this figure are described in “GLOBAL Statement” on page 4-6 below and “Report Control Statements” on page 4-7.

Figure 4-2 Sample Control Statement Members (CMFMNB00)

```
*                                                                       00010000
* SAMPLE CONTROL STATEMENT TO PRODUCE CMFMON BATCH REPORTS              00011001
*                                                                       00014001
* GLOBAL CONTROL STATEMENT MUST BE THE FIRST ONE SPECIFIED              00050001
*                                                                       00060001
  GLOBAL   SYSOUT(A)              -  A IS THE DEFAULT OUTPUT CLASS      00065902
*                                                                       00066000
  ARD                            /* TOTAL MODE REPORTS */              00067001
  ARD      DELTA                 /* DELTA MODE REPORTS */              00068101
  ARDJ     JOBNAME(CATALOG)      -  JOBNAME IS REQUIRED                00069201
  ARDJ     JOBNAME(CATALOG)      /* , END OF LINE FOR CONTINUATION*/,  00070201
           DELTA                 -  DELTA MODE REPORT                  00070301
*                                                                       00071000
  ASD                                                                   00080001
  ASDJ     JOBNAME(CATALOG)      -  JOBNAME IS REQUIRED                00090101
  ASRM                                                                  00090401
  ASRMJ    JOBNAME(CATALOG)      -  JOBNAME IS REQUIRED                00090601
*                                                                       00090701
  CHANNEL                                                               00090801
  DDMN                                                                  00090901
*                                                                       00091001
  DEVICE                         /* TOTAL MODE REPORTS */              00091101
  DEVICE   DELTA                 /* DELTA MODE REPORTS */              00091201
  DEVV     VOLSER(ABCDEF)        -  VOLSER OR NUMBER REQUIRED          00091401
  DEVV     VOLSER(ABCDEF) DELTA                                         00091501
  DEVV     NUMBER(0200)                                                 00093001
  DEVV     NUMBER(0200)   DELTA                                         00093101
*                                                                       00094001
  IOQUEUE                        /* TOTAL MODE REPORTS    */          00096001
  IOQUEUE  DELTA                 /* DELTA MODE REPORTS    */          00097001
  PGSPP                          /* PAGE DATASET ACTIVITY */          00098001
```

GLOBAL Statement

A single GLOBAL statement specifies information that pertains to each report you request. The GLOBAL statement must be the first control statement specified. This statement contains keywords that control how the report is formatted:

SYSOUTSpecifies the sysout class of the data sets containing the output reports. Only alphanumeric values are valid. The default value is *A*.

Each report control statement generates a separate, dynamically allocated data set.

Note: If the CMF79MSG DD statement is not specified on the job JCL, a message data set is also allocated to this sysout class.

RUNTIMESpecifies (in minutes) the length of time the CMFMON batch session is to remain active for running reports with realtime data. The range of RUNTIME values is from 1 to 10080 (one week).

Note: If your reports are produced based on historical data from a data set (specified with the CMF79 DD statement), this keyword is ignored.

If your reports are produced based on data from the XDS data buffer, you must omit this keyword.

INTERVALSpecifies the interval lengths in either seconds (S) or minutes (M). The range of INTERVAL values is from 5S to 3600S. The default is 1M (one minute); however, if you specify a value of less than 5S (5 seconds), the value 5S is used.

Note: This keyword is ignored unless the RUNTIME keyword is specified.

SYSIDThe four-character SYSID that specifies the system on which you want to produce reports. If you do not specify this keyword, the default value depends on the data source:

- For historical data from a data set, data from all systems is included in the reports.
- For realtime data, and data from the XDS data buffer, data from the local system is included in the reports. To obtain data from another system for your CMFMON batch reports, you not only must use the SYSID keyword but also must make sure that data from the remote system is available. For more information, see "Using Data from Remote Systems" on page 4-3.

RECTYPESpecifies which type of records are to be analyzed. Specify CMF for analyzing records produced by CMF (this is the default). Specify RMF for analyzing records produced by RMF.

COMPANYSpecifies the title that is centered on the second line of all report headers. The text must be enclosed within single quotes.

LINECTSpecifies how many lines of data are printed before a page break; the default is 60 lines.

Note: If you specify a value outside the range of 2 to 32760 lines, the default value is used.

Report Control Statements

The following list shows the control statements that define the reports to be produced.

ARD	ASRM	DEVV	SENQ
ARDJ	ASRMJ	IOQ	SENQR
ASD	CHANNEL	PGSPP	SPAG
ASDJ	DEV	PGSPS	TRX

You can use keywords with these statements to organize and to filter the contents of the reports. The same keywords are used with all control statements (except for GLOBAL). These keywords are described in “Keywords for Report Control Statements” on page 4-9.

Understanding Report Headings

Each report contains a three-line heading. These headings provide information about both the data included in the report and the report itself. A description of each field in a report heading is given in Table 4-2.

Table 4-2 Field Descriptions for a Report Heading

Field Name	Description
PRODUCED BY	Name and version number of the product producing this report.
(date)	Contains different information depending on the control statement used. For details about this field as it pertains to a particular report, see the information about that control statement in “Defining Control Statements for Requesting Reports” on page 4-9.
(report title)	Title of report followed by user-generated data. This data is specified on the optional TITLE keyword for each report control statement.
REPORT DATE	Date and time the reports were produced.
SYSTEM	A two-part field that indicates first the four-character sysid, then the eight-character sysname of the system from which the data was obtained.
SP	Release number of the MVS system.
CPU	Current CPU utilization percentage. Note: This field is available only on reports containing realtime data.
UIC	Current high unreferenced interval count. Note: This field is available only on reports containing realtime data from the local system.
PAGING	Current page-in rate due to page faults. Note: This field is available only on reports containing realtime data.
ES MIG AGE	Average number of seconds that pages are remaining in expanded storage before being paged to auxiliary storage. Note: This field is available only on reports containing realtime data from the local system. It is not available for reports containing data from remote systems.

Defining Control Statements for Requesting Reports

You can specify any or all of the control statements in the SYSIN data set. With the exception of GLOBAL, each control statement generates a specific type of report, as listed in Table 4-3. This table also shows where you can find more detailed information about each report.

Table 4-3 Batch Report Control Statements

Control Statement	Report Title	For more information, see
ARD	Address Space Resource (ARD) Report	“ARD” on page 4-12
ARDJ	Address Space Resource (ARDJ) Report for a specific address space	“ARDJ” on page 4-13
ASD	Address Space State (ASD) Report	“ASD” on page 4-13
ASDJ	Address Space State (ASDJ) Report for a specific address space	“ASDJ” on page 4-14
ASRM	Address Space SRM (ASRM) Report	“ASRM” on page 4-14
ASRMJ	Address Space SRM (ASRMJ) Report for a specific address space	“ASRMJ” on page 4-14
CHANNEL	Channel Path Activity Report	“CHANNEL” on page 4-15
DDMN	Domain Activity (DDMN) Report	“DDMN” on page 4-15
DEVICE	Device Activity Report	“DEVICE” on page 4-16
DEVV	Device Activity Report for a specific device	“DEVV” on page 4-17
IOQ	I/O Queue Activity Report	“IOQ” on page 4-17
PGSPP	Page Data Set Activity (PGSPP) Report	“PGSPP” on page 4-18
PGSPS	Swap Data Set Activity (PGSPS) Report	“PGSPS” on page 4-18
SENQ	Enqueue Contention (SENQ) Report	“SENQ” on page 4-19
SENQR	Enqueue Reserve (SENQR) Report	“SENQR” on page 4-19
SPAG	System Paging Activity (SPAG) Report	“SPAG” on page 4-20
SRCS	Central Storage/Processor/SRM (SRCS) Report	“SRCS” on page 4-20
TRX	Transaction Activity (TRX) Report	“TRX” on page 4-21

Keywords for Report Control Statements

By using report control statement keywords, you can control:

- Report mode
- Ordering of columns of data
- Sorting of data
- Filtering of data by one or more conditions

- Report title (centered on the third line of the header)

The following list shows each keyword and its operands:

[DELTA]
[ORDER(columnID1,columnID2,...columnID25)]
[SORT(columnID,A|D)]
[columnID(operator value)]
[TITLE('title')]

DELTAControls the mode in which the report data is reported.

Note: The DELTA keyword is available only for the ARD, ARDJ, DEVICE, DEVV, and IOQ statements. If you specify DELTA, the report is in Delta mode.

If DELTA is not specified, the report is in Total mode, which is the default.

- Delta mode for the reports requested by these five statements reflects data between the previous and current snapshots.

Note: For DEVICE, IOQ, PGSPP, PGSPS, and TRX, the snapshots must be in the same Extractor interval to produce a report.
For DEVV, the snapshots must be in the same Extractor interval to produce a line on the report.

- Total mode for the reports requested by these five statements reflects data either from the time the address space became active to the time of the snapshot (for the ARD and ARDJ reports) or from the beginning of the CMF Extractor interval to the time of the snapshot (for the DEVICE, DEVV, and IOQ reports).

Note: Not all fields in a report are affected by the mode. All “rate” columns in the report reflect the interval from the last snapshot to the current snapshot, regardless of mode.

ORDERSpecifies which columns are included in the report.

Note: This keyword is not available for the IOQ and SENQ statements.

If you use the ORDER keyword, the report contains only those columns specified, and the columns appear in the order in which they are specified. For example, if you want only the JOBNAME and SWAPRATE fields to appear on the ARD report, specify ORDER(JOBNAME,SWAPRATE) as a keyword for ARD.

columnIDMost reports can be filtered by criteria. For a list of column names used in each report, see Appendix A, “Report Column Information” or the customization panels for CMFMON online.

Note: This keyword is not valid for ARDJ, ASDJ, ASRMJ, DEVV, IOQ, SENQ, SPAG, and SRCS.

For all other control statements, these criteria are specified by column ID followed by:

- A valid operator (>, <, =, ¬, >=, or <=). The default operator value is =.
- The filtering value. Wildcard characters of * and ? may be used as part of the filtering value.

For example, if you want to filter the ARD report to contain only information about jobs beginning with the letter A, you can specify JOBNAME(A*). Or, if you want to filter the ARD report to contain only information about jobs holding more than one page of fixed storage below 16 megabytes, you can specify FFBEL(>1).

Filtering for batch reports is the same as for online screens. For more information about filters, see “Rules for Setting Filters” on page 2-21.

SORTSorts the lines in the report according to the criteria you choose. For a list of column names used in each report, see Appendix A, “Report Column Information” or the customization panels for CMFMON online.

Note: This keyword is not available for ARDJ, ASDJ, ASRMJ, DEVV, IOQ, SENQ, SPAG, and SRCS.

For all other control statements, specify a column ID followed by either A or D. For example, in the ARD report, to sort the lines in ascending order of address space name, specify SORT(JOBNAME,A) as a keyword.

Note: If you do not specify either A (for ascending) or D (for descending) after the column name, the report is sorted in descending order by default.

TITLESpecifies information to be centered on the third line of the report header, as described in Table 4-2 on page 4-8. For example, if you want to include your company’s name on the third line of a report, you would specify TITLE(‘XYZ Company’) as a keyword on the report control statement.

The following sections describe each control statement in greater detail.

ARD

The ARD control statement produces the Address Space Resource (ARD) Report. This report is available in two modes, total and delta. Some of the fields in this report are calculated in a different way for each mode:

- In total mode, SRM ABS, TCB TIME, CPU TIME, EXCP RATE, and DEV CONN reflect the interval from the address space creation to the time of the snapshot.
- In delta mode, DSRM ABS, DTCB TIME, DCPU TIME, DELT EXCP, and DDEV CONN reflect the interval between the previous and current snapshots.

Note: Rate columns in this report always reflect the interval between the previous and current snapshots, regardless of the mode selected for the report.

To produce a report in delta mode, specify DELTA as a keyword for the ARD control statement.

To produce a report in total mode, omit the DELTA keyword.

The header of this report shows the date and time the data was collected, the report mode, and the duration of the report. Each row in this report reflects the activity of a single active address space. This report is sorted by default in order of increasing ASID. Figure 4-3 is an example of the Address Space Resource (ARD) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system and on whether the report is in Delta or Total mode.

Figure 4-3 Address Space Resource (ARD) Report

```
PRODUCED BY CMF MONITOR (5.5.00)               ADDRESS SPACE RESOURCE (ARD) REPORT                                  PAGE:
1
BMC SOFTWARE, INC.                                                                          REPORT DATE: 06/10/03 15:53:35
06/10/03 15:53:35 TOTAL (01:00)                                                             SYSTEM: SYSE SYSE     02.06.00
CPU= 37/ 29  UIC=254  PAGING=   1  ES MIG AGE=  2245
 JOBNAME  DEV    FF PRIV LSQA LSQA X SRM  TCB    CPU   EXCP SWAP LPA CSA NVI V&H AST A
          CONN  BEL   FF  CSF  ESF M ABS  TIME   TIME  RATE RATE  RT  RT  RT  RT
 *MASTER* 213.0   0  245   68   23   0.0 192.12 707.73 0.00 0.00 0.0 0.0 0.0 0.0 STC Y
 PCAUTH   0.000   0    2   33    3 X 0.0  0.047  0.207 0.00 0.00 0.0 0.0 0.0 0.0 STC Y
 RASP     0.000                  X 0.0  0.020  5.234 0.00 0.00 0.0 0.0 0.0 0.0 STC Y
 TRACE    0.000   0    3  591    2 X 0.0  0.015  0.177 0.00 0.00 0.0 0.0 0.0 0.0 STC Y

  PGSPS                          /* SWAP DATASET ACTIVITY */          00099001
*                                                                     00099201
  SENQ                                                               00100001
  SENQR                                                              00110001
  SPAG                                                               00120001
  SRCS                                                               00130001
  TRX                                                                00140001
```

Table A-1 on page A-1 lists the header; ID (used when specifying keywords); whether the column appears in Total mode, Delta mode, or both modes; and a brief description of each column in this report.

ARDJ

The ARDJ control statement produces the Address Space Resource (ARDJ) Report for a single address space. To produce this report, you must use the keyword JOBNAME with a valid address space. For example, to produce the ARDJ report for CAS1, specify:

ARDJ JOBNAME(CAS1)

All other information about this report is identical to the information in “ARD” on page 4-12.

ASD

The ASD control statement produces the Address Space State (ASD) Report. This report is available in total mode only.

The header of this report shows the date and time the data was collected and the duration of the report. Each row in this report reflects the activity of a single active address space. This report is sorted by default in order of increasing ASID. Figure 4-4 is an example of the Address Space State (ASD) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-4 Address Space State (ASD) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                ADDRESS SPACE STATE (ASD) REPORT                                PAGE:
1
BMC SOFTWARE,  INC.                                                                  REPORT DATE: 06/10/03 16:27:21
06/10/03 16:27:21       (01:00)                                                        SYSTEM: SYSE SYSE     02.06.00
CPU= 23/ 19  UIC=254  PAGING=   0  ES MIG AGE=  3243
 JOBNAME  DMN   P P C  R  DP   CS   ESF   CS   TAR X   PIN   ES  TX  SWAP   WSM AST A EXCP
                G P L  LS PR    F        TAR   WSS M    RT   RT  SC    RV    RV       RATE
 *MASTER*   0   0 0 NS    FF  378    62          0       0    0   0     0       STC Y 0.00
 PCAUTH     0   0 0 NS    F9   45    17          0 X     0    0   0     0       STC Y 0.00
 RASP       0   0 0 NS    FF  121    22          0 X     0    0   0     0       STC Y 0.00
 TRACE      0   0 0 NS    F9  613   520          0 X     0    0   0     0       STC Y 0.00
```

Table A-2 on page A-2 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

ASDJ

The ASDJ control statement produces the Address Space State (ASDJ) Report for a single address space. To produce this report, you must use the keyword JOBNAME with a valid address space. For example, to produce the ASDJ report for CAS1, specify:

ASDJ JOBNAME(CAS1)

All other information about this report is identical to the information in “ASD” on page 4-13.

ASRM

The ASRM control statement produces the Address Space SRM (ASRM) Report. The header of this report shows the date and time the data was collected and the duration of the report. Each row in this report reflects the activity of a single active address space. This report is sorted by default in order of increasing ASID. Figure 4-5 is an example of the Address Space SRM (ASRM) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-5 Address Space SRM (ASRM) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                ADDRESS SPACE SRM (ASRM) REPORT                                    PAGE:
1
BMC SOFTWARE, INC.                                                                        REPORT DATE: 06/10/03 16:34:19
06/10/03 16:34:19                                                                           SYSTEM: SYSE SYSE     02.06.00
CPU= 23/ 17  UIC=254  PAGING=   0  ES MIG AGE=  3856
 JOBNAME  SERVICE  S  TRANS    TRANS     TX   TX    TX    TX    TX    TX   SESS  AST A WORKLOAD RESOURCE
          CLASS    P  ACTIVE   CUR RES   CT   SC   CPU   MSO   IOC   SRB   TOTAL               GROUP
 *MASTER* SYSTEM   1  16:50:01  16:50:01   1   0  1.8M  4.1M 41067  4.7M   10.6M STC Y SYSTEM
 PCAUTH   STCNRM   1  16:50:08  16:50:08   1   0     1   131     0  1347    1479 STC Y STC
 RASP     SYSTEM   1  16:50:08  16:50:08   1   0     1   102     0 48328   48431 STC Y SYSTEM
 TRACE    STCNRM   1  16:50:08  16:50:08   1   0     1    46     0  1374    1421 STC Y STC
```

Table A-3 on page A-4 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

ASRMJ

The ASRMJ control statement produces the Address Space SRM (ASRMJ) Report for a single address space. To produce this report, you must use the keyword JOBNAME with a valid address space. For example, to produce the ASRMJ report for CAS1, specify:

ASRMJ JOBNAME(CAS1)

All other information about this report is identical to the information in “ASRM” on page 4-14.

CHANNEL

The CHANNEL control statement produces the Channel Path Activity Report. The header of this report shows the date and time the data was collected and the interval between snapshots. Each row in this report reflects the activity of a single channel path. This report is sorted by default in order of increasing channel path ID. Figure 4-6 is an example of the Channel Path Activity Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-6 Channel Path Activity Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    CHANNEL PATH ACTIVITY REPORT                                    PAGE:
1
BMC SOFTWARE, INC.                                                                                  REPORT DATE: 06/10/03 16:40:28
06/10/03 16:40:28       (01:00)                                                                     SYSTEM: SYSE SYSE     02.06.00
        CPU  21/ 21 UIC  260 Paging     11 ES Mig Age    N/A Time 10:37:44

 ID  NO   G CHAN         PART  TOTAL BUS   PART  TOTAL PART  TOTAL PART  TOTAL  PART  TOTAL  PART  TOTAL  PART   PART  TOTAL
             TYPE     SHR BUSY  BUSY  BUSY  READ  READ  WRITE WRITE B/SEC B/SEC  M/SEC M/SEC M-SIZE M-SIZE S-FAIL R-FAIL R-FAIL
 -- ---- -- -------- --- ----- ----- ----- ----- ----- ----- ----- ----- ----- ------ ------ ------ ------ ------
 ----------------------------------------------------------------------------------------------------------------------------
       2    CNCSM         0.00  0.00
 1A         CNCSM Y       0.00  0.00
 1B         CNCSM Y       0.00  0.00
 26         OSD   Y       0.00  3.58 15.59  0.00  0.00  0.00
 27         OSD   Y       0.00  2.73  8.75  0.00  0.01  0.00
 47         CNC_S Y       0.00  0.00
 59         CNC_P Y       0.25  0.25
 6E         CNC_S Y       0.00  0.00
 70         CNC_P Y       0.00  0.00
 73         CNC_S Y       0.00  0.00
 77         CNC_S Y       0.00  2.23
 F7         IQD   Y                                          1.12G  1.12G  2.41M 2.41M    465    465   0.00   0.00   0.00
```

Table A-4 on page A-5 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

DDMN

The DDMN control statement produces the Domain Activity (DDMN) Report. The header of this report shows the date and time the data was collected. Each row in this report reflects the activity of a single domain. This report is sorted by default in order of increasing domain number. Figure 4-7 is an example of the Domain Activity (DDMN) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-7 Domain Activity (DDMN) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                  DOMAIN ACTIVITY (DDMN) REPORT                                    PAGE:
1
BMC SOFTWARE, INC.                                       XYZ COMPANY                          REPORT DATE: 06/10/03 07:38:47
06/10/03 07:38:47                                                                             SYSTEM: SYSB SYSB     Z 1.01.0

CPU= 24/ 22  UIC= 54  PAGING=   0  ES MIG AGE= 77866
IPS=PT  SRM COEFFICIENTS: CPU=10.0  I/O= 5.0  SRB=10.0  MSO= 3.0000

 DMN MIN MAX IMPLT OMPLT CMPL RUA INC NSW OUTU TWSR  CIDX    RTOB

   0 999 999   999   999    4   4   0   4    0  1044   99.99  0.0
   1 999 999   999   999   49  49   1  48    0  6802   99.99  0.0
```

Table A-5 on page A-6 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

DEVICE

The DEVICE control statement produces the Device Activity Report. This report is available in both total and delta mode.

Note: The DEVICE sampler must be active in the PAS to collect realtime data for this report.

The header of this report shows the date and time the data was collected, the report mode, and the interval. Each row in this report reflects the activity of a single device. The rows of this report are grouped by device class, then sorted by device number within each class. Figure 4-8 is an example of the Device Activity Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-8 Device Activity Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    DEVICE ACTIVITY REPORT                                                    PAGE:
1
BMC SOFTWARE, INC.                                                                                                REPORT DATE: 06/10/03 16:46:28
06/10/03 16:46:28 TOTAL (01:28)                                                                                   SYSTEM: SYSE SYSE     02.06.00
EXTRACTOR INTERVAL - START=06/10/03 16:45:00  LENGTH=15:00  I%= 10
CPU= 11/  8  UIC=254  PAGING=   0  ES MIG AGE=  4924
 STG      VOLSER DEV DEV  LCU ACTV RESP IOSQ DPB CUB DB  PEND DISC CONN %DEV %D
 GRP             CLS NUM      RATE TIME TIME DLY DLY DLY TIME TIME TIME UTIL RV
          SPLA20 DAS 0220 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          PAGA21 DAS 0221 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SPLB22 DAS 0222 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          PAGB23 DAS 0223 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SPLC24 DAS 0224 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          PAGE25 DAS 0225 00B  0.0 25.4  0.0 0.0 0.0 0.0  0.3 23.6  1.4  0.0 0.0
          SPLD26 DAS 0226 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          PAGD27 DAS 0227 00B  0.0  0.0  0.0 0.0 0.0 0.0  0.0  0.0  0.0  0.0 0.0
          SPLE28 DAS 0228 00B  0.8  2.7  0.0 0.0 0.0 0.0  0.4  1.3  0.9  0.2 0.0
          TSG301 DAS 0229 00B  0.0  1.8  0.0 0.0 0.0 0.0  0.3  0.0  1.4  0.0 0.0
```

Table A-6 on page A-6 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

DEVV

The DEVV control statement produces the Device Activity Report for Volser *nnnnnn* or the Device Activity Report for Number *nnnn*. This report is available in two modes, total and delta. To produce this report, you must use the keyword VOLSER with a valid volume serial or the keyword NUMBER with a valid device number. For example, to produce the DEVV report for volume serial XCF001, specify:

DEVV VOLSER(XCF001)

All other information about this report is identical to the information in “DEVICE” on page 4-16.

IOQ

The IOQ control statement produces the I/O Queueing Activity Report. This report is available in both total and delta mode.

Note: The IOQ sampler must be active in CPM mode in the PAS if realtime reports are to be generated.

The header of this report shows the date and time the data was collected, the report mode, and the interval. Each row in this report reflects the activity of a single channel path. Figure 4-9 is an example of the I/O Queueing Activity Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-9 I/O Queueing Activity Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    I/O QUEUEING ACTIVITY REPORT                                    PAGE:
1
BMC SOFTWARE, INC.                                                                                  REPORT DATE: 06/10/03 16:53:42
06/10/03 16:53:42 TOTAL (08:42)                                                                     SYSTEM: SYSE SYSE     02.06.00
EXTRACTOR INTERVAL - START=06/10/03 16:45:00  LENGTH=15:00  I%= 58
CPU= 13/  9  UIC=254  PAGING=   0  ES MIG AGE=  5559
 CHAN         CNTL                LCU  CONT  DEL Q % ALL  CHPID    %DP    %CU
 PATH         UNIT                     RATE   LNG  CH BSY TKN      BUSY   BUSY
 66           E020                001  0.01   0.00   0.04   1.02   0.00   1.66
 25           F220                00B  0.00   0.00   0.00   1.76   0.00   6.63
 60           F220                                       1.67   0.00  12.34
 6C           F220                                       1.82   0.00   4.72
 21           F280                00C  0.41   0.00  13.33   3.91   0.00   9.55
 20           F300                00D  0.85   0.04   5.84   3.71  17.15   2.13
 6E           14A0                00E  0.00   0.00   0.00   0.00   0.00   0.00
```

Table A-7 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

PGSPP

The PGSPP control statement produces the Page Data Set Activity (PGSPP) Report.

Note: The ASMDATA sampler must be active in CPM mode in the PAS if realtime reports are to be generated.

The header of this report shows the date and time the data was collected and the interval. Each row in this report reflects the activity of a single page data set. Figure 4-10 is an example of the Page Data Set Activity (PGSPP) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-10 Page Data Set Activity (PGSPP) Report

```
PRODUCED BY CMF MONITOR (5.5.00)              PAGE DATA SET ACTIVITY (PGSPP) REPORT                             PAGE:
1
BMC SOFTWARE, INC.                                                                                  REPORT DATE: 06/10/03 16:57:38
06/10/03 16:57:38       (01:00)                                                                     SYSTEM: SYSE SYSE     02.06.00
EXTRACTOR INTERVAL - START=06/10/03 16:45:00  LENGTH=15:00  I%= 84
CPU= 13/ 10  UIC=254  PAGING=   0  ES MIG AGE=  5905
 S VOLUME DEV  DEV    %SLOTS  PAGE   I/O   AV PG BAD  V DATA SET NAME
 T        NUM  TYPE     OCC  TR TM  REQ RT  P IO SLCT
 P PAGE25  225 3380K   41.58  0.000  0.000  0.00    0 N PAGE.VPAGE25.PLPA
 C PAGE25  225 3380K    3.83  0.000  0.000  0.00    0 N PAGE.VPAGE25.COMMON
 L PAGE25  225 3380K   99.95  0.000  0.000  0.00    0 Y PAGE.VPAGE25.LOCAL1
 L PAGE25  225 3380K   16.17  0.000  0.000  0.00    0 Y PAGE.VPAGE25.LOCAL2
```

Table A-8 on page A-7 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

PGSPS

The PGSPS control statement produces the Swap Data Set Activity (PGSPS) Report.

Note: The ASMDATA sampler must be active in CPM mode in the PAS if realtime reports are to be generated.

The header of this report shows the date and time the data was collected and the duration. Each row in this report reflects the activity of a single swap data set. Figure 4-11 is an example of the Swap Data Set Activity (PGSPS) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-11 Swap Data Set Activity (PGSPS) Report

```
PRODUCED BY CMF MONITOR (5.5.00)              SWAP DATA SET ACTIVITY (PGSPS) REPORT                                  PAGE:
1
BMC SOFTWARE, INC.                                      XYZ COMPANY                          REPORT DATE: 06/10/03 07:38:47
06/10/03 07:38:47       (00:09)                                                              SYSTEM: SYSB SYSB     Z 1.01.0

EXTRACTOR INTERVAL - START=10/24/00 07:30:00  LENGTH=15  I%= 58
CPU= 24/ 22  UIC= 54  PAGING=   0  ES MIG AGE= 77866

 S VOLUME DEV  DEV     %SETS  AVG    I/O   DATA SET NAME
 T        NUM  TYPE     OCC  SV TM  REQ RT

 P PAGEB1  B10 3380    57.73  0.000  0.000 SWAP.VSWAPB1.LOCAL2
 C PAGEB1  B10 3380     5.09  0.000  0.000 SWAP.VSWAPB1.COMMON
 L PAGEB1  B10 3380    62.79  0.000  0.000 SWAP.VSWAPB1.LOCAL1
```

Table A-9 on page A-8 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

SENQ

The SENQ control statement produces the Enqueue Contention (SENQ) Report. The header of this report shows the date and time the data was collected. Figure 4-12 is an example of the Enqueue Contention (SENQ) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-12 Enqueue Contention (SENQ) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                ENQUEUE CONTENTION (SENQ) REPORT                                PAGE:
1
BMC SOFTWARE, INC.                                      XYZ COMPANY                          REPORT DATE: 06/10/03 07:38:56
06/10/03 07:38:56                                                                            SYSTEM: SYSB SYSB     Z 1.01.0

CPU= 38/ 36  UIC= 73  PAGING=   0  ES MIG AGE= 77866

 JOBNAME  SYSTEM ASID   REQ SCOPE MAJOR    MINOR

 JES2     SYSB   501    EO  STEP  SYSZJES2 SYSP10SYS1.HASPCPB1
```

Table A-10 on page A-8 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

SENQR

The SENQR control statement produces the Enqueue Reserve (SENQR) Report. The header of this report shows the date and time the data was collected. Each row in this report reflects a currently outstanding reserve request. Figure 4-13 is an example of the Enqueue Reserve (SENQR) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-13 Enqueue Reserve (SENQR) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                  ENQUEUE RESERVE REPORT                                  PAGE:
1
BMC SOFTWARE, INC.                                      XYZ COMPANY                          REPORT DATE: 06/10/03 07:38:56
06/10/03 07:38:56                                                                            SYSTEM: SYSB SYSB     Z 1.01.0

CPU= 38/ 36  UIC= 73  PAGING=   0  ES MIG AGE= 77866

 JOBNAME  ASID SYSTEM   REQ VOLSER DEV  RSV MAJOR    MINOR

 JES2     501  SYSB     EO  SYSP10  210 OFF SYSZJES2 SYSP10SYS1.HASPCPB1
```

Table A-11 on page A-9 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

SPAG

The SPAG control statement produces the System Paging Activity (SPAG) Report. The header of this report shows the date the data was collected. Each row in this report reflects the paging data for the time at which the snapshot was taken. Figure 4-14 is an example of the System Paging Activity (SPAG) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-14 System Paging Activity (SPAG) Report

```
PRODUCED BY CMF MONITOR (5.5.00)               SYSTEM PAGING ACTIVITY (SPAG) REPORT                                PAGE:
1
BMC SOFTWARE, INC.                                        XYZ COMPANY                              REPORT DATE: 06/10/03 07:38:47
06/10/03                                                                                           SYSTEM: SYSB SYSB     Z 1.01.0

 TIME     LPA CSA SWP PGSW PGSW PIN PIN PRV V&H TAR        HI   ES  MIG  ESF  MIG DURA- CPU     UIC PAGING ES MIG
          IN  IN  OUT IN   OUT  BLK NBK OUT I+O CWS  AFC  UIC  RTE  AGE  AVL  RTE -TION                  AGE

 07:38:47 0.0 0.0 0.0  0.0  0.0  0.0 0.0 0.0 0.0 0.0    0  226  54  0.0  77K  218  0.0 --:--  24/ 22  54      0  77866
 07:38:56 0.0 0.0 0.0  0.0  0.0  0.7 0.3 0.0 0.0 0.0    0  188  73 52.2  77K  346 16.6 00:09  38/ 36  73      0  77866
```

Table A-12 on page A-9 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

SRCS

The SRCS control statement produces the Central Storage/CPU/SRM (SRCS) Report.

Note: To produce this report with realtime data, BBXS must be active.

The header of this report shows the date the data was collected. Each row in this report reflects the central storage, processor, and SRM utilization data for the time at which the snapshot was taken. Figure 4-15 is an example of the Central Storage/CPU/SRM (SRCS) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-15 Central Storage/CPU/SRM (SRCS) Report

```
PRODUCED BY CMF MONITOR (5.5.00)          CENTRAL STORAGE / CPU / SRM (SRCS) REPORT                                PAGE:
1
BMC SOFTWARE, INC.                                        XYZ COMPANY                              REPORT DATE: 06/10/03 07:38:47
10/24/00                                                                                           SYSTEM: SYSB SYSB     Z 1.01.0

 TIME     AFC  HI  SQA  LPA  LPA  CSA L+C  PRI LSQA LSQA CPU  IN OUT OUT OUT CPU     UIC PAGING ES MIG
              UIC    F    F   FF    F  FF   FF  CSF  ESF UTL   Q LOG  RQ  WQ                  AGE

 07:38:47 226  54 3363 1784  268 1241 383  541 4667 3182  24  58  28   0 118  24/ 22  54      0  77866
 07:38:56 188  73 3363 1785  268 1242 383  534 4708 3184  38  57  30   0 119  38/ 36  73      0  77866
```

Table A-13 on page A-10 lists the header; ID (used when specifying keywords); and a brief description of each column in this report.

TRX

The TRX control statement produces the Transaction Activity (TRX) Report.

Note: The WORKLOAD sampler must be active in the PAS if realtime reports are to be generated.

The header of this report shows the date and time the data was collected and the interval.

- In systems running in goal mode, each row in this report reflects the transactions for a single service class period, sorted first by service class, and then in increasing order of service class period within each service class.

- In systems in compatibility mode, each row in this report reflects the transactions for a single performance group period, sorted in order of increasing performance period within each performance group.

Figure 4-16 is an example of the Transaction Activity (TRX) Report.

Note: The fields on your report may not necessarily look like those in the example. Report fields vary based on the MVS level of your system.

Figure 4-16 Transaction Activity (TRX) Report

```
PRODUCED BY CMF MONITOR (5.5.00)                TRANSACTION ACTIVITY (TRX) REPORT                                    PAGE:
1
BMC SOFTWARE, INC.                                        XYZ COMPANY                          REPORT DATE: 06/10/03 11:01:17
06/10/03 11:01:17       (00:10)                                                                SYSTEM: SYSB SYSB     Z 1.01.0

EXTRACTOR INTERVAL - START=06/10/03 11:00:00  LENGTH=15  I%=  8
CPU= 99/ 66  UIC= 11  PAGING=   9  ES MIG AGE=  1950
ICS=IEAICSPT  IPS=IEAIPSPT

 SUB  TRXCLASS   USERID     TRXNAME    ACCT PGC    P   P TRANS  AVG TRANS TIME
 SYS                                   INFO        G   P RATE   HHH&GML.MM&GML.SS.TTT

                                        NO  C      0   1  0.000
 STC                                    NO  C      1   1  0.000
 TSO                                    NO  C      2   1  2.500  00:00:01.338
```

Table A-14 on page A-11 lists the header, ID (used when specifying keywords), and a brief description of each column in this report.

Appendix A Report Column Information

This appendix contains information about the columns for type 79 batch reports described in Chapter 4, “Generating CMFMON Batch Reports” on page 4-1.

Note: The latest list of available columns can be created using the CUST command.

Table A-1 Address Space Resource (ARD and ARDJ) Report Columns (Part 1 of 2)

Column Header	Column ID	Mode	Description
JOBNAME	JOBNAME	Both	Name of the address space.
ASID	ASID	Both	Address space identifier of the job as assigned by the system.
DEV CONN	DEVCON	Total	Device connect time (in seconds).
DDEV CONN	DDEVCON	Delta	Delta device connect time (in seconds).
FF BEL	FFBEL	Both	Number of fixed storage frames below 16 megabytes.
PRIV FF	PRIVFF	Both	Number of private, non-LSQA fixed storage frames.
LSQA CSF	LSQACSF	Both	Number of fixed private central storage frames allocated to private LSQA.
LSQA ESF	LSQAESF	Both	Number of fixed expanded storage frames allocated to private LSQA.
X M	XM	Both	Contains an X for address spaces considered to be cross-memory address spaces.
SRM ABS	SRMABS	Total	Total SRM service absorption rate per second.

Table A-1 Address Space Resource (ARD and ARDJ) Report Columns (Part 2 of 2)

Column Header	Column ID	Mode	Description
DSRM ABS	DSRMABS	Delta	Delta SRM service absorption rate per second.
TCB TIME	TCBTIME	Total	Number of seconds of TCB processor time used.
DTCB TIME	DTCBTIME	Delta	Number of seconds of TCB processor time used.
CPU TIME	CPUTIME	Total	Number of seconds of CPU time (TCB + SRB) used.
DCPU TIME	DCPUTIME	Delta	Number of seconds of CPU time (TCB + SRB) used.
DELT EXCP	DELTEXCP	Delta	Number of SSCH instructions issued by the job.
EXCP RATE	EXCPRATE	Total	Number of SSCH instructions issued per second.
SWAP RATE	SWAPRATE	Both	Current page rate for the job.
LPA RT	LPART	Both	Current LPA page-in rate.
CSA RT	CSART	Both	Rate per second at which CSA pages are being paged in.
NVI RT	NVIRT	Both	Private non-VIO page-in rate.
V&H RT	VHRT	Both	Hiperspace and private VIO page rate.
AST	AST	Both	Type of address space.
C L	CL	Both	Current location of the job.
A	A	Both	Contains Y if the address space is active; contains N if the address space is inactive.

Table A-2 Address Space State (ASD and ASDJ) Report Columns (Part 1 of 2)

Column Header	Column ID	Description
JOBNAME	JOBNAME	Name of the address space.
ASID	ASID	Address space identifier of the job that has the requested resource.
DMN	DMN	Domain associated with the address space. This field is available only on systems running in compatibility mode.
P G	PFG	Performance group associated with the address space. This field is available only on systems running in compatibility mode.
P P	PP	Performance period associated with the address space. This field is available only on systems running in compatibility mode.

Table A-2 Address Space State (ASD and ASDJ) Report Columns (Part 2 of 2)

Column Header	Column ID	Description
SERVICE CLASS	SRVCLASS	Service class associated with the address space. This field is available only on systems running in goal mode.
S P	SRV_PER	Service class period associated with this address space. This field is available only on systems running in goal mode.
C L	CL	Current location of the job.
R LS	RLS	Reason for the last swap out associated with the job.
DP PR	DPPR	Dispatch priority for the address space.
CS F	CSF	Number of central storage frames currently held by the job.
ESF	ESF	Number of expanded storage frames currently held by the job.
CS TAR	CSTAR	SRM central storage target value.
TAR WSS	TARWSS	Number of pages in the target working set size.
X M	XM	Contains an X for address spaces considered to be cross-memory address space.
PIN RT	PINRT	Rate at which pages are being paged in for the job.
ES RT	ESRT	Rate of page movement from expanded to central storage due to page faults.
TX SC	TXSC	Swap count for the current transaction.
SWAP RV	SWAPRV	Value used by the Workload Manager to determine whether the job needs to be swapped in or out.
WSM RV	WSMRV	Recommended value for address spaces managed by Working Set Management (WSM).
AST	AST	Type of address space.
A	A	Contains Y if the address space is active; contains N if the address space is inactive.
WORKLOAD	WORKLOAD	Name of the workload.
RESOURCE GROUP	RESOURCE	Name of the resource group.
EXCP RATE	EXCPRATE	Number of SSCH instructions issued per second.

Table A-3 Address Space SRM (ASRM and ASRMJ) Report Columns

Column Header	Column ID	Description
JOBNAME	JOBNAME	Name of the address space.
ASID	ASID	Address space identifier of the job that has the requested resource.
DMN	DMN	Domain associated with the address space. This field is available on systems running MVS 4.3 or below or on systems running MVS 5.1 or later in compatibility mode.
P G	PFG	Performance group associated with the address space. This field is available only on systems running in compatibility mode.
P P	PP	Performance period associated with the address space. This field is available only on systems running in compatibility mode.
SERVICE CLASS	SRVCLASS	Service class associated with the address space. This field is available only on systems running in goal mode.
S P	SRV_PER	Service class period associated with this address space. This field is available only on systems running in goal mode.
TRANS ACTIVE	TRANACT	Amount of time that has passed since the current transaction began.
TRANS CUR RES	TRANRES	Amount of time that the current transaction has been active since the last time it was swapped in.
TX CT	TXCT	Number of transactions that have occurred for the job.
TX SC	TXSC	Swap count for the current transaction.
TX CPU	TXCPU	Number of CPU service units used by the current transaction.
TX MSO	TXMSO	Number of MSO service units used by the current transaction.
TX IOC	TXIOC	Number of I/O service units used by the current transaction.
TX SRB	TXSRB	Number of SRB service units used by the current transaction.
SESS TOTAL	TXTOT	Total number of SRM service units consumed by the job.
AST	AST	Type of address space.
C L	CL	Current location of the job.
A	A	Contains Y if the address space is active; contains N if the address space is inactive.
WORKLOAD	WORKLOAD	Name of the workload.
RESOURCE GROUP	RESOURCE	Name of the resource group.

Table A-4 Channel Path Activity Report Columns

Column Header	Column ID	Description
ID	CHPID	Hexadecimal number representing the channel path.
CHANNEL NO	GNO	For each channel type which is managed by DCM (Dynamic CHPID Management) a summry line is shown with the average values for all channels in this group. The number of channels of the group is given in column NO.
CHANNEL G	CHGEN	G indicates the generation and is used to differntiate between channels of the same channel type, when one has significant differences from the other.
CHAN TYPE	TYPE	Channel path type.
SHR	SHR	Indicates whether the channel path is shared between LPARs
PART BUSY	PARTBUSY	Percentage of time that a shared channel path was busy on the home partition.
TOT BUSY	TOTBUSY	Channel path utilization percentage for the entire system.
BUS BUSY	BUSBUSY	Percentage of the cycles per second used for I/O operations over the maximum internal bus cycles per second.
PART READ	PARTREAD	Rate per second of megabytes read using the channel for the partition.
TOT READ	TOTREAD	Rate per second of megabytes read using the channel for the complex.
PART WRITE	PARTWRITE	Rate per second of megabytes written using the channel for the partition.
TOT WRITE	TOTWRITE	Rate per second of megabytes written using the channel for the complex.
PART B/SEC	MSGPBYT	Rate of messages sent by programs (in bytes) for the partition.
TOTAL B/SEC	MSGTBYT	Rate of messages sent by programs (in bytes) for the entire complex.
PART M/SEC	MSGPRTE	Rate of messages sent by programs for the partition.
TOTAL M/SEC	MSGTRTE	Rate of messages sent by programs for the entire complex.
PART M-SIZE	MSGPSZE	Average size of messages sent for the partition.
TOTAL M-SIZE	MSGTSZE	Rate of messages sent by programs for the entire complex.
PART S-FAIL	MSGPSEN	Rate of messages sent by the partition that failed, excluding the attempts failed due to unavailable buffers in the receiving partition.
PART R-FAIL	MSGPREC	Rate of messages sent by the partition that failed due to unavailable buffers in the receiving partition.
TOTAL R-FAIL	MSGTREC	Rate of messages sent by the entire complex that failed due to unavailable buffers in the receiving partition.

Table A-5 Domain Activity (DDMN) Report Columns

Column Header	Column ID	Description
DMN	DMN	Domain number.
MIN	MIN	Minimum multiprogramming level for the domain as defined in the IPS.
MAX	MAX	Maximum multiprogramming level for the domain as defined in the IPS.
IMPLT	IMPLT	Swap-in level target that SRM has calculated for the domain.
OMPLT	OMPLT	Swap-out level target that SRM has calculated for the domain.
CMPL	CMPL	Current multiprogramming level for the domain.
RUA	RUA	Average number of in-and-ready and out-and-ready jobs in the domain.
INC	INC	Number of swappable users that are currently in storage.
NSW	NSW	Number of nonswappable users that are currently in storage.
OUTU	OUTU	Number of address spaces in the domain that are unilaterally swapped out.
TWSR	TWSR	Average time-weighted service rate for the domain.
CIDX	CIDX	Contention index calculated by SRM for the domain.
RTOB	RTOB	Average response time for the first period TSO transactions.

Table A-6 Device Activity Report Columns

Column Header	Column ID	Description
STG GRP	STGGRP	Name of the storage group to which the device belongs.
VOLSER	VOLSER	Volume serial of the volume mounted on the device.
DEV CLS	DEVCLS	Class of the device.
DEV NUM	DEVNUM	Device address.
LCU	LCU	Hexadecimal identification for the LCU to which the device belongs.
ACTV RATE	ACTVRATE	Rate at which SSCH instructions issued to the device are completing successfully.
RESP TIME	RESPTIME	Average number of milliseconds the device required to complete an I/O request.
IOSQ TIME	IOSQTIME	Average number of milliseconds that I/O requests were queued by IOS before processing.
DPB DLY	DPBDLY	Average number of milliseconds that an I/O request is being delayed because the ESCON Director port is busy.
CUB DLY	CUBDLY	Average number of milliseconds that an I/O request is being delayed because the control unit is busy.
DB DLY	DBDLY	Average number of milliseconds that an I/O request is being delayed because the device is busy.

Table A-6 Device Activity Report Columns (continued)

Column Header	Column ID	Description
PEND TIME	PENDTIME	Average number of milliseconds that an I/O request remains queued in the channel.
DISC TIME	DISCTIME	Average number of milliseconds that the device had an active I/O request before it was disconnected from the channel path.
CONN TIME	CONNTIME	Average number of milliseconds that the device was connected to the channel path and actively transferring data between the device and central storage.
%DEV UTIL	DEVUTIL	Percentage of time that the device was in use.
%D RV	DRV	Percentage of time that a shared device was reserved by the processor on which CMFMON was started.

Table A-7 I/O Queue Activity Report Columns

Column Header	Column ID	Description
CHAN PATH	CHANPATH	Hexadecimal identifier of the online channel path attached to the physical control units in the LCU group.
CNTL UNIT	CNTLUNIT	Hexadecimal identifier of control units associated with an online channel path in the LCU group.
LCU	LCU	Hexadecimal identifier for the LCU.
CONT RATE	CONTRATE	Rate per second that delayed I/O requests are placed on the CU-HDR.
DEL Q LNG	DELQLNG	Average number of delayed requests on the CU-HDR.
% ALL CH BSY	ALLCHBSY	Percentage of time that all channel paths belonging to the LCU were busy at the same time.
CHPID TKN	CHPIDTKN	Rate at which the CHPID is processing I/O requests for the LCU.
%DP BUSY	DPBUSY	Level of contention for the director port.
%CU BUSY	CUBUSY	Percentage of time that I/O requests to the devices on this LCU were delayed because a control unit was busy.

Table A-8 Page Data Set Activity (PGSPP) Report Columns

Column Header	Column ID	Description
S T	ST	Type of data set.
VOLUME	VOLUME	Volume serial of the volume mounted on the device.
DEV NUM	DEVNUM	Identification of the device on which the data set resides.
DEV TYPE	DEVTYPE	Type of device on which the data set resides.

Table A-8 Page Data Set Activity (PGSPP) Report Columns (continued)

Column Header	Column ID	Description
%SLOTS OCC	SLOTSOCC	Percentage of auxiliary storage slots currently in use.
PAGE TR TM	PAGETRTM	Page transfer time.
I/O REQ RT	IOREQRT	Rate per second at which page I/O operations were directed to this data set.
AV PG P IO	AVERGPIO	Average number of pages transferred to or from the data set per I/O request.
BAD SLCT	BADSLCT	Number of unusable slots associated with the data set.
V	V	Indicates whether or not the data set accepts VIO pages.
DATA SET NAME	PAGEDSN	Name of the data set.

Table A-9 Swap Data Set Activity (PGSPS) Report Columns

Column Header	Column ID	Description
S T	ST	Type of data set.
VOLUME	VOLUME	Volume serial of the volume mounted on the device.
DEV NUM	DEVNUM	Identification of the device on which the data set resides.
DEV TYPE	DEVTYPE	Type of device on which the data set resides.
%SETS OCC	SETSOCC	Percentage of auxiliary storage slots currently in use.
AVG SV TM	AVGSVTM	Average number of seconds required to complete an I/O request to the data set.
IO REQ RT	IOREQRT	Rate per second at which swap I/O requests were issued to the data set.
DATA SET NAME	SWAPDSN	Name of the data set.

Table A-10 Enqueue Contention (SENQ) Report Columns

Column Header	Column ID	Description
JOBNAME	JOBNAME	Name of the address space.
SYSTEM	SYSTEM	System on which the job that owns or requests the resource is running.
ASID	ASID	Address space identifier of the job that owns or waits for the resource.
REQ	REQ	Request type for the resource and status of the request.
SCOPE	SCOPE	Scope of the resource enqueue.

Table A-10 Enqueue Contention (SENQ) Report Columns (continued)

Column Header	Column ID	Description
MAJOR	MAJOR	Major queue name (qname) of the resource.
MINOR	MINOR	Minor queue name (qname) of the resource.

Table A-11 Enqueue Reserve (SENQR) Report Columns

Column Header	Column ID	Description
JOBNAME	JOBNAME	Name of the address space.
ASID	ASID	Address space identifier of the job that has the requested resource.
SYSTEM	SYSTEM	System on which the job that owns the requested resource is running.
REQ	REQ	Request type for the resource and status of the request.
VOLSER	VOLSER	Volume serial of the volume mounted on the device.
DEV	DEV	Identifier of the device for which the reserve was issued.
RSV	RSV	Reserve status of the device.
MAJOR	MAJOR	Major queue name of the resource.
MINOR	MINOR	Minor queue name of the resource.

Table A-12 System Paging Activity (SPAG) Report Columns

Column Header	Column ID	Description
TIME	TIME	The time at which a particular row of information was collected.
LPA IN	LPAIN	Page-in rate for LPA pages.
CSA IN	CSAIN	Page-in rate for CSA pages.
SWP OUT	SWPOUT	Swap-out rate.
PGSW IN	PGSWIN	Swap-in page rate.
PGSW OUT	PGSWOUT	Swap-out page rate.
PIN BLK	PINBLK	Page-in rate for private area pages paged in blocks.
PIN NBK	PINNBK	Page-in rate for private area pages.
PRV OUT	PRVOUT	Page-out rate for private area pages.
V&H I+O	VHIO	Rate of hiperspace and VIO pages paged in and paged out.
TAR CWS	TARCWS	Target working set size for the common area.

Table A-12 System Paging Activity (SPAG) Report Columns (continued)

Column Header	Column ID	Description
AFC	AFC	Number of central storage frames currently available.
HI UIC	HIUIC	Highest unreferenced interval count.
ES RTE	ESRTE	Rate of page movement from expanded to central storage due to page faults.
MIG AGE	MIGAGE	Length of time that pages remain in expanded storage before being moved to auxiliary storage.
ESF AVL	ESFAVL	Number of expanded storage frames currently not in use.
MIG RTE	MIGRTE	Rate at which pages are being moved from expanded to auxiliary storage.
CPU	CPU	CPU busy percentage.
UIC	UIC	Highest unreferenced interval count.
PAGING	PAGING	System demand paging rate in pages per second.
ES MI GAGE	ESMIGAGE	Length of time pages remain in expanded storage before being moved to auxiliary storage.

Table A-13 Central Storage/CPU/SRM (SRCS) Report Columns (Part 1 of 2)

Column Header	Column ID	Description
TIME	TIME	Time at which a particular row of information was collected.
AFC	AFC	Number of central storage frames currently available.
HI UIC	HIUIC	Highest unreferenced interval count.
SQA F	SQAF	Number of central and expanded storage frames allocated to SQA.
LPA F	LPAF	Number of storage frames allocated to LPA.
LPA FF	LPAFF	Number of fixed storage frames allocated to LPA.
CSA F	CSAF	Number of storage frames allocated to CSA.
L+C FF	LCFF	Number of fixed storage frames allocated to LPA and CSA.
PRI FF	PRIFF	Number of private, non-LSQA fixed storage frames held by the job.
LSQA CSF	LSQACSF	Number of private LSQA frames in central storage.
LSQA ESF	LSQAESF	Number of private LSQA frames in expanded storage.
CPU UTL	CPUUTL	CPU utilization.

Table A-13 Central Storage/CPU/SRM (SRCS) Report Columns (Part 2 of 2)

Column Header	Column ID	Description
IN Q	INQ	Length of the SRM in queue.
OUT LOG	OUTLOG	Number of address spaces that are logically swapped out.
OUT RQ	OUTRQ	Length of SRM out ready queue.
OUT WQ	OUTWQ	Length of SRM out wait queue.
CPU	CPU	CPU busy percentage.
UIC	UIC	Highest unreferenced interval count.
PAGING	PAGING	System demand paging rate in pages per second.
ES MI GAGE	ESMIGAGE	Length of time pages remain in expanded storage before being moved to auxiliary storage.

Table A-14 Transaction Activity (TRX) Report Columns (Part 1 of 2)

Column Header	Column ID	Description
SUB SYS	SUBSYS	Name of the subsystem associated with the performance group.
TRXCLASS	TRXCLASS	Name of the transaction class specified in the ICS for the performance group.
USERID	USERID	User ID defined in the ICS for the performance group.
TRXNAME	TRXNAME	Name defined in the ICS for performance group.
AACT INFO	ACCTINFO	Indicates whether an account number was specified in the ICS for the performance group.
PGC	PGC	Performance group class (C for Control or R for Report).
P G	PG	Number of the performance group associated with the address space.
P P	PP	Performance period associated with the address space.
SERVICE CLASS	CLASNAME	Service class associated with the address space. This field is available only on systems running MVS 5.1 or later in goal mode.
S P	SERV_PER	Service class period associated with this address space. This field is available only on systems running MVS 5.1 or later in goal mode.
CLASS TYPE	CLASTYPE	Indicates whether the service class is a control service class or a report service class.
WORKLOAD	WORKLOAD	Name of the workload.
RESOURCE GROUP	RESOURCE	Name of the resource group.

Table A-14 Transaction Activity (TRX) Report Columns (Part 2 of 2)

Column Header	Column ID	Description
TRANS RATE	TRANRATE	Transaction rate for the performance group and performance period.
AVG TRANS TIME HHH:MM:SS.TTT	AVGTIME	Average response time of the transactions that terminate in the performance group and period or in the service class and period.

Appendix B Getting Data You Want

Most of the data for both CMFMON's online and write facilities is provided by CMF Type 79 API, which collects its data from MVS system control blocks. However, a few of the 79 subtypes require additional support before they can be displayed online or written to a data set. This appendix describes these requirements. (For more information about CMF Type 79 API, see "CMF Type 79 API" on page C-1.)

CMF Extractor Requirements

Some 79 record subtypes require an active Extractor sampler to provide the data. If you are planning to display any of the screens or code any of the control statements shown in the first column of the following table, make sure the corresponding sampler is active **in CPM mode**:

Screen/Statement	Data Description	CMF Sampler	Subtype
TRX	Transaction activity	WORKLOAD	79-8
DEV/DEVICE	Device activity	DEVICE	79-9
PGSPP PGSPS	Paging activity	ASMDATA	79-11
IOQUEUE/IOQ	I/O queuing activity for 438x and 308x processors	IOQ	79-13
IOQUEUE/IOQ	I/O queuing activity for ES/9000 and 3090 processors	IOQ	79-14

Data returned by these subtypes reflects activity that occurred during the *current* CMF recording interval. These fields are reset at the beginning of each interval.

BBXS Requirements

When certain fields in subtype 2 and 3 are requested, the BBX subsystem (BBXS) must also be active. In addition, record subtype 12 requires channel measurement, which typically is provided by BBXS.

Note: BBXS is automatically activated by the CMF Extractor.

If BBXS is not active when subtype 2 records are requested, the fields shown in Table B-1 contain null data. The equivalent fields in CMFMON's online component appear on the ARD screen; these fields are identified in Table B-1 below.

Table B-1 Fields Containing Null Data when BBXS Is Inactive

Field	Description	ARD Field Name
R792PRFX	Total fixed frames	PRIV FF
R792FXBL	Fixed frames below the 16MB line	FF BEL
R792NLQF	Non-LSQA fixed frames	LSQA ESF
R792LSQA	LSQA fixed frames	LSQA CSF
R792LSQR	LSQA real storage pages	Not used
R792LSQE	LSQA expanded storage pages	Not used

Flag R792RSM is set to indicate that these fields are invalid.

If BBXS is not active when subtype 3 records are requested, the record cannot be returned at all. The CMF Type 79 API issues a return code of 12 to indicate that an external sampler is required.

XDS Requirements

Displaying data from a remote system or displaying 79 subtype 15 records requires XDS to provide the data. If you are planning to display remote system data or display the ILOCK screen, make sure the XDS data buffer is active. For more information, see "Displaying Data from a Remote System" on page 2-28.

Additional ILOCK Screen Requirements

CMFMON displays ILOCK data from all systems. Therefore, XDS must be active on every system from which you want information, as well as on the local system.

There is no data-gathering component for the ILOCK screen. Instead, the retrieval of the IRLM data from the SMF data buffer is done by CMFMON.

Data collection is initiated by the operator who, at the console, issues the RUNTIMEO exit for one system in the sysplex by typing:

F irlmid,RUNTIMEO

The command will be propagated automatically to all other systems.

When the SMF records are eventually written by the IRLMs in the data-sharing group, the reporter can fetch these SMF records (79-15) out of the XDS data buffer.

If you request ILOCK information and receive the message that no data is available for the report, you need to ask the operator to issue the previously discussed command.

Note: Access to the SMF data buffer requires appropriate security authorization.

Other Requirements

If you are running in a PR/SM or MDF environment, the Extractor CPU sampler must be active for the CMF Type 79 API to report on system CPU utilization. If the CPU sampler is not active in a PR/SM environment, the API returns a value of -1 (x'FFFFFFFF') in field R793CPUU instead of CPU utilization data.

Appendix C CMF Type 79 API

The CMF Type 79 application program interface (API) provides an interface to SMF type 79 records for use by CMFMON and other performance tools. For example, SDSF 1.3.3 displays certain fields from SMF records 79-1 and 79-2 using the CMF Type 79 API. In addition, performance monitors, such as Candle's OMEGAMON, have also adopted the CMF Type 79 API to display data concerning device utilization, page/swap data set activity, and channel path utilization.

See Chapter 5, "Using the CMF MONITOR APIs", in the *CMF MONITOR Batch User Guide* for details about the CMF APIs.

Appendix D Quick Reference

Table D-1 Features Available in CMFMON's Online Facility

To take this action	Do this	For more information, see this
Find out what a field contains	Place the cursor on the field and press PF1.	"Getting Help" on page 2-2
Find out what a screen contains	Place the cursor anywhere on the screen ***except a field*** and press PF1.	"Getting Help" on page 2-2
Sort a field in ascending or descending order	In the **COMMAND** field, type **SORT fieldname A|D** .	"Sorting the Display (SORT)" on page 2-18
Remove sort criteria from a display	In the **COMMAND** field, type **NOSORT**.	"Sorting the Display (SORT)" on page 2-18
Add/remove a filter to/from a field	Type the filter in the underscores below the field name, or space over the existing filter.	"Filtering the Display" on page 2-20
Reorder fields	In the **COMMAND** field, type **CUST**. In the **S** column next to the field to be moved, type **M** , then **A**(after) or **B** (before) to indicate where the fields should go.	"Customizing the Display (CUST)" on page 2-23
Look at the fields in delta mode	In the **COMMAND** field, type **DELta**.	"Displaying Deltas and Totals" on page 2-25
Look at the fields in total mode	In the **COMMAND** field, type **DELta OFF**.	"Displaying Deltas and Totals" on page 2-25
Automatically update the screen	In the **COMMAND** field, type **ASU *xx*,** where ***xx*** is the number of minutes between updates.	"Automatically Updating the Screen" on page 2-27
Access data from a remote system in the sysplex	Overtype the value in the SYSTEM field with the SMF ID of the system you wish to access.	"Displaying Data from a Remote System" on page 2-28
Export the data to an ISPF data set	In the **COMMAND** field, type **EXPORT**.	"Saving the Data for Later Use (EXPORT)" on page 2-28

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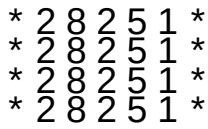

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