CMF® MONITOR

Batch Reference Guide

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bmcsoftware

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- product information
  - product name
  - product version (release number)
  - license number and password (trial or permanent)
- operating system and environment information
  - machine type
  - operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - 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 contains detailed information about CMF MONITOR and is intended for data center operators, managers, and system programmers who use CMF MONITOR to gather and produce information to help perform system tuning tasks, and improve the performance and efficiency of their systems.

To use this book, you should be familiar with Multiple Virtual Storage (MVS) systems, job control language (JCL), the Interactive System Productivity Facility (ISPF), and how to respond to ISPF panels.

How This Book Is Organized

This book is organized as follows. In addition, an index appears at the end of the book.

Chapter/Appendix	Description
Chapter 1, “Extractor Control Statements”	Describes all Extractor control statements and their parameters.
Chapter 2, “Analyzer Control Statements”	Describes all Analyzer control statements and their parameters.
Chapter 3, “CMF MONITOR Reports”	Provides examples and descriptions of the reports, data, and field calculations.
Appendix A, “Measure and Trace Values”	Contains information about traceable data fields and EXCEPTS and GRAPH measures.

Related Documentation

BMC Software products are supported by several types of documentation:

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

Category	Document	Description
Using CMF MONITOR batch reporting components	*CMF MONITOR Batch Reference Guide* *CMF MONITOR Batch User Guide*	Explains how to use the Extractor and Analyzer components, and how to interpret the report data.
Using CMF MONITOR Online	*CMF MONITOR Online Getting Started* *CMF MONITOR Online User Guide*	Explains how to use the MAINVIEW window interface and the CMF MONITOR Online views, as well as how to interpret the information presented.
Installing CMF MONITOR	*MAINVIEW Installation Requirements Guide* *OS/390 and z/OS Installer Guide* *CMF MONITOR Customization Guide*	Explains the allocation of data sets for the CMF MONITOR Extractor, how to download product tape components, access AutoCustomization, and perform manual customization steps that are specific to CMF MONITOR.
Using CMFMON	*CMF MONITOR CMFMON User Guide*	Explains how to use CMFMON's online facility and write facility, as well as how to generate CMFMON batch reports.
Using the DSO component	*DSO User Guide and Reference*	Explains how to use the DATA SET OPTIMIZER (DSO) batch report control statements, and how to interpret the report information.

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Online Help

The CMF MONITOR 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 Used in This Book

To learn about how CMF MONITOR's batch reporting functions work, it is helpful to understand certain conventions of the product. The Extractor and Analyzer command processors share a common control and statement format. The following sections describe the syntax notation and punctuation, and provide general information about control statement usage for CMF MONITOR.

Control Statement Format

The control statement format for both Extractor and Analyzer commands is as follows:

[name] command parameter [- comment]

The following explains general usage information about the statement format:

- All commands, except the Analyzer COMBINE statement, begin in or to the right of column 2.
- The **COMMAND** field is required.
- The **NAME** and **PARAMETER** fields may be optional, depending on the command.
- The **COMMENT** field is optional and does not affect the logical content of the statement.
- All fields can be coded in columns 1 through 71; columns 72 through 80 are ignored. Column 72 can contain a continuation character to maintain compatibility with MACRO Assembler syntax; however, a continuation character is not required.

The fields in the control statement format are explained below.

Statement Field	Description
Label	Required only for Analyzer COMBINE command. Must begin in column 1, be a 1–2 digit numeric value, and be terminated with one or more blanks.
Command	Required and must contain a valid CMF MONITOR command. Preceded and followed by one or more blanks. Can begin anywhere except in column 1.

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Statement Field	Description
Parameter(s)	A command can have no parameters, one parameter, or multiple parameters. The first parameter is separated from the command by one or more blanks. When a command has multiple parameters, they are listed consecutively and are separated by commas. There are two types of parameters: Keyword parameter A value or parenthesized list of values preceded by a keyword= clause; for example: keyword=*value* or keyword=(value/,...,value*n*) Positional parameter Is interpreted by its position in the parameter list with respect to other positional parameters. Can be preceded by any number of keyword parameters, but must retain its position in regard to any preceding positional parameter. Must have a comma to mark its placement in the parameter list, even when you want the default.
Comment	An optional field that does not affect the logical content of the statement. Indicated in one of two ways: A space-dash-space (outside of a quotation string in the parameter field), which indicates the rest of the statement is comment information. An * (asterisk) in column 1, which indicates the entire statement is a comment.

Command Notation

The following notation is used in the control statements.

Notation	Meaning
Uppercase letters and words	Used exactly as they appear.
Lowercase letters and words	Represent variables for values that you supply. Variables appear in *italics.*
Ellipsis ...	Indicates that the preceding parameter value can be repeated one or more times. If followed by the same parameter value and a number, the number indicates the maximum number of times the value can be repeated. An ellipsis is not coded in a control statement.
Underlined parameter values	Indicate defaults used if the parameter is not otherwise specified. Underlines are not coded in a control statement.
Braces { }	When enclosing a parameter, indicate a parameter is required and must be coded with the command. When enclosing a string of parameter values, one value must be chosen, and, in some cases, multiple values can be selected. Braces are not coded in a control statement.
Brackets [ ]	Indicate a parameter or parameter value is optional. If a default is listed, it is chosen unless specifically overridden. Brackets are not coded in a control statement.

Notation	Meaning
Parentheses ( )	When enclosing a string of repeatable values (indicated by an ellipsis), one or more values can be defined, up to the maximum. When enclosing a string of unique parameter values and only one is selected, the parentheses are optional. Parentheses must be coded in a control statement when more than one parameter value is defined.
Nested parentheses (( ))	Only the COMBINE Analyzer control statement allows one level of nested parentheses.
Vertical bar |	Indicates or.
Special characters	Are coded exactly as they appear. Special characters are **,** Comma **=** Equal sign **( )** Parentheses **:** Colon **'** S ingle quote * Asterisk

Punctuation Conventions

The following punctuation conventions apply to both Extractor and Analyzer control statements.

Punctuation	Meaning
Spaces	Must separate the **NAME** field from the **COMMAND** field, the **COMMAND** field from the **PARAMETER** field, and the **PARAMETER** field from the hyphen (-) in a **COMMENT** field. One or more spaces must be used.
Two successive commas ,,	Indicate an unspecified positional parameter. The default is used.
Commas between parameters	Are mandatory for parameters in a list. If the parameter on a previous line ends in a comma, the next line is treated as a continuation. The continued statement must begin in column 3 or beyond. The last parameter defined in a statement must not have a comma after it.
Quotation strings	Can be continued to the next line by omitting the closing single quotation mark. On the next line, a single quotation mark at or to the right of column 3 starts the quotation string continuation. A second single quotation mark on a continuation statement terminates the quotation string.

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Chapter 1 Extractor Control Statements

This section describes the control statements used by the CMF MONITOR Extractor. The Extractor control statements and parameters are summarized in Table 1-1, and are cross-referenced to associated Analyzer control statements and report titles.

Following this table are separate sections that describe each Extractor control statement in detail; these sections are organized alphabetically.

Table 1-1 Extractor Control Statements (Part 1 of 5)

Extractor Command	Extractor Function	Analyzer Command and Report Title
ASMDATA See page 1-6 for more information.	Samples auxiliary storage manager data. Produces SMF type 75 records; produces CMF type 240-02 and 240-09 user records.	AUXSTOR (see page 3-6) Auxiliary Storage Report (see page 3-7) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175)
CACHE See page 1-8 for more information.	Samples cache control unit data. Produces CMF type 240-27 user records and SMF type 74-5 records.	CACHE (see page 2-9 for reports based on CMF type 240-27 records) Cache Subsystem Counts Report, when TYPE=COUNT is specified (see page 3-11) Cache Subsystem Detail Report (see page 3-14) Cache Subsystem Percent Report, when TYPE=PERCENT is specified (see page 3-25) Cache Subsystem Summary Report (see page 3-28) Cache Subsystem Transfer Report, with TYPE=TRANSFER is specified (see page 3-29) CACHEACT (see page 2-14 for reports based on SMF type 74-5 records) Cache Subsystem Overview Report (see page 3-32) Cache Subsystem Activity Report (see page 3-35) when REPORT=SUBSYS is specified Cache Device Activity Report (see page 3-41) when REPORT=DEVICE is specified.

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Table 1-1 Extractor Control Statements (Part 2 of 5)

Extractor Command	Extractor Function	Analyzer Command and Report Title
CFDATA See page 1-10 for more information.	Samples coupling facility activity. Produces SMF type 74-4 records.	CFACT (see page 2-17) Coupling Facility Activity Report (see page 3-71)
CHANNEL See page 1-12 for more information.	Samples channel path activity data. Produces SMF type 73 records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) CPUCHAN (see page 2-33) CPU and Channel Path Activity Report (see page 3-82) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175)
CPU See page 1-14 for more information.	Samples CPU activity data. Produces SMF type 70 records; produces CMF type 240-01 user records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) CPU (see page 2-31) CPU Utilization Report (see page 3-85) CPUCHAN (see page 2-33) CPU and Channel Path Activity Report (see page 3-81) CPUCON (see page 2-34) Processor Concurrency Report (see page 3-185) WKLDCHAR (see page 2-122) Workload Characterization Report (see page 3-235) MDF (see page 2-72) MDF Report (see page 3-169) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175) PROTKEY (see page 2-88) CPU Utilization by Protect Key Report (see page 3-100) PRSM (see page 2-89) Logical Partition Report (see page 3-158) SRM (see page 2-109) System Resources Manager Report (see page 3-201) TSOPERF TYPE=INT (see page 2-116) TSO Interval Summary Report (see page 3-222)
CRYPTO See page 1-18 for more information.	Collects cryptographic hardware activity measurements. Produces SMF type 70-2 records.	CRYPTO (see page 2-35) Cryptographic Hardware Activity Report (see page 3-106)
CSMON See page 1-20 for more information.	Activates the CMF MONITOR CSMS sampler, which gathers and formats data collected by COMMON STORAGE MONITOR, if active. Produces CMF type 240-29 user records.	COMMSTOR (see page 2-28) Common Storage Usage Detail Report (see page 3-67) Common Storage Usage Summary Report (see page 3-70) CSMAPSAS Sample SAS report in the BBSAMP library (see *CMF MONITOR Batch User Guide*, Chapter 7, “Mapping CMF Records Created by CMF MONITOR” for more information)

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Table 1-1 Extractor Control Statements (Part 3 of 5)

Extractor Command	Extractor Function	Analyzer Command and Report Title
DEVICE See page 1-23 for more information.	Samples whatever device classes are defined at the CLASS parameter. Produces SMF type 74-1 records; produces CMF type 240-05 user records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) DASD (see page 2-39) Direct Access Report (see page 3-112) DASD,VOLSER (see pages 2-39 and 2-121) Direct Access Report Plot of Volume (see page 3-114) DEVACT (see page 2-43) Device Activity Report (see page 3-109) WKLDCHAR (see page 2-122) Workload Characterization Report (see page 3-235) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175) SHARDEV (see pages 2-100) Shared Device Activity Report (see page 3-191)
DISTIM See page 1-27 for more information.	Monitors disabled time delay of CPU interrupts. Produces a CMF type 240-24 record.	*Not applicable* Disabled Delay Report (see page 3-116)
ENQUEUE See page 1-29 for more information.	Collects enqueue contention data. Produces SMF type 77 records.	ENQUEUE (see page 2-49) Enqueue Conflict Report (see page 3-125) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175)
EXTSUM See page 1-31 for more information.	Automatically produces a spinoff report, called the Extractor Summary Report (see page 3-131), at each Extractor interval if SPINOFF=*class* is specified. Produces CMF type 240-06 and 240-07 user records; these records are required for other reports.	PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175)
HEADMOVE See page 1-37 for more information.	Samples DASD head movement data. Produces CMF type 240-12, 240-13, and 240-14 user records.	DASD (see page 2-39) Direct Access Report (see page 3-112) DASD,VOLSER (see pages 2-39 and 2-121) Direct Access Report Plot of Volume (see page 3-114)
HFS See page 1-42 for more information.	Samples global, buffer, and file system statistics. Produces SMF type 74-6 records.	HFS (see page 2-65) HFS Statistics Report (see page 3-138)
IOQ See page 1-44 for more information.	Samples I/O queuing activity. Produces SMF type 78-3 records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) IOQ (see page 2-67) I/O Queuing Activity Report (see page 3-146)

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Table 1-1 Extractor Control Statements (Part 4 of 5)

Extractor Command	Extractor Function	Analyzer Command and Report Title
LINKMAP See page 1-46 for more information.	Collects mapping data for link pack area. Produces CMF type 240-19 user records.	LINKPACK (see page 2-69) Link Pack Area Report (see page 3-154)
MACSCHAR See page 1-48 for more information.	Samples I/O, page fault, data by performance group and period. Produces CMF type 240-19 user records.	WKLDCHAR (see page 2-122) Workload Characterization Report (see page 3-235
OMVS See page 1-50	Collects OMVS kernel activity data. Produces SMF type 74-3 records.	OMVS (see page 2-76) OMVS Kernel Activity Report (see page 3-172)
PAGING See page 1-52 for more information.	Samples page and swap data. Produces SMF type 71 records; produces CMF type 240-03 user records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175) SRM (see page 2-109) System Resources Manager Report (see page 3-201) STORAGE (see page 2-110) Storage Management Report (see page 3-195)
PGDDLAY See page 1-54 for more information.	Samples delay and storage utilization data for service classes or performance groups. Produces SMF type 72-2 records; produces SMF type 72-4 records in goal mode.	PGDDLAY (see page 2-85) Domain Delay Analysis Report (see page 3-123)
REPORT See page 1-58 for more information.	Required; defines recording mode and other Extractor operating characteristics. Produces CMF type 240-00 and 240-11 user records.	Not applicable GBLS=YES parameter must be defined on the REPORT control statement for COMBCONF (see page 2-24) Combinations of Configuration Activity Report (see page 3-66) LINKPACK (see page 2-69) Link Pack Area Report (see page 3-154)
TRACE See page 1-65 for more information.	Invokes the trace facility. Produces CMF type 240-18 user records.	TRACE (see page 2-114) Trace Report (see page 3-217)
TRACE76 See page 1-71 for more information.	Samples selected fields. Produces SMF type 76 records.	EXCEPTS TRACE=YES (see page 2-50) Exception Trace Detail Report (see page 3-128) GRAPH TYPE=TRACE (see page 2-56) Graphics Trace Detail Report (see page 3-135)

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Table 1-1 Extractor Control Statements (Part 5 of 5)

Extractor Command	Extractor Function	Analyzer Command and Report Title
TSODATA See page 1-74 for more information.	Monitors TSO command activity and gathers user statistics. Produces CMF type 240-20 and 240-21 user records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) PERFSUM,PERFORM (see pages 2-81 and 2-77) Performance Summary Report (see page 3-175) TSOPERF TYPE=CMD (see page 2-116) TSO Command Summary Report (see page 3-220) TSOPERF TYPE=INT (see page 2-116) TSO Interval Summary Report (see page 3-222) TSOUSER (see page 2-118) TSO User Summary Report (see page 3-224), when USERS=YES is defined on the TSODATA Extractor control statement
USER See page 1-77 for more information.	Provides an interface for user-written RMF exits. User-written exits may or may not create their own record types.	Not applicable
VSMDATA See page 1-79 for more information.	Collects data on virtual storage, including SQA by subpool, CSA by subpool and key, and private area virtual storage by specific jobs. Produces SMF type 78-2 records.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) VIRTSTOR (see page 2-119) Virtual Storage Activity Report (see page 3-226)
WORKLOAD See page 1-82 for more information.	Collects system workload running in service classes or performance groups. Produces SMF type 72-1 records in compatability mode. Produces SMF type 72-3 records in goal mode.	CMFSUM (see page 2-20) CMF Summary Report (see page 3-46) WKLDCHAR (see page 2-122) Workload Characterization Report (see page 3-235) WLMGL (see page 2-124) Workload Manager Report (see page 3-240)
XCFDATA See page 1-84 for more information.	Samples Cross-System Coupling Facility (XCF) performance data. Produces SMF type 74-2 records.	XCF (see page 2-129) Cross-System Coupling Facility Report (see page 3-102)

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ASMDATA

ASMDATA
[SAMPLE={1000|*nnnn*}]

Overview

The ASMDATA control statement causes the CMF MONITOR Extractor to collect auxiliary storage management (ASM) data, including information about the I/O activity of page and swap data sets and ASM data constants.

Monitoring modes

One ASMDATA statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The ASMDATA statement controls the ASMS sampler, which produces SMF type 75 records and CMF type 240-02 and 240-09 user records.

Analyzer statements and reports

AUXSTOR (see page 2-8)
Auxiliary Storage Report (see page 3-6)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

Other BMC Software products

The ASMDATA control statement must be defined in the CMF MONITOR Extractor JCL for MAINVIEW for OS/390 (see *CMF MONITOR Batch User Guide*, “MAINVIEW for OS/390” for more information).

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Parameters

The parameter for the ASMDATA control statement is

SAMPLE= Specifies the number of milliseconds between data gathering cycles for the ASM data being sampled. The default is 1000 or one millisecond. Acceptable values are 20 to 9999.

Example

```
ASMDATA  SAMPLE=2000
```

Instructs the CMF MONITOR Extractor to sample ASM data every 2000 milliseconds or once every two seconds.

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CACHE

CACHE
[SUBSYS=(nnnn1,nnnn2,nnnn3,….nnnn16)]

Overview

The CACHE control statement causes the CMF MONITOR Extractor to collect configuration and activity data for all or selected cache Subsystems.

Monitoring modes

Multiple CACHE statements can be defined for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The CACHE statement controls the CA93 and CA20 samplers, which produce SMF type 74-5 records and CMF type 240-27 user records.

Analyzer statements and reports

CACHE (see page 2-9 for reports based on CMF type 240-27 records)
Cache Subsystem Summary Report (see page 3-28)
Cache Subsystem Detail Report (see page 3-14)
Cache Subsystem Percent Report, TYPE=PERCENT defined (see page 3-24)
Cache Subsystem Counts Report, TYPE=COUNT defined (see page 3-11)
Cache Subsystem Transfer Report,TYPE=TRANSFER defined (see page 3-29)
CACHEACT (see page 2-14 for reports based on SMF type 74-5 records)
Cache Subsystem Overview Report (see page 3-32)
Cache Subsystem Activity Report (see page 3-35)
Cache Device Activity Report (see page 3-41)

Other BMC Software products

The CACHE control statement is used by the CMF MONITOR Extractor only.

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Parameters

The parameters for this control statement is

SUBSYS= Specifies one or more cache subsystem to be sampled. Up to 16 subsystem addresses may be specified. If more than one subsystem address is specified, commas must separate the addresses, and the entire string must be enclosed within parentheses.A cache subsystem address is a 3 or 4-digit hexadecimal string corresponding to the lowest device address attached to the subsystem.When this parameter is omitted, CMF MONITOR automatically detects active cache subsystems and monitors them.

Note: If you specify parameters available in CMF MONITOR versions prior to 5.5, they are ignored and a warning message is issued.

Examples

```
CACHE
```

Samples all cache subsystems detected.

```
CACHE    SUBSYS=(CF00,0B00)
```

Invokes sampling for two cache subsystems -- CF00 and 0B00 -- only.

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CFDATA

CFDATA
[SAMPLE={10000|*nnnnn*}]

Overview

The CFDATA control statement causes the CMF MONITOR Extractor to collect data for all coupling facilities to which the system is connected, and write one SMF type 74-4 record for each coupling facility per interval.

To collect synchronous data from all systems to which the coupling facility is connected, BMC Software recommends using the SYNCH=SMF parameter of the CMF MONITOR Extractor REPORT control statement.

Monitoring modes

One CFDATA statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The CFDATA statement controls the CFTS sampler, which produces SMF type 74-4 records.

Analyzer statements and reports

CFACT (see page 2-17)
Coupling Facility Activity Report (see page 3-71)

Other BMC Software products

The CFDATA control statement is used by the CMF MONITOR Extractor only.

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Parameters

The parameter for the CFDATA control statement is

SAMPLE= Specifies the number of milliseconds between data gathering cycles for coupling facility data. The default is 10000 milliseconds, or 10 seconds. Acceptable values are 20 to 59000.

Examples

```
CFDATA
```

The CMF MONITOR Extractor collects coupling facility data once every ten seconds.

```
CFDATA SAMPLE=5000
```

The CMF MONITOR Extractor collects coupling facility data once every five seconds.

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CHANNEL

CHANNEL

Overview

The CHANNEL control statement causes the CMF MONITOR Extractor to collect channel path busy counts. The system records channel path statistics in the channel path measurement table. CMF MONITOR inspects this table at the beginning and end of each recording interval, so the CHANNEL control statement does not need a default sample rate.

Monitoring modes

One CHANNEL statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The CHANNEL statement controls the CHNS sampler, which produces SMF type 73 records.

Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

CPUCHAN (see page 2-33)
CPU and Channel Path Activity Report (see page 3-81)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

Other BMC Software products

The CHANNEL control statement is used by the CMF MONITOR Extractor only.

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Parameters

There are no parameters for this control statement.

Example

```
CHANNEL
```

The CMF MONITOR Extractor collects channel path statistics from the channel path measurement table.

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CPU

```
CPU
[SAMPLE={1000|nnnn}]
[,CAPMSG={YES|NO}]
[,CAPMSGRP={10|nn|NO}]
[,RMI={NO|YES}]
```

Overview

The CPU control statement causes the CMF MONITOR Extractor to collect CPU and CPU-dispatching data. This data includes information about CPU wait, busy, and idle status, online and offline times, queue depth, and processor concurrency.

Monitoring modes

One CPU statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The CPU statement controls the CPUS sampler, which produces SMF type 70 records and CMF type 240-01 user records.

Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

CPU (see page 2-31)
CPU Utilization Report (see page 3-85)

CPUCHAN (see page 2-33)
CPU and Channel Path Activity Report (see page 3-81)

CPUCON (see page 2-34)
Processor Concurrency Report (see page 3-185)

WKLDCHAR (see page 2-122)
Workload Characterization Report (see page 3-235)

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MDF (see page 2-72)
MDF Report (see page 3-169)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

PROTKEY (see page 2-88)
CPU Utilization Report by Protect Key (see page 3-100)

PRSM (see page 2-89)
Logical Partition Report (see page 3-158)

SRM (see page 2-109)
System Resources Manager Report (see page 3-201)

TSOPERF TYPE=INT (see page 2-116)
TSO Interval Summary Report (see page 3-222)

Other BMC Software products

The CPU control statement must be defined in the CMF MONITOR Extractor JCL for MAINVIEW for OS/390 (see *CMF MONITOR Batch User Guide*, “MAINVIEW for OS/390” for more information).

Parameters

The parameters for the CPU control statement are

SAMPLE= Specifies the number of milliseconds between data gathering cycles for CPU data. The default is 1000 milliseconds or one second. Acceptable values are 20 to 9999.

CAPMSG= Specifies whether the MVS PAS issues the message notifying that the local logical partition is soft capped by WLM. If YES is specified, the MVS PAS issues the following message after detecting that the logical partition has been soft capped by WLM

```
CMFCPU13 LPAR SOFT CAPPED BY WLM
```

When the logical partition is no longer capped, the following message is issued

```
CMFCPU15 LPAR NO LONGER SOFT CAPPED BY
WLM; CAPPED DURATION WAS hhh.mm.ss
```

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Notes:

— If the weight of the local logical partition represents a CPU capacity below the defined capacity, WLM needs to turn capping on and off to keep the short-term CPU usage at the defined capacity. In this scenario, the above CMFCPU13 and CMFCPU15 messages are issued repeatedly, normally a few minutes apart but may be as short as 10 seconds apart. When hhh.mm.ss is relatively short, the logical partition might be soft-capped again soon.

— The CPU sampler checks the capped status approximately every 10 seconds. When the message CMFCPU13 or CMFCPU15 is issued, the capped status has actually changed, on average, 5 seconds earlier.

— This parameter is applicable only for CPM mode and is ignored if specified for the IPM mode

CAPMSGRP= Specifies whether the MVS PAS issues the message notifying that the local logical partition remains soft capped by WLM. If a value nn from 1 to 60 is specified (the default is 10), the MVS PAS issues the following CMFCPU14 message every nn minutes as follows

```
CMFCPU14 LPAR SOFT CAPPED BY WLM SINCE
hh:mm:ss ddmmmyy FOR hhh.mm.ss
```

If NO is specified, the message CMFCPU14 is not issued.

Notes:

— If CAPMSG=NO is specified, either omit this parameter or specify CAPMSGRP=NO.

— This parameter is applicable only for CPM mode and is ignored if specified for the IPM mode.

RMI= RMI=YES specifies the utilization of Amdahl Version 1 RMI interface. This parameter is used only if Amdahl Version 1 RMI is installed. The RMI keyword is ignored in a non-Amdahl environment or in an environment with an Amdahl Millennium or Century server due to differences in the RMI interface for those processors. The default is RMI=NO.

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Examples

```
CPU
```

The CMF MONITOR Extractor samples CPU data once per second, using the default SAMPLE=1000.

```
CPU  SAMPLE=1500
```

The CMF MONITOR Extractor samples CPU data once every 1 1/2 seconds.

```
CPU SAMPLE=2000,RMI=YES
```

The CMF MONITOR Extractor samples CPU data once every 2 seconds, utilizing Version 1 RMI interface, if it is installed and if the processor environment is supported.

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CRYPTO

CRYPTO

Overview

The CRYPTO control statement causes the CMF MONITOR Extractor to collect activity measurements of cryptographic hardware features, including the standard Cryptographic Coprocessor Facility (CCF), and the optional adjunct features: PCI Cryptographic Coprocessor (PCICC) and PCI Cryptographic Accelerator (PCICA).

This control statement is applicable only on z/OS 1.2.0 system or higher.

Monitoring modes

One CRYPTO statement can be specified for each monitoring mode, CPM and IPM.

Sampler and record types

The CRYPTO statement controls the CRYS sampler, which produces SMF type 70-2 records.

Analyzer statements and reports

CRYPTO (see page 2-35)
Cryptographic Hardware Activity Report (see page 3-106)

Other BMC Software products

The CRYPTO control statement is used by the CMF MONITOR Extractor only.

Parameters

There are no parameters for this control statement.

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Example

```
CRYTPO
```

The CMF MONITOR Extractor collects cryptographic hardware activity measurements.

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CSMON

CSMON

Overview

The CSMON control statement causes the CMF MONITOR Extractor to gather and write data collected by COMMON STORAGE MONITOR. COMMON STORAGE MONITOR must be active for the CMF MONITOR Extractor to gather this data.

If COMMON STORAGE MONITOR is active, CMF MONITOR's extraction of COMMON STORAGE MONITOR data occurs only if the CSMON statement is defined. COMMON STORAGE MONITOR keeps its own data current, so data is collected once by the CMF MONITOR Extractor at the end of each CMF MONITOR Extractor interval; therefore, common storage obtained and subsequently released by a job within an interval is not reported.

If COMMON STORAGE MONITOR is not active, the CMF MONITOR Extractor bypasses processing until the COMMON STORAGE MONITOR becomes active.

Controlling COMMON STORAGE MONITOR

The CSMON control statement requires that the COMMON STORAGE MONITOR be active. The *CMF MONITOR Customization Guide* describes how to customize COMMON STORAGE MONITOR as either a subsystem or a started task.

- If defined as a subsystem, COMMON STORAGE MONITOR is started automatically at IPL.
- If defined as a started task, you can start COMMON STORAGE MONITOR automatically after an IPL by adding this command to the SYS1.PARMLIB member COMMND*xx*:

  COM='START BB$CSMON[,SUB=MSTR]'

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where

BB$CSMON Is the name of the procedure containing the start command JCL. (This default name is used by AutoCustomization when creating this procedure.)

SUB=MSTR Specifies that you want to start COMMON STORAGE MONITOR before JES2 or JES3 so you can track common storage requests from JES. If SUB=MSTR is specified:

— The JCL must not specify any JES data sets.
— BB$CSMON must reside in SYS1.PROCLIB.

You can stop the COMMON STORAGE MONITOR by executing the program BBXCSMON with the STOP option. A sample of the required JCL is shown below:

```
//STOPCSM EXEC PGM=BBXCSMON,PARM='STOP'
//STEPLIB DD  DISP=SHR,DSN=hilevel.BBLINK
<-- if not in linklist
```

Monitoring modes

A CSMON statement can be specified for CPM mode only; this statement is not valid for IPM mode.

Sampler and record types

The CSMON statement controls the CSMS sampler, which produces CMF type 240-29 user records.

Analyzer statements and reports

COMMSTOR (see page 2-28)
Common Storage Usage Summary Report (see page 3-70)

Note: The type 240-29 records can also be used to produce your own reports. See information about member CSMAPSAS, which is a sample SAS report in *hilevel*.BBSAMP, in *CMF MONITOR Batch User Guide*, Chapter 7, “Mapping CMF Records Created by CMF MONITOR”.

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Other BMC Software products

The CSMON control statement is used by the CMF MONITOR Extractor only.

Parameters

There are no parameters for this control statement.

Example

```
CSMON
```

The CMF MONITOR Extractor activates the CSMS sampler, which gathers and formats COMMON STORAGE MONITOR data, if active.

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DEVICE

DEVICE [ALL]
[,RANGE=(*xxxx*[:*xxxx*]1,...,*xxxx*[:*xxxx*]8)]
[,CLASS={DASD|TAPE|UNITR|CHRDR|GRAPH|COMM}]
[,EXCEPT=(*xxxx*[:*xxxx*]1,...,*xxxx*[:*xxxx*]8)]
[,OFFLINE={NO|YES}]
[,SAMPLE={1500|*nnnn*}]

Note: When CLASS=TAPE, the default for the OFFLINE parameter is OFFLINE=YES. For all other CLASS types, the default is OFFLINE=NO.

Overview

The DEVICE control statement causes the CMF MONITOR Extractor to measure specified devices for busy and wait status, I/O activity, online and offline times, and volume activity.

Note: If SMF type 74-1 records that are compatible with those produced by RMF are desired, the CLASS parameter must be specified.

Using DEVICE with HEADMOVE

If the HEADMOVE control statement (see “HEADMOVE” on page 1-37) is specified for only one mode (either CPM or IPM) and you also want to use the DEVICE control statement, both HEADMOVE and DEVICE must run in the same mode.

Monitoring modes

Any number of DEVICE control statements can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Different sample rates can be specified in each DEVICE statement; a high sampling rate can be specified for one device group, and a low rate can be specified for a less active group. However, a single device can be specified only once for each monitoring mode; subsequent duplicate specifications for a device are ignored.

Sampler and record types

The DEVICE statement controls the DEVS sampler, which produces SMF type 74-1 records and CMF type 240-05 user records.

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Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

DASD (see page 2-39)
Direct Access Report (see page 3-112)

DASD,VOLSER (see pages 2-39 and 2-121)
Direct Access Report Plot of Volume (see page 3-114)

DEVACT (see page 2-43)
Device Activity Report (see page 3-109)

WORKLOAD (see page 2-126)
System Workload Activity Report (see page 3-211)

WKLDCHAR (see page 2-122)
Workload Characterization Report (see page 3-235)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

SHARDEV (see pages 2-100)
Shared Device Activity Report (see page 3-191)

Other BMC Software products

The DEVICE control statement must be defined in the CMF MONITOR Extractor JCL for MAINVIEW for OS/390 (see *CMF MONITOR Batch User Guide*, “MAINVIEW for OS/390” for more information).

Parameters

Parameters for the DEVICE control statement are

ALL= Specifies that all online devices in the system are to be measured.

RANGE= Specifies a range of devices to be measured. The range can consist of a list of single device addresses, a list of device ranges (*xxxx*:*xxxx*), or a combination of both.

Up to eight devices or device ranges can be specified. The first device specified for a device range must be a physically attached device.

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CLASS= Specifies a class of device to be sampled. Only one class can be specified per DEVICE statement. Only the EXCEPT, OFFLINE, and SAMPLE parameters are valid with CLASS. Parameters ALL and RANGE are ignored when CLASS is specified.

Note: This parameter must also be specified for CMF MONITOR Online and MAINVIEW for OS/390. If SMF type 74 records that are compatible with those produced by RMF are desired, the CLASS parameter must be specified.

TAPE Magnetic tape devices (UCBTBYT3 is X'80').

Note: When CLASS=TAPE, the default for the OFFLINE parameter is OFFLINE=YES.

COMM Communications equipment (UCBTBYT3 is X'40').
DASD Direct access storage devices (UCBTBYT3 is X'20').
GRAPH Graphics devices (UCBTBYT3 is X'10').
UNITR Unit record devices (UCBTBYT3 is X'08').
CHRDR Character reader devices (UCBTBYT3 is X'04')

Note: If ALL, RANGE, and CLASS are not specified, all online DASDs and tape devices are measured. If a device class other than TAPE or DASD is specified and RMF I/O monitoring is not active, the DEVICE sampler invokes start/stop I/O monitoring through BBXS.

EXCEPT= Specifies a range of devices to be excluded from measurement activity. This exclusion applies only to the specification on this control statement and has no effect on prior or subsequent control statements. A maximum of eight devices or device ranges can be specified.

Note: The EXCEPT parameter of the HEADMOVE control statement (see “HEADMOVE” on page 1-37) has no impact on the data collected by the DEVICE sampler.

OFFLINE= Specifies whether offline devices are to be sampled. The default is NO. If CLASS=TAPE, the default is YES.

If OFFLINE=NO is specified and a device that was varied offline when the sampler was started is varied online, activity for that device is not measured.

If OFFLINE=YES is coded, activity for the offline-to-online device is measured. Coding OFFLINE=YES also causes the DEVICE sampler to attempt to sample devices that are in SYSGEN but are not physically present.

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Some classes of devices are almost always online; others are not. For example, DASDs are almost always online, so code OFFLINE=NO in this case. Tape devices are frequently varied, so code OFFLINE=YES in this case.

SAMPLE= Specifies the number of milliseconds between data gathering cycles for this group of devices. The default is 1500. Acceptable values are 20 to 9999.

Examples

```
DEVICE ALL,EXCEPT=(104,20F,313:41F,70A)
```

Causes the CMF MONITOR Extractor to sample all online devices (except device addresses 104, 20F, 313 through 41F, and 70A) at the default interval of every 1½ seconds.

```
DEVICE RANGE=(201,204:305),SAMPLE=1000
```

Instructs the CMF MONITOR Extractor to sample device addresses 201 and 204 through 305 once every second.

```
DEVICE  SAMPLE=1000
```

Causes all online DASD and tape devices to be measured once per second.

```
DEVICE  SAMPLE=2000,CLASS=UNITR
```

Causes the CMF MONITOR Extractor to sample all unit record devices every 2 seconds.

```
DEVICE CLASS=DASD
```

Causes the CMF MONITOR Extractor to sample online DASDs only, at the default interval of every 1½ seconds.

```
DEVICE  CLASS=TAPE
```

Causes the CMF MONITOR Extractor to sample all magnetic tape devices, including all offline-to-online activity, at the default frequency of once every 1½ seconds.

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DISTIM

```
DISTIM
[SPINOFF={A|class|NO}]
[,COPIES={1|nn}]
[,SAMPLE={157|nnnn}]
[,LODELAY={0|nnnn}]
[,HIDELAY={0|nnnn}]
[,SHIFT={0|nnnn}]
```

Overview

The DISTIM control statement allows you to monitor the disabled time delay of CPU interrupts. In each sampling interval, the disabled time sampler queues a TQE containing

TQEVAL Time that the interrupt should take place

TQEXIT Address of the exit

If an interrupted CPU runs disabled, the interrupt is stacked in the hardware until the running process enables itself. The exit performs a STCK to get the time the routine actually did take control. The exit then calculates and records the difference as disabled time delay. If the delay falls inside specified limits, the ASID of the last address space in control is recorded as well.

Monitoring modes

One DISTIM statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The DISTIM statement produces a CMF type 240-24 record.

Analyzer statements and reports

None.

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Other BMC Software products

The DISTIM control statement is used by the CMF MONITOR Extractor only.

Parameters

Parameters for the DISTIM control statement are

SPINOFF= Specifies the SYSOUT class to be dynamically allocated for printing the Disabled Delay Report. Any valid SYSOUT class can be specified. The default is A. The SPINOFF=NO parameter eliminates the Disabled Delay Report.

COPIES= Specifies the number of copies of the Disabled Delay Report to be printed. Up to 99 copies can be specified. The default is 1. This parameter is meaningful only if the SPINOFF parameter is defined with a valid SYSOUT class.

SAMPLE= Specifies the number of milliseconds between data gathering cycles. The default is 157. You should avoid specifying a sampling interval that is a divisor of an interval that is used by a different control statement. Since 1000, 1500, and 5000 are default sampling intervals for various control statements, you should avoid specifying a sampling interval that contains 0 as its final digit.

LODELAY= Specifies the lower limit of the range of delay time for which ASID counts are desired. LODELAY must be below HIDELAY for the ASID count to be maintained. The default is 0.

HIDELAY= Specifies the upper limit of the range of delay times for which ASID counts are desired. The default is 0.

SHIFT= Specifies the lower value of delay which is to appear on the graphical output. It is the amount by which the graph is shifted to make the relevant portions fit on the page. The default is 0. The maximum is 380.

Example

```
DISTIM SPINOFF=R,COPIES=1,SAMPLE=293,LODELAY=30,HIDELAY=60
```

Instructs the CMF MONITOR Extractor to produce one copy of a spinoff report in SYSOUT class R for each recording interval, sampling every 293 milliseconds. The report indicates which address spaces were last dispatched for any delay in the range of 30 to 60 milliseconds.

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ENQUEUE

ENQUEUE
[MAJOR=*nnnnnnnn*]
[,MINOR=*nnnnnnnn*]

Overview

The ENQUEUE control statement causes the CMF MONITOR Extractor to collect enqueue contention data.

Sampler and record types

The ENQUEUE statement controls the ENQS sampler, which produces SMF type 77 records.

Analyzer statements and reports

ENQUEUE (see page 2-49)
Enqueue Conflict Report (see page 3-125)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

Parameters

Parameters for the ENQUEUE control statement are

MAJOR= Specifies a major name to be monitored. If this parameter is not specified, enqueue activity for all major and minor names is collected. The major name can be from 1 to 8 characters long.

MINOR= Specifies a minor name to be monitored. If this parameter is not specified, enqueue activity for all minor names is collected. The minor name can be from 1 to 44 characters long. A MINOR name cannot be specified unless a MAJOR name is specified.

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Examples

```
ENQUEUE
```

Instructs the CMF MONITOR Extractor to collect all enqueue activity information.

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EXTSUM

EXTSUM
[JOBCLASS=(JC=*class*1,JD=*description*1,...,JC=*class*36,JD=*description*36)]
[,PERFORM=(PG=*group*1,PP=*period*1,PD=*description*1,
...,PG=*group*64,PP=*period*64,PD=*description*64)]
[,SRVCLASS=(SC=*serviceclass*1,SCP=*period*1,...,SC=*serviceclass*64,
SCP=*period*64)]
[,JES={NO|YES}]
[,COPIES={1|*n*}]
[,SAMPLE={1000|*nnnn*}]
[,SPINOFF={A|*class*|NO}]
[,INITRECS={FIRSTDS|EACHDS}]

Overview

The EXTSUM control statement causes the CMF MONITOR Extractor to sample data on CPU and channel busy status, paging, swapping, I/O activity, TSO transaction rate, workload status, and service allocation percentages.

Monitoring modes

An EXTSUM statement can be specified for CPM mode only; this statement is not valid for IPM mode.

Sampler and record types

The EXTSUM statement controls the EXTS sampler, which produces CMF type 240-06 and 240-07 user records.

Analyzer statements and reports

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

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Producing the Extractor Summary Report

The Extractor Summary Report is produced only if the SPINOFF parameter is defined with a valid SYSOUT class in the EXTSUM statement. The SPINOFF parameter causes the CMF MONITOR Extractor to dynamically allocate a JES spin-off data set at the end of each recording interval, without disrupting the continuous sampling functions of the CMF MONITOR Extractor. From this spin-off data, the CMF MONITOR Extractor automatically produces the Extractor Summary Report for every recording interval and sends it to the specified SYSOUT.

However, the other parameters and the WORKLOAD control statement also affect the Extractor Summary Report:

- If JES=NO is defined in the EXTSUM statement, the Job Class Activity section of the Extractor Summary Report is not produced.
- The Performance Group Activity section of the Extractor Summary Report is not produced unless the PERFORM parameter is defined to the EXTSUM statement and the WORKLOAD control statement is defined.

Other BMC Software products

The EXTSUM control statement is used by the CMF MONITOR Extractor only.

Parameters

Parameters for the EXTSUM control statement are

JOBCLASS= Specifies the job class queues to be monitored for activity and a description for each class to be reported in the Extractor Summary Report. A maximum of 36 classes and descriptions can be specified. Any class that is specified is reported separately on the Extractor Summary Report; all other classes are grouped together and described as OTHER. There are two values to define to the JOBCLASS parameter:

JC= Name of the job class.

JD= Description of job class. For every JC= value specified, a job class description up to 15 characters long can be specified. The *description* specified as the JD value is displayed on the Extractor Summary Report.

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PERFORM= Specifies the performance groups and periods to be monitored and a description for each performance group reported in both the Extractor Summary and Performance Summary Reports. The information defined to this parameter is recorded in CMF MONITOR initialization records.

Up to 64 definitions can be specified, with a maximum of 8 definitions for any one performance group. There are three values to define to the PERFORM parameter:

PG= Name of the performance group.

PP= Performance group period. If no performance period is specified, all performance periods for the specified performance group are summarized.

PD= Each performance group can have a description. If no performance description is specified, the WORKLOAD DESCRIPTION fields on both the Extractor Summary and Performance Summary Reports are blank, although you can define the WORKLOAD DESCRIPTION for the Performance Summary Report on the PERFORM Analyzer control statement (see "PERFORM" on page 2-77 for more information).

Notes:

- The WORKLOAD Extractor control statement must be defined, or the Performance Group Activity section of the Extractor Summary Report is not produced.
- If you do not define a performance group to this parameter on the EXTSUM statement, the input data does not contain initialization records for the performance group and you cannot report on the performance group using the PERFORM Analyzer control statement and in the Performance Summary Report.
- Performance group descriptions defined to PD in this parameter on the EXTSUM statement are overridden by values defined to the PD parameter of the Analyzer PERFORM control statement.
- The PERFORM parameter may be used within the same control statement as the SRVCLASS parameter. You may want to use both parameters if you are planning to switch between compatibility mode and goal mode on an MVS 5.1 or later system.

SRVCLASS= Specifies the service classes and periods to be monitored for the Extractor Summary Report and the Performance Summary Report. A maximum of 64 service classes can be specified. There are two values to define to the SRVCLASS parameter:

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SC= Name of the service class. You can specify the name of the service class or you can use an asterisk (*) as a wildcard character to specify multiple service classes that use a pattern. For example, if you have two batch service classes (say, BATNRML and BATHOT), you can define SC=BAT* to specify both of those service classes.

Note: A maximum of 64 service classes may be specified. If use of the asterisk wildcard includes more than 64 service classes, only the first 64 service classes appear on the report.

SCP= Number of the service class period. For every SC value specified, up to eight periods can be specified. If you do not specify SCP for a particular service class, all periods appear in the reports. The SRVCLASS parameter may be used within the same control statement as the PERFORM parameter. You may want to use both parameters if you are planning to switch between compatibility mode and goal mode.

JES= Specifies whether the job entry subsystem is to be sampled and controls whether the Job Class Activity section of the Extractor Summary Report is produced. The default is JES=NO.

For the Job Class Activity section of the Extractor Summary Report to be produced, this value must be defined as JES=YES and the SPINOFF parameter must be defined with a valid SYSOUT class.

For JES2 sampling, code JES=YES.

For JES3 sampling, code JES=YES and make sure the procedure for JES3INIT was assembled and linked during AutoCustomization or manual customization. If you have upgraded your JES3 release since you installed CMF MONITOR, you must re-assemble the JES3INIT procedure to link to the new offsets. Use AutoCustomization or the instructions in the *hilevel*.BBILIB member @@YCH300 to re-assemble the JES3INIT procedure.

COPIES= Specifies the number of copies of the Extractor Summary Report to be printed. Up to 99 copies can be specified. The default is 1. This parameter is meaningful only if the SPINOFF parameter is defined with a valid SYSOUT class.

SAMPLE= Specifies the number of milliseconds between data gathering cycles. The default is 1000. The sample rate cannot be below 500 or over 9999.

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SPINOFF= Specifies the SYSOUT class to be dynamically allocated for printing the Extractor Summary Report. Any valid SYSOUT class can be specified. The default is A. The SPINOFF=NO parameter eliminates all spin-off reports but allows Extractor summary records (CMF type 240-06 user records) to be written and later summarized by the Analyzer.

INITRECS= Specifies when EXTSUM initialization mapping records are to be written.

Note: These are the records that map performance groups, service classes, and jobclasses to names.

If you specify INITRECS=FIRSTDS, EXTSUM records are written only when the CMF MONITOR Extractor begins recording. This setting is the default.

If you specify INITRECS=EACHDS, EXTSUM records are written when the CMF MONITOR Extractor begins recording, as well as whenever CMF MONITOR Extractor output flips to an alternate data set.

Examples

```
EXTSUM JOBCLASS=(JC=A,JD=PRODUCTION,JC=T,JD=TEST),
       PERFORM=(PG=1,PP=12345678,PD=BATCH,PG=2,PP=12,
                PD=TSO-TRIVIAL,PG=2,PP=3,PD=TSO-LONG),
       SPINOFF=D,COPIES=3
```

The CMF MONITOR Extractor monitors and reports on job classes A and T and performance groups 1 and 2. D is the SYSOUT class allocated to print the Extractor Summary Report. Three copies of the report are printed at Extractor recording intervals specified on the REPORT control statement.

Job class A has a description of PRODUCTION, and job class T has a description of TEST.

Performance group 1 specifies that all periods are reported under the description BATCH. Performance group 2 specifies that periods 1 and 2 are reported under the description TSO-TRIVIAL, and period 3 is reported under the description TSO-LONG.

```
EXTSUM JOBCLASS=(JC=A,JD=PRODUCTION,JC=T,JD=TEST),
       SRVCLASS=(SC=*,SCP=1234)
       INITRECS=EACHDS
```

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The CMF MONITOR Extractor monitors and reports on job classes A and T and the first 4 periods on all service classes (up to 64 service classes). D is the SYSOUT class allocated to print the Extractor Summary Report. EXTSUM records are written each time CMF MONITOR Extractor recording flips to an alternate data set.

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HEADMOVE

```
HEADMOVE  [ALL]|
[,NUMBER=(c1,...,c15)]|
[,RANGE=(xxxx[:xxxx]1,...,xxxx[:xxxx]8)]
[,EXCEPT=(xxxx[:xxxx]1,...,xxxx[:xxxx]8)]
[,VTOC={NO|YES}]
[,DSNLIST=(dsn1,...,dsn101)]
[,DDNAME=ddn]
[,DSN='dsn']
[,ALTDSN='dsn']
[,SAMPLE={33|nn}]
[,OFFLINE={NO|YES}]
[,BUFSIZE={20|nnn}]
[,RESUME={0|n}]
[,SUSPEND={0|n}]
```

Overview

The HEADMOVE control statement causes the CMF MONITOR Extractor to measure specified DASDs for head movement activity.

HEADMOVE samples a maximum of 4,096 DASD devices. Multiple exposure devices, such as the 2305 eight-exposure drum, are not sampled.

Because its overhead can be greater than that of other samplers, BMC Software recommends that you run HEADMOVE only in IPM mode, with a sampling rate between 33 milliseconds and 25 milliseconds.

Using DEVICE with HEADMOVE

If the HEADMOVE control statement is specified for only one mode (either CPM or IPM), and you also want to use the DEVICE control statement, both HEADMOVE and DEVICE must run in the same mode. (See “DEVICE” on page 1-23 for more information.)

Monitoring modes

One HEADMOVE statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM); however, BMC Software recommends that this statement be run in IPM mode only.

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Sampler and record types

The HEADMOVE statement controls the HMOV sampler, which produces CMF type 240-12, 240-13, and 240-14 user records.

Analyzer statements and reports

DASD (see page 2-39)
Direct Access Report (see page 3-112)

DASD,VOLSER (see pages 2-39 and 2-121)
Direct Access Report Plot of Volume (see page 3-114)

Other BMC Software products

The HEADMOVE control statement must be defined in the CMF MONITOR Extractor JCL for DSO (see *CMF MONITOR Batch User Guide*, “DSO” for more information).

Parameters

Parameters for the HEADMOVE control statement are

ALL= Specifies that all online DASDs in the system are to be measured.

Note: If ALL is not specified, specify either NUMBER or RANGE, or both.

NUMBER= Specifies a list of one or more numbers. Every online DASD having that number as its first digit is measured. Up to 16 numbers can be specified. Each number specified must be a unique hexadecimal number in the range of 0 through F. If more than one number is specified, numbers must be enclosed in parentheses and separated by commas.

RANGE= Specifies a range of devices to be measured. The range can consist of a list of single device addresses, a list of device ranges (*xxxx*:*xxxx*), or a combination of both. A maximum of eight devices or device ranges can be specified.

Note: The NUMBER and RANGE parameters are ignored if ALL is specified.

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EXCEPT= Specifies a range of devices to be excluded from measurement activity. A maximum of eight devices or device ranges can be specified.

Note: The EXCEPT parameter of the DEVICE control statement (see "DEVICE" on page 1-23) has no impact on the data collected by the HEADMOVE sampler.

VTOC= Specifies whether VTOC data is to be extracted from volumes being sampled for head movement. Data is collected at initialization. The HMOVRESCAN modify command can be used to collect and write VTOC records on request. (See *CMF MONITOR Batch User Guide*, "MODIFY Command Examples" for more information.)

The default is NO. Specify YES only if the DSO option is used.

DSNLIST= Specifies the names of up to 101 Extractor data sets where head movement data is to be written. The data set must be previously allocated and cataloged. This parameter can be used in place of DDNAME or DSN and ATLDSN. If you use the DSNLIST parameter, do not include the ddname CMFCDS*xx* or CMFIDS*xx* in the CMF MONITOR Extractor JCL.

You can specify DSNLIST=NULLFILE if you want the records to be discarded. This option may be useful if you are using IPM mode for running either CMF MONITOR Online or MAINVIEW for OS/390.

DDNAME= Specifies the ddname of an Extractor data set (defined through JCL) that the head movement data is written to. This parameter is invalid if DSN or DSNLIST is used.

To support data set flipping, if DSO is writing to its own data set, specify ddnames CMFCDS*xx* for CPM and CMFIDS*xx* for IPM.

Note: If DDNAME, DSNLIST, or DSN is not specified, output goes to the file defined by the REPORT control statement.

DSN= Specifies the data set name where head movement data is to be written. The data set must be previously allocated and cataloged. This parameter is invalid if DDNAME or DSNLIST is used. For DSN, do not include the ddname CMFCDS*xx* or CMFIDS*xx* in the CMF MONITOR Extractor JCL.

ALTDSN= Specifies the data set name of a previously allocated, cataloged Extractor data set to be used for head movement data if the data set specified by DDNAME or DSN fills up. If this option is used, do not include the ddname CMFCDS*xx* or CMFIDS*xx* in the CMF MONITOR Extractor JCL. This parameter is invalid if the DSNLIST parameter is used.

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SAMPLE= Specifies the number of milliseconds between data gathering cycles for this group of devices. The default is 33. Acceptable values are 20 to 9999.

OFFLINE= OFFLINE=YES specifies that entries should be reserved in the sample tables for selected devices that are marked offline. If these devices are then varied online, they are sampled. The default of NO eliminates unwanted dummy device entries.

BUFSIZE= Specifies the maximum number of WKQEs (work queue elements) that the HEADMOVE sampler can acquire per sampling function. The default value is BUFSIZE=20. A WKQE is a unit of Extractor-managed CSA storage. There are approximately 3600 WKQEs available to the CMF MONITOR Extractor when CSA=512 is defined on the REPORT control statement.

Note: The BUFSIZE parameter should be defined if the SUSPEND and RESUME parameters are defined.

SUSPEND= Defines a suspension threshold for CSA usage by the HEADMOVE sampler. The suspension threshold is the minimum number of WKQEs that must be available in CSA or HEADMOVE sampling suspends. The default is SUSPEND=0, which provides no suspension threshold. The suspension threshold is calculated as follows:

(value of SUSPEND=) * (value of BUFSIZE=) = (suspension threshold)

The SUSPEND, RESUME, and BUFSIZE parameters must always be defined together.

RESUME= Defines a resumption threshold for CSA usage by the HEADMOVE sampler. The resumption threshold is the minimum number of WKQEs that must be available in CSA for HEADMOVE sampling to resume from a period of suspension. The default is RESUME=0, which provides no resumption threshold.

The RESUME value must always be greater than the SUSPEND value. The SUSPEND, RESUME, and BUFSIZE parameters must always be defined together.

The resumption threshold is calculated as follows:

(value of RESUME) * (value of BUFSIZE) = (resumption threshold)

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Using the SUSPEND, RESUME, and BUFSIZE Parameters

The following procedure should provide reasonable SUSPEND, RESUME, and BUFSIZE values for a system providing 512K of CSA:

1. Specify CSA=512 on the REPORT control statement (see “REPORT” on page 1-56 for more information). The maximum CSA allowance provides the best environment.
2. Specify BUFSIZE=100 on the HEADMOVE control statement. If you already use a BUFSIZE value greater than 100, set it to 200.
3. Specify SUSPEND=4 on the HEADMOVE control statement.
4. Specify RESUME=8 on the HEADMOVE control statement.

If numerous suspension/resumption messages are logged while running the Extractor, adjustment to the SUSPEND and RESUME values may be required. The following list provides some guidelines:

- Numerous suspension messages indicate that the SUSPEND value may be too large. Decrease the SUSPEND value by 1.
- Long suspension periods indicate that the RESUME value may be too large. Decrease the RESUME value by 1.
- Numerous short suspension periods indicate that the SUSPEND and RESUME values may be too close numerically. Increase the RESUME value by 1.
- If HEADMOVE terminates, the SUSPEND value is too small. Increase SUSPEND by 1 and reconsider the value of RESUME.

Example

```
HEADMOVE  ALL,EXCEPT=(142,145:147),OFFLINE=YES
```

The Extractor measures head movement activity for all online DASDs, except device addresses 142 and 145 through 147, reserving entries in the sample tables for devices marked offline. By default, the data is sampled every 33 milliseconds, and the output goes to the file defined in the REPORT control statement.

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HFS

HFS

[FSNLIST=(fsname1,...,fsname101)]

Overview

The HFS control statement causes the Extractor to collect global, buffer, and file system statistics for the hierarchical file system (HFS).

The statistics are available on OS/390 2.7.0 and later systems. If specified on an earlier system, the control statement is ignored.

Monitoring modes

One HFS statement can be specified for each monitor mode, CPM and IPM.

Sampler and record types

The HFS statement controls the HFS sampler, which produces SMF type 74-6 records.

Analyzer statements and reports

HFS (see page 2-65)
HFS Statistics Report (see page 3-138)

Other BMC Software products

The HFS control statement is used by the CMF MONITOR Extractor only.

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Parameters

The parameter for the HFS control statement is:

FSNLIST= Specifies the names of up to 101 hierarchical file systems, each is the fully qualified name of the MVS HFS data set (without quotes) that contains the file system. This parameter is optional; it is specified to produce the File System Statistics section of the HFS Statistics Report.

Example

```
HFS
```

Instructs the Extractor to collect HFS global and buffer statistics.

```
HFS FSNLIST=SYSI.IBMOEM.SMS.OS270.GLDE.ETC
```

Instructs the Extractor to collect HFS global and buffer statistics and the statistics for the file system SYSI.IBMOEM.SMS.OS270.GLDE.ETC.

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IOQ

IOQ
[,IGNORE={NO|INACTIVE}]
[,CLASS=(*class*[,*class*]...)]

Overview

The IOQ control statement causes the Extractor to collect I/O configuration and activity data. Statistics are gathered for I/O processors (IOP) and Logical Control Units (LCU) and written to SMF type 78-3 records. These records are used by the Analyzer to produce the I/O Queuing Activity Report.

Note: When MVS runs under VM, do not specify the IOQ control statement. VM does not allow configuration data to be read, so the IOQ sampler does not function.

Monitoring modes

One IOQ statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The IOQ statement controls the IOQS sampler, which produces SMF type 78-3 records.

Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

IOQ (see page 2-67)
I/O Queuing Activity Report (see page 3-146)

Other BMC Software products

The IOQ control statement is used by the CMF MONITOR Extractor only.

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Parameters

Parameters for the IOQ control statement are

IGNORE= Specifies how LCUs that have no activity during an interval are to be treated.

- **INACTIVE** Specifies that no SMF 78-3 data be written for LCUs that had no activity for the reporting period.
- **NO** Specifies that SMF 78-3 data be written for all devices, whether or not they had any activity. This value is the default.

CLASS= Specifies the classes of devices to be sampled. The default is *all classes*.

- **TAPE** Magnetic tape devices.
- **COMM** Communications equipment.
- **DASD** Direct access storage devices.
- **GRAPH** Graphics devices.
- **UNITR** Unit record devices.
- **CHRDR** Character reader devices.

Examples

```
IOQ
```

Invokes I/O queuing sampling for all device classes.

```
IOQ CLASS=DASD
```

Invokes I/O queuing sampling for DASD devices only.

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LINKMAP

LINKMAP
[INITRECS={FIRSTDS|EACHDS}]

Overview

The LINKMAP control statement causes the Extractor to produce mapping data on modules located in the pageable link pack area (PLPA).

Monitoring modes

One LINKMAP statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The LINKMAP statement controls the LPAM sampler, which produces CMF type 240-16 user records.

Analyzer statements and reports

LINKPACK (see page 2-69)
Link Pack Area Report (see page 3-154)

Other BMC Software products

The LINKMAP control statement is used by the CMF MONITOR Extractor only.

Parameters

The parameter for the LINKMAP control statement is

INITRECS= Specifies when LINKMAP initial records are to be written.

— If you specify INITRECS=FIRSTDS, LINKMAP records are written only when the Extractor begins recording. This selection is the default.

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— If you specify INITRECS=EACHDS, LINKMAP records are written when the Extractor begins recording as well as whenever Extractor output flips to an alternate data set. In this case, the records have improved integrity, though slightly larger SMF files are produced.

Examples

```
LINKMAP
```

Generates link pack mapping records only at Extractor initialization.

```
LINKMAP INITRECS=EACHDS
```

Generates link pack mapping records at Extractor initialization and each time recording flips to an alternate data set.

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MACSCHAR

MACSCHAR
[,IOWSAMP={4000|*nnnn*}]

Overview

The MACSCHAR control statement causes the Extractor to produce I/O and page fault data by performance group and period.

To use this control statement, the MVS operating system TRACE must be active.

Note: This sampler can potentially cause high CPU overhead; the amount of overhead increases when the IOWSAMP value decreases or the System Trace Table size increases. See the description of keyword IOWSAMP below.

Monitoring modes

One MACSCHAR statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The MACSCHAR statement controls the IOWS sampler which produces CMF type 240-19 user records.

Analyzer statements and reports

WKLDCHAR (see page 2-122)
Workload Characterization Report (see page 3-235)

Other BMC Software products

The MACSCHAR control statement is used by the CMF MONITOR Extractor only.

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Parameters

The parameter for the MACSCHAR control statement is

IOWSAMP= Specifies the sampling rate for gathering I/O and page fault data. Because of the potentially high overhead, the minimum sampling rate is 4000 milliseconds.

Examples

```
MACSCHAR IOWSAMP=5000
```

Causes the I/O and page fault data to be sampled once every five seconds.

```
MACSCHAR
```

Causes the I/O and page fault data to be sampled once every four seconds by default.

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OMVS

OMVS
[SAMPLE={1000|*nnnn*}]

Overview

The OMVS control statement causes the Extractor to collect data on MVS OpenEdition kernel activity.

Monitoring modes

One OMVS statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The OMVS statement controls the OMVS sampler, which produces SMF type 74-3 records.

Analyzer statements and reports

OMVS (see page 2-76)
OMVS Kernel Activity Report (see page 3-172)

Other BMC Software products

The OMVS control statement is used by the CMF MONITOR Extractor only.

Restrictions

To run this control statement, the user ID under which the Extractor is running must be designated as a valid OMVS user ID. You can use your security system facilities for your system to define the user ID to OMVS. For more information about defining security for OMVS accounts, see the IBM manual *z/OS UNIX System Services Planning*.

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Parameters

The parameter for the OMVS control statement is

SAMPLE= Specifies the number of milliseconds between data gathering cycles for the paging and swapping data being gathered.

The default value is 1000.

Example

```
OMVS  SAMPLE=5000
```

The Extractor samples OpenEdition MVS kernel activity data every five seconds.

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PAGING

PAGING
[SAMPLE={5000|*nnnn*}]

Overview

The PAGING control statement causes the Extractor to collect paging and swapping data.

Monitoring modes

One PAGING statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The PAGING statement controls the PAGS sampler, which produces SMF type 71 records and CMF type 240-03 user records.

Analyzer statements and reports

AUXSTOR (see page 2-8)
Auxiliary Storage Report (see page 3-6)

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

SRM (see page 2-109)
System Resources Manager Report (see page 3-201)

STORAGE (see page 2-110)
Storage Management Report (see page 3-195)

Other BMC Software products

The PAGING control statement must be defined in the Extractor JCL for MAINVIEW for OS/390 (see *CMF MONITOR Batch User Guide*, “MAINVIEW for OS/390” for more information).

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Parameters

The parameter for the PAGING control statement is

SAMPLE= Specifies the number of milliseconds between data gathering cycles for the paging and swapping data being gathered.

The default and minimum value is 5000. Because this sampler causes high overhead , acceptable values are 5000 to 9999.

Example

```
PAGING  SAMPLE=5000
```

The Extractor samples paging and swapping data every five seconds.

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PGDDLAY

```
PGDDLAY
[ALLPGS|ALLDMNS|,PG=({n1|n:n1},...,{n16|n:n16})]
[,TYPE={PGROUP|DOMAIN}]
[,DMN1=({n1|n:n1},...,{n8|n:n8})]
        .       .
        .       .
        .       .
[,DMN16=({n1|n:n1},...,{n8|n:n8})]
[,DMN=({n1|n:n1},...,{n8|n:n8})]
```

Overview

The PGDDLAY sampler samples delay and storage utilization data.

In WLM compatibility mode, the PGDDLAY control statement allows you to sample

- all domains within all performance groups
- specific domains within all performance groups
- all domains within a performance group or subset of performance groups
- specific domains within a performance group or subset of performance groups

In WLM goal mode, the PGDDLAY control statement allows you to sample all service class periods within each service class.

Monitoring modes

One PGDDLAY statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The PGDDLAY statement controls the PGDS sampler, which produces SMF type 72-2 records for WLM compatibility mode, and SMF type 72-4 records for WLM goal mode.

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Analyzer statements and reports

PGDDLAY (see page 2-85)
Domain Delay Analysis Report (see page 3-122)

Note: For WLM goal mode, a report is not available at this time.

Other BMC Software products

The PGDDLAY control statement is used by the CMF MONITOR Extractor only.

Restrictions

This sampler is unique among Extractor samplers because it does not function unless the MVS PAS data collectors are active. If the MVS PAS is started with the DC=STOP parameter defined, the PGDDLAY sampler is initialized but suspends sampling functions until the beginning of the next recording interval after the data collectors become active through a MODIFY command with DC=START defined. Likewise, if the data collectors are active and the DC=STOP parameter is entered through a MODIFY command at any time during MVS PAS operation, the PGDDLAY sampler suspends its sampling functions.

Parameters

In WLM goal mode, PGDDLAY parameters are ignored. In compatibility mode, parameters for the PGDDLAY control statement are

ALLPGS= Specifies all domains in all performance groups for sampling. You can limit the domains to be sampled within all performance groups by using the DMN parameter. To limit the performance groups to be sampled, you must use the PG parameter and remove this parameter. The ALLPGS parameter is the default and causes all performance groups to be sampled.

This parameter cannot be defined with the PG, DMNk, or ALLDMNS parameters.

ALLDMNS= Specifies all domains in all performance groups for sampling. The ALLDMNS parameter requires that TYPE=DOMAIN also be coded. This parameter cannot be defined with the PG, DMNk, DMN, or ALLPGS parameters.

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PG= Specifies all domains in a subset of performance groups for sampling. You can limit the domains to be sampled within this subset of performance groups by using the DMN and the DMNk parameters. To define all performance groups for sampling, you must use the ALLPGS parameter and remove this parameter.

Up to 16 performance group values may be defined in the PG parameter. A value can be a range of performance groups or an individual performance group. A range of performance groups is specified by separating the start and end group values with a colon; for example, a range for performance groups 1 through 6 is defined as 1:6. A range counts as one of the 16 allowable PG parameters that can be specified.
This parameter cannot be defined with the ALLPGS, ALLDMS, or TYPE=DOMAIN parameters.

TYPE= This parameter is required only when the ALLDMNS parameter is defined, and it must be specified as TYPE=DOMAIN. However, there are two values that can be defined to the TYPE parameter:

PGROUP Data sampling is performed on defined domains within specified performance groups or all domains within all performance groups. The TYPE parameter is optionally specified for the ALLPGS or PG parameters, because TYPE=PGROUP is the default.

DOMAIN Data sampling is performed on specified domains in all performance groups or all domains in all performance groups. This parameter is required when the ALLDMNS parameter is defined. When defined, all domains in all performance groups are sampled.

To define specific domains in all performance groups for sampling, specify the DMN parameter. You cannot use the DMNk, ALLPGS, or PG parameters when TYPE=DOMAIN.

DMN*k*= Defined only with the PG parameter to specify a subset of domains within specific performance groups or ranges of performance groups for sampling. The variable *k* in the DMNk parameter is a value of 1 to 16 corresponding to a positional PG value.

At the PG parameter, 1 to 16 values can be defined which select certain performance groups or ranges of performance groups for sampling. Each performance group or range value is positionally coded in one of 16 slots at the PG parameter. The DMNk parameter defines specific domains to be sampled within a positional PG performance group or range value, when *k* is equal to the PG position.

If the DMNk parameter is omitted, the values specified in the DMN parameter are used. If the DMN parameter is omitted, all domains are sampled.

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DMN= Defines specific domains within all or specific performance groups to be sampled. The DMN cannot be defined when the ALLDMNS parameter is specified.

The DMN parameter defines the domains to be sampled, unless overwritten by a DMNk parameter for a specific performance group or range of performance groups. If the DMN parameter is omitted, all domains are sampled.

Examples

```
PGDDLAY TYPE=PGROUP,PG=(1,3:7,9,232:233),
             DMN2=(2:8,12,54),DMN4=(1,5:6,8,37,44,46,49,63),
             DMN=(1:10,30:80)
```

The Extractor limits data collection to performance groups 1, 3, 4, 5, 6, 7, 9, 232, and 233. Data about domains is collected for the defined performance groups in the following manner:

1 All domains

3 through 7 Domains 2, 3, 4, 5, 6, 7, 8, 12, and 54

9 All domains

232 and 233 Domains 1, 5, 6, 8, 37, 44, 46, 49, and 63

```
PGDDLAY  TYPE=DOMAIN,DMN=(1,4:7,10)
```

The Extractor limits data collection for domains 1, 4, 5, 6, 7, and 10, only.

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REPORT

```
REPORT {CPM|IPM}
[,INTERVAL={30|nn|HOUR|QTR|HALF|SMF}]
[,RUNTIME={1440|nnnn}]
[,SYNCH={00|nn|HOUR|QTR|HALF|SMF}]
[,CSA={80|nnn}]
[,SMFRECID={240|nnn}]
[,DSNLIST=(dsn1,...,dsn101)]
[,DSN='dsn']
[,ALTDSN='dsn']
[,SMF={NO|YES}]
[,DISP=NEW]
[,GBLS={YES|NO|1000...|9000}]
[, SRVCLASS={SYSSTC|WLM-RULE}]
```

Overview

This statement is required for all BMC Software products that use the CMF MONITOR Extractor. The REPORT control statement sets global parameters for an Extractor batch report job. It must be defined before any other Extractor control statement in the JCL. Only one REPORT statement can be defined in a single job.

Some Extractor functions that REPORT statement controls include are:

- monitoring mode
- runtime value
- recording interval
- location of where data is to be recorded

For example, Extractor output is written to SMF, if all of the following conditions exist:

- SMF=YES and SMFRECID parameters are specified.
- DSN, ALTDSN, and DSNLIST parameters are not specified.

Monitoring modes

One REPORT statement must be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

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Sampler and record types

The REPORT statement controls both the RECD and GBLS samplers, which produce CMF type 240-11 and 240-00 user records, respectively.

Analyzer statements and reports

None.

Note: The GBLS=YES parameter must be defined on the REPORT control statement for

COMBCONF (see page 2-24)
Combinations of Configuration Activity Report (see page 3-66)

LINKPACK (see page 2-69)
Link Pack Area Report (see page 3-154)

Other BMC Software products

The REPORT control statement must be defined in the Extractor JCL, for BMC Software products that use the CMF MONITOR Extractor. These include

- DSO (see *CMF MONITOR Batch User Guide*, “DSO” for more information)
- MAINVIEW for OS/390 (see *CMF MONITOR Batch User Guide*, “MAINVIEW for OS/390” for more information)

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Parameters

Parameters for the REPORT control statement are

CPM or IPM Specifies whether the REPORT control statement and the succeeding control statements are for continuous (CPM) or intermittent (IPM) mode. This positional parameter must be specified.

INTERVAL= Specifies the number of minutes for the Extractor recording interval. The recording interval is the amount of time that passes before the Extractor gathers data collected by the samplers and saves it to SMF or another data set.

A number or a keyword parameter can be defined as the INTERVAL value. The default is 30. The maximum allowable numeric value is 60; the minimum allowable numeric value is 2.

Note: The INTERVAL parameter works in conjunction with the SYNCH parameter.

Keyword parameters are described in the following list:

HALF Same as 30 minutes.
HOUR Same as 60 minutes.
QTR Same as 15 minutes.
SMF Same as the recording interval and synchronization value defined for SMF in the SMFPRM*xx* member of SYS1.PARMLIB. You can record data to CMF MONITOR data sets and still use INTERVAL=SMF.

Note: The INTERVAL parameter works in conjunction with the SYNCH parameter. If you define INTERVAL=SMF, do not define a value for the SYNCH parameter, unless you define SYNCH=SMF. It is not necessary to define both parameters, because defining one of these parameters with the SMF value causes the Extractor to use the same recording and synchronization values defined to SMF.

RUNTIME= Specifies the number of minutes this monitoring mode is to remain active. This parameter is intended primarily for use with IPM mode. CPM mode should be allowed to run as long as possible so that long-term trending data can be collected. The default is 1440 (untimed), which is also the maximum value. If the specified interval is greater than run time, the run time defaults to 1440. The minimum value is 2.

Note: This time value is for elapsed time, not CPU time.

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SYNCH= Specifies the number of minutes into the hour to which the recording interval is synchronized. The recording interval is defined by the INTERVAL parameter.

The SYNCH parameter affects the INTERVAL parameter by determining the start time of recording, whereas the INTERVAL parameter defines the amount of time that passes before records are gathered by the Extractor.

The maximum SYNCH value is 60 minutes; the minimum value is 00, which is the default. Keyword parameters define the same time values as they do for INTERVAL.

Note: The SYNCH parameter works in conjunction with the INTERVAL parameter. If you define SYNCH=SMF, do not define a value for the INTERVAL parameter, unless you define INTERVALSMF. It is not necessary to define both parameters, because defining one of these parameters with the SMF value causes the Extractor to use the same recording and synchronization values defined to SMF.

CSA= Specifies the amount of extended CSA required in K (1024 bytes). The default is 80. The maximum value is 1024.

Note: A small amount of CSA is obtained below the line. The majority of CSA requested by the Extractor is satisfied from above the 16-megabyte line (ECSA).

SMFRECID= Specifies an identification for the CMF MONITOR user subtype SMF records written by the Extractor. If you intend to write CMF MONITOR records to SMF, SMFRECID must be defined.

CMF MONITOR verifies that the number specified as the SMF record ID is a value between 128 and 255. The SMFRECID value must be unique from SMF record IDs used by other software on your system. The default is 240, if SMF=YES is not specified.

Note: If SMF=YES is specified, SMFRECID must also be specified.

DSNLIST= Specifies the names of up to 101 preallocated, cataloged data sets that contain the measurement data written by CPM or IPM mode. The data sets are dynamically allocated. If this option is used, do not include the ddnames CMFCPM*xx* or CMFIPM*xx* in the CMF MONITOR Extractor JCL, and do not define the SMF=YES parameter to the REPORT statement. You can use this parameter instead of the DSN and ALTDSN parameters.

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You can specify DSNLIST=NULLFILE if you want the records to be discarded. This option may be useful if you are using IPM mode for running either CMF MONITOR Online or MAINVIEW for OS/390.

DSN= Specifies the name of a preallocated, cataloged data set that contains the measurement data written by CPM or IPM mode. The data set is dynamically allocated. If this option is used, do not include the ddnames CMFCPM*xx* or CMFIPM*xx* in the CMF MONITOR Extractor JCL, and do not define the SMF=YES parameter to the REPORT statement. Do not use this parameter if you use the DSNLIST parameter.

ALTDSN= Specifies the name of a preallocated, cataloged data set that is to be flipped to when the data set specified by DSN fills up with recorded data. Use this parameter only if you also use the DSN parameter. If ALTDSN is used, do not include the ddnames CMFCPM*xx* or CMFIPM*xx* in the CMF MONITOR Extractor JCL, and do not define the SMF=YES parameter to the REPORT statement.

SMF= Specifies whether data should be written to the SMF data sets. If SMF=YES is specified, SMFRECID must also be specified explicitly. NO is the default.

Notes:

— If SMF=YES is specified, do not define the DSNLIST, DSN, or ALTDSN parameters on the REPORT control statement, as they are mutually exclusive with SMF=YES.

— When SMF=YES is specified, the //CMFCPM1 DD, //CMFCPM2 DD, //CMFIPM1 DD, and //CMFIPM2 DD statements are ignored, if defined in the JCL.

— If data is to be recorded to SMF, the SYS and/or SUBSYS parameter of member SMFPRM*xx* in SYS1.PARMLIB must be specified.

DISP=NEW Specifies at initialization that the primary CMF MONITOR Extractor output data set for the selected monitoring mode (CPM or IPM) is to be rewritten from the beginning. If you are recording to SMF, the DISP=NEW parameter is not required.

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The DISP=NEW parameter applies only at CMF MONITOR Extractor initialization, when the primary output data set is first opened. When the primary data set becomes full and an alternate data set is switched to by the CMF MONITOR Extractor, the disposition automatically switches to MOD, and DISP=NEW has no effect.

Note: If you are using VSAM data sets and the first data set has been opened (by PERUSE, for example), the CMF MONITOR Extractor skips the first data set.

GBLS= Gathers data needed for the link pack and combinations reports. NO specifies that no global sampling takes place; CMF type 11 records are suppressed. However, the global sampler continues to perform some sampling functions under the DIE; these functions are used by other samplers. The sample rate for GBLS can be controlled by specifying the number of milliseconds in multiples of 1000. The default is YES with a sampling rate of 1000.

SRVCLASS= Specifies whether the MVS PAS is to run in the SYSSTC service class. If SYSSTC is specified, upon CPM mode initialization and at the end of every recording interval of CPM mode, CMF MONITOR assigns the MVS PAS to the SYSSTC service class if it does not run in this service class. SYSSTC is the default.

If WLM-RULE is specified, the MVS PAS runs in the service class determined by WLM classification rules. This service class should have an execution velocity goal of at least 80%.

Note: This parameter is applicable only if the system is in WLM goal mode and is ignored if specified on the REPORT control statement of the IPM mode.

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Examples

```
REPORT IPM,INTERVAL=QTR,RUNTIME=30,SMFRECID=187,DSN='CMF.IPM.OUTPUT',
          ALTDSN='CMF.IPM.ALT.OUTPUT'
```

The CMF MONITOR Extractor writes SMF type 70 and CMF type user records with an ID of 187 every quarter-hour over a 30-minute period. The CMF MONITOR Extractor is running in IPM mode. The data is written to data set CMF.IPM.OUTPUT, and if that data set is filled, an alternate data set, CMF.IPM.ALT.OUTPUT is allocated.

```
REPORT CPM,INTERVAL=30,SMFRECID=188
```

The CMF MONITOR Extractor writes SMF records and CMF type user records with an ID of 188 every 30 minutes (continuous mode). Defaults are used for CSA area (80K) and the runtime period of 1440 minutes, which is forever.

```
REPORT IPM,RUNTIME=120,SMFRECID=199,SMF=YES
```

The CMF MONITOR Extractor uses IPM mode to write SMF type 70 records and CMF type user records with an ID of 199. The IPM mode runs for 120 minutes. Data is written to the SMF data sets. Defaults are used for the sampling interval (30 minutes) and CSA area size (80K).

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TRACE

TRACE
[SAMPLE={60|*nn*}]
[,SRB={NO|YES}]
[,SYSEVENT=(*n*1,...,*n*6)]
[,ASID=*asid*]
[,ID=0|*n*]
[,NAME=*jobname*]

Overview

The TRACE control statement invokes the trace facility of the CMF MONITOR Extractor. Before using this facility, review the information explained in “SRB and SRM TRACE Facilities” on page 1-67.

The trace facility uses two sampling methods:

SRB Schedules a user-written SRB routine at specified intervals. A default SRB routine, CX10UMOD, is located in the CMF MONITOR BBSAMP data set.

SRM Allows you to trace specified SYSEVENTs. This facility traces the jobname for which the SYSEVENT was issued, along with parameter registers zero and one. For the TSEVENT (SYSEVENT 0), the name of the TSO command is traced rather than the parameter registers.

Monitoring modes

One TRACE statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The TRACE statement controls the TRCE sampler, which produces CMF type 240-18 user records.

Analyzer statements and reports

TRACE (see page 2-114)
Trace Report (see page 3-217)

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Other BMC Software products

The TRACE control statement is used by the CMF MONITOR Extractor only.

Parameters

Parameters for the TRACE control statement are

SAMPLE= Indicates the rate, in seconds, at which the user-written SRB routine receives control. Acceptable values are 1 to 999. The default is 60 seconds.

SRB= Indicates whether the user-written trace routine is to be scheduled. The default is NO.

SYSEVENT= Lists 1 to 6 optional SYSEVENTs that are to be traced. If nothing is specified, the SYSEVENT trace is suppressed. Valid SYSEVENT IDs are 0 through 79. A specification of SRB=NO and no SYSEVENTs results in an error.

Note: SYSEVENT data is traced for all address spaces, unless a NAME or ASID parameter is specified.

ID= Specifies the trace ID to be assigned to the SYSEVENT trace records. The default is zero, which signifies that each SYSEVENT trace record is to be identified with the SYSEVENT ID. If ID is specified, all SYSEVENT trace records receive that ID.

Note: The ID parameter is ignored if there is no SYSEVENT parameter defined.

NAME= Specifies the name of the batch job, started task, or TSO logon ID for which SYSEVENT data is to be traced. The NAME parameter is invalid if ASID is defined.

Note: The NAME parameter is ignored if there is no SYSEVENT parameter defined.

ASID= Specifies the address space identifier for which SYSEVENT data is to be traced. ASID is invalid if NAME is used.

Note: The ASID parameter is ignored if there is no SYSEVENT parameter defined.

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Examples

```
TRACE   SAMPLE=1,SRB=YES
```

Invokes the trace sampler; a user SRB is scheduled every second.

```
TRACE   SRB=NO,SYSEVENT=(0,8,9,15,20,21),NAME=TSOUSER
```

Invokes the trace sampler with the SRM option. The following SYSEVENTs are examples of those traced for TSOUSER:

0	PPMODE
8	Job select
9	Job termination
15	Swap-out complete
20	Enqueue hold
21	Enqueue release

Each trace entry has the ID of the SYSEVENT number.

```
TRACE   SAMPLE=10,SRB=YES,SYSEVENT=15,ID=77,ASID=10
```

Invokes the trace sampler with both the SRB and SRM options. The user SRB is scheduled every 10 seconds. The swap-out complete system event (SYSEVENT 15) is traced for address space 10 and is stamped with an ID of 77.

SRB and SRM TRACE Facilities

The CMF MONITOR trace facility uses service request block (SRB) and system resource manager (SRM) sampling methods.

SRB Allows you to code trace routines for specialized system sampling.

CMF MONITOR schedules global SRBs to perform many sampling functions. The trace facility permits you to interact with the SRB scheduling mechanism and introduce user-supplied trace routines.

At intervals specified by you, the SRB routine receives control and a data area of from 1 to 112 bytes is added as an entry in a trace record. Trace records vary in size up to a maximum of 4K.

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SRM Allows selected SYSEVENTs to be traced.

Using the SRM trace facility, you can trace selected SYSEVENTs as specified in the CMF MONITOR Extractor TRACE control statement (see “TRACE” on page 1-65 for more information). A trace for a SYSEVENT includes the name of the job for which the SYSEVENT was issued, along with the parameter registers, zero and one. TSEVENT (SYSEVENT zero) includes the TSO command name.

Implementing the User Trace SRB

A sample user trace SRB routine is distributed with CMF MONITOR in two formats:

Load module The load module is contained in BBLINK member CX10UMOD. The name of the trace SRB module must be CX10UMOD.

Assembly language source The source is contained in BBSAMP member CX10UMOD. The source for the SRB routine contains four macros that are used to code the user trace SRB. The SRB is composed of the following sections of code:

ENTRY Contains standard linkage conventions that set up a save area and establish addressability to CMF MONITOR control blocks. This is done by the CMFENTER MACRO.

USER Is the section that you actually code. After moving data to the trace data area, the CMFTRACE MACRO is issued to add that trace entry to the trace record.

EXIT Performs standard-ending linkage conventions; provides an error routine that can terminate the trace, if necessary; and sets up a work area. This is done by the CMFEXIT MACRO.

DSECT Contains DSECTs for the necessary CMF MONITOR control blocks. It is generated by the CMFDSECT MACRO.

Note: Before implementing a trace SRB sampler, BMC Software recommends that you assemble the sample SRB and study the source and comments. A typical CMF MONITOR trace SRB looks like this:

```
CMFENTER
USER CODE
CMFTRACE
CMFEXIT
CMFDSECT
```

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CMFTRACE MACRO

The CMFTRACE MACRO moves a data area into the trace buffer. This data area is then displayed as a trace entry in the CMF MONITOR trace record. The format of the CMFTRACE MACRO is

```
CMFTRACE  ID=99,LEN=U@LEN,ADDR=(R6),TYPE=SRB,MF=(E,(1))
```

ID= Identification of the trace entry. Each trace entry has an ID that allows many trace entries to be created and selectively formatted. Any ID value from 0 to 99 is valid. The sample trace routine ID is 99. Because the SYSEVENT trace facility sets the default to ID for the trace entry of each SYSEVENT, BMC Software recommends that the SRB trace ID be restricted to a value between 73 and 99.

LEN= Length of the data area to be traced. The maximum size of a data area is 112 bytes. The sample trace routine traces a 16-byte area.

ADDR= Address of the data area to be traced. This address is set up with register 6 pointing to the 112-byte data area. Move the data to be traced to this area.

TYPE= Specifies the mode of this trace entry.

MF= Specifies the address of a 16-byte remote parameter list used to maintain the trace SRB as re-entrant.

User Trace SRB Characteristics

The trace SRB routine is subject to the restrictions of all SRBs. SRBs have the following characteristics:

- All routines are entered in supervisor state, key zero, enabled, and unlocked.
- SVCs cannot be issued.
- The routines can take page faults.

The CMF MONITOR trace SRB must be re-entrant because it is possible for multiple CPUs belonging to the same multiprocessor to execute this routine at the same time. On entry to the SRB routine, register 13 points to a unique work area that contains a save area and a trace area. You should move all data to be traced to the trace area. The DSECT name, UWORK, maps this area; UWORK’s address is in register 6.

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Sample User Trace SRB

The sample trace routine provided with CMF MONITOR traces the following fields:

- FLCEOPSW from the Prefixed Save Area (PSA). This field is the address from the interrupted external old PSW.
- ASCBJBNI/ASCBJBNS pointer to the current job name.

To invoke the sample trace, specify **SRB=YES** in the CMF MONITOR Extractor TRACE control statement. The data generated is formatted by the Analyzer TRACE control statement.

User Trace Applications

The SRB routine is used as a pure trace function or as a sampler:

- A trace implies dumping a particular storage area repeatedly at specified intervals. This is done to key fields in system control blocks to track a special problem, such as a paging overload or excessive storage consumption.
- A sampler looks at various data areas and keeps an accumulator of the values, along with the number of observations. Average values can then be calculated.

  To implement a sampler:

  1. Define a data area of up to 112 bytes.
  2. Execute the required sampling function at every invocation of the SRB. Keep the sample values in the collection fields defined in the data area.
  3. Issue a trace for this data area. At predetermined intervals, zero out the collection fields and start sampling again.
  4. Write a program to analyze the data area written out. (CMF MONITOR Trace Report only formats the data.)

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TRACE76

TRACE76
{FIELD=(*name*1,...,*name*120)}
[,SAMPLE={1000|*nnnn*}]
[,SAMPSET={60|*nn*}]

Overview

The TRACE76 control statement traces selected fields from MVS control blocks and summarizes the traced data in sets.

A set is a user-specified number of samples and contains maximum, minimum, and end snapshot values for the fields selected. The sum of values and the sum of squares are also included so that an average value and a standard deviation can be calculated.

Monitoring modes

One TRACE76 statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The TRACE76 statement controls the TRAS sampler, which produces SMF type 76 records.

Analyzer statements and reports

EXCEPTS (see page 2-50)
Exception Trace Detail Report (see page 3-129)

Note: The EXCEPTS Analyzer statement must have TRACE=YES defined.

GRAPH (see page 2-56)
Graphics Trace Detail Report (see page 3-135)

Note: The GRAPH Analyzer statement must have TYPE=TRACE defined.

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Other BMC Software products

The TRACE76 control statement is used by the CMF MONITOR Extractor only.

Parameters

Parameters of the TRACE76 control statement are

FIELD= Name of the data field to be traced. This parameter is required. Up to 120 fields can be specified. Valid data field names are described in "Traceable Data Fields" on page A-12.

Note: Measures and trace values provided in "Traceable Data Fields" contain variable information, such as device addresses, which reflects how the fields are reported in a graph. In defining measures, specify the full name of the measure—do not define the variable information.

SAMPLE= Rate, in milliseconds, between data gathering cycles. The default is 1000 (1 second).

SAMPSET= Number of samples per set. The default is 60.

SAMPLE and SAMPSET Usage Notes

These parameters directly impact the amount of ECSA required for the TRACE76 sampler. At initialization, the CMF MONITOR Extractor obtains a pool of ECSA in the amount specified in the CSA parameter of the REPORT control statement (see "REPORT" on page 1-58). Increasing the SAMPLE or SAMPSET values, or decreasing the INTERVAL value on the REPORT control statement, reduces the ECSA requirement.

Calculating CSA

Use this equation to calculate CSA required by the TRACE76 sampler:

W * 20 * N + X * 32 * N + Y * 20 * N * D + Z * 32 * N * D + (I * D) + J) * 40

N	Is (INTERVAL * 60000)/(SAMPLE *SAMPSET).
D	Is the count of domains.
W	Is the number of 2-byte fields to trace (excluding domain fields).
X	Is the number of 4-byte fields to trace (excluding domain fields).
Y	Is the number of 2-byte domain fields to trace.
Z	Is the number of 4-byte domain fields to trace.

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I Is the number of domain fields.
J Is the number of nondomain fields.

This example assumes five domains and uses the equation above to calculate CSA:

```
N = (30 * 60000) / (1000 * 60) = 30

0 * 20 * 30        =      0
1 * 32 * 30        =    960
2 * 32 * 30 * 5    =   9600
6 * 20 * 30 * 5    =  18000
((8 * 5) + 1) * 40 =  1640
               0200 =  30K
```

Example

```
REPORT CPM,INTERVAL=30, CSA=50,SMFRECID=240,RUNTIME=60
TRACE76  SAMPLE=1000,SAMPSET=60,FIELD=(CCVUTILP,LSCTMTE)
```

The CMF MONITOR Extractor produces records at 30-minute intervals. The 2-byte field CCVUTILP and the 4-byte field LSCTMTE are being traced.

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TSODATA

TSODATA
[SAMPLE={1000|*nnnn*}]
[,CMDS=(*cl*1,...,*c*32)]
[,LIMIT={32|*nnn*}]
[,USERS={YES|NO}]

Overview

The TSODATA control statement specifies the TSO commands to be monitored, and indicates whether TSO user data is collected.

TSO commands executed under ISPF do not issue SYSEVENT ZERO; therefore, these commands are not timed under ISPF. However, the EDIT and TEST subcommands under EDIT and TEST modes are counted and monitored. If FSE is being used and the subcommands are stacked, FSE replaced the last character of the subcommand with the character Z.

Monitoring modes

One TSODATA statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The TSODATA statement controls the TSOS sampler, which produces CMF type 240-20 and 240-21 user records.

Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

PERFSUM,PERFORM (see pages 2-81 and 2-77)
Performance Summary Report (see page 3-175)

TSOPERF (see page 2-116)
TSO Command Summary Report (see page 3-220) and TSO Interval Summary Report (see page 3-222)

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TSOUSER (see page 2-118)
TSO User Summary Report (see page 3-224), when TSOUSER USERS=YES is defined in the CMF MONITOR Extractor control statement set.

Other BMC Software products

The TSODATA control statement is used by the CMF MONITOR Extractor only.

Parameters

Parameters for the TSODATA control statement are

SAMPLE= Specifies the number of milliseconds between data gathering cycles for TSO data. The default is 1000. The sampling rate can be between 20 and 9999.

CMDS= Identifies specific TSO commands (up to 32) that you want to monitor for response time information. If CMDS is not specified, the first *nnn* commands issued are monitored, where *nnn* is the value specified on the LIMIT parameter.

For standard TSO commands, TSO aliases (command short forms) are acceptable. Only one form of the command need be specified; for example, ALLOC also implies ALLOCATE. All commands are identified by their long names on the TSO Command Summary Report.

LIMIT= Limits the total number of TSO commands (up to 251) that the CMF MONITOR Extractor can monitor. Any commands specified in the CMDS parameter are monitored along with any other commands that are detected, up to the LIMIT value. The default value for LIMIT is 32; the maximum value is 251. Specifying a value greater than 251 forces 251.

If LIMIT exceeds the number of commands specified in CMDS, the additional commands are the first ones issued.

If LIMIT is below the number of commands specified in CMDS, the limit is increased to the number of commands specified.

USERS= Specifies whether statistics are to be collected for each TSO user at logoff. The default is YES. USERS=YES is required to produce the TSO User Summary report.

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Examples

```
TSODATA
```

The first 32 TSO commands encountered are monitored at the default interval of once per second; according to default, data is gathered at each TSO user logoff.

```
TSODATA  SAMPLE=2000,CMDS=(TEST,STAT),LIMIT=50,USERS=NO
```

The TEST and STAT commands and up to 48 additional TSO commands are monitored every 2 seconds. No TSO user summary data is generated.

```
TSODATA  SAMPLE=500,LIMIT=251
```

Up to 251 TSO commands are monitored twice per second.

```
TSODATA  CMDS=EDIT,LIMIT=1,USERS=NO
```

The EDIT command is monitored at the default interval of once per second. No TSO user summary data is generated.

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USER

USER
[SAMPLE={1000|*nnnn*}]
[,IEXIT=*name*]
[,DEXIT=*name*]
[,REXIT=*name*]
[,TEXIT=*name*]

Overview

The USER control statement provides the CMF MONITOR user the same user exit sampling capability as that provided by RMF. The USER control statement activates the CMF MONITOR user exits and specifies the sampling rate. This enables any user-written RMF exits to run under CMF MONITOR, unless they depend on RMF internal control blocks.

Default CMF MONITOR exit names and equivalent RMF exit names are listed in Table 1-2.

Table 1-2 Default CMF MONITOR Exit Names and Equivalent RMF Exit Names

RMF Exit Name	CMF MONITOR Exit Name	Exit Type
ERBMFIUC	CX10IXIT	Initialization exit
ERBMFDUC	CX10DXIT	Data gathering exit
ERBMFRUR	CX10RXIT	Report writing exit
ERBMFTUR	CX10TXIT	Termination exit

Monitoring modes

One USER statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The USER statement controls the USER sampler, which monitors user exit routines that may produce unique records types.

Analyzer statements and reports

None.

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Other BMC Software products

The USER control statement is used by the CMF MONITOR Extractor only.

How Exits Work with CMF MONITOR

CMF MONITOR supplies default exit routines that are equivalent to IBM utility module IEFBR14. These routines or user-supplied routines are loaded by the LEXICON module (CX10L020). Any combination of the exits can be used.

- If an exit is not present, CMF MONITOR returns control to the caller, passing back return code 0 to the calling program.
- IEXIT receives control from CSECT CX10USER in module CX10USER. REXIT and TEXIT receive control from CSECT USEREC in module CX10USER. The USER sampler, if loaded by IEXIT, receives control from CSECT USEDIE in module CX10USER.
- IEXIT, REXIT, and TEXIT are protected by an ESTAE. If an abend occurs in one of these routines, the appropriate CMF MONITOR error message identifies the abending routine as USER. DEXIT is protected by a functional recovery routine (FRR). If this routine abends, a message is issued for the USER sampler. Sampling for this function is terminated and a software error record is written to SYS1.LOGREC.

Parameters

Parameters for the USER control statement are

SAMPLE= Rate at which the sample routine (if loaded by CX10IXIT) receives control, in milliseconds. The default is 1000.

IEXIT= Name of the initialization exit. The default is CX10IXIT.

DEXIT= Name of the data gathering exit. The default is CX10DXIT.

REXIT= Name of the report writing exit. The default is CX10RXIT.

TEXIT= Name of the termination exit. The default is CX10TXIT.

Example

```
USER  SAMPLE=2000,TEXIT=USERTXIT
```

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Invokes the USER sampling exits with control being given to the USER sampler every two seconds. All exits are loaded using the default names, except for the termination exit, which loads module name USERTXIT.

VSMDATA

VSMDATA
[SAMPLE={5000|*nnnn*}]
[JOBNAME=(*job*1,...,*job*32)]

Overview

The VSMDATA control statement causes the CMF MONITOR Extractor to collect information about the use of virtual storage, including the use of system queue area (SQA) by subpool, common storage area (CSA) by subpool and key, and private area virtual storage by specific jobs.

Note: Both CMF MONITOR VSMDATA sampler and RMF VSTOR sampler use the MVS VSMLIST service, which can have high CPU overhead.

Monitoring modes

One VSMDATA statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The VSMDATA statement controls the VSMS sampler, which produces SMF type 78-2 records.

Analyzer statements and reports

CMFSUM (see page 2-20)
CMF Summary Report (see page 3-46)

VIRTSTOR (see page 2-119)
Virtual Storage Activity Report (see page 3-226)

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Other BMC Software products

The VSMDATA control statement is used by the CMF MONITOR Extractor only.

Usage Notes for Private Area Sampling

Private area sampling is most useful for long-running, nonswappable jobs. Sampling other jobs may be insufficient because

- Jobs are sampled only if they are active at the beginning of a recording interval. If a job starts after a recording interval has begun, it will not be sampled until the next recording interval.

  Similarly, if a job ends during a recording interval and another job of the same name begins, the data for the first job is flagged as *job terminated during interval* and sampling for the new job does not begin until the next recording interval. In addition, the data for the two like-named jobs is reported as though they were the same job.

- A job that begins and ends in the same recording interval is not sampled.

- If CMF MONITOR finds that a job is swapped out, it skips the current sample; thus, the sample count for a particular job may be below that of another job and below the overall sample count. If the job was swapped out for every sample during a recording interval, no data is recorded for that job.

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Parameters

Parameters for the VSMDATA control statement are

SAMPLE= Specifies the number of milliseconds between data gathering cycles for the VSM data being gathered. The default is 5000, which is also the minimum value. The maximum sampling rate is 60,000.

Note: The virtual storage sampler is a high overhead sampler. For this reason, the lowest sampling rate allowed is 5000 milliseconds. If a value below 5000 is specified, CMF MONITOR automatically changes it to 5000.

JOBNAME= Specifies the names of jobs for which private area storage usage data is to be collected. Up to 32 jobnames can be specified. The sampling rate for jobs is the same as that for the common areas. If the JOBNAME parameter is not specified, no private area data is collected and the Virtual Storage Activity Report's Private Area Storage Summary and Detail sections are unavailable.

Examples

```
VSMDATA  SAMPLE=5000
```

The CMF MONITOR Extractor samples virtual storage data once every 5 seconds (the minimum sampling rate). Private area data is not collected.

```
VSMDATA  SAMPLE=8000,JOBNAME=(RESOLVE,VAM2)
```

The CMF MONITOR Extractor samples virtual storage data for the common and private areas for jobs RESOLVE and VAM2 once every 8 seconds.

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WORKLOAD

WORKLOAD

Overview

The WORKLOAD control statement specifies that workload activity data is to be gathered.

Monitoring modes

One WORKLOAD statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The WORKLOAD statement controls the WLMS sampler, which produces SMF type 72-1 records in compatibility mode, and type 72-3 records in goal mode.

Analyzer statements and reports

WLMGL (see page 2-124)
Workload Manager Goal Mode Reports (see pages 3-240)

Note: The following reports are not available in goal mode. They are available only in compatibility mode.

WORKLOAD (see page 2-126)
System Workload Activity Report (see page 3-211)

WKLDCHAR (see page 2-122)
Workload Characterization Report (see page 3-235)

Other BMC Software products

The WORKLOAD control statement is used by the CMF MONITOR Extractor only.

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Parameters

There are no parameters for this control statement.

Example

WORKLOAD

Workload activity data is to be collected.

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XCFDATA

XCFDATA
[SAMPLE={1000|*nnnn*}]

Overview

The XCFDATA control statement causes the CMF MONITOR Extractor to collect performance data about the activity of the Cross-System Coupling Facility (XCF).

Monitoring modes

One XCFDATA statement can be specified for each monitoring mode, continuous (CPM) or intermittent (IPM).

Sampler and record types

The XCFDATA statement controls the XCFS sampler, which produces SMF type 74-2 records.

Analyzer statements and reports

XCF (see page 2-129)
Cross-System Coupling Facility Report (see page 3-102)

Other BMC Software products

The XCFDATA control statement is used by the CMF MONITOR Extractor.

Parameters

The parameter for the XCFDATA control statement is

SAMPLE= Specifies the sampling rate for collecting XCF data in milliseconds. The default is 1000, which is also the minimum value.

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Example

```
XCFDATA
```

Invokes collecting XCF measurement data once per second.

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Chapter 2 Analyzer Control Statements

The CMF MONITOR Analyzer processes, analyzes, and formats data gathered by the CMF MONITOR Extractor or RMF into reports. The Analyzer uses general and report control statements to control its functions.

The Analyzer's general control statements specify overall data selection and reporting parameters for CMF MONITOR reports. Report control statements cause specific reports to be produced. Report control statements use positional and keyword parameters to control the outcome of report data, just as Extractor control statements use parameters to control the input of report data.

The Analyzer also automatically produces some of its own reports that do not require control statements. These reports are Collection Phase Log reports, which describe various processing aspects of a particular batch report run.

General Control Statements

General control statements are valid only when placed at the beginning of the control statement set. These statements specify general data collection and reporting parameters for the Analyzer; the information from these control statements applies to all report requests.

General control statements can appear in any order within the general control statement group, except for Positional general control statements. The DATETIME, CYCLE, and PERIOD control statements are positional, and must appear in that order.

Note: DATETIME is required if CYCLE and PERIOD are to be used.

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A command error results if these commands are not entered in this sequence (see “CYCLE” on page 2-36, “DATETIME” on page 2-40, and “PERIOD” on page 2-83).

Table 2-1 summarizes all of the general control statements used by the Analyzer, the parameters for each statement, and each command’s function or impact on the reports.

Table 2-1 Analyzer General Control Statements (Part 1 of 2)

Analyzer Command	Parameter List	Function
CMFREC See page 2-18 for more information	No parameters	Writes only the CMF MONITOR records from an SMF input data set that were processed during a batch job to a data set defined in the Analyzer //CMXREC DD JCL statement.
CYCLE See page 2-36 for more information.	{BIWEEKLY|CYCLE*nn*|CYCLE99|DAILY|HOLIDAYS| MONTHLY|WEEKENDS|WEEKLY|WORKWKLY} [,(*sdate*:[*stime*],*edate*:[*etime*])1,... ,(*sdate*:[*stime*],*edate*:[*etime*])31]	Specifies a subset of the DATETIME period that can be applied to any report by using the PERIOD statement.
DATETIME See page 2-40 for more information.	(*sdate*:[*stime*],*edate*:[*etime*])	Specifies an overall start and end date and time for the data you want to use in your reports.
DMSS See page 2-47 for more information.	{INIT|NOINIT} [,RESERVE={400|*nnn*}] [HIPERSP={*|nnn}]	Specifies initialization of the DMSSMAIN work file, or the use and size of a hiperspace. Also reserves storage for use by the DMSS component of the Analyzer.
HEADERS See page 2-64 for more information.	[TITLE='title'] [,LOCATION=*'location'*] [,LINES={60|*nn*}]	Defines optional headline information and number of lines per report.
PERIOD See page 2-83 for more information.	CYCLE=*cyclename* [,RPTS={COMBINED|SEPARATE}]	Applies a date and time range defined by a CYCLE statement (CYCLE statements define a subset of the overall DATETIME value), to all or a single report control statement.
RECTYPE See page 2-92 for more information.	[*xxx*|240] [,MONITOR={CPM|IPM|RMF}] [,STOPAFT={EOF|DATETIME}]	Specifies characteristics of the Extractor data to be read; used if running RMF data or CMF MONITOR user type records with an SMF record ID other than 240.
REPORTS See page 2-94 for more information.	REPORTS RPTGROUP=(*a*[,*b*[,*c*[,*d*]]]) [,DDGROUP=*e* [,SYSOUT=*class*]]	Specifies how reports are to be grouped, whether separate DD’s are to be used, and what default SYSOUT Class to use.

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Table 2-1 Analyzer General Control Statements (Part 2 of 2)

Analyzer Command	Parameter List	Function
SEVERITY See page 2-99 for more information.	nnn	Specifies an error limit for processing.
SHIFT See page 2-102 for more information.	[DINTV=(*starttime*,*intervals*,*duration*)] [(*startshift*,*endshift*)1 [,...,(*startshift*,*endshift*)96]| (080000,160000),(160000,240000), (000000,080000)] [,TYPE={GLOBAL|LOCAL}] [,DAYS={ALL|(MON|TUE|WED|THU|FRI|SAT|SUN)}] [,RPTS={SEPARATE|COMBINED|INTERVAL|DAILY}] [,UNIT=*unittype*]	Specifies date and time range intervals by time of day and day of week, within the limitations set by the DATETIME, CYCLE, or PERIOD statements. Up to 96 intervals may be specified on the DINTV parameter, or a maximum of 96 startshift,endshift pairs is allowed.
SUBTITLE See page 2-111 for more information.	'text'	Defines an additional headline.
SYSPLEX See page 2-112 for more information.	[RPTS={COMBINED|SEPARATE}] [,SUBPLEX=(*|sysname*1*[,...,sysname*n*])}] [,TYPE={SYSID|SYSNAME}] [,INPUT={(dd*1*[,...,dd*n*])}]	Provides a way to define the data set that is used in generating Analyzer reports.

Report Control Statements

This section discusses the report control statements supported by the Analyzer. When a report control statement is used, the corresponding CMF MONITOR report is printed.

Table 2-2 summarizes the report control statements and parameters, and shows the corresponding report titles and associated Extractor control statements.

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All statements follow the syntax rules in “Conventions Used in This Book” on page -xx.

Table 2-2 Analyzer Report Control Statements (Part 1 of 4)

Analyzer Command	Report Title	Extractor Command
AUXSTOR See page 2-8 for more information.	Auxiliary Storage Report (see page 3-6)	ASMDATA (see page 1-6) PAGING (see page 1-52)
CACHE See page 2-9 for more information.	Cache Subsystem Counts Report, with TYPE=COUNT defined (see page 3-11) Cache Subsystem Detail Report (see page 3-14) Cache Subsystem Percent Report, with TYPE=PERCENT defined (see page 3-25) Cache Subsystem Summary Report (see page 3-28) Cache Subsystem Transfer Report, with TYPE=TRANSFER defined (see page 3-29)	CACHE (see page 1-8)
CACHEACT See page 2-14 for more information.	Cache Subsystems Overview Report (see page 3-32) with REPORT=OVERVIEW defined. Cache Subsystem Activity Report (see page 3-35) with REPORT=SUBSYS defined. Cache Device Activity Report (see page 3-41) with REPORT=OVERVIEW defined.	CACHE (see page 1-8)
CFACT See page 2-17 for more information.	Coupling Facility Activity Report (see page 3-71)	CFDATA (see page 1-10)
CMFSUM See page 2-20 for more information.	CMF Summary Report (see page 3-46)	CHANNEL (see page 1-12) CPU (see page 1-14) DEVICE (see page 1-23) IOQ (see page 1-44) PAGING (see page 1-52) TSODATA (see page 1-74) VSMDATA (see page 1-79) WORKLOAD (see page 1-82)
COMBCONF See page 2-24 for more information.	Combinations of Configuration Activity Report (see page 3-65)	The Extractor REPORT control statement must have GBLS=YES defined (see page 1-58).
COMBINE See page 2-25 for more information.	Used with the COMBCONF, EXCEPTS, or GRAPH report control statement to specify logical combinations of data for several reports.	None
COMMSTOR See page 2-28 for more information.	Common Storage Usage Detail Report (see page 3-67) Common Storage Usage Summary Report (see page 3-69)	CSMON (see page 1-20)
CPU See page 2-31 for more information.	CPU Utilization Report (see page 3-85)	CPU (see page 1-14)

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Table 2-2 Analyzer Report Control Statements (Part 2 of 4)

Analyzer Command	Report Title	Extractor Command
CPUCHAN See page 2-33 for more information.	CPU and Channel Path Activity Report (see page 3-81)	CPU (see page 1-14) CHANNEL (see page 1-12)
CPUCON See page 2-34 for more information.	Processor Concurrency Report (see page 3-185)	CPU (see page 1-14)
CRYPTO See page 2-35 for more information.	Cryptographic Hardware Activity Report (see page 3-106)	CRYPTO (see page 1-18)
DASD See page 2-39 for more information.	Direct Access Report (see page 3-112)	DEVICE (see page 1-23) HEADMOVE (see page 1-37)
DEVACT See page 2-43 for more information.	Device Activity Report (see page 3-109)	DEVICE (see page 1-23)
DOMINO See page 2-46 for more information.	LOTUS DOMINO Server Summary Report (see page 3-161) LOTUS DOMINO Server Detail Report (see page 3-162) LOTUS DOMINO Database Activity Report (see page 3-165) LOTUS DOMINO User Activity Report (see page 3-167)	Records created by LOTUS DOMINO server
ENQUEUE See page 2-49 for more information.	Enqueue Conflict Report (see page 3-125)	ENQUEUE (see page 1-29)
EXCEPTS See page 2-50 for more information.	Exception Trace Detail Report (see page 3-128) Exception Subreport (see page 3-127)	TRACE76 (see page 1-71) Depends on measure or measures being reported.
GRAPH See page 2-56 for more information.	Graphics Trace Detail Report (see page 3-135) Any graph type	TRACE76 (see page 1-71) Depends on graph.
HFS See page 2-65 for more information.	HFS Statistics Report (see page 3-138)	HFS (see page 1-42)
HTTP See page 2-66 for more information.	HTTP Server Summary Report (see page 3-141) HTTP Server Detail Report (see page 3-142)	Records created by HTTP server
IOQ See page 2-67 for more information.	I/O Queuing Activity Report (see page 3-146)	IOQ (see page 1-44)
LINKPACK See page 2-70 for more information.	Link Pack Area Report (see page 3-154)	LINKMAP (see page 1-46) Also, the Extractor REPORT control statement must have GBLS=YES defined (see page 1-58).

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Table 2-2 Analyzer Report Control Statements (Part 3 of 4)

Analyzer Command	Report Title	Extractor Command
LPARCOMB See page 2-70 for more information.	CPU Utilization Report (see page 3-85)	None
MDF See page 2-72 for more information.	MDF Report (see page 3-169) Logical Partition Report (see page 3-158)	CPU (see page 1-14)
OMVS See page 2-76 for more information.	OMVS Kernel Activity Report (see page 1-50)	None
PERFORM See page 2-77 for more information.	Performance Summary Report (see page 3-175) System Workload Activity Report (see page 3-211)	None
PERFSUM See page 2-81 for more information.	Performance Summary Report (see page 3-175)	ASMDATA (see page 1-6) CHANNEL (see page 1-12) CPU (see page 1-14) DEVICE (see page 1-23) ENQUEUE (see page 1-29) EXTSUM (see page 1-31) PAGING (see page 1-52) TSODATA (see page 1-74) WORKLOAD (see page 1-82)
PGDDLAY See page 2-85 for more information.	Domain Delay Analysis Report (see page 3-122)	PGDDLAY (see page 1-54)
PROTKEY See page 2-88 for more information.	CPU Utilization by Protect Key Report (see page 3-100)	CPU (see page 1-14)
PRSM See page 2-89 for more information.	Logical Partition Report (see page 3-158) MDF Report (see page 3-169)	CPU (see page 1-14)
SHARDEV See page 2-100 for more information.	Shared Device Activity Report (see page 3-191)	DEVICE (see page 1-23)
SRM See page 2-109 for more information.	System Resources Manager Report (see page 3-201)	CPU (see page 1-14) PAGING (see page 1-52)
STORAGE See page 2-110 for more information.	Storage Management Report (see page 3-195)	PAGING (see page 1-52)
TRACE See page 2-114 for more information.	Trace Report (see page 3-217)	TRACE (see page 1-65)
TSOPERF See page 2-116 for more information.	TSO Command Summary Report (see page 3-220) TSO Interval Summary Report (see page 3-222)	CPU (see page 1-14) TSODATA (see page 1-74)

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Table 2-2 Analyzer Report Control Statements (Part 4 of 4)

Analyzer Command	Report Title	Extractor Command
TSOUSER See page 2-118 for more information.	TSO User Summary Report (see page 3-223)	TSODATA with USERS=YES defined (see page 1-74)
VIRTSTOR See page 2-119 for more information.	Virtual Storage Activity Report (see page 3-226)	VSMDATA (see page 1-79)
VOLSER See page 2-121 for more information. Requires DASD report control statement.	Direct Access Report Plot of Volume (see page 3-114)	None
WKLDCHAR See page 2-122 for more information.	Workload Characterization Report (see page 3-235)	CPU (see page 1-14) DEVICE (see page 1-23) MACSCHAR (see page 1-48) WORKLOAD (see page 1-82)
WLMGL See page 2-124 for more information.	Workload Manager Goal Mode Reports (see page 3-240)	WORKLOAD (see page 1-82)
WORKLOAD See page 2-126 for more information.	System Workload Activity Report (see page 3-211)	WORKLOAD (see page 1-82)
XCF See page 2-129 for more information.	Cross-System Coupling Facility Report (see page 3-102)	XCFDATA (see page 1-84)

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AUXSTOR

AUXSTOR

Overview

The AUXSTOR control statement requests the Auxiliary Storage Report discussed in “Auxiliary Storage Report” on page 3-6.

The AUXSTOR statement uses data collected by the ASMDATA Extractor control statement (see “ASMDATA” on page 1-6) and the PAGING Extractor control statement (see “PAGING” on page 1-52).

Parameters

This statement has no parameters.

Example

```
AUXSTOR
```

The Auxiliary Storage Report is produced.

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CACHE

CACHE
*(name[,format][,symbol][,length])*1,
*...,(name[,format][,symbol][,length])*32
[,TYPE={GLOBAL|LOCAL}]
[,TYPE={SUMMARY|DETAIL|PERCENT|COUNT|TRANSFER|ALL}]
[,MODEL={ALL|(3880-13,3880-23,2105-20, 3990-03,3990-06,7880-3C)}]
[,ORDER={DEVICE|SUBSYS}]

Overview

While the CACHE Analyzer control statement continues to function, BMC Software recommends that you use the CACHEACT Analyzer control statement, since CACHE will not be supported in future CMF MONITOR releases. See “CACHEACT” on page 2-14.

The CACHE Analyzer control statement generates various Cache Subsystem Reports using the CMF type 240-27 data record collected by the CACHE Extractor control statement (see “CACHE” on page 1-8). The following reports can be produced using this statement:

Cache Subsystem Summary Report
Contains overall summary information for each type of controller. The data varies depending on the type of cache controller being measured. Subsystems are grouped by the type of cache controller. New headers are generated for each type of cache controller.

Cache Subsystem Detail Report
Contains information about the devices attached to the caching subsystem. You can customize it by defining specific report fields using the (name,[format,symbol,length]) parameter.

Cache Subsystem Percent Report
Contains a summary of subsystem information shown in measurement percentages and ratios.

Cache Subsystem Counts Report
Contains a summary of subsystem information shown in measurement counts.

Cache Subsystem Transfer Report
Contains a summary of subsystem information and subsystem data transfer and staging information.

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Note: In this report the information about transfers varies depending on the type of cache controller being measured.

Parameters

Parameters for this statement are

(name,[format,symbol,length])

This parameter allows you to select the device data fields to be included in the Cache Subsystem Detail Report and the format of that data. For the histogram format, you can define the symbol and length as well. Up to 32 (name,format[,symbol,length]) parameters can be defined.

name Defines a field to the Cache Subsystem Detail Report. Acceptable values are listed in Table 3-9 on page 3-20. Up to 32 field names may be specified. If only the field name is specified, the defaults are assumed and no parentheses are required. Otherwise, each parameter must be enclosed in its own pair of parentheses, and the *name* value must be separated from the *format* value by a comma.

format Defines one of three formats as the display type for the data field. Certain data fields are not displayed in a histogram format.

If the *format* value is not defined, the report data is displayed as percentages, which is the default.

This format can be defined as one of the following types:

COUNT (C) Causes the data to appear as a numeric value.

PERCENT (P) Causes the data to appear as a percentage value. This type is the default.

HISTOGRM (H) Causes the report data to appear in a histogram. All contiguous HISTOGRM requests are displayed in one histogram.

The default histogram symbol associated with each field is shown in Table 3-9 on page 3-20. You can override a default histogram symbol and define the length of a histogram while you are defining the field name and HISTOGRM format. The values for the symbol and length are defined as follows:

symbol Is the symbol character to be used instead of the default. If no symbol is specified, the default is used. If there is no default symbol character for a field, this value is ignored. All alphabetic, numeric, and special characters are supported. Only one symbol for each field is supported. The *symbol* value is ignored for PERCENT and COUNT displays.

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length Is the length of the histogram. If this value is not specified, the length of the histogram is calculated based on its share of the display area. The *length* value is ignored for PERCENT and COUNT displays.

The minimum length is 21. The maximum length is 117. The default is 21 for the first histogram measure. For each measure after the first, 10 is added to the default length.

In a continuous set of histogram requests, the length value for the first request sets the length value for all succeeding requests to be included in this histogram.

TYPE= The TYPE parameter has two functions.

The first function specifies either a global set of report characteristics and default field names for all succeeding Cache Subsystem Detail Reports, or a change in report characteristics for a single report.

GLOBAL Defines report characteristics and default field names for all succeeding Cache Subsystem Detail Reports. If TYPE=GLOBAL is defined multiple times, new characteristics are established with each succeeding TYPE=GLOBAL parameter. Parameters for all other Cache Subsystem reports are ignored, except where TYPE=LOCAL is defined to a specific CACHE statement.

LOCAL Defines the characteristics for the Cache Subsystem report that immediately precedes it. A TYPE=LOCAL parameter overrides any TYPE=GLOBAL parameter, but only for that one report.

TYPE= The second function specifies the type of report generated. Any combination of reports can be defined, up to a maximum of five names. The allowable values are

SUMMARY Generates the Cache Subsystem Summary Report. Values are shown as general performance percentages at the subsystem or controller level. This is one of the default values for the TYPE parameter.

DETAIL Generates the Cache Subsystem Detail Report. Values are specific measures that can be displayed as percentages, counts, or histogram. If no specific measures are defined, default values are used. This value is one of the default values for the TYPE parameter.

COUNT Generates the Cache Subsystem Counts Report. Values are specific performance measures shown as counts at the subsystem or controller level.

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PERCENT Generates the Cache Subsystem Percent Report. Values are specific performance measures shown as percents at the subsystem or controller level.

TRANSFER Generates the Cache Subsystem Transfer Report. Data includes specific storage values and transfer measurements at the subsystem or controller level.

ALL Produces all five reports.

MODEL= Allows you to limit the report to specific cache controller model data. Only data about the model or models specified is reported. If MODEL is not specified, all models are reported because MODEL=ALL is the default. Valid values are

2105-20
3880-13
3880-23
3990-03
3990-06
7880-3C
ALL (default)

Table 2-3 shows the default device data fields for each model type. Defining ALL has the same effect as defining all of the fields.

Table 2-3 Default Device Data Fields for Each Model Type

Model	Default Device Data Fields
3880-13	DEVTYP, STATUS, (IORATE,COUNT), (IORATE,PERCENT), (READHIT,COUNT), (READHIT,PERCENT), (WRITEHIT,COUNT), (WRITEHIT,PERCENT), (READHIT,HISTOGRM), (WRITEHIT,HISTOGRAM)
3880-23 or 7880-3C	DEVTYP, STATUS, (IORATE,COUNT), (IORATE,PERCENT), (NREADHIT,COUNT), (NREADHIT,PERCENT), (SREADHIT,COUNT), (SREADHIT,PERCENT), (READMS,PERCENT), (WRITE,PERCENT), (READHIT,HISTOGRM)
3990-03 or 3990-06	DEVTYP, STATUS, (IORATE,COUNT), (IORATE,PERCENT), (READHIT,COUNT), (READHIT,PERCENT), (READMS,COUNT), (READMS,PERCENT), (WRITEHIT,COUNT), (WRITEHIT,PERCENT), (WRITEMS,COUNT), (WRITEMS,PERCENT)

ORDER= Applies only if the Cache Subsystem Detail Report is to be generated. This parameter allows you to select how the device data is ordered in the Cache Subsystem Detail Report. Allowable values are

DEVICE Presents the report data based on device unit address, regardless of the subsystem or controller. Default fields for ORDER=DEVICE are determined by the types of cache devices defined at the MODEL parameter and other specifications on the CACHE Analyzer statement. Any (name,[format,symbol,length]) overrides the default hierarchy. The default hierarchy is

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3990-03 default
3880-23 / 7880-3C default
3880-13 default

SUBSYS Presents the report data by subsystem or controller. Default fields for ORDER=SUBSYS are determined by the value set for the cache controller type. Devices for each subsystem or controller are reported on separate pages, so the value set matches the controller type. This value is the default.

Examples

```
CACHE
```

Produces the Cache Subsystem Summary and Cache Subsystem Detail Reports with data about all models included in the data ordered by subsystem.

```
CACHE  3990-03,TYPE=ALL
```

Generates all Cache reports using the default detail fields for a model 3990-03.

```
CACHE  TYPE=TRANSFER
```

Produces the Cache Subsystem Transfer Report.

```
CACHE  TYPE=(TRANSFER,PERCENT)
```

Produces the Cache Subsystem Transfer Report and the Cache Subsystem Percent Report.

```
CACHE
(READ,HISTOGRM),(NREAD,HISTOGRM),(NREADHIT,HISTOGRM),
       (SREAD,HISTOGRM),(SREADHIT,HISTOGRM),
       TYPE=GLOBAL
CACHE  MODEL=3990-03,ORDER=DEVICE
CACHE  MODEL=3880-13,ORDER=DEVICE
CACHE  MODEL=3880-23,ORDER=DEVICE
CACHE  MODEL=7880-3C,ORDER=DEVICE
```

Generates a device ordered Cache Subsystem Detail Report for each type of cache device, with the fields specified in the global CACHE control statement.

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CACHEACT

```
CACHEACT
[REPORT={OVERVIEW|SUBSYS|DEVICE}]
[,MODEL={ALL|3990-03|3990-06|2105-20}]
[,ORDER={TOTAL|DASD|CACHE|ASYNC }]
[,SUBSYS=(nnnn,aaaa:bbbb,.....,dddd:eeee)16]
[,DEVICE=(nnnn,aaaa:bbbb,.....,dddd:eeee)16]
[,EXCLUDE=(nnnn,aaaa:bbbb,.....,dddd:eeee)16]
[,THRESHLD=nnnnnnnnn]
```

Overview

The CACHEACT control statement causes the Analyzer to generate various reports using the SMF type 74-5 records that are generated by the CACHE Extractor control statement (see “CACHE” on page 1-8). The following reports can be produced:

Cache Subsystem Overview Report
Contains a line of summary data for each cache subsystem, and a single page showing the DASD device activity. The last report page lists the most active DASD devices, by total and DASD I/O rates and can have a variable number of lines, since filtering options and lack of device activity affect this section of the report. This is the default report.

Cache Subsystem Activity Report
Contains detail data about every cache subsystem. For each subsystem, the report shows one page of detail information for the subsystem, plus one or more pages of summary data for every DASD device attached to that subsystem. These pages consist of one line per device, plus additional lines for RAID rank activity.

Cache Device Activity Report
Contains detail data about every cache subsystem and detail data about every logical DASD device attached to a subsystem. For each cache subsystem, this report generates one page of detail subsystem information, and one or more pages of detail device information, one device per page.

Note: This report can be quite voluminous, so BMC Software suggests you only request it for specific devices or ranges, or when troubleshooting cache subsystem problems.

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Parameters

Parameters for this statement are

REPORT= Specifies the type of report to generate, as follows:

- **OVERVIEW** Produces the default Cache Subsystems Overview Report (see page 3-32)
- **SUBSYS** Produces the Cache Subsystem Activity Report (see page 3-35)
- **DEVICE** Produces the Cache Device Activity Report (see page 3-41)

MODEL= Generates a report on particular cache subsystems by model ID

- **ALL** All models are reported. This value is the default.
- **3990-03** Only model 3990-03 subsystems are reported
- **3990-06** Only model 3990-06 subsystems are reported
- **2105-20** Only model 2105-20 subsystems are reported

ORDER= Specifies the manner in which subsystems and devices in a report are ordered

- **TOTAL** Report is ordered by total I/O rates
- **DASD** Report is ordered by DASD I/O rates
- **CACHE** Report is ordered by Cache Hit rates
- **ASYNC** Report is ordered by Async I/O rates

SUBSYS= Generates a report on particular cache subsystems or ranges of subsystems by specifying a list of subsystem IDs or ranges of subsystem IDs. Any item in the list can be either a single subsystem ID (nnnn), or a range of subsystem IDs (aaaa:bbbb). They can appear in any combination and order, up to a maximum of 16. This parameter overrides any DEVICE or EXCLUDE filter, so devices that are specified by those keywords are ignored unless attached to the selected subsystem.

DEVICE= Generates a report on particular cache DASD devices or ranges of DASD devices by specifying a list of device numbers or range of device numbers. Any item in the list can be either a device number (nnnn), or a range of device numbers (aaaa:bbbb). They can appear in any combination and order, up to a maximum of 16. This parameter is ignored when REPORT=OVERVIEW is specified or the default.

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EXCLUDE= Excludes particular cache DASD devices or ranges of DASD devices from all reports by specifying a list of device numbers or range of device numbers. Any list item may be either a device number (nnnn) or a range of device numbers (aaaa:bbbb). They can appear in any combination and order, up to a maximum of 16. If a device is specified in both the DEVICE= and EXCLUDE= lists, the former takes precedence. This parameter is ignored when REPORT=OVERVIEW is specified or the default.

THRESHLD= Limits a report so that only those subsystems or devices meeting or exceeding the threshold value are included. The value is assumed to be the total I/O rate unless ORDER=DASD|CACHE|ASYNC is specified, in which case the threshold value is of the same type (DASD I/O rate, cache hit percentage, or async I/O rate) as the order. Specify as an integer value, 0 to (2GB - 1). This parameter is ignored when REPORT=OVERVIEW is specified or the default.

Examples

```
CACHEACT
```

The Cache Subsystems Overview Report is produced.

```
CACHEACT   MODEL=2105-20,REPORT=SUBSYS
```

The Cache Subsystem Activity Report is produced for 2105 cache subsystems.

```
CACHEACT    REPORT=DEVICE,
            DEVICE=(AC00:AC1F,C108),ORDER=DASD
```

The Cache Device Activity Report is produced for devices AC00 to AC1F, and device C108, for a total of 33 devices. The report is ordered in descending DASD I/O rate sequence.

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CFACT

CFACT

Overview

The CFACT control statement requests the Coupling Facility Activity Report. To collect synchronous data from all systems to which the coupling facility is connected, BMC Software recommends using the SYNCH=SMF parameter of the Extractor REPORT control statement.

Note: You must also specify the SYSPLEX control statement with RPTS=COMBINED to produce the Coupling Facility Activity Report.

Parameters

This statement has no parameters.

Example

```
SYSPLEX SUBPLEX=*,TYPE=SYSID,RPTS=COMBINED
CFACT
```

One Coupling Facility Activity Report is produced for each coupling facility.

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CMFREC

CMFREC

Overview

The CMFREC control statement provides additional processing for CMF MONITOR SMF data. This control statement directs the Analyzer to identify the CMF MONITOR records saved to SMF, process them, and write only the CMF MONITOR records accepted for analysis to a data set defined by a //CMXREC DD statement (see *CMF MONITOR Batch User Guide*, Chapter 4, “Producing and Using Reports”, the section titled, “Defining Analyzer JCL Manually”).

The CMFREC control statement is useful when processing a large amount of data. By removing extraneous data and saving only the processed CMF MONITOR records in a separate data set, subsequent runs against these records can be made without incurring additional overhead required to process those records not used by the Analyzer or excluded because of date, time, or system ID.

The CMFREC Analyzer statement is a general control statement, and can process data from all Extractor control statements.

- The CMFREC control statement is ignored if there is no //CMXREC DD statement defined in the Analyzer JCL.
- No report is generated by this control statement.

Parameters

This statement has no parameters.

Example

```
CMFREC
```

Only CMF MONITOR records are written to the data set defined on the //CMXREC DD statement.

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CMFSTAT

CMFSTAT

Overview

The CMFSTAT control statement requests the CMF Records Statistics Report (see “CMF Record Statistics Report” on page 3-44), which is a summary of date, time, and duration for all record types accepted for analysis.

This report includes information about all record types contained in the input data set.

Parameters

This statement has no parameters.

Example

```
CMFSTAT
```

The CMF Record Statistics Report is produced.

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CMFSUM

CMFSUM
[INTERVAL={*hh*:*mm*:*ss*|Extractor interval|HOURLY|DAILY|
WEEKLY|MONTHLY|QTRLY|SEMIANNL|FOREVER}]
[,MEASURE={ALL|RMF|(*xxxxxxxx*,...,*xxxxxxxx*)}]

Overview

The CMFSUM Analyzer control statement requests the CMF Summary Report discussed in “CMF Summary Report” on page 3-46.

The CMFSUM statement uses data collected by the following Extractor control statements:

- CHANNEL (see “CHANNEL” on page 1-12)
- CPU (see “CPU” on page 1-14)
- DEVICE (see “DEVICE” on page 1-23)
- IOQ (see “IOQ” on page 1-44)
- PAGING (see “PAGING” on page 1-52)
- TSODATA (see “TSODATA” on page 1-74)
- VSMDATA (see “VSMDATA” on page 1-79)
- WORKLOAD (see “WORKLOAD” on page 1-82)

Parameters

Parameters for the CMFSUM control statement are

INTERVAL= Specifies the time divisions on the graph. If no INTERVAL parameter is defined, the default used is the value defined to the INTERVAL parameter of the Extractor REPORT control statement (see “REPORT” on page 1-58). Do not define INTERVAL with a value greater than 24 hours; the interval will not be reported. The INTERVAL parameter may be specified with the following values:
hh:mm:ss

where:
hh: Is the hour
mm: Is the minutes
ss: Is the seconds

HOURLY Each line of the graph represents one hour.

DAILY Each line of the graph represents one 24-hour period.

WEEKLY Each line of the graph represents one 168-hour period.

MONTHLY Each line of the graph represents one month.

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QTRLY Each line of the graph represents a calendar year quarter.

SEMIANNL Each line of the graph represents a half year.

FOREVER Summarize all input into one output line.

Note: If you define INTERVAL with the values WEEKLY, MONTHLY, QTRLY, SEMIANNL, or FOREVER, and you have MEASURE=INTERVAL defined, the CMF Summary Report does not report information in the INTERVAL HH:MM:SS field.

MEASURE= Defines measures that are included in the report. The following values can be defined with this parameter:

ALL Data on all measures are included in the report.

RMF Data on the same measures that appear in the RMF Summary Report are included in the report.

nnnnnnnn Name of a specific measure. Data on each defined measure is included in the report. You can define as many measures as you want. Measures must be separated by commas, and all of them enclosed within parentheses.
Specific names for each measure that can be defined to the MEASURE parameter, and the corresponding report field name are shown in Table 2-4.

Note: If MEASURE=ALL is specified, or if more measures are specified than can be printed in one report, multiple reports are generated until all values have been reported upon.

Table 2-4 Valid Measure Names and Corresponding Report Fields for MEASURE (Part 1 of 2)

Measure Name	Report Field Name
AFQUEUE	AVERAGE AVAILABLE FRAMES QUEUE
APPCAVG	APPC AVERAGE
APPCMAX	APPC MAXIMUM
AVGREADY	AVERAGE READY QUEUE
BATCHAVG	BATCH AVERAGE
BATCHMAX	BATCH MAXIMUM
CAPRATIO	AVERAGE CAPTURE RATIO
CHPUTIL	CHANNEL PATH UTILIZATION RATE
CHPBUSY	CHANNEL PATH BUSY
CPUBUSY	CPU BUSY
CPUBZMVS	MVS CPU BUSY

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Table 2-4 Valid Measure Names and Corresponding Report Fields for MEASURE (Part 2 of 2)

Measure Name	Report Field Name
CPUSERV	CPU SERVICE RATE
CSALLOC	AVERAGE CSA ALLOCATED
DASDRATE	DASD RATE
DASDRESP	DASD RESPONSE TIME
DPAGING	DEMAND PAGING
ECSALLOC	AVERAGE ECSA ALLOCATED
EPGRATE	EXPANDED STORAGE PAGE RATE
ESFRAME	EXPANDED STORAGE FRAMES
ESQALLOC	AVERAGE ESQA ALLOCATED
EXCPRATE	AVERAGE EXCPs RATE
FIXFRAME	AVERAGE FIXED FRAMES
HIGHUIC	HIGH UNREFERENCED INTERVAL COUNT
HSFRAME	AVERAGE HIPERSPACE FRAMES
INTERVAL	INTERVAL HH.MM.SS
IOSERV	I/O SERVICE RATE
LPARDISP	LPAR DISPATCH PERCENTAGE
MIGRAGE	MIGRATION AGE
MIGRATE	MIGRATION RATE
MSOSERV	MSO SERVICE RATE
OMVSAVG	OMVS AVERAGE
OMVSMAX	OMVS MAXIMUM
SPOOLUTL	SPOOL UTILIZATION
SQALLOC	AVERAGE SQA ALLOCATED
SRVRATE	SERVICE RATE
STCAVG	STC AVERAGE
STCMAX	STC MAXIMUM
SWAPPAGS	SWAP PAGE RATE
SWAPRATE	SWAP RATE
TAPERATE	TAPE RATE
TRANRATE	TRANSACTION RATE
TSOAVG	TSO AVERAGE
TSOMAX	TSO MAXIMUM
TSOTRANS	TSO TRANSACTION RATE
VIOFRAME	AVERAGE VIO FRAMES

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Examples

```
CMFSUM
```

A CMF Summary Report is produced where each row on the graph is based on the period defined by the INTERVAL= valued defined to the Extractor REPORT control statement (see “REPORT” on page 1-58 for more information). The measures reported are identical to those reported in RMF Summary Report.

```
CMFSUM  INTERVAL=HOURLY,MEASURE=RMF
```

A CMF Summary Report is produced where each row on the graph is for a one-hour period, and the measures reported are the same as those in the RMF Summary Report.

```
CMFSUM  INTERVAL=00:30:00,MEASURE=(MIGRATE,MIGRAGE)
```

A CMF Summary Report is produced where each row on the graph is for a half-hour period, and the measures reported are the MIGRATE and MIGRAGE values.

```
CMFSUM  INTERVAL=DAILY
```

A CMF Summary Report is produced where each row on the graph is for a 24-hour period, and the measures reported are the same as those in the RMF Summary Report.

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COMBCONF

COMBCONF [MEASURE=(CMB-*nn*1,...,CMB-*nn*40)]

Overview

The COMBCONF control statement requests the Combinations of Configuration Activity Report discussed in “Combinations of Configuration Activity Report” on page 3-65.

The COMBCONF statement requires that GBLS=YES be defined on the REPORT Extractor control statement (see “REPORT” on page 1-58).

Parameters

The parameter for the COMBCONF control statement is

MEASURE= Specifies the various combinations that appear on the report. Up to 40 combinations can be used. Each combination is defined as CMB-*nn*, where *nn* is a one- or two-character COMBINE statement identifier. The values specified must match the identifier used in the label field of the COMBINE control statement. If MEASURE is not used, standard defaults are used. Refer to Figure 2-1 on page 2-27 for more information about defaults.

Example

```
COMBCONF   MEASURE=CMB-21
```

Requests the Combinations of Activity report for the logical combination defined on a previous COMBINE statement with a label of 21.

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COMBINE

cc COMBINE
[(*combinations*)]
[,DESC='*description*']

Overview

The COMBINE control statement specifies logical combinations of data to be reported in the Combinations of Configuration Activity Report, the Exception Subreport, and the Kiviat, plot, profile, pie, tabular, and distribution graphs. Use COMBINE with “PRSM” on page 2-89, “EXCEPTS” on page 2-50, and “GRAPH” on page 2-56.

Any combination of CPUs and channel paths, both busy and not busy, can be specified.

Parameters

Combinations for the COMBINE control statement and their command expressions are

cc
Specifies a unique one- or two-character numeric label between 0 and 40 that identifies the combination. This label must begin in column one, and must be followed by one or more blanks. This label is required whenever combinations are specified. If no combinations are specified, a default set of combinations and labels is used.

The COMBINE statement is the only CMF MONITOR control statement that uses the label field. The identifier in this field is used in the COMBCONF, EXCEPTS, and GRAPH control statements to reference the selected logical combination.

combinations
Specifies a series of up to 200 elements in a combination expression connected by the following logical operators:

Expression	Means
*	and
<AND>	and
+	or
<OR>	or

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One additional level of parentheses can be specified within the initial parentheses required for the combinations expression. Combinations and expressions are listed in Table 2-5.

Table 2-5 Combinations and Expressions for COMBINE Control Statement

Combination	Busy	Not Busy
CPU	CPU	NCPU (or WAIT)
A specific channel path	CH*ii*	NCH*ii*
Any channel path	ANYCHS	NOCHS
Note: The *ii* expression is a hexadecimal number from 0 to FF.		

Defining a Specific CPU ID with a Combination Expression

The CPU ID for a multiprocessor system can be specified by attaching a /*xx* parameter to any of the combinations above. For example, defining NCPU/02 as a combination value specifies the CPU not busy time on CPU 02. The default for /*xx* is ALL.

DESC= Describes the combination. The description can be up to 100 characters long. It is printed on each report that references the combination. The default is blanks.

Syntax Rules for the COMBINE Statement

Specific syntax rules for the COMBINE statement are as follows:

- The COMBINE statement can be continued if all the following syntax conditions are met:
  - Column 71 of the continuation contains a logical operator or the last character of a combination expression.
  - The continued statement begins in column 3 or higher.
  - The first non-blank character of the continued statement is a logical operator or the first character of a combination expression.
- Using a COMBINE statement with no label or combinations specified is the same as using all of the COMBINE statements shown in Figure 2-1 on page 2-27.
- If the COMBINE defaults are specified and another COMBINE statement is used with a label that matches a default label, only that statement within the default group is overridden.

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Figure 2-1 COMBINE Statement Defaults

```
01   COMBINE  (ANYCHS/00),DESC='ANY CHANNELS BUSY ON CPU0'
02   COMBINE  (ANYCHS/02),DESC='ANY CHANNELS BUSY ON CPU2'
03   COMBINE  (WAIT/00*ANYCHS),DESC='CPU/0 WAIT AND ANY CHANNELS BUSY ON CPU/O'
04   COMBINE  (CPU/00*ANYCHS),DESC='CPU/0 BUSY AND ANY CHANNELS BUSY ON CPU/0'
05   COMBINE  (WAIT/02*ANYCHS/02),
     DESC='CPU/2 WAIT AND ANY CHANNELS BUSY ON CPU/2'
06   COMBINE  (CPU/02*ANYCHS/02),
     DESC='CPU/2 BUSY AND ANY CHANNELS BUSY ON CPU/2'
07   COMBINE  (WAIT/00),DESC='CPU/0 WAIT'
08   COMBINE  (WAIT/02),DESC='CPU/2 WAIT'
09   COMBINE  (WAIT/00*NOCHS),DESC=CPU/0 WAIT AND NO CHANNELS BUSY ON CPU/0'
10   COMBINE  (WAIT/02*NOCHS/02),DESC='CPU/2 WAIT AND NO CHANNELS BUSY ON CPU/2'
11   COMBINE  (CPU/00*NOCHS),DESC='CPU/0 BUSY AND NO CHANNELS BUSY ON CPU/0'
12   COMBINE  (CPU/02*NOCHS/02),DESC='CPU/2 BUSY AND NO CHANNELS BUSY ON CPU/2
13   COMBINE  (CPU/00*CPU/02),DESC='CPU/0 BUSY AND CPU/2 BUSY'
```

Example

```
03 COMBINE (CPU/00*CH00*CH02/02)
```

Shows a percentage of time during the interval on the requested report or graph where CPU 0 (CPU/00) was busy, channel path 0 was busy on all CPUs (CH00), and channel path 2 was busy on CPU 2 (CH02/02). Using the *and* operand (*) in this example means the reported time percentage is when all of the resources were busy concurrently.

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COMMSTOR

```
COMMSTOR
[REPORT={SUMMARY|DETAIL}]
[,SELECT=(name1,...,name32)]
[,SORT=([CSA<,AVG|MAX|MIN],|
      [CSA>,AVG|MAX|MIN],|
      [CSA,AVG|MAX|MIN],|
      [SQA<,AVG|MAX|MIN],|
      [SQA>,AVG|MAX|MIN],|
      [SQA,AVG|MAX|MIN])]
[,LIMIT=nnnn]
[TBLSIZE={20,000|nnnnnn}]
```

Overview

The COMMSTOR control statement requests either the “Common Storage Usage Summary Report” on page 3-70 or the “Common Storage Usage Detail Report” on page 3-67. If a summary report is requested, the average data values are printed. If a detail report is requested, the average, maximum, and minimum data values, and the date and time stamps of these data values are printed.

The COMMSTOR statement uses data collected by the CSMON Extractor control statement (see “CSMON” on page 1-20).

Parameters

Parameters for the COMMSTOR control statement are

REPORT= Optionally selects either a summary report (default) that reports only the average CSA and SQA usage by jobname, or a detail report that reports on the average, maximum, and minimum CSA and SQA usage by jobname.

SELECT= Optionally selects from 1 to 32 specific jobnames or selection masks. Data for all other jobs is ignored. If SELECT is not specified, ***all*** jobnames are selected. The following wildcard characters can be used to define groups of jobnames:

+	Any character
*	Any combination of characters

Note: Use the * wildcard character only at the end of a string. The + wildcard character can be used in any position within the string.

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For example, the parameter SELECT=(+MF) would select only those jobnames that are three-characters long and where the first character is any character, but the second and third characters are MF. Whereas, the parameter SELECT=(+MF*) would select those jobnames that are from three- to eight-characters long and where the first character is any character, the second and third characters are MF, and the remaining characters are in any number and combination.

SORT= Optionally selects the sort sequence for the report. The first entry defines what data area is to be the sort sequence.

If SORT is not specified, the sort is by jobname.

CSA<	CSA below 16M line
CSA>	CSA above 16M line
CSA	All CSA
SQA<	SQA below 16M line
SQA>	SQA above 16M line
SQA	All SQA

The second SORT entry defines whether to use the average, maximum, or the minimum value as the sort sequence for the DETAIL report. These values define

MIN	Minimum value; sort sequence ascending
MAX	Maximum value; sort sequence descending
AVG	Average value; sort sequence descending

LIMIT= Specifies that only the first *nnnn* jobname entries are displayed in the report. Jobnames are selected by alphabetical order.

TBLSIZE= Specifies how much storage is allocated for an internal table used by the COMMSTOR report modules. The table is used to store jobnames and address space IDs (ASIDs) as 10-byte entries for each recording interval. The default size of the table is 20,000 bytes, which can store up to 2,000 jobnames and ASIDs.

Note: This parameter should be used only if error message CMF07385 is issued.

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Examples

```
COMMSTOR
REPORT=DETAIL,SELECT=(ADMPRINT,ALT1),SORT=(CSA,AVG)
```

A detail Common Storage Usage Report is produced containing CSA usage data for the jobs ADMPRINT and ALT1 only. The data is sorted by all CSA, regardless of whether it is above or below the 16M line, and the values are sorted by average in descending order.

```
COMMSTOR  REPORT=DETAIL,LIMIT=5
```

A detail Common Storage Usage Report is produced containing CSA usage data for the first five jobs, based on jobname by alphabetical order.

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CPU

```
CPU
[MSUDIST=YES|NO]
[MSUDTAIL=4HOURMSU|INTVLMSU|INTVLWLM|TIME]
[MSUDTPCT=10|nnn]
[PRSMCHNG=MANYRPTS,ONERPT
```

Overview

The CPU control statement requests the CPU Utilization Report discussed in “CPU Utilization Report” on page 3-85.

To add combinations in the LPAR Combination section or suppress this section altogether, see the LPARCOMB control statement discussed in “LPARCOMB” on page 2-70.

The CPU Analyzer statement uses data collected by the CPU Extractor control statement (see “CPU” on page 1-14).

Parameters

The parameters for the CPU control statement are

MSUDIST= Specifies whether the Rolling 4-Hour MSU Usage Distribution section is produced. The default is YES.

MSUDTAIL= Specifies that the MSU Usage Detail section and the sorting order of the recording intervals are produced.

4HOURMSU The recording intervals are sorted in decreasing 4-hour MSU/hour (MSU/hour consumed in the four-hour period up to the end of the recording interval).

INTVLMSU The recording intervals are sorted in decreasing interval MSU/hour (MSU/hour consumed during the recording interval).

INTVLWLM The recording intervals are sorted in decreasing % capped by WLM during the recording interval.

TIME The recording intervals are sorted in chronological order.

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MSUDTPCT= Specifies that the top nnn % of recording intervals are formatted in the MSU Usage Detail section when 4HOURMSU, INTVLMSU, or INTVLWLM is specified for the MSUDTAIL parameter. nnn is in the range 1 to 100; the default is 10. MSUDTPCT is ignored when MSUDTAIL is not specified or when MSUDTAIL=TIME is specified.

PRSMCHNG= Specifies whether one or many reports are produced if there are changes detected in PR/SM configuration.

MANYRPTS If there are changes in PR/SM configuration, multiple reports are produced, one for each configuration. Examples of PR/SM configuration attributes include number of partitions, weight (share) of any partition, number of logical processors of any partition, and number of physical processors.

ONERPT Single report is produced, ignoring all PR/SM configuration changes. This parameter is the default.

Example

```
CPU MSUDTAIL=4HOURMSU
```

Produces one CPU Utilization Report with MSU Usage Detail section containing the top 10% busiest of recording intervals sorted by 4-hour MSU/hour consumed in the four-hour period up to the end of the recording interval.

```
CPU PRSMCHNG=MANYRPTS
```

Produces multiple CPU Utilization Reports if there are changes in PR/SM configuration.

```
CPU
```

Produces one CPU Utilization Report, even if there are changes in PR/SM configuration.

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CPUCHAN

CPUCHAN
[ZERO={YES|NO}]

Overview

The CPUCHAN control statement requests the CPU and Channel Path Activity Report discussed in “CPU and Channel Path Activity Report” on page 3-81. If the Extractor data contains records from a system that has ESCON Multiple Image Facility (EMIF) support, the CPU and Channel Path Activity Report contains different fields that report on EMIF.

The CPUCHAN statement uses data collected by the following Extractor control statements:

- CPU (see “CPU” on page 1-14)
- CHANNEL (see “CHANNEL” on page 1-12)

Parameters

The parameter for the CPUCHAN control statement is

ZERO= This parameter controls whether channel paths with no activity during the reporting period are included in the report. The default is ZERO=YES, which includes all channel paths in the report, even those that were 0% busy.

When ZERO=NO is defined, reporting of channel paths with 0% busy is suppressed and does not appear on the report. All channel paths with busy activity are reported.

Examples

```
CPUCHAN
```

The CPU and Channel Path Activity Report is produced which includes all channel paths, even those with no activity during the reporting period, because ZERO=YES is the default parameter.

```
CPUCHAN   ZERO=NO
```

The CPU and Channel Path Activity Report is produced which includes only channel paths that had activity during the reporting period. Non-active channel paths are not reported because of the ZERO=NO parameter.

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CPUCON

CPUCON

Overview

The CPUCON control statement requests the “Processor Concurrency Report” on page 3-185.

The CPUCON statement uses data collected by the CPU Extractor control statement (see “CPU” on page 2-31).

Parameters

This statement has no parameters.

Example

```
CPUCON
```

The Processor Concurrency Report is produced.

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CRYPTO

CRYPTO

Overview

The CRYPTO control statement requests the “Cryptographic Hardware Activity Report” on page 3-106.

Parameters

This statement has no parameters.

Example

```
CRYPTO
```

The Cryptographic Hardware Activity Report is produced.

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CYCLE

CYCLE
{BIWEEKLY|CYCLE*nn*|CYCLE99|DAILY|HOLIDAYS|
MONTHLY|WEEKENDS|WEEKLY|WORKWKLY}
[,(*sdate*:[*stime*],*edate*:[*etime*])1...,(*sdate*:[*stime*],*edate*:[*etime*])31]

Overview

The CYCLE control statement assigns a name to a unique date-time range. The period of the CYCLE range must be a subset of the range defined by the DATETIME control statement (see “DATETIME” on page 2-40 for more information). The CYCLE control statement requires that a DATETIME control statement also be defined.

A CYCLE range can be activated as a general default range to all report requests in a job or to individual report requests. Data is included in a report for any time range specified in a CYCLE statement, if the interval time for the data falls within that time range.

The CYCLE control statement only defines the name and time slice of a CYCLE range. A PERIOD statement (see “PERIOD” on page 2-83) is used to activate a CYCLE range. It is the placement of the PERIOD statement that determines whether one or all report requests are affected by a single CYCLE range.

When the CYCLE, DATETIME, and PERIOD control statements are used in the same statement set, they must appear in the following order, or else a command error results:

- DATETIME
- CYCLE
- PERIOD

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Parameters

cycle name Is the first positional parameter in the CYCLE statement and must be specified.
The cycle name can be any of the values specified in Table 2-6.

Table 2-6 Default Values for the Cycle Name Parameter

Cycle Name	Default
BIWEEKLY	One report is generated for each two-week period defined within the cycle range.
CYCLE*nn*	One report is generated for each cycle range specified to the CYCLE*nn* value, where *nn* is a two digit number between 01 and 98.
CYCLE99	One report is generated for the entire DATETIME period. The cycle range for the CYCLE99 value defaults to the DATETIME period.
DAILY	A separate cycle is generated for each day during the general DATETIME period, up to a maximum of 31 days.
HOLIDAYS	One report is generated for each cycle range specified to the HOLIDAYS value. If this information is desired, cycle ranges must be defined that specify the start and end dates and times covering the duration of any holiday. The value HOLIDAYS is printed on the report.
MONTHLY	A separate cycle is defined for each month during the general DATETIME period.
WEEKENDS	A separate cycle is defined for each weekend (Saturday and Sunday) during the general DATETIME period.
WEEKLY	A separate cycle is defined for each week (Monday through Sunday) during the general DATETIME period.
WORKWKLY	A separate cycle is defined for each work week (Monday through Friday) during the general DATETIME period.

Note: The BIWEEKLY, HOLIDAYS, and CYCLE*nn* values require at least one cycle range be specified.

(*sdate*:[*stime*],*edate*:[*etime*])
The *s* and *e date* and *time* values define a specific cycle range to a *cycle name* value. Up to 31 cycle ranges can be defined to one CYCLE statement. The cycle range is defined using the same format as that used in the DATETIME control statement (see “DATETIME” on page 2-40).

None of the ranges defined in a single CYCLE statement can overlap with one another. All ranges must be a subset of the range specified in the DATETIME control statement.

The cycle range is optional for all values except the BIWEEKLY, HOLIDAYS, and CYCLE*nn* values.

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Examples

```
DATETIME   (03001:000000,03040:240000)
CYCLE      DAILY
PERIOD     CYCLE=DAILY
```

The reporting period is daily, within the DATETIME specified. Daily reports are generated for the 1st through the 31st days of 2003. Reports are not generated for any days past the 31st day in the range defined by the DATETIME control statement.

```
DATETIME    (01363:,03028:)
CYCLE       WEEKLY,(01364:,03006:),(03006:,03013:),
                   (03013:,03020:),(03020:,03027:)
PERIOD      CYCLE=WEEKLY
```

Data is collected weekly from day 364 of 2002 to day 6 of 2003; day 6 to day 13 of 2003; day 13 to day 20; and day 20 to day 27 (time default operates: 000000.00).

```
DATETIME   (03001:,03080:)
CYCLE      MONTHLY,(03001:,03032:)
PERIOD     CYCLE=MONTHLY
```

The collection period is the first month of 2003, using the time default of 000000.00.

Note: Collection Phase Log reports do not require cycle definition, but do require DATETIME boundaries.

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DASD

DASD

Overview

The DASD control statement requests the Direct Access Report discussed in “Direct Access Report” on page 3-112.

The DASD statement used in combination with the VOLSER control statement (see “VOLSER” on page 2-121 for more information), requests the Direct Access Plot of Volume Report discussed in “Direct Access Report Plot of Volume” on page 3-114. The VOLSER statement must immediately follow the DASD statement in the Analyzer JCL.

Note: Both reports require records written at CMF MONITOR Extractor initialization. To obtain the desired report, ensure that the input data includes records written when the extraction began. It is not necessary to include the period of these records in the DATETIME or SHIFT ranges.

The DASD statement uses data collected by the following Extractor control statements:

- DEVICE (see “DEVICE” on page 1-23)
- HEADMOVE (see “HEADMOVE” on page 1-37)

Parameters

This statement has no parameters.

Examples

```
DASD
```

Produces the Direct Access Report.

```
DASD
VOLSER MVS001,SYSPK1,PAGE01
```

Produces a Direct Access Report and a Direct Access Report Plot of Volume for DASD volumes MVS001, SYSPK1, and PAGE01.

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DATETIME

DATETIME (*sdate*:[*stime*],*edate*:[*etime*])

Overview

The DATETIME control statement defines the overall date and time range for the data you want to use in your reports. A record is selected for a report only if the date and time of the start of its recording interval falls within the specified DATETIME range. To clarify, if you define

DATETIME (980322:080000,980333:240000)

Any SMF record whose *start-of-interval* date and time falls within 8 A.M. and midnight of the specified days is used to produce records. Note that the data collection (or extraction) interval affects how reports are produced. For example, if REPORT CPM,SYNCH=59, INTERVAL=30 was specified when starting the CMF MONITOR Extractor, records will exist which have a *start-of-interval* time under a minute before 8 A.M. Thus, using the above DATETIME statement, these records will not be selected even though most of their data was gathered after 8 A.M.

A specific report time range can be smaller because there are other control statements, such as the CYCLE, SHIFT, and PERIOD statements that divide the overall DATETIME range into smaller ranges of time. When applied to a report control statement, the report is modified to include only data that falls between the defined period.

When using this statement, both a begin date-time and an end date-time must be specified.

Parameters

Parameters for the DATETIME control statement are

sdate Specifies the start date for the report data range. This parameter is required for the DATETIME statement. The : (colon) must be coded as the last character of the sdate parameter. This parameter is expressed in one of the following three formats:

Julian yyddd: or yyyyddd: where

yy The year can be represented as two digits. Two-digit years represent years in the range 1950-2049. Example: January 1, 2003 can be represented as 03001.

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yyyy The year can be represented as four digits. Example: January 1, 2003 can be represented as 2003001.

ddd The number of days into the year can be represented as three digits and can be a value from 1 to 365 (366 during leap years).

Gregorian ddmmmyy: or ddmmmyyyy: where

dd The number of the date of the month; must be represented as a value between 1 and 31 (a leading zero for values below 10 is not required).

mmm The month can be represented as three alphabetic characters. The acceptable values are

JAN	MAY	SEP
FEB	JUN	OCT
MAR	JUL	NOV
APR	AUG	DEC

yy The year can be represented as two digits. Two-digit years represent years in the range 1950-2049. Example: January 1, 2003 can be represented as 01JAN03.

yyyy The year can be represented as four digits. Example: January 1, 2003 can be represented as 01JAN2003.

Relative *{-*nnn*}: where

* Indicates today; if defined by itself without an -*nnn* value, the date specified is today. When an asterisk is used, the DATETIME card reads today's date from your system time.

[-*nnn*] Optional; indicates the number of days prior to today's date where the report data should start. For example, *-7 means the DATETIME range is today minus 7 days, or the date exactly one week ago (7 days) through today.

stime Specifies the start time for the DATETIME range start date. The start time is optionally defined based on a 24-hour clock. This parameter is expressed as hhmmss{.th} where

hh The number of hours; acceptable values are 00 to 24.
mm The number of minutes; acceptable values are 00 to 59.
ss The number of seconds; acceptable values are 00 to 59.
.th Thousandths of seconds; acceptable values are 00 to 99. This value is optionally defined. A . (period) must separate this value from the ss value, if defined.

Note: If the time is not defined, the default value midnight is used.

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edate Specifies the end date for the DATETIME range. This parameter is required and must be expressed in the same format as the sdate parameter.

etime Specifies the end time for the DATETIME range end date. The end time is optionally defined. The same format used to define the optional stime parameter is used to define this parameter.

Syntax Rules for the DATETIME Statement

Syntax rules for the DATETIME statement are as follows:

- A colon must appear at the end of every date, regardless of what format is used.
- A comma must separate the start and end dates.
- The relative format is useful for running reports on a consistent basis because the dates defining the DATETIME range need not change each time the reports run. For example, if a site requires weekly reports to be produced each Monday, *-7 as the start range date and * as the end range date could be defined once; otherwise, the Julian day or Gregorian day or month values must be changed each week to obtain the current data.
- If the CYCLE or PERIOD statement is used, a DATETIME control statement must be used (see Table 2-6 on page 2-37 and “PERIOD” on page 2-83 for further information). The order of these statements must be

1. DATETIME
2. CYCLE
3. PERIOD

Note: If these commands are entered out of this sequence, a command error results.

Examples

```
DATETIME  (03294:104000,03294:110000)
```

A record whose recording interval occurred on October 20th, 2003, any time from 10:40 A.M. until 11:00 A.M. is selected.

```
DATETIME  (03294:080000,03300:080000)
```

Specifies the date-time range from 0800 hours of day 294 (October 20th) of year 2003 to 0800 hours of day 300 (October 26th), 2003.

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DEVACT

```
DEVACT
[TYPE={ALL|DASD|TAPE|COMM|GRAPH|UNITR|CHRDR}]
[,STORGRP={*|(aa,bb,dd:ff,ccc,....,gg:hh)16}]
[,RANGE=(aa:bb,cc,....,dd:ee)16]
[,ORDER={LCU|DEVICE|STORGRP}]
```

Overview

The DEVACT control statement requests the Device Activity Report (see “Device Activity Report” on page 3-109). You can define a specific class of device for this report, or the Device Activity Report is generated for each class of device encountered in the input data.

The DEVACT statement uses data collected by the DEVICE Extractor control statement (see “DEVICE” on page 1-23).

Parameters

The parameters for the DEVACT control statement are

TYPE= Specifies the class of device for which the Device Activity report is to be produced. The default is ALL, unless the STORGRP parameter is present, in which case the default is DASD.

STORGRP= Specifies up to 16 SMS storage group names, or ranges of names, to be reported. Storage group names must be one to eight alphanumeric characters. Ranges of names are specified as two names separated by a colon (:). The first name in a range must precede the second in the standard collating sequence. Single names and multiple ranges of names may be specified, separated by commas.
STORGRP=* may be used to indicate that ALL storage groups are to be reported.

RANGE= Specifies up to 16 devices or device ranges to be reported. Device addresses must be entered as either three- or four-digit hexadecimal values. Device ranges are specified as two addresses separated by a colon (:). The first address in a range must be less than the second address. Single devices and multiple ranges may be specified, separated by commas.

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ORDER= Specifies the order in which devices are reported. If LCU is specified, devices are reported by Logical Control Unit number and device number. If DEVICE is specified, the order is strictly by device number. If STORGRP is specified, the order is storage group name and device number.

The default is LCU, unless the STORGRP parameter is present, in which case the default is STORGRP.

Usage Notes

The TYPE, STORGRP, and RANGE parameters are filters, that is, they are used to select the devices which are to be reported. The filtering is done from the least restrictive option (TYPE=) to the most restrictive (RANGE=). For example, if TYPE=TAPE,RANGE=(100:300) is specified, only tape devices whose numbers are between 100 and 300 are reported.

However, when STORGRP= is specified, any TYPE parameter is ignored and TYPE=DASD is forced.

When the STORGRP parameter is used, only those devices pertaining to the named storage groups are included in the report. If no storage group names are found in the input data, the following message is issued:

CMF07830: NO DATA AVAILABLE FOR THIS REPORT

When the RANGE parameter is used, only those devices specified are included in the report. If none of the specified device addresses are found in the input data, message CMF07830 is issued.

When both STORGRP= and RANGE= are specified, a device must meet both criteria in order to be reported. If none do, message CMF07830 is issued.

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Example

```
DEVACT TYPE=DASD
```

Produces the Device Activity Report for all DASD devices.

```
DEVACT  STORGRP=*
```

Produces the Device Activity Report for all DASD devices that are in SMS storage groups.

```
DEVACT  STORGRP=(Y:Z,BMC)
```

Produces the Device Activity Report for all DASD devices belonging to storage groups whose names are within the range Y to Z, and for the storage group named BMC. This report is ordered by storage group names.

```
DEVACT  STORGRP=(ADAMANT:ZZTOP),ORDER=DEVICE
```

Produces the Device Activity Report for all DASD devices belonging to storage groups whose names are within the range ADAMANT to ZZTOP. This report is ordered by device number, not by storage group names.

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DOMINO

DOMINO
[TYPE={SERVER|USER|DATABASE|ALL}]

Overview

The DOMINO control statement requests the LOTUS DOMINO activity reports. These reports provide information about the activities of Lotus Domino servers, users, and databases in order to analyze problem servers and to view performance data.

SMF type 108 records are used to generate the LOTUS DOMINO server report. These records are created by LOTUS DOMINO servers. CMF MONITOR does not create these records.

To produce a valid report, the SMF type 108 records must remain in the order in which they were written (SYSID, DATE, and TIME). The following sort control statement will sort the records in their original order:
`SORT FIELDS=(15,4,CH,A,11,4,BI,A,7,4,BI,A),EQUALS`

Parameters

The parameters for the DOMINO control statement are

TYPE= Specifies the type of report desired, as one of the following:

- **SERVER** The server activity report (see “LOTUS DOMINO Server Report” on page 3-161) is generated.
- **DATABASE** The database activity report (see “LOTUS DOMINO Database Activity Report” on page 3-165) is generated.
- **USER** The user activity report (see “LOTUS DOMINO User Activity Report” on page 3-167) is generated.
- **ALL** All of the above reports are generated.

Example

```
DOMINO
```

The LOTUS DOMINO Server Activity report is produced.

```
DOMINO  TYPE=USER
```

The LOTUS DOMINO User Activity report is produced.

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DMSS

DMSS {INIT|NOINIT}
[,RESERVE=*nnn*]
[,HIPERSP={*|nnn}]

Overview

The DMSS control statement is optional. It may be specified to force the use of a hiperspace, to force initialization of the DMSSMAIN data set, or to manually set the amount of storage used by the DMSS component of the Analyzer.

BMC Software recommends you omit this statement if you have also omitted the DMSSMAIN DD statement.

Parameters

Parameters for the DMSS control statement are

INIT Specifies that the DMSSMAIN work file should be initialized. The Analyzer automatically determines whether a given DMSSMAIN data set was already initialized; it initializes a data set only if it was not previously initialized. INIT should be specified if, for example, the data set was damaged by an Analyzer run that abended. This parameter is ignored when hiperspace is used.

NOINIT May be specified if the data set is old and was previously initialized by CMF MONITOR. This saves I/O activity. NOINIT is the default.

RESERVE= Specifies the amount of storage (in K) to be reserved within the address space for the Analyzer. (See *CMF MONITOR Batch User Guide*, Chapter 4, “Setting Values of Region, DMSS Reserve, and CTRLSIZE” for information about setting this value.) If this parameter is omitted, the Analyzer computes a default value based on the amount of available storage.

HIPERSP= Specifies that a hiperspace is to be used, even when a DMSSMAIN data set is present, and the number of 4K hiperspace blocks to be allocated as the initial size of the hiperspace. The number of blocks must be a numeric value between 10 and 520000. If an asterisk (*) is specified instead of a numeric value, it indicates that the Analyzer default value is to be used. This default is currently 200 blocks. Note that if the Analyzer runs out of hiperspace blocks, it attempts to extend the hiperspace by the number of blocks specified or defaulted to by this parameter.

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Example

```
DMSS INIT,RESERVE=400
```

Invokes the initialization of DMSSMAIN, reserving 400K storage for the Analyzer.

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ENQUEUE

ENQUEUE
[THRESHLD={0|*nnn*}]
[,TYPE={SUMMARY|DETAIL|ALL}]

Overview

The ENQUEUE control statement requests the Enqueue Conflict Report discussed in “Enqueue Conflict Report” on page 3-125.

The ENQUEUE Analyzer statement uses data collected by the ENQUEUE Extractor control statement (see “ENQUEUE” on page 1-29).

Parameters

Parameters for the ENQUEUE control statement are

THRESHLD= Specifies a conflict percentage that causes the major name-minor name pair to appear on the report. The THRESHLD value has two decimal places implied; for example, if THRESHLD=250 is specified, the conflict percentage would be 2.5%. The percentage represents that portion of the total conflict for which any resource was enqueued with conflict. The default is zero.

TYPE= Specifies the type of enqueue report to be produced. The default is ALL.

- **SUMMARY** Lists the major and minor names that were in contention without listing their requestors.
- **DETAIL** Lists all requestors of a major and minor name.
- **ALL** Produces a summary listing followed by a detailed listing.

Example

```
ENQUEUE THRESHLD=150,TYPE=SUMMARY
```

Produces an Enqueue Conflict report that shows major and minor name enqueue conflicts with a contention factor over 1.5%.

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EXCEPTS

EXCEPTS
[INTERVAL=*hh:mm:ss*]
[,MIN=0|*n*]
[,MAX=0|*n*]
[,ASSOC=(*measname*1,*measname*2,*measname*3)]
[,CPU={0|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|ALL}]
[,MEASURE=*measname*]
[,TRACE={YES|NO}]
[,TRCETYPE=(T1=*trace-type*,...,T4=*trace-type*)]

Overview

The EXCEPTS control statement requests the Exception Subreport discussed in “Exception Subreport” on page 3-127 and the Exception Trace Detail Report discussed in “Exception Trace Detail Report” on page 3-129. Use the COMBINE statement with the EXCEPTS statement to produce reports with various combinations of CPU and channel path data. See Figure 2-1 on page 2-27 for more information.

The EXCEPTS statement uses data collected by the TRACE76 Extractor control statement (see “TRACE76” on page 1-71).

Parameters

Parameters for the EXCEPTS control statement are

INTERVAL= Specifies the time divisions on the report. The default is the size of the recording interval. Specifying an interval that is less than the recording interval has the same effect as using the INTERVAL default. If TRACE=YES is specified, the default interval is the trace set size.

The EXCEPTS interval is used to gather data in multiples of the Extractor record interval. Data cannot be prorated over time. A data collection key is generated for each Extractor record encountered that meets date-time qualification requirements. The equation for this record key is

Extractor record start time / EXCEPTS interval

If the start of the Extractor record cycle and the size of the EXCEPTS interval parameter are known, you can determine which EXCEPTS record (graph line) contains which Extractor record group. The use of the EXCEPTS interval is illustrated in examples 1 and 2, following.

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MIN= Specifies the lower limit that can trigger the exception. It must be a one- to eight-digit number greater than or equal to zero. The default is zero and there is no implied precision.

MAX= Specifies the upper limit that can trigger the exception. It can be a one- to eight-digit number. The default is zero and there is no implied precision.

ASSOC= Specifies up to three additional measures (regardless of type) to be printed if the MEASURE value is less than the MIN value or greater than the MAX value. In the EXCEPTS statement, three or fewer ASSOC measures can be requested together, independent of type.

CPU= In a multiprocessor system, specifies the CPU for which CPU-related measures are to be reported. The possibilities are 0 through 15 and ALL (the default).

MEASURE= Specifies the measure that can be monitored for each exceptional condition. Only one measure can be monitored for each EXCEPTS command. Valid measures are the same as those used in the GRAPH statement; they are listed in Appendix A, “Measure and Trace Values” 1. If you want to define more than one measure, use the ASSOC parameter.

TRACE= Produces the Exception Trace Detail report, discussed in “Exception Trace Detail Report” on page 3-129. This report is for TRACE76 measures only. Any other graphics measures included on the measure list cause an error. One TRACE76 measure name can be on the MEASURE parameter, and three associative TRACE76 measure names can be included on the ASSOC parameter. TRACE76 measures are shown in Appendix A “Measure and Trace Values” on page A-1.

Note: View member CMFANLTR in the UBBPARM data set for examples of using the TRACE, MEASURE, and TRCETYPE parameters.TRACE uses the ASSOC, MEASURE, and TRCETYPE parameters to format the trace report.

TRCETYPE= Specifies a *trace-type* value to be associated with the entries on the MEASURE and ASSOC parameters. There are four values for the TRCETYPE parameter

T1 Specifies the *trace-type* value for the measure name on the MEASURE parameter.

T2 Specifies the *trace-type* value for the first measure name on the ASSOC parameter.

T3 Specifies the *trace-type* value for the second measure name on the ASSOC parameter.

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T4 Specifies the *trace-type* value for the third measure name on the ASSOC parameter.

The *trace-type* values can have any of the following values:

MIN Minimum value captured during the specified time interval calculation: SMF76MIN

MAX Maximum value captured during the specified time interval calculation: SMF76MAX

AVG This is the default value. Average value captured during the specified time interval calculation: SMF76AVG / SMF76SSS

END Last value captured during the specified time interval calculation: SMF76ENV

STD Standard deviation value captured during the specified time interval calculation: (SMF76SSS * ∑(SMF76STD) - (∑(SMF76AVE) **2)) **.5 / SMF76SSS

DIF Difference between the starting end value and the ending end value calculation: SMF76ENV(last) - SMF76ENV(first)

Note: The *trace-types* collected must be selected in the RMF data collector. The CMF MONITOR Extractor always collects all *trace-types*. If a *trace-type* is selected for data that was not collected by RMF, it is marked N/A in the report output and a warning message is produced.

Examples

Determine which EXCEPTS interval contains Extractor record data for CPU busy, as of 10:15 A.M., on March 28, 2003, if:

1. Extractor start time is 00:15 A.M. on March 28, 2003
2. Extractor REPORT control statement interval parameter value is QTR
3. EXCEPTS parameter interval value is 02:00:00

From this information you know that

- data collection begins at 00:15:00 (from Extractor start time).
- there are 12 EXCEPTS intervals that cover the 24-hour period encompassing the data of March 28, 2003. (This value is calculated by dividing 24 hours by the EXCEPTS interval value of 2; the result is 12.)
- a maximum of eight Extractor intervals can be summed into each EXCEPTS data collection interval (This value is calculated by dividing the EXCEPTS collection interval of 2 by the Extractor QTR hour (1/4) hour interval; the result is 8.)

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Table 2-7 shows the EXCEPTS intervals and EXCEPTS interval time ranges for this situation. EXCEPTS interval 06 contains the Extractor record data for CPU busy at 10:15 A.M. .

Table 2-7 EXCEPTS Interval Time Range for Twelve Intervals

Interval Number	EXCEPTS Interval Time Range	Description
01	00:00:00 - 02:00:00	
02	02:00:00 - 04:00:00	
03	04:00:00 - 06:00:00	
04	06:00:00 - 08:00:00	
05	08:00:00 - 10:00:00	
06	10:00:00 - 12:00:00	
07	12:00:00 - 14:00:00	10:15:00 EXTR RECORD
08	14:00:00 - 16:00:00	
09	16:00:00 - 18:00:00	
10	18:00:00 - 20:00:00	
11	20:00:00 - 22:00:00	
12	22:00:00 - 24:00:00	

When using the SHIFT control statement with an EXCEPTS control statement containing the interval parameter, use this equation to generate the record key:

```
Record Key = ((Extractor record start date)
             - (January 1, 2003)
             + (Extractor record start time))
             / EXCEPTS interval
```

Example 1

```
SHIFT (010000,090000),(090000,170000)
EXCEPTS MEASURE=CPU,INTERVAL=02:00:00
```

Determine which EXCEPTS intervals have a CPU busy less than 8% or greater than 20% if the

- Extractor start time is 00:15 on March 28, 2003.
- Extractor REPORT control statement INTERVAL parameter value is QTR.
- EXCEPTS INTERVAL value is 02:00:00 (2 hours).
- SHIFT request time ranges are 010000 to 090000 (1:00 A.M. to 9:00 A.M.) and 090000 to 170000.

From this information, you know that

- Data collection begins at 01:00:00 (from the SHIFT control statement request).

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- There are four EXCEPTS intervals within each SHIFT time range definition defined on the SHIFT control statement. (This is calculated by dividing the 8 hour time range by the EXCEPTS interval value of 2; the result is 4.)
- A maximum of eight Extractor intervals can be summed into each EXCEPTS data collection interval. (This is calculated by dividing the EXCEPTS collection interval of 2 by the Extractor QTR (1/4) hour interval; the result is 8.)

Table 2-8 shows the EXCEPTS intervals and EXCEPTS interval time range for this situation. The EXCEPTS interval 05 contains the Extractor record data for CPU busy at 10:15 A.M.

Table 2-8 EXCEPTS Interval Time Range for Eight Intervals

Interval Number	EXCEPTS Interval Time Range	Description
01	01:00:00 - 03:00:00	
02	03:00:00 - 05:00:00	
03	05:00:00 - 07:00:00	
04	07:00:00 - 09:00:00	
05	09:00:00 - 11:00:00	
06	11:00:00 - 13:00:00	
07	13:00:00 - 15:00:00	10:15:00 EXTR RECORD
08	15:00:00 - 17:00:00	

Example 2

```
EXCEPTS INTERVAL=00:30:00,MIN=8,MAX=20,
        MEASURE=PAGESEC,ASSOC=(PAGEINS,PAGEOUTS)
```

In this example, the INTERVAL parameter value causes the time division on the Exception Report generated to be 30 minutes; minimum/maximum trigger range is less than 8 or greater than 20; the average paging rate per second is measured, as well as the number of pages brought into and out of central storage.

Example 3

```
EXCEPTS  MEASURE=RCEAFC,
         TRACE=YES,
         ASSOC=(RCECOMAL,
                RCECOMPI,
                RCECOMPO),
         TRCETYPE=(T1=AVG,T2=DIF,T3=MAX,T4=MIN)
```

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where

T1=AVG Specifies the trace value for exception-measure

T2=DIF Specifies the trace value for associate-measure-1

T3=MAX Specifies the trace value for associate-measure-2

T4=MIN Specifies the trace value for associate-measure-3

Note: VSDB and VSDA labels used in the calculations in Table A-1 on page A-1 are DSECT fields in VSDATA, which define areas within major SMF78RCD triplet areas associated with CSA and SQA data.

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GRAPH

```
GRAPH
[TYPE={PLOT|KIVIAT|PIE|TAB|DISTRIB|
     PROFILE|DOMAIN|TRACE}]
[,TRCETYPE=(T1=trace-type,...,T16=trace-type)]
[,INTERVAL=hh:mm:ss]
[,PLOTFILL={YES|NO}]
[,CIRCLE={YES|NO}]
[,AXES={YES|NO}]
[,LPI={6|n}]
[,CPI={10|n}]
[,LINES={60|n}]
[,FILLCHAR='*'

[,MEASURE=(measname1,...,measname16)]
[,LIMIT=(n1,...,n16)]
[,CPU={0|1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|ALL}]
[,IPS=xx]
[,NORMALIZ={YES|NO}]
```

Overview

The GRAPH control statement requests a Kiviat, pie, plot, tabular, distribution, profile, or domain graph and the Graphics Trace Detail Report discussed in “Graphics Trace Detail Report” on page 3-135. The valid parameters used for each graph type specified by the TYPE parameter are listed in Table 2-9 and explained following the table.

The GRAPH statement uses data collected by the TRACE76 Extractor control statement (see “TRACE76” on page 1-71). The values must be specified in the MEASURE parameter of the GRAPH statement for reporting.

Table 2-9 Valid Parameters for Graph Types

Parameter	Plot	KIVAT	PIE	TAB	DISTRIB	PROFILE	DOMAIN	TRACE
INTERVAL	X	X	X	X	X	X		X
PLOTFILL	X	X				X		
CIRCLE		X	X					
AXES		X						
LPI		X	X					
CPI		X	X					
LINES		X	X					
FILLCHAR	X	X	X		X	X		

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Table 2-9 Valid Parameters for Graph Types (continued)

Parameter	Plot	KIVAT	PIE	TAB	DISTRIB	PROFILE	DOMAIN	TRACE
MEASURE	X	X	X	X	X	X		X
LIMIT	X	X			X	X		X
CPU	X	X	X	X	X	X		
IPS							X	
NORMALIZE					X			

On a multiprocessing (MP) system, components associated with different processors can be displayed on the same graph by using the combination identifier from the label field of the COMBINE control statement. For example, the series of statements below request a plot of the activity for channel 5 on CPUs 0 and 1.

```
39   COMBINE  (CH5/0),DESC='CHNL 5 BUSY ON CPU 0'
40   COMBINE  (CH5/1),DESC='CHNL 5 BUSY ON CPU 1'
     GRAPH INTERVAL=01:00:00, TYPE=PLOT,
     MEASURE=(CMB-39,CMB-40) - PLOT CHNL 5 CPU0 x CPU1
```

Refer to the COMBINE control statement (see Figure 2-1 on page 2-27 for more information).

Parameters

Parameters for the GRAPH control statement are

TYPE= Specifies the type of graph to be produced. The default for TYPE is PLOT.

PLOT Produces a horizontal bar graph (see Interval Bar Graph discussed in “Interval Bar Graph” on page 3-150).

KIVIAT Produces a polygon within a circle (see “Kiviat Graph” on page 3-152).

Note: Special JCL is needed to produce this type of graph. (See *CMF MONITOR Batch User Guide*, Chapter 4, “Producing Graphics Reports on a JES2 System” for more information.)

PIE Produces a segment graph within a circle (see “Pie Chart” on page 3-182).

Note: Special JCL is needed to produce this type of graph. (See *CMF MONITOR Batch User Guide*, Chapter 4, “Producing Graphics Reports on a JES2 System” for more information.)

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TAB Produces a tabular listing of up to 12 measures by interval (see "Tabular Subreport" on page 3-215).

DISTRIB Produces a distribution for each measure requested (see "Distribution Graph" on page 3-119).

PROFILE Produces a horizontal bar graph based on time of day only (see "Profile Bar Graph" on page 3-188).

DOMAIN Produces a graphic display of performance objective slopes for each domain (see "Performance Summary Report" on page 3-175).

TRACE Produces the Graphics Trace Detail Report. This report is for TRACE76 measures only. Any other graphics measures included on the measure list will cause an error. Twelve TRACE76 measure names can be entered on the measure list.

TRACE uses the MEASURE and TRCETYPE parameters to format the trace report. If a trace value is not specified for a measure name, the Graphics Trace Detail Report is produced, displaying a column for each of the six *trace-type* values of TRCETYPE. A separate graph is generated for each measure as requested.

View member CMFANLTR in the UBBPARM data set for examples of using the TRACE, MEASURE, and TRCETYPE parameters.

Note: For TYPE=TRACE, the only valid parameters are INTERVAL, MEASURE, and LIMIT.

TRCETYPE= Specifies a *trace-type* value to be associated with the entries on the MEASURE parameter. The *trace-type* values and the measure names are positional.

T*n* Specifies the *trace-type* value for the *n*th measure name.

Up to 12 *trace-type* values and measure names can be entered. The default value is AVG. The *trace-type* values can be any of the following:

MIN Minimum value captured during record interval calculation: smallest SMF76MIN value

MAX Maximum value captured during record interval calculation: greatest SMF76MAX value

AVG Average value captured during record interval calculation: SMF76AVG / SMF76SSS

END Last value captured during record interval calculation: SMF76ENV

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STD Standard deviation value captured during record interval calculation: (SMF76SSS * ∑(SMF76STD) - (∑(SMF76AVE) **2)) **.5 / SMF76SSS

DIF Difference between the starting end value and the ending end value calculation: SMF76ENV(last) - SMF76ENV(first)

TRACE76 measures can be included on the measure list with other graphics measures for other graphics displays (PLOT, PROFILE, KIVIAT, TAB, and so on.). The default value, AVG, is assigned to any measure name that does not have a TRCETYPE value associated with it for any graph type except TRACE.

INTERVAL= Specifies the time divisions on the graph. The INTERVAL= may be specified with the following values:

hh:mm:ss where
hh: Is the hour.
mm: Is the minutes.
ss: Is the seconds.

HOURLY Each line of the graph represents one hour.

DAILY Each line of the graph represents one 24-hour period.

WEEKLY Each line of the graph represents one 168-hour period.

MONTHLY Each line of the graph represents one month.

QTRLY Each line of the graph represents a calendar year quarter.

SEMIANNL Each line of the graph represents a half year.

Note: If INTERVAL is specified when TYPE=KIVIAT or PIE, one graph is produced for each occurrence of the interval.

The defaults are

TRACE The size of the trace set.

PLOT, TAB, PROFILE The size of the Extractor record interval.

KIVIAT, DISTRIBUTION, PIE The entire Extractor measurement interval.

Specifying an interval that is less than the Extractor recording interval has the same effect as specifying the Extractor recording interval.

The GRAPH interval is used to gather data in multiples of the Extractor record interval. Data cannot be prorated over time. A data collection key is generated for each Extractor record encountered that meets date-time qualification requirements. The equation for this record key is

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Record key = Extractor record start time / GRAPH interval

If the start of the Extractor record cycle and the size of the GRAPH interval parameter are known, you can determine which GRAPH record contains which Extractor record group.

PLOTFILL= Specifies the format of the plots in which two or more measures are shown. When YES is specified, a continuous string of characters leads from the plotted value on one line to the plotted value on the next line, making it easier to see the changes in values. When NO is specified, the point plotting format is produced. Whenever two or more characters occupy the same space, the character O is produced. The default is YES.

CIRCLE= Specifies whether a circle of asterisks should be printed to mark the outer boundary of the Kiviat graph or Pie chart. The default is YES.

AXES= Specifies whether periods should be printed to mark the location of the axis for each measure in the Kiviat graph. The default is YES.

CPI= Specifies the height and width of print characters. Set CPI to characters per inch. The default is CPI=10. If CPI is set incorrectly, the resulting Kiviat graph or Pie chart is elliptical.

LPI= Specifies the height and width of print characters. Set LPI to lines per inch. The default is LPI=6. If LPI is set incorrectly, the resulting Kiviat graph or Pie chart is elliptical.

LINES= Specifies the number of lines per page to be used for domain, Kiviat, or pie graphs. A value greater than 60 cannot be specified. Kiviat and pie graphs are always printed one to a page, but unusual page sizes can be accommodated with this parameter. The default is 60. All other graph types print without page breaks until the graph is complete.

FILLCHAR= For Kiviat graphs, specifies the character to use to fill the interior of the polygon; the default is *. For plot graphs, specify one FILLCHAR for each measure requested; the default is *+=:-<.#12345678. For domain graphs, specify one FILLCHAR as a symbol for each objective slope graphed; the default is to use the objective number as the symbol for its slope.

MEASURE= Specifies the measures to be graphed. See Appendix A “Measure and Trace Values” on page A-1 for acceptable values. Up to 16 measures can be specified for the Kiviat, Plot, Profile, and Distribution graphs and Pie chart. Up to 12 measures can be specified for the Tabular Subreport (see “Tabular Subreport” on page 3-215 for more information) or Trace graph; if more are specified, only the first 12 are recognized.

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LIMIT= Specifies a limit value to be associated with each measure. There is a one-to-one correspondence between the MEASURE and LIMIT parameters for the Kiviat and distribution graphs. For the plot and profile graphs, the highest limit specified is used.

To establish useful graphs of measures that have a range of values exceeding 100, run the tab graph first, to determine a proper set of limit specifications. Two decimal places are implied for each LIMIT= value. The default for each value is 10000 (100.00). A value less than 1000 (10.00) causes results to be unpredictable.

The limit value should be high enough to accommodate the measure being graphed. For example, if the PAGEIO measure is being graphed and it is estimated that the value is in the thousands, specify a limit value of 1000000 (10,000.00). Erroneous graphs can result if the limit value is too small.

CPU= Specifies the CPU for which CPU data is to be displayed. The possibilities are 0 through 15 and ALL. The default is ALL.

IPS= Specifies the two-character suffix of the IPS member to be graphed (applicable only to TYPE=DOMAIN). The default is the current IPS.

NORMALIZ= Specifies if the distribution graph is to be normalized. If normalized, the X-axis starts at the minimum value instead of zero (does not apply to percent), and the Y-axis ends at 50% (if no distribution exceeds 50%). The default is YES.

Examples

Determine which GRAPH interval contains Extractor record data for CPU busy, as of 10:15 A.M., on March 28, 2003:

- Extractor start time is 00:15 A.M. on March 28, 2003
- INTERVAL value on the Extractor REPORT control statement is QTR
- GRAPH INTERVAL value is 02:00:00

From this information you know that

- data collection begins at 00:15:00 (from Extractor start time).
- there are 12 GRAPH intervals that cover the 24-hour period encompassing the data of March 28, 2003 (This is calculated by dividing 24 hours by the GRAPH interval value of 2; the result is 12.)
- a maximum of eight Extractor intervals can be summed into each GRAPH data collection interval (This is calculated by dividing the GRAPH collection interval of 2 by the Extractor QTR (1/4) hour interval; the result is 8.)

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Table 2-10 shows the GRAPH intervals and interval time range for this situation. Interval Number 06 contains the Extractor record data for CPU busy at 10:15 A.M.

Table 2-10 GRAPH Interval Time Range for Twelve Intervals

Interval Number	GRAPH Interval Time Range	Description
01	00:00:00 - 02:00:00	
02	02:00:00 - 04:00:00	
03	04:00:00 - 06:00:00	
04	06:00:00 - 08:00:00	
05	08:00:00 - 10:00:00	
06	10:00:00 - 12:00:00	10:15:00 EXTR RECORD
07	12:00:00 - 14:00:00	
08	14:00:00 - 16:00:00	
09	16:00:00 - 18:00:00	
10	18:00:00 - 20:00:00	
11	20:00:00 - 22:00:00	
12	22:00:00 - 24:00:00	

When using the SHIFT control statement with a GRAPH control statement containing the interval parameter, use the following equation to generate the record key:

```
Record Key = ((Extractor record start date)
             - (January 1, 2003)
             + (Extractor record start time))
             / GRAPH interval
```

For example:

```
SHIFT (010000,090000),(090000,170000)
GRAPH MEASURE=CPU,INTERVAL=02:00:00
```

Determine which GRAPH interval contains Extractor record data for CPU busy, as of 10:15 A.M., on March 28, 2003, if the

- Extractor start time is 00:15 on March 28, 2003.
- INTERVAL value on the Extractor REPORT control statement is QTR.
- GRAPH parameter interval value is 02:00:00.
- SHIFT request time ranges are 010000 to 090000 and 090000 to 170000.

From this information you know that

- Data collection begins at 01:00:00 (from the SHIFT control statement request).
- There are four GRAPH intervals within each SHIFT time range definition defined on the SHIFT control statement. (This is calculated by dividing the 8 hour time range by the GRAPH interval value of 2; the result is 4.)

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- A maximum of eight Extractor intervals can be summed into each GRAPH data collection interval. (This is calculated by dividing the GRAPH collection interval of 2 by the Extractor QTR hour (1/4) hour interval; the result is 8.)

Table 2-11 shows the GRAPH intervals and GRAPH interval time range for this situation. The GRAPH interval 05 contains the Extractor record data for CPU busy, at 10:15 A.M.

Table 2-11 GRAPH Interval Time Range for Eight Intervals

Interval Number	GRAPH Interval Time Range	Description
01 02 03 04 05 06 07 08	01:00:00 - 03:00:00 03:00:00 - 05:00:00 05:00:00 - 07:00:00 07:00:00 - 09:00:00 09:00:00 - 11:00:00 11:00:00 - 13:00:00 13:00:00 - 15:00:00 15:00:00 - 17:00:00	10:15:00 EXTR RECORD

```
GRAPH TYPE=PLOT,INTERVAL=01:00:00,MEASURE=(SUP,SYST)
```

Instructs the Analyzer to produce a horizontal bar graph, using time divisions of one hour, displaying the percentage of CPU busy time during which the system was in supervisor and system test state.

```
GRAPH TYPE=DOMAIN,IPS=AA
```

Produces a domain graph showing performance objective slopes for IPS member AA, with a default measure limit value of 100.00.

```
GRAPH TYPE=KIVIAT,CPU=ALL,MEASURE=(DEV-13F,CHN-1,ERR-13F),
      LIMIT=(8000,,8000)
```

Generates a Kiviat graph of all CPUs, displaying busy times for device 13F and channel 1, and the percentage of time device address 13F is in error recovery; measure limit value is 8000 for the first and third measures.

```
GRAPH TYPE=PIE,INTERVAL=04:00:00,MEASURE=(CPK-02,CPK-00,
      CPU,SUP,SYST,PPB)
```

Produces a pie chart, using time divisions of 4 hours, to display CPU busy time for problem programs designated by protect key 02 and 00, total CPU capacity used, and percentage of time CPU was in supervisor, system task, and problem program states.

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HEADERS

HEADERS
[TITLE=*'title'*]
[,LOCATION=*'location'*]
[,LINES={60|*nn*}]

Overview

The HEADERS control statement defines optional headline information for the CMF MONITOR reports. In addition, it can be used to adjust the maximum number of lines per report page.

Parameters

Parameters for the HEADERS control statement are

TITLE= Specifies a quoted-character string, which is centered on the second line of each CMF MONITOR report. Up to 52 characters (excluding outside quote marks) can be used. The enclosing quotes can be omitted if the string contains only alphabetic or numeric characters (no spaces). The default value is blanks.

LOCATION= Specifies a quoted-character string, which is centered on the third line of the CMF MONITOR reports. Up to 40 characters (excluding outside quote marks) can be used. The enclosing quotes can be omitted if the string contains only alphabetic or numeric characters (no spaces). The default value is blanks.

LINES= Specifies the maximum number of lines per page on the CMF MONITOR reports. The maximum value is 99. The default value is 60.

Note: Graphic reports ignore the Lines parameter. See “GRAPH” on page 2-56 for information about how graphic reports are printed.

Example

```
HEADERS TITLE='XYZ COMPANY, INC.',LOCATION='HOMETOWN,
USA',LINES=55
```

CMF MONITOR reports are headed by XYZ COMPANY, INC. centered on the second line and HOMETOWN, USA centered on the third line; 55 lines are allotted for each page of this report.

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HFS

HFS

Overview

The HFS control statement requests the HFS Statistics Report, which provides information about caching by HFS buffer pools and mounted file systems.

The HFS statement uses data collected by the HFS Extractor control statement.

NOTE: This report is not meaningful when data from multiple systems is combined into one report. Therefore, the control statement must not follow a SYSPLEX control statement specifying multiple systems and RPTS=COMBINED.

Parameters

This statement has no parameters.

Example

```
HFS
```

The HFS Statistics Report is produced.

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HTTP

HTTP

Overview

The HTTP control statement requests the HTTP server report (see “HTTP Server Report” on page 3-141). This report provides information about the activities of HTTP servers. The information may be used to analyze problem servers and to view performance data.

SMF type 103 records are used to generate the HTTP server report. CMF MONITOR does not gather these records. HTTP servers create these records.

To produce a valid report, the SMF type 103 records must remain in the order in which they were written (SYSID, DATE, and TIME). The following sort control statement will sort the records in their original order:

```
SORT FIELDS=(15,4,CH,A,11,4,BI,A,7,4,BI,A),EQUALS
```

Note: This report differs from all other Analyzer reports because of the characteristics of the SMF type 103 records. A number of fields are not displayed in the report header, including the system name (only system ID is shown), the operating system version and release information, the duration of the report (both ACTUAL and RQSTD). The following general control statements are not supported for this report and if present, are not applied to this report:
COMBINE, CYCLE, PERIOD, SHIFT, SYSPLEX

Parameters

This statement has no parameters.

Example

```
HTTP
```

The HTTP Statistics Report is produced.

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IOQ

IOQ
[,IGNORE={NO|INACTIVE}]

Overview

The IOQ control statement requests the I/O Queuing Activity Report discussed in “I/O Queuing Activity Report” on page 3-146. Optionally, Logical Control Units (LCUs) that had no activity can be ignored; this may yield a more concise report.

Parameters

Parameters for the IOQ control statement are

IGNORE= Specifies how LCUs that have no activity during the reporting period are to be treated.

- **INACTIVE** Specifies that the report not show LCUs that had no activity for the reporting period.
- **NO** Specifies that the report contain all LCUs, whether or not they had any activity. This option is the default.

Example

```
IOQ   IGNORE=INACTIVE
```

The I/O Queuing Activity report is produced only for those LCUs that had some activity for the reporting period.

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LCU

LCU

Overview

IOQ will replace LCU. While the LCU control statement continues to function, BMC Software recommends that you use the IOQ control statement, since LCU will not be supported in future CMF MONITOR releases. See “IOQ” on page 1-44.

The LCU control statement requests the I/O Queuing Activity Report discussed in “I/O Queuing Activity Report” on page 3-146.

Parameters

This statement has no parameters.

Example

```
LCU
```

The I/O Queuing Activity report is produced.

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LINKPACK

LINKPACK
[THRESHLD={0|*nnnnn*}]

Overview

The LINKPACK control statement requests the Link Pack Area Report discussed in “Link Pack Area Report” on page 3-156.

Note: This report requires records that are written at CMF MONITOR Extractor initialization. To obtain the desired report, make certain that the input data includes the records that were written when the extraction began. It is not necessary to include the period of these records in the DATETIME or SHIFT ranges.

The LINKPACK statement uses data collected by the LINKMAP Extractor control statement (see “LINKMAP” on page 1-46) and the REPORT control statement must have GBLS=YES defined (see “REPORT” on page 1-58).

Parameters

The parameter for the LINKPACK control statement is

THRESHLD= Specifies a one- to five-digit value used to determine an activity threshold value for any one link pack module. If the number of samples determines that a specific module had activity which exceeded the threshold value, the module is marked on the Link Pack Area Report with an action flag of ****. All active link pack modules are reported. The default is zero.

Example

```
LINKPACK   THRESHLD=6000
```

Produces Link Pack Area report, with a threshold set to flag modules with over 6000 busy samples.

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LPARCOMB

LPARCOMB
{[ALL=NO]
[, DESC='description',LPARS=(name1,...,name16)]}

Overview

The LPARCOMB control statement specifies a combination of LPARs to be included in the LPAR Combination Section of the “CPU Utilization Report” on page 3-85. One or more LPARCOMB control statements can be specified and they all must immediately follow a CPU control statement.

Parameters

The parameters for the LPARCOMB control statement are

ALL= By default, the combination with the description 'ALL LPARS' consisting of all LPARs is displayed. To suppress this combination, specify ALL=NO.

DESC= Specifies the description of the combination of LPARs. This parameter can contain up to 32 characters. If it contains spaces, enclose the parameter in quotation marks; otherwise, quotation marks are not required. When this parameter is specified, the LPARS parameter is required.

LPARS= Specifies the names of up to 16 LPARs in the combination. When this parameter is specified, the DESC parameter is required. If the reserved LPAR name PHYSICAL is specified, it is ignored.

Example

```
CPU
```

Produces a CPU Utilization Report with an LPAR Combination Section containing only the default 'ALL LPARS' combination.

```
CPU
LPARCOMB  DESC='DB2 systems',LPARS=(DB2A,DB2B)
```

Produces a CPU Utilization Report with an LPAR Combination Section containing the default 'ALL LPARS' combination consisting of all LPARs and the 'DB2 systems' combination consisting of LPARs DB2A and DB2B.

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```
CPU
LPARCOMB  DESC='DB2 systems',LPARS=(DB2A,DB2B)
LPARCOMB ALL=NO
```

Produces a CPU Utilization Report with an LPAR Combination Section containing only the 'DB2 systems' combination. The default 'ALL LPARS' combination is suppressed.

```
CPU
LPARCOMB ALL=NO
```

Produces a CPU Utilization Report without the LPAR Combination Section.

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MDF

```
MDF
[MARKER=>]
[,DETAIL=(NONE,FULL,PHYSPROC,WAITCOMP,
      DISPINTV,STATUS,WEIGHT,LOGPROC)]
[,EMPHASIS={1|2|3|4|5|6|7|8|9|10|11|12|LASER}]
```

Overview

The MDF Analyzer control statement requests either the MDF Report discussed in “Multiple Domain Facility (MDF) Report” on page 3-169 or the Logical Partition Report discussed in “Logical Partition Report” on page 3-158, depending on the data.

This report shows the activity of the Multiple Domain Facility (MDF) used on Amdahl systems. The report also provides special emphasis support for impact printers and laser printer support (for more information, see *CMF MONITOR Batch User Guide*, Chapter 8, “Laser Printer Support”).

The MDF statement uses data collected by the CPU Extractor control statement (see “CPU” on page 1-14).

Note: The MDF Report is not generated if you are running on an Amdahl 5890.

Parameters

Parameters for the MDF Analyzer control statement are

MARKER= Placed to the right of fields to indicate that a change occurred in the value of a field during the display interval. The default marker is >; however, you can specify any other character as the marker.

DETAIL= Specifies the circumstances under which CMF MONITOR generates a new row of data for the domain or a new iteration of the report. If you select NONE, the default, it must be the only value specified. All the other values are field names, and you may specify them in any combination.

If a change during the interval triggers more than one row of data for a domain, a subtotal row is generated to summarize the measurements.

Note: The characters in parentheses are abbreviations for the operands. They can be specified instead of the full operand name.

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NONE (N): No domain splitting. This is the default value.

FULL (F): If you request FULL detail, a new report or a new row is generated (depending on the change that occurs) when a change is detected in any one of the six fields described below.

PHYSPROC (P): Domain split on physical processor. If you request DETAIL by physical processor, the report is started again on a new page each time there is a change in the number of physical processors during the display interval.

WAITCOMP (WA): Domain split on wait completion. If you request DETAIL by the wait completion flag, a new row is generated for that domain for each value of the wait completion.

DISPINTV (D): Domain split on dispatch interval. If you request DETAIL by dispatch interval, the report is started again on a new page each time there is a change during the display interval.

STATUS (S): Domain split on status flag. If you request DETAIL by the status flag, a new row is generated for that domain for each different status flag value encountered during the display interval.

WEIGHT (WE): Domain split on weighting factor. If you request DETAIL by the weighting factor, a new row is generated for that domain for each unique weighting factor encountered during the display interval.

LOGPROC (L): Domain split on logical processors. If you request DETAIL by the number of logical processors, a new row is generated for that domain for each change in the number of logical processors detected during the display interval.

EMPHASIS= Special emphasis field parameter for impact printers and laser printer support. This parameter controls the appearance of special emphasis field output. Acceptable EMPHASIS values are LASER or *n* (a number from 1 to 12). The default value for EMPHASIS is 6.

n Defines the number of times special emphasis fields in this report are overstruck on an impact printer or eliminates all bold type and special emphasis from this report when produced on a laser printer.

When 1 is selected as the EMPHASIS option, bold or special emphasis is not used in the report and all data is displayed the same for both impact and laser printers. Option 1 is useful if bold type is causing printer delays and does not produce any meaningful clarification of the data.

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Selecting 2 causes the special emphasis fields to appear the same as all bolded fields, when printed on an impact printer, because both field types are overstruck twice. This value has no effect on reports printed on a laser printer; bolded and special emphasis fields are produced.

Selecting 3 through 12 causes special emphasis fields to appear different from bolded fields, when printed on an impact printer. Special emphasis fields are overstruck the number of times defined; bolded fields are overstruck twice. These values have no effect on reports printed on a laser printer; bolded and special emphasis fields are produced.

LASER Selecting the LASER option causes the report generator to select certain fields for special emphasis.

When LASER is defined as the EMPHASIS= value, no characters are overstruck, so this value should not be used when printing on an impact printer.

Note: If LASER is selected, the //SYSPRINT DD general control statement must contain the OPTCD=J parameter. In addition, the CHARS=(font1,...,font4) operand must be defined by one of the following methods:

//SYSPRINT DD statement
OUTPUT statement
As a system default

For more information, see *CMF MONITOR Batch User Guide*, Chapter 8, "Laser Printer Support".

Examples

The following examples show you what reports are generated given the parameters you specify in the control statement.

```
MDF   EMPHASIS=LASER
```

Produces the MDF Report formatted for printing on a laser printer, so special emphasis fields appear. If processed on an impact printer, the report output does not handle special emphasis fields differently from other fields. Only one row of data is produced about each domain for each record interval, regardless of whether changes to the domain occurred during an interval.

```
MDF   MARKER=*,DETAIL=(P,D)
```

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Produces a report that generates a new report for each combination of changes (identified with an *) in either the physical processor or dispatch interval.

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OMVS

OMVS

Overview

The OMVS control statement requests the OMVS Kernel Activity Report discussed on page 3-172.

The OMVS Analyzer statement uses data collected by the OMVS Extractor control statement (see “OMVS” on page 1-50).

Parameters

This statement has no parameters.

Example

```
OMVS
```

The OMVS Kernel Activity Report is produced.

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PERFORM

PERFORM
[(PG=*name*,PP=*period*,PD='*description*')1,...
,(PG=*name*,PP=*period*,PD='*description*')64]
[,INCLUDE=(*name*1,...,*name*99)|,EXCLUDE=(*name*1,...,*name*99)]
[,PGTYPE={CTL|RPT|BOTH}]
[,SCTYPE={CTL|RPT|BOTH}]

Overview

The PERFORM control statement is used with the PERFSUM or WORKLOAD control statements to modify report contents. On goal mode systems, PERFORM can be used with the WLMGL control statement. This statement does not produce a report if used by itself.

The PERFORM control statement allows you to control how performance group data is handled in both the Performance Summary (see “Performance Summary Report” on page 3-175) and System Workload Activity Reports (see “System Workload Activity Report” on page 3-211). You can define only report, only control, or both performance group types to be included or excluded from these reports, as well as defining that specific performance group data is either included or excluded. PERFORM also allows you to include or exclude service classes in the Workload Manager Goal Mode Report.

If used, the PERFORM statement must immediately follow the PERFSUM, WLMGL, or WORKLOAD statement that it is modifying. Only one PERFORM statement can be defined after each PERFSUM, WLMGL, or WORKLOAD statement; if multiple PERFORM statements are defined after a PERFSUM, WLMGL, or WORKLOAD statement, only the last PERFORM statement affects the report.

Note: If PERFORM is used in conjunction with WLMGL TYPE=SUMMARY, the PERFORM card is ignored. (See the summary description of “Workload Manager Goal Mode Report” on page 3-240 for more information).

If PERFORM is defined with PERFSUM, you can describe information that affects the *Performance Group Activity* section of the Performance Summary Report.

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Note: If no PERFORM statement is specified with PERFSUM, the *Performance Group Activity* section is grouped as defined in the PERFORM parameter of the EXTSUM Extractor control statement (see “EXTSUM” on page 1-31 for more information) and only if initialization records exist in the input data. Without initialization records present, a default arrangement of performance group data is presented in the report.

If no PERFORM parameter is defined on the EXTSUM Extractor control statement, the Performance Group Activity section is based on all performance groups sampled by the CMF/RMF workload sampler, if it was active.

Parameters

Parameter meanings are

(**PG=***name*,**PP=***period*,**PD=***'description'*)

This parameter applies only when using PERFORM with the PERFSUM statement. It defines the names, periods, and descriptions of the performance groups to be reported. These values must have been defined at the PERFORM parameter in the Extractor EXTSUM control statement (see “EXTSUM” on page 1-31 for more information) so that data was collected. The PERFORM parameter data is read only at Extractor initialization. If your input data does not contain the initialization records, this parameter string must be defined, or information is omitted from the report. BMC Software recommends that you copy the PERFORM parameter values to the Analyzer PERFORM control statement. This parameter string can be repeated up to 64 times. The variables are

PG= The performance group number. The range of PG= is from 0 through 9999.

PP= The performance group period or periods. The range is 1 through 8, and is 8-spaces wide; for example, periods 1, 3, and 4 would be specified as 134. If multiple periods are defined, they are summarized on the Performance Summary Report.

PD= The description of the performance group being displayed. This parameter affects only the PERFSUM control statement, not the WORKLOAD statement. This parameter can contain up to 15 characters. If this parameter contains spaces, it must be enclosed in quotation marks; if it does not contain spaces, quotation marks are not required.

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INCLUDE= On systems running in compatibility mode, this parameter specifies a list of performance group numbers to be included in the report; all other groups are excluded except those defined with PGTYPE. When both INCLUDE and PGTYPE are defined, the performance group values are combined, so that all specified performance groups are reported upon.

On systems running in goal mode, this parameter specifies a list of service classes and report classes to be included in the report. When both INCLUDE and SCTYPE are defined, the values are combined, so that all specified service classes and report classes are reported upon.

The INCLUDE parameter is mutually exclusive with the EXCLUDE parameter. If both INCLUDE and EXCLUDE are defined, the INCLUDE parameter is ignored.

EXCLUDE= On systems running in compatibility mode, this parameter specifies a list of performance group numbers to be excluded from the report.

On systems running in goal mode, this parameter specifies a list of service classes and/or report classes to be excluded from the report.

EXCLUDE is mutually exclusive with the INCLUDE parameter. If both INCLUDE and EXCLUDE are defined, the EXCLUDE parameter is used.

PGTYPE= Specifies the performance group types to be included in the report. Allowable values are

CTL Requests that only control performance groups be included in the report. This is the default when defined with the PERFSUM statement.

RPT Requests that only report performance groups be included in the report.

BOTH Requests that both control and report performance groups be included in the report. This is the default when defined with the WORKLOAD statement.

SCTYPE= Requests that service classes and/or report classes be included in the report. Acceptable values are

CTL Requests that only service classes be included in the report. This is the default when defined with the PERFSUM statement.

RPT Requests that only report classes be included in the report.

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BOTH Requests that both service and report classes be included in the report. This is the default when defined with the WLGML statement.

Usage Notes for PERFSUM and PERFORM

If a PERFORM statement is defined that has no PG, INCLUDE, or EXCLUDE parameters, the Performance Group Activity section of the Performance Summary Report is based on all active control performance groups sampled by the CMF or RMF workload sampler.

If a PERFORM control statement is defined that has no PG parameter, but does have either an INCLUDE or EXCLUDE parameter, the Performance Group Activity section of the Performance Summary Report is based on the parameters specified on the EXTSUM (see “EXTSUM” on page 1-31) Extractor control statement.

Example

```
PERFSUM
PERFORM    (PG=01,PP=1,PD='BATCH'),
           (PG=02,PP=12,PD='TSO-TRIVIAL')
```

Produces a Performance Summary Report with a Performance Group Activity section that breaks down performance group activity. The activity will show for performance group 1 under period 1 with a description of BATCH and for performance group 2 under periods 1 and 2 with a description of TSO-TRIVIAL.

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PERFSUM

```
PERFSUM
[BOTNECKS=([ENQUEUE={10|nn}][,CHANNEL={50|nn}]
        [,OVERUTIL={95|nn}][,UNDERUTL={20|nn}]
        [,PAGING={50|nn}][,TSO={15|nn}]
        [,SUPERVSR={50|nn}][,AUXSTORE={90|nn}]
        [,SERVICE={30|nn}])]
```

Overview

The PERFSUM control statement requests the Performance Summary Report discussed in “Performance Summary Report” on page 3-175.

The PERFSUM statement uses data collected by the following Extractor control statements:

- ASMDATA (see “ASMDATA” on page 1-6)
- CPU (see “CPU” on page 1-14)
- CHANNEL (see “CHANNEL” on page 1-12)
- DEVICE (see “DEVICE” on page 1-23)
- ENQUEUE (see “ENQUEUE” on page 1-29)
- EXTSUM (see “EXTSUM” on page 1-31)
- PAGING (see “PAGING” on page 1-52)
- TSODATA (see “TSODATA” on page 1-74)
- WORKLOAD (see “WORKLOAD” on page 1-82)

Parameters

The value that constitutes a bottleneck can be overridden with the following parameters:

BOTNECKS= The major parameter under which all of the following minor parameters fall. This parameter must be coded. Parentheses must enclose the minor parameters if more than one is coded; for example:

BOTNECKS=(CHANNEL=60,TSO=2)

ENQUEUE= Specifies the percentage of total time that an excessive ENQUEUE conflict existed. The default is 10%.

CHANNEL= Specifies the percentage of overused channel path busy time. The default is 50%.

OVERUTIL= Specifies the percentage of overused CPU busy time. The default is 95%.

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UNDERUTL= Specifies the percentage of underused CPU busy time. The default is 20%.

PAGING= Specifies a value for average pages per second that would be considered too high. The default is 50 pages per second.

TSO= Specifies an average TSO response time that would be considered too high. The default is 15 seconds.

SUPERVSR= Specifies a percentage of CPU busy time spent excessively in supervisor state. The default is 50%.

AUXSTORE= Specifies the percentage of overused auxiliary storage slots. The default is 90%.

SERVICE= Specifies the percentage of total service consumed by a single performance group, where the total service is considered excessive. The default is 30%.

Note:

- If the PERFORM control statement is not specified after the PERFSUM control statement, the Analyzer looks for PERFORM data written at Extractor initialization.
- If the PERFORM parameter was specified on the Extractor EXTSUM control statement (see “EXTSUM” on page 1-31 for more information), the data is only available to the Analyzer if the records, written at Extractor initialization, are included in the input data. It is not necessary to include the period of these records in the DATETIME or SHIFT ranges.
- If the PERFORM control statement is not specified in the Analyzer after the PERFSUM control statement and the PERFORM parameter is not specified on the Extractor EXTSUM control statement, the Performance Group Activity section is presented by performance group or service class, where all periods for a single performance group or service class are summarized.

Example

```
PERFSUM  BOTNECKS=(OVERUTIL=98,CHANNEL=35,PAGING=20,TSO=6)
```

Produces a Performance Summary Report designating bottleneck tolerance thresholds: the percentage of time the CPU is over 98% busy; the percentage of channel busy time over 35%; average pages per second over 20; and TSO response time slower than 6 seconds.

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PERIOD

PERIOD CYCLE=*cyclename*
[,RPTS={COMBINED|SEPARATE}]

Overview

The PERIOD control statement can define a variable reporting period either to all reports or just one report specified in a single batch job. It also allows you to define how the data within the variable reporting period is presented, either as a single combined report or as a series of separate reports.

To use the PERIOD statement, a CYCLE statement must be defined first. A CYCLE statement (see “CYCLE” on page 2-36) is used to define the date-time range and assign a unique cycle name identifier to the variable reporting period. The CYCLE range can be equal to or a subset of the DATETIME range (see “DATETIME” on page 2-40 for more information). Then the PERIOD statement is used to apply the CYCLE range to a single or all reports in a control statement set.

The PERIOD statement can appear in the general control statement set, in the report control statement set, or in both sets. Within the general control statement set, PERIOD specifies a reporting period cycle name for all reports. Within the report control statement set, PERIOD specifies a reporting period cycle name for an individual report. Any time a PERIOD statement is defined directly to a specific report, it overrides any PERIOD statement defined in the general control statement set, but only for the one report.

When using the PERIOD statement, both the DATETIME and CYCLE control statements must be defined. The order of these statements must be

DATETIME
CYCLE
PERIOD

If the commands are not entered in this sequence, a command error results.

Parameters

Parameters for the PERIOD control statement are

CYCLE= Specifies the unique cycle name identifier defined in a preceding CYCLE control statement. This parameter is required and must be a recognized CMF MONITOR cycle name identifier from the following list:

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DAILY
WEEKLY
WORKWKLY
WEEKENDS
BIWEEKLY
MONTHLY
HOLIDAYS
CYCLE*nn*, where ***nn*** is a two-digit number from 01 to 99

RPTS= Allows you to request individual reports or one report for the entire cycle. The default is COMBINED.

COMBINED One report is produced by combining all data gathered within the specified CYCLE range.

SEPARATE Multiple reports are produced by separating all data gathered within the specified CYCLE range.

Depending upon how your CYCLE range is defined, it can specify multiple subsets of a reporting period. When a CYCLE range consists of multiple subsets and RPTS=SEPARATE is specified, multiple reports are produced, each containing data from a separate subset of the reporting period.

For example, if the DATETIME range defines 1 1/2 months' worth of data (and there is input data available for this period), a CYCLE range defined as DAILY produces one report for each whole or fractional day that falls within the DATETIME range.

Examples

When defined in the general control statement set

```
PERIOD  CYCLE=WEEKLY,RPTS=SEPARATE
```

produces separate reports for each weekly period.

When defined directly after a report control statement in the report control statement set

```
IOQ
PERIOD  CYCLE=DAILY
```

produces an I/O Queuing Activity report for each day's worth of data. This PERIOD statement has no affect on other report control statements defined in the report control statement set.

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PGDDLAY

```
PGDDLAY
[TYPE=({PGROUP|DOMAIN}[,SUMMARY|DETAIL][,DOMAIN|USER])
]
[,PG=ALL|(n1|n:n1,...,n16|n:n16)]
[,DMN1=(n1|n:n1,...,n8|n:n8)]
        .       .
        .       .
        .       .
[,DMN16=(n1|n:n1,...,n8|n:n8)]
[,DMN=ALL|(n1|n:n1,...,n16|n:n16)]
[,PG1=(n1|n:n1,...,n8|n:n8)]
        .       .
        .       .
        .       .
[,PG16=(n1|n:n1,...,n8|n:n8)]
```

Overview

The PGDDLAY control statement requests the Domain Delay Analysis Report discussed in “Domain Delay Analysis Report” on page 3-122.

Note: The Domain Delay Analysis Report is not available in goal mode.

The PGDDLAY Analyzer statement uses data collected by the PGDDLAY Extractor control statement (see “PGDDLAY” on page 1-54).

Parameters

Parameters for the PGDDLAY control statement are

TYPE= Specifies whether to produce a report organized by domain or by performance group.

- **PGROUP** Produces report organized by performance group. This is the default.
- **DOMAIN** Produces report organized by domain. You cannot define the PG=, DMN, or DMN*k* parameters when TYPE=DOMAIN.
- **SUMMARY** A secondary TYPE qualifier that allows you to specify the summary format of the Domain Delay Analysis Report. The summary format displays report data sorted by performance group only for TYPE=PGROUP or by domain only for TYPE=DOMAIN.

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DETAIL A secondary TYPE qualifier that allows you to specify the detail format of the Domain Delay Analysis Report. The detail format displays report data sorted by domain within the performance groups for TYPE=PGROUP or by performance group within domains for TYPE=DOMAIN. This is the default.

USER A tertiary TYPE qualifier that allows you to specify that the calculations are based on the average user.

DOMAIN A tertiary TYPE qualifier that allows you to specify that the calculations are based on the lowest level. This is the default.

Domain- versus User-based Values

Domain-based values are displayed based on the lowest level of the report. Therefore, a Detail report by domain within performance group would have a lowest level of the domain. A Summary report by performance group would have a lowest level of the performance group.

User-based values are displayed based on the average number of users. The type of user included in this average depends on the field being displayed. User-based values do not apply to several fields. These fields are displayed with the same base on both types of reports.

Those fields to which user-based values apply have different titles on the user-based report.

- Titles containing BY USER are by the average number of all users.
- Titles containing BY IDLE USER are by the average number of idle users.
- Titles containing BY ACTIVE USER are by the average number of active users.

PG= This parameter specifies a list of performance groups to be reported or all performance groups. Up to 16 values may be specified or ALL. A value can be a single performance group or a range of performance groups.

To define a range of performance groups, separate the start group value and the end group value with a colon. Performance groups must be specified as decimal values. For example, to define all the performance groups from 1 through 6, specify 1:6 as a value at the PG parameter. A range counts as 1 of the 16 allowable PG parameters that can be specified.

The parameter PG=ALL defines all performance groups. This is the default.

You cannot define this parameter when TYPE=DOMAIN.

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DMN*k*= This parameter is specified only with TYPE=(PGROUP,DETAIL), the default, where *k* is a value of 1 to 16 corresponding to a PG value. The DMN*k* parameter specifies a list of up to 8 domains or domain ranges within the corresponding PG performance group or range of groups to be reported. If DMN*k* is not defined for a specific performance group or range of performance groups, the corresponding value defined at the DMN parameter is used. If DMN does not contain a corresponding value, all domains are reported. The DMN*k* parameter cannot be used with PG=ALL.

DMN= This parameter is specified only with TYPE=DOMAIN. The DMN parameter specifies a list of domains to be reported or ALL domains. Domain ranges or values are specified just as they are for the PG parameter.

PG*k*= This parameter is specified only with TYPE=(DOMAIN,DETAIL), where *k* is a value of 1 to 16 corresponding to a DMN= value. The PG*k* parameter specifies a list of performance groups within the corresponding DMN domains or range of domains to be reported. If PG*k* is not defined for a specific domain or range of domains, the corresponding value defined at the PG parameter is used. If PG does not contain a corresponding value, all performance groups are reported. This parameter cannot be used with DMN=ALL.

Examples

```
PGDDLAY  TYPE=DOMAIN
```

A Domain Delay Analysis Report is produced that is organized by domain.

```
PGDDLAY
```

Generates the Domain Delay Analysis Report by performance group including all performance groups. Data included in the report is based on the PG= values.

```
PGDDLAY TYPE=(DOMAIN,SUMMARY,USER)
```

Generates the Domain Delay Analysis Report by domain, including all domains but no performance groups within the domains. Values displayed are based on user values.

```
PGDDLAY PG=(40:245,782,805),DMN3=(20:50)
```

Generates the Domain Delay Analysis Report by performance group. The performance groups reported are limited to 40 through 245, 782, and 805. The domains displayed for performance group 805 are limited to domains 20 through 50.

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PROTKEY

PROTKEY [CPU={ALL|(0,1,2,...,F)]

Overview

The PROTKEY control statement requests the CPU Utilization by Protect Key Report discussed in “CPU Utilization by Protect Key Report” on page 3-100.

The PROTKEY statement uses data collected by the CPU Extractor control statement (see “CPU” on page 1-14).

Parameters

The parameter for the PROTKEY control statement is

CPU= Specifies the CPU as a hexadecimal value for which protect key information is to be produced. From 1 to 16 CPUs can be specified. The default is ALL.

If more than one CPU is specified, Protect Key reports appear in the order specified in this parameter.

Example

```
PROTKEY   CPU=1
```

Produces a CPU Utilization Report by Protect Key for CPU 1 only.

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PRSM

```
PRSM
[MARKER=>]
[,DETAIL=(NONE,FULL,PHYSPROC,WAITCOMP,
        DISPINTV,STATUS,WEIGHT,LOGPROC)]
[,EMPHASIS={1|2|3|4|5|6|7|8|9|10|11|12|LASER}]
```

Overview

The PRSM Analyzer control statement requests either the Logical Partition Report discussed in “Logical Partition Report” on page 3-158, or the MDF Report discussed in “Multiple Domain Facility (MDF) Report” on page 3-169, depending on the data.

The Logical Partition Report shows the activity of logical partition (LPAR) management time incurred on a Processor Resource/Systems Manager (PR/SM) or a Multiple Logical Processor Facility (MLPF) system. The report also provides special emphasis support for impact printers and laser printer support (for more information, see *CMF MONITOR Batch User Guide*, Chapter 8, “Laser Printer Support”).

The PRSM statement uses data collected by the CPU Extractor control statement (see “CPU” on page 1-14).

Parameters

Parameters for the PRSM Analyzer control statement are

MARKER= Placed to the right of fields to indicate where changes occurred to field values during the display interval. The default marker is > (greater-than sign); however, you can specify any other character as the marker.

DETAIL= Specifies the circumstances under which CMF MONITOR generates a new row of data for the partition or a new iteration of the report. If you select the default NONE, it must be the only value specified. All the other values are field names and you may specify them in any combination.

If a change during the interval triggers more than one row of data for a partition, a subtotal row is generated to summarize the measurements.

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Note: The characters in parentheses are abbreviations for the operands. They can be specified instead of the full operand name.

NONE (N) No partition splitting. This value is the default.

FULL (F) If you request FULL detail, a new report or a new row is generated (depending on the change that occurs) when a change is detected in any one of the six fields described below.

PHYSPROC (P) Partition split on physical processor. If you request DETAIL by physical processor, the report is started again on a new page each time there is a change in the number of physical processors during the display interval.

WAITCOMP (WA) Partition split on wait completion. If you request DETAIL by the wait completion flag, a new row is generated for that partition for each value of the wait completion.

DISPINTV (D) Partition split on dispatch interval. If you request DETAIL by dispatch interval, the report is started again on a new page each time there is a change during the display interval.

STATUS (S) Partition split on status flag. If you request DETAIL by the status flag, a new row is generated for that partition for each different status flag type encountered during the display interval.

WEIGHT (WE) Partition split on weighting factor. If you request DETAIL by the weighting factor, a new row is generated for that partition for each unique weighting factor encountered during the display interval.

LOGPROC (L) Partition split on logical processors. If you request DETAIL by the number of logical processors, a new row is generated for that partition for each logical processor detected during the display interval.

EMPHASIS= Special emphasis field parameter for impact printers and laser printer support. This parameter controls the appearance of special emphasis field output. Acceptable EMPHASIS values are LASER or *n* (a number from 1 to 12). The default value for EMPHASIS is 6.

n Defines the number of times special emphasis fields in this report are overstruck on an impact printer, or eliminates all bold type and special emphasis from this report when produced on a laser printer.

When 1 is selected as the EMPHASIS option, bold or special emphasis is not used in the report and all data is displayed the same for both impact and laser printers. Option 1 is useful if bold type is causing printer delays and does not produce any meaningful clarification of the data.

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Selecting 2 causes the special emphasis fields to appear the same as all bolded fields when printed on an impact printer, because both field types are overstruck twice. This value has no effect on reports printed on a laser printer; bolded and special emphasis fields are produced.

Selecting 3 through 12 causes special emphasis fields to appear different from bolded fields when printed on an impact printer. Special emphasis fields are overstruck the number of times defined; bolded fields are overstruck twice. These values have no effect on reports printed on a laser printer; bolded and special emphasis fields are produced.

LASER Selecting the LASER option causes the report generator to select certain fields for special emphasis.

When LASER is defined as the EMPHASIS value, no characters are overstruck, so this value should not be used when printing on an impact printer.

Note: If LASER is selected, the //SYSPRINT DD general control statement must contain the OPTCD=J parameter. In addition, the CHARS=(*font*1,...,*font*4) operand must be defined by one of the following methods:

//SYSPRINT DD statement
OUTPUT statement
As a system default

For more information, see *CMF MONITOR Batch User Guide*, Chapter 8, “Laser Printer Support”.

Examples

These examples show what reports are generated given the parameters you specify in the control statement.

```
PRSM
```

Produces the Logical Partition Report. No separation is performed for changed values.

```
PRSM  MARKER=*,DETAIL=(P,D)
```

Produces a report that generates a new report for each combination of changes (identified with an *) in either the physical processor or the dispatch interval.

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RECTYPE

RECTYPE [*xxx*|240]
[,MONITOR={CPM|IPM|RMF}]
[,STOPAFT={EOF|DATETIME}]

Overview

The RECTYPE control statement specifies the characteristics of the Extractor data set to be read.

Parameters

Parameters for the RECTYPE control statement are

xxx Specifies a number from 128 through 255. This number should be the same as the SMFRECID parameter value specified for the Extractor on the REPORT control statement. The default is 240.

MONITOR= Specifies the monitoring mode used to produce data for the Analyzer run. Only data from the specified monitoring mode is used. (Since CPM and IPM can run concurrently in the Extractor, statistics might overlap and produce erroneous results if the data were analyzed together.) The default is CPM.

- **CPM:** Indicates that the Analyzer will process data that was produced by the Extractor Continuous Performance Monitoring mode.
- **IPM**: Indicates that the Analyzer will process data that was produced by the Extractor Intermittent Performance Monitoring mode.
- **RMF**: Indicates that the Analyzer will process data that was produced by the RMF monitor only. When using this option, some reports are incomplete because RMF does not provide the additional data that CMF MONITOR produces in its user records.

STOPAFT= Specifies when the Analyzer stops reading input data. EOF is the default.

- **EOF** The Analyzer stops reading input at the end of the file.
- **DATETIME** The Analyzer stops reading input at the end of the time range specified in the DATETIME statement. If the input is out of time sequence, this parameter (STOPAFT=DATETIME) causes a portion of the data in the DATETIME range to be ignored.

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A DATETIME control statement must be defined to use STOPAFT=DATETIME parameter; otherwise, STOPAFT=EOF is assumed.

Example

```
RECTYPE   128,MONITOR=IPM,STOPAFT=DATETIME
```

Specifies that data to be processed by the Analyzer is CMF MONITOR data extracted in IPM mode and CMF MONITOR user records with an SMF ID of 128. The Analyzer will stop reading records for the reports at the end of the DATETIME range.

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REPORTS

REPORTS RPTGROUP=(*a*[,*b*[,*c*[,*d*]]])
[,DDGROUP=*e* [,SYSOUT=*class*]]

Overview

The REPORTS control statement specifies how reports are to be grouped, whether separate DDs are to be used, and what SYSOUT Class to use. For example, all reports for a system can be grouped together, or all reports requested by a report control statement (such as Performance Summary) can be grouped together. Reports can also be sent to separate DD statements for ease of distribution.

There can be only one REPORTS statement, and it must appear in the general control statement set.

Parameters

Parameters of the REPORTS control statement are

RPTGROUP= Up to four levels of grouping may be specified in any order without repetitions. Possible selections are

- **SYSTEM** Reports are grouped by System. The ID used for this determination are specified on the TYPE parameter of the SYSPLEX control card.
- **RPTSTMT** Reports are grouped by Report Control Statement.
- **CYCLE** Reports are grouped by Cycle.
- **SHIFT** Reports are grouped by Shift.

DDGROUP= Specifies the level at which reports are written to separate DD statements. The DDGROUP operand must also be specified as one of the RPTGROUP operands.

When a report is produced that is different at the DDGROUP level from the previous report, a new DD is created for the new report.

If DDGROUP is not specified, reports are written to SYSPRINT.

SYSOUT= Specifies the SYSOUT Class to which reports are written if DDGROUP is specified. The default class is the same as MSGCLASS.

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Examples

The following examples illustrate the use of the REPORTS control statement:

```
REPORTS RPTGROUP=(SYSTEM,RPTNAME,CYCLE,SHIFT)
```

This example shows the default. It groups reports by System, and then Report Control Statement, and then Cycle, and finally Shift. All reports are written to the SYSPRINT DD.

```
SYSPLEX TYPE=SYSNAME,RPTS=SEPARATE
REPORTS RPTGROUP=(SYSTEM),DDGROUP=SYSTEM
```

Groups reports by SYSTEM and generates DDNames based on SYSNAME.

```
SYSPLEX RPTS=COMBINED
REPORTS RPTGROUP=(SYSTEM),DDGROUP=SYSTEM
```

Groups reports together (because of RPTS=COMBINED) and generates a DDName of CMFR0001.

```
REPORTS RPTGROUP=(RPTSTMT),DDGROUP=RPTSTMT,SYSOUT=F
```

Groups reports by Report Control Statement, writes each report to a separate DD, assigned to SYSOUT Class F.

```
REPORTS RPTGROUP=(SYSTEM,SHIFT),DDGROUP=SHIFT
```

Groups reports by System and then Shift, and writes each System/Shift combination to a separate DD with names of CMFR*nnnnn* assigned to the same SYSOUT class as MSGCLASS.

For the following examples, assume that there are two systems: SYSA and SYSB.

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Example 1:

```
SYSPLEX SUBPLEX=*,RPTS=SEPARATE
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(SYSTEM,SHIFT,RPTSTMT)
PERFSUM
TSOUSER
```

DDName	System	Shift	Report
SYSPRINT	SYSA	00:00-08:00	PERFSUM
SYSPRINT	SYSA	00:00-08:00	TSOUSER
SYSPRINT	SYSA	08:00-16:00	PERFSUM
SYSPRINT	SYSA	08:00-16:00	TSOUSER
SYSPRINT	SYSB	00:00-08:00	PERFSUM
SYSPRINT	SYSB	00:00-08:00	TSOUSER
SYSPRINT	SYSB	08:00-16:00	PERFSUM
SYSPRINT	SYSB	08:00-16:00	TSOUSER

Example 2:

```
SYSPLEX SUBPLEX=*,RPTS=SEPARATE
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(SYSTEM,SHIFT,RPTSTMT),
DDGROUP=SYSTEM PERFSUM TSOUSER
```

DDName	System	Shift	Report
SYSA	SYSA	00:00-08:00	PERFSUM
SYSA	SYSA	00:00-08:00	TSOUSER
SYSA	SYSA	08:00-16:00	PERFSUM
SYSA	SYSA	08:00-16:00	TSOUSER
SYSB	SYSB	00:00-08:00	PERFSUM
SYSB	SYSB	00:00-08:00	TSOUSER
SYSB	SYSB	08:00-16:00	PERFSUM
SYSB	SYSB	08:00-16:00	TSOUSER

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Example 3:

```
SYSPLEX SUBPLEX=*,RPTS=SEPARATE
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(SYSTEM,SHIFT,RPTSTMT),
DDGROUP=SHIFT PERFSUM TSOUSER
```

DDName	System	Shift	Report
CMFR0001	SYSA	00:00-08:00	PERFSUM
CMFR0001	SYSA	00:00-08:00	TSOUSER
CMFR0002	SYSA	08:00-16:00	PERFSUM
CMFR0002	SYSA	08:00-16:00	TSOUSER
CMFR0003	SYSB	00:00-08:00	PERFSUM
CMFR0003	SYSB	00:00-08:00	TSOUSER
CMFR0004	SYSB	08:00-16:00	PERFSUM
CMFR0004	SYSB	08:00-16:00	TSOUSER

Example 4:

```
SYSPLEX SUBPLEX=*,RPTS=SEPARATE
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(RPTSTMT,SYSTEM,SHIFT),DDGROUP=RPTSTMT
PERFSUM TSOUSER
```

DDName	System	Shift	Report
PERFSUM	SYSA	00:00-08:00	PERFSUM
PERFSUM	SYSA	08:00-16:00	PERFSUM
PERFSUM	SYSB	00:00-08:00	PERFSUM
PERFSUM	SYSB	08:00-16:00	PERFSUM
TSOUSER	SYSA	00:00-08:00	TSOUSER
TSOUSER	SYSA	08:00-16:00	TSOUSER
TSOUSER	SYSB	00:00-08:00	TSOUSER
TSOUSER	SYSB	08:00-16:00	TSOUSER

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Example 5:

```
SYSPLEX SUBPLEX=*,RPTS=COMBINED
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(SYSTEM,SHIFT,RPTSTMT),
DDGROUP=SYSTEM PERFSUM TSOUSER CFACT
```

DDName	System	Shift	Report
CMFR0001	**ALL**	00:00-08:00	PERFSUM
CMFR0001	**ALL**	00:00-08:00	TSOUSER
CMFR0001	**ALL**	00:00-08:00	CFACT
CMFR0001	**ALL**	08:00-16:00	PERFSUM
CMFR0001	**ALL**	08:00-16:00	TSOUSER
CMFR0001	**ALL**	08:00-16:00	CFACT

Example 6:

```
SYSPLEX SUBPLEX=*,RPTS=COMBINED
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(SHIFT,RPTSTMT),DDGROUP=SHIFT
PERFSUM TSOUSER CFACT
```

DDName	System	Shift	Report
CMFR0001	**ALL**	00:00-08:00	PERFSUM
CMFR0001	**ALL**	00:00-08:00	TSOUSER
CMFR0001	**ALL**	00:00-08:00	CFACT
CMFR0002	**ALL**	08:00-16:00	PERFSUM
CMFR0002	**ALL**	08:00-16:00	TSOUSER
CMFR0002	**ALL**	08:00-16:00	CFACT

Example 7:

```
SYSPLEX SUBPLEX=*,RPTS=COMBINED
SHIFT DINTV=(000000,2,080000),RPTS=SEPARATE
REPORTS RPTGROUP=(RPTSTMT,SYSTEM,SHIFT),DDGROUP=RPTSTMT
PERFSUM TSOUSER CFACT
```

DDName	System	Shift	Report
PERFSUM	**ALL**	00:00-08:00	PERFSUM
PERFSUM	**ALL**	08:00-16:00	PERFSUM
TSOUSER	**ALL**	00:00-08:00	TSOUSER
TSOUSER	**ALL**	08:00-16:00	TSOUSER
CFACT	**ALL**	00:00-08:00	CFACT
CFACT	**ALL**	08:00-16:00	CFACT

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SEVERITY

SEVERITY *nnn*

Overview

The SEVERITY control statement specifies the maximum error severity that can be encountered for processing to continue. If the severity of an error exceeds the value defined in the SEVERITY control statement, the Analyzer terminates processing. If the error severity is equal to or less than the value defined in this statement, processing continues.

Note: If the SEVERITY statement is defined with an error value greater than 4, results can be unpredictable.

If the SEVERITY statement is omitted, the default of severity 0 (zero) is used, and processing terminates if any errors are encountered.

The severity codes associated with each command error are described in “To access the Messages & Codes application from any CMF MONITOR panel, type MSG on the COMMAND line.” (see page -xix).

Parameters

The parameter for the SEVERITY control statement is

nnn Specifies a number from zero to 255 as the maximum error severity value. The default is zero.

Example

```
SEVERITY  4
```

Processing continues if a control statement error of 4 or less is encountered.

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SHARDEV

```
SHARDEV
[TYPE=(BOTH|DASD|TAPE)]
[,RANGE=(deva,devb,...devn)]
[,RANGE=(deva:devn)]
[,OFFLINE=(NO|YES)]
```

Overview

The SHARDEV control statement requests the Shared Device Activity Report.

The Shared Device Activity Report requires data from multiple MVS systems. To collect synchronous data from all systems sharing devices, BMC Software recommends using the SYNCH=SMF parameter of the Extractor REPORT control statement.

The SHARDEV statement uses data collected by the DEVICE Extractor control statement.

Notes:

- To specify which systems on which devices are shared, you must include the SYSPLEX control statement with RPTS=COMBINED. Issuing the SHARDEV control statement without the controlling SYSPLEX statement results in an error message.
- To produce interval type reports, you must specify each interval to be reported using the *startshif, endshift* time pairs on the SHIFT control statement. You may not specify RPTS=INTERVAL on the SHIFT statement.
- To match the logical device on various systems to a physical device, the Analyzer attempts to match devices using the 28-byte device ID, which is returned from self-describing devices. If the device ID contains only zeros, DASD devices are matched using the volume serial number and tape devices are matched using the device address. If a device cannot be matched using any of these criteria, it does not appear in the report.
- BMC Software recommends that you use the DATETIME statement to generate a more meaningful report. Without this statement, all records are accepted from each system, regardless of their date/time, which may result in a report that contains many hours or days of data from one system and only a few minutes of data from another system.

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Parameters

Parameters for the SHARDEV control statement are

TYPE= Specifies whether DASD, tape, or both DASD and tape devices should be included in the report. The default is BOTH.

RANGE= Specifies which devices are reported. You may specify either the device address or a range of device addresses on this parameter. The report contains a detail line for each system that shared the device during the reporting interval. Up to 16 devices or ranges of devices may be specified.

If the RANGE parameter is not specified, all shared devices are reported.

OFFLINE= Specifies whether offline devices should be included in the report. The default is OFFLINE=YES.

Examples

```
SYSPLEX SUBPLEX=*, RPTS=COMBINED
SHARDEV
```

Produces a Shared Device Activity Report that lists all DASD and tape devices shared between all systems.

```
SYSPLEX SUBPLEX=*, RPTS=COMBINED
SHARDEV RANGE=(2140,2145)
```

Produces a Shared Device Activity report for the two devices at addresses 2140 and 2145.

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SHIFT

SHIFT
[DINTV=(*starttime*,*intervals*,*duration*)]
[(*startshift*,*endshift1*)1[,...,(*startshift*,*endshift*)96]|
(080000,160000),(160000,240000),(000000,080000)]
[,TYPE={GLOBAL|LOCAL}]
[,DAYS={ALL|(MON|TUE|WED|THU|FRI|SAT|SUN)}]
[,RPTS={SEPARATE|COMBINED|INTERVAL|DAILY}]
[,UNIT=*unittype*]

Overview

The SHIFT control statement specifies data selection intervals by time of day and day of the week. For example, a single invocation of this command can produce CMF MONITOR reports for system activity during prime, swing, and graveyard shifts.

The SHIFT statement can appear in the general control statement set, the report control statement set, or both sets. In the general control statements, SHIFT defines the collection start and end times used to produce all the reports requested in the report control statements. A SHIFT statement for an individual report request overrides a global SHIFT statement for that one report request only.

The SHIFT statement can be used with the DATETIME, CYCLE, and PERIOD statements to produce monthly reports and basic history database trends.

Parameters

Parameters for the SHIFT control statement are

DINTV= Allows you to generate up to 96 *startshift, endshift* pairs by specifying a start time, number of intervals, and a duration for data that is to be included in a report. This parameter specifies that reports be created from data obtained during multiple, evenly-spaced, sequential intervals. These three fields are all required and commas must separate the three values.

starttime Contains the time you want the first interval to begin. This field must be specified in time format hhmmss.

intervals Specifies the number of time pairs to be generated. This field must be specified as a number from 1 to 96.

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duration Specifies how long the interval lasts. This field must be specified in the format *hhmmss.*

Notes:

— Use of the DINTV parameter or manually coded *startshift, endshift* pairs increases the storage requirements for the Analyzer. (See *CMF MONITOR Batch User Guide*, Chapter 4, "Setting Values of Region, DMSS Reserve, and CTRLSIZE" for an explanation of Analyzer storage requirements.)

— While multiple *startshift, endshift* pairs may be used to specify any combination of report collection intervals, using the DINTV parameter eliminates the need to specify multiple *startshift, endshift* pairs when data from evenly-spaced sequential intervals is required.

— Specifying both the DINTV parameter and one or more *startshift, endshift* pairs results in an error message.

(startshift,endshift) Specifies a time-pair range that is equivalent to the duration of a shift. These variables are expressed in the time format *hhmmss.* Up to 96 different shift ranges can be specified in one SHIFT statement; the ranges must be separated by commas and enclosed within parentheses. Data is included in a report if its recording time is equal to or greater than the *startshift* value and less than the *endshift* value.

CMF MONITOR does not check to ensure that the time pairs specified correspond to default or actual shift periods. When time ranges are specified, they should not overlap. If they do and if RPTS=SEPARATE is specified, some data is used in more than one report shift.

If time-pair ranges are not specified, three default time pairs are used. The default is

(080000,160000)8:00 A.M. to 4:00 P.M., corresponding to shift 1.

(160000,240000)4:00 P.M. to 12:00 A.M. (midnight), corresponding to shift 2.

(000000,080000)12:00 A.M. (midnight) to 8:00 A.M., corresponding to shift 3.

Note: The default for RPTS=DAILY is no SHIFT ranges. Time-pair ranges are mutually exclusive with RPTS=INTERVAL.

TYPE= Defines how the SHIFT statement is used. The default is GLOBAL.

GLOBAL Valid in either the general or the report statement set. Defines the shift characteristics for all report requests that follow it, except single report requests associated with LOCAL SHIFT statements.

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If multiple GLOBAL SHIFT statements are used, each succeeding GLOBAL statement establishes new shift characteristics for the following report requests. GLOBAL is the default.

LOCAL Valid only in the report statement set. The LOCAL SHIFT statement defines the shift characteristics for the report request that immediately precedes it. A LOCAL SHIFT statement overrides any GLOBAL SHIFT statement, but only for that one report.

DAYS= Limits the scope of the input data by specifying from 1 to 7 days of the week. The days can be listed individually or collectively by using the parameter values shown in Table 2-12. The default is ALL, except when RPTS=INTERVAL and RPTS=DAILY, because these parameters are mutually exclusive with DAYS=ALL.

Table 2-12 Parameter Values for DAYS

Parameter Value	Abbreviations	Synonym (if applicable)
MONDAY	MON or MO	—
TUESDAY	TUE or TU	—
WEDNESDAY	WED or WE	—
THURSDAY	THU or TH	—
FRIDAY	FRI or FR	—
SATURDAY	SAT or SA	—
SUNDAY	SUN or SU	—
WEEKLY	None	ALL or (SU,MO,TU, WE,TH,FR,SA)
WORKWEEK	None	(MO,TU,WE,TH,FR)
WEEKENDS	None	(SA,SU)
ALL	None	WEEKLY or (SU,MO,TU,WE,TH, FR,SA)

RPTS= Requests one report for the entire SHIFT definition set or individual reports for each time pair used to define the shift. The default is SEPARATE.

SEPARATE One report is produced for each time pair of the corresponding SHIFT statement.

COMBINED One combined report is produced for all data gathered within the time ranges specified in the corresponding SHIFT statement.

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INTERVAL A complete set of reports is produced for each recording interval. Reasonable limitations should be exercised with this parameter, since it may produce a large volume of output, which uses more memory and requires a larger DMSSMAIN data set or greater use of hiperspace.

Warning! All other SHIFT statements are ignored if this parameter is used anywhere in the control statement set.

When using the INTERVAL value, only one Control Card Log is printed to the //CMFLOG DD data set, and no Collection Phase Log reports are printed. Data from multiple images must not be merged, and the records must be sorted by date and time.

Note: This parameter does not function when the WKLDCHAR report control statement is specified or when RPTS=COMBINED is specified on the SYSPLEX control statement.

DAILY A complete set of reports is produced for each day where there is data in the input stream defined by the //EXTDATA DD statement.

Warning! All other SHIFT statements are ignored if this parameter is used anywhere in the control statement set.

When using the DAILY value, only one Control Card Log is printed to the //CMFLOG DD data set, and no Collection Phase Log reports are printed. Data from multiple images must not be merged, and the records must be sorted by date and time.

Note: This parameter does not function when RPTS=COMBINED is specified on the SYSPLEX control statement.

UNIT= Defines a valid unit type for a temporary data set that is allocated when the RPTS=INTERVAL or RPTS=DAILY parameter is specified. For these RPTS= values, a temporary staging data set can be required and, if required, is dynamically allocated. It is possible that the default unit for your system does not allow the dynamic allocation of this data set. The UNIT value allows you to specify a valid unit type for this data set; for example, UNIT=SYSDA.

If your system still does not allow the dynamic allocation of the temporary staging data set after specifying the UNIT parameter, define //CMFSTAGE DD and //CMFSTAGO DD statements to your Analyzer JCL (see *CMF MONITOR Batch User Guide*, Chapter 4, “JCL Control Statements for the CMF MONITOR Analyzer”.

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Examples

These examples illustrate the use of the SHIFT control statement in the general control statement set:

```
SHIFT
```

All defaults are in effect. This statement is equivalent to specifying:

```
SHIFT (080000,160000),(160000,240000),(000000,080000),
       TYPE=GLOBAL,DAYS=ALL,RPTS=SEPARATE
```

Regardless of the number of days encountered in the data set, three reports are generated for each report request, based on the default time pairs. The reports reflect an average profile of each shift time-pair range.

```
SHIFT  DAYS=MO
```

All defaults are in effect except DAYS. All Extractor data in the data set with a date of Monday is included for all report requests; all other days are excluded. The reports reflect a profile of an average Monday by each of the default shift time-pair ranges. If there is more than one Monday in the input data, a separate report is produced for each shift of each Monday.

```
SHIFT  DAYS=(MO,WE,FR),RPTS=COMBINED
```

All defaults are in effect except DAYS and RPTS. Data for Mondays, Wednesdays, and Fridays is collected into one report for each default shift time-pair range. Then all data collected under the default shift time-pair ranges is reported as a combined data group for all report requests. The result is one report for each report request containing data for Mondays, Wednesdays, and Fridays.

```
SHIFT  (100000,120000),(140000,160000)
```

All defaults are in effect except the shift time-pair ranges. Two reports for each report request are created. This feature can be used to break a shift into smaller reporting periods. Up to 96 ranges can be specified per SHIFT command, either as LOCAL shifts or multiple GLOBAL shifts.

```
SHIFT  DINTV=(080000,32,001500)
```

All defaults are in effect except the shift time-pair ranges. For each report request, 32 reports are created. The first report contains data collected during a 15-minute interval beginning at 8:00 A.M. (from 8:00 to 8:15), the second report contains data collected from 8:15 A.M. to 8:30 A.M., and so on.

The following examples illustrate the use of the SHIFT control statement in the report control statement set:

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```
SHIFT  (080000,120000),(130000,170000),RPTS=COMBINED
CPU
CPUCHAN
DEVACT
SHIFT (000000,060000),(160000,220000),
       TYPE=GLOBAL,DAYS=WORKWEEK
PERFSUM
SRM
DASD
```

The second SHIFT statement that is displayed in this example is designated as TYPE=GLOBAL, redefining the shift characteristics for the report requests that follow.

The CPU, CPUCHAN, and DEVACT report requests that precede the SHIFT TYPE=GLOBAL statement conform to the shift characteristics set by the first SHIFT statement in the control statement set.

```
IOQ
SHIFT TYPE=LOCAL
```

All defaults are in effect except TYPE. Because LOCAL is specified, this SHIFT statement applies only to the I/O Queuing Activity report request. Three I/O Queuing Activity reports are generated, one for each of the default time-pair ranges.

```
WORKLOAD TYPE=SUMMARY
SHIFT TYPE=LOCAL,DAYS=WEEKENDS
```

All defaults are in effect except TYPE and DAYS. Because LOCAL is specified, this SHIFT statement applies only to the WORKLOAD report request. All workload summary-type data with a date of Saturday and Sunday is included in the Workload Summary report; all data from other days is excluded. Three reports are produced, one for each default time-pair range. Each report reflects an average profile for that shift for an average Saturday and Sunday.

The SHIFT statement can be used with the DATETIME, CYCLE, and PERIOD statements to produce monthly performance evaluation reports; for example:

```
DATETIME (1MAR03:000000,31MAR03:235959)
CYCLE    DAILY
PERIOD   CYCLE=DAILY,
         RPTS=SEPARATE
SHIFT    (080000,163000)
DMSS     INIT,
         RESERVE=400
RECTYPE  240,
         MONITOR=CPM
```

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```
CPU
LGLCHAN
LCU
AUXSTOR
REALSTOR
PERFSUM
.
.
.
```

This request produces reports for each prime shift (8:00 A.M. to 4:30 P.M.) for each day in March 2003. Thirty-one sets of reports are produced.

The SHIFT statement can be used with DATETIME, CYCLE, and PERIOD to produce historical trend data for performance evaluation reporting; for example:

```
DATETIME (1JAN03:000000,31MAR03:235959)
CYCLE    WEEKLY
PERIOD   CYCLE=WEEKLY,
         RPTS=SEPARATE
SHIFT    (080000,163000),
         DAYS=(MO,WE,FR)
DMSS     INIT,
         RESERVE=400
RECTYPE  240,
         MONITOR=CPM
CPU
TSOPERF
SRM
PERFSUM
WORKLOAD
.
.
.
```

This request produces 14 sets of reports, for the first 13 weeks of 2003 and one for the last 6 days of March. Each week comprises data collected from Monday, Wednesday, and Friday between 0800 and 1630.

Average profiling of a day, week, and weekend can be accomplished using Tabular Summary reports. The PROFILE parameter on the GRAPH command statement enables graphic measures to be represented in a profile manner similar to the Tabular reports.

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SRM

SRM

Overview

The SRM control statement requests the System Resources Manager Report discussed in “System Resources Manager Report” on page 3-201.

The SRM statement uses data collected by the following Extractor control statements:

- CPU (see “CPU” on page 1-14)
- PAGING (see “PAGING” on page 1-52)

Parameters

This statement has no parameters.

Example

```
SRM
```

Produces the System Resource Manager Reports.

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STORAGE

STORAGE

Overview

The STORAGE control statement requests the Storage Management Report discussed in “Storage Management Report” on page 3-195.

The STORAGE statement uses data collected by the PAGING Extractor control statement (see “PAGING” on page 1-52).

Parameters

This statement has no parameters.

Example

```
STORAGE
```

Produces the Storage Management Report.

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SUBTITLE

SUBTITLE '*text*'

Overview

The SUBTITLE control statement specifies a text string to be printed on the fourth line of the requested report. This text string can also appear under the SUBTITLE column in the Report Table of Contents. The text string is used as a unique identifier when several similar reports are requested. The SUBTITLE control statement must follow the report control statement for the report to be subtitled.

Parameters

There is one parameter for this control statement.

'*text*' The *'text'* is a quoted character string up to 52 characters long, excluding outside delimiting apostrophes. If the string contains no blank spaces and consists only of alphabetic and numeric characters, the enclosing apostrophes can be omitted.

Examples

```
IOQ
SUBTITLE   'SUMMARY REPORT'
```

One I/O Queuing Activity Report is produced for the entire reporting period and a subtitle SUMMARY REPORT is printed on the fourth line of the report header.

```
IOQ
SUBTITLE  'DAILY REPORT'
SHIFT      RPTS=DAILY,TYPE=GLOBAL
```

Multiple I/O Queuing Activity Reports are produced, one for each whole or partial day within the reporting period, and the subtitle DAILY REPORT is printed on the fourth line of the report header.

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SYSPLEX

```
SYSPLEX
[RPTS={COMBINED|SEPARATE}]
[,SUBPLEX={(*|sysname1[,...,sysnamen])}]
[,TYPE={SYSID|SYSNAME}]
[,INPUT={(dd1[,...,ddn])}]
```

Overview

With SYSPLEX, you select the data that is used in generating Analyzer reports. Data selection is based on SYSNAME or SYSID, and on DDNAME.

Parameters

Parameters for the SYSPLEX control statement are

RPTS= Specifies whether the data collected is combined into one report per group of SYSNAMEs, or is divided into separate reports for each SYSNAME. The default is SEPARATE.

Warning! When using RPTS=COMBINED, BMC Software recommends that data from each MVS image covers identical date and time ranges. Averages are calculated based on the duration time of the data rather than the number of systems.

SUBPLEX= Specifies a list of SYSNAMEs that are used in selecting records for reporting. You may specify up to 128 SYSNAMEs. The default is SUBPLEX=*, which specifies that records from all SYSNAMEs or SYSIDs (depending on what you specify in the TYPE parameter) found in the input data are accepted.

TYPE= Specifies whether the names used in the SUBPLEX parameter are SYSNAMEs or SYSIDs. The default is SYSNAME.

INPUT= Specifies a list of DDNAMEs that are read. You may specify up to 128 DDNAMEs, which are read in the order in which they are specified. The default is the same data sets specified by //EXTDATA in the Analyzer JCL (see *CMF MONITOR Batch User Guide*, Chapter 4, “Defining Analyzer JCL Manually” for more information).

Note: If you want to use data from the XDS data server for your reports, this parameter must be omitted.

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Examples

```
SYSPLEX
```

Specifies that separate reports are produced for each SYSNAME, reading every data set specified by //EXTDATA in the Analyzer JCL.

```
SYSPLEX RPTS=COMBINED
```

Specifies that a single report is produced, combining all SYSNAMEs, reading every data set specified by //EXTDATA in the Analyzer JCL.

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TRACE

```
TRACE
[ID={ALL|(0,1,2,...,99)}]
[,MODE={SRB|SRM}]
[,LIMIT=0|nnnn]
[,START=(yyddd:hhmmss)]
[,STOP=(yyddd:hhmmss)]
```

Overview

The TRACE control statement produces the Trace Report shown in Figure 3-71 on page 3-218. This statement causes the data in the trace records generated by the Extractor to be formatted. The trace formatter differs in architecture from other Analyzer reporters in that the trace formatter does not have a data collection phase. The trace records are formatted and written out as they are read. For this reason, a separate DCB is used to produce the Trace Report. The ddname for this DCB is allocated dynamically by the Analyzer, unless the optional DD statement, //CMXTRACE, is used to direct the output from the Trace Report.

The TITLE and LOCATION parameters from the HEADERS general control statement are not reproduced on the Trace Report. If a SUBTITLE statement is defined, it is displayed on the Trace Report.

Note: Records must be sorted by date and time when using the TRACE statement.

The TRACE statement uses data collected by the TRACE Extractor control statement (see “TRACE” on page 1-65).

Parameters

Parameters for the TRACE control statement are

ID= Specifies IDs for which the trace data is to be formatted; 0 through 99 and ALL are valid ID values. The default is ALL. If ALL is defined, all encountered trace IDs are formatted.

If you specify a value for this parameter, the corresponding values must be specified in the TRACE Extractor control statement.

MODE= Specifies one of two types of trace entries to be formatted: SRB or SRM. If no mode is specified, all modes are formatted.

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LIMIT= Limits the number of entries to be processed. Any value from 0 through 9999 is valid. The default is 0. If 0 is defined, all entries encountered are formatted.

START= Specifies the starting date and time for selecting trace records. If not specified, selection begins with the first trace record encountered. The starting date and time is defined in the same manner as the start date-time value for the DATETIME control statement (see “DATETIME” on page 2-40 for more information).

STOP= Specifies the ending date and time for selecting trace records. If not specified, selection terminates with the last trace record encountered. The ending date and time is defined in the same manner as the end date-time value for the DATETIME control statement (see “DATETIME” on page 2-40 for more information).

Note: The DATETIME control statement affects the TRACE statement, but TRACE ignores all CYCLE, PERIOD, and SHIFT control statements. Data in the Trace Report is limited by the ranges defined in the DATETIME control statement, and in the START and STOP parameters of the TRACE control statement.

Examples

```
TRACE
```

Produces the Trace report with all defaults in effect. These defaults are all modes and all IDs for the Analyzer date-time range, with no limit on the number of entries to be formatted.

```
TRACE  ID=(0,8,9),MODE=SRM,LIMIT=5000,START=(02145:113000),
       STOP=02145:143000
```

Produces the Trace Report for only SRM-type entries with IDs of 0, 8, and 9. Only the first 5000 entries are formatted. Record selection begins at 1130 hours on May 25, 2003, and ends at 1430 hours on May 25, 2003.

```
TRACE  ID=ALL,MODE=SRB
```

Produces the Trace Report for only SRB-type entries. All IDs are formatted.

```
TRACE  LIMIT=100,MODE=SRM,ID=0
```

Produces the Trace Report for only SRM-type entries. Only ID 0 is selected and only the first 100 entries are formatted.

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TSOPERF

```
TSOPERF
[TYPE={COMMAND|CMD|INTERVAL|INT|ALL}]
[,PLOT={RESPONSE|RSP|TSO}]
[,LIMIT={32|nn}]
[,SCALE={999|nnn}]
[,DARK={NO|YES}]
```

Overview

The TSOPERF control statement requests two reports.

- TSO Command Summary Report discussed in “TSO Command Summary Report” on page 3-220.
- TSO Interval Summary Report discussed in “TSO Interval Summary Report” on page 3-222.

The data for both of these reports is gathered by using the Extractor TSODATA control statement (see “TSODATA” on page 1-74). The TSODATA statement contains a LIMIT parameter that affects data extraction, which can also affect the information available for this report.

The TSOPERF statement uses data collected by the following Extractor control statements:

- CPU (see “CPU” on page 1-14)
- TSODATA (see “TSODATA” on page 1-74)

Parameters

Parameters for the TSOPERF control statement are

TYPE= Specifies which of the two report formats is to be produced. The default is ALL.

COMMAND Produces the Command Summary report; it can be abbreviated CMD.

INTERVAL Produces the Interval Summary report; it can be abbreviated INT.

ALL Produces both the Command and the Interval Summary reports.

PLOT= Identifies which of two variables reported in the Interval Summary report is to be plotted. The default is RESPONSE.

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RESPONSE Plots the average response time for the interval; it can be abbreviated RSP.

TSO Plots the average CPU busy percent.

LIMIT= Limits the number of TSO commands that are reported. If 999 is specified, all TSO commands are reported. If a value less than 999 is specified, it defines the maximum number of TSO commands that can be reported. TSO commands are selected for the report by order of usage until the LIMIT value is reached. If TYPE=INT is specified, LIMIT is ignored. The default is 32.

SCALE= Specifies the scaling value to be used on the response plot for the Command Summary report. The range of values is from 1 to 999. The default is 999: the maximum response time is used for the scale. If TYPE=INT is specified, SCALE is ignored.

DARK= Specifies whether the average bar line on the plots is to be overstruck. Overstriking the print line highlights the average line. The default is NO.

Examples

```
TSOPERF
```

Produces both the TSO Command Summary and the TSO Interval Summary Reports, showing the average response times of the 32 most-used commands. For the TSO Command Summary Report, the default scaling value is used to plot the maximum response times.

```
TSOPERF  TYPE=CMD,LIMIT=25,SCALE=10
```

Produces a TSO Command Summary Report showing the average response times of the 25 most-used commands, using a scaling value of 10.

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TSOUSER

TSOUSER
[LIMIT={32|*nn*}]

Overview

The TSOUSER control statement requests the TSO User Summary Report discussed in "TSO User Summary Report" on page 3-224. The report data includes only those active TSO users that were sampled. The most-active users are the ones with the greatest total service units.

The TSOUSER statement uses data collected by the TSODATA Extractor control statement, when USERS=YES is defined (see "TSODATA" on page 1-74).

Parameters

The parameter for the TSOUSER control statement is

LIMIT= Limits the number of TSO users that are reported. If 999 is specified, all TSO users are reported. However, if a number less than 999 is specified, it defines the maximum number of TSO users that can be reported. TSO users are selected for the report by order of activity until LIMIT value is reached. The default is 32.

Examples

```
TSOUSER
```

Produces a TSO User Summary Report showing the activity data of the 32 most-active users who were sampled.

```
TSOUSER  LIMIT=999
```

Produces a TSO User Summary Report showing TSO activity for all users sampled.

```
TSOUSER  LIMIT=5
```

Produces a report showing activity for only the five most-active users who were sampled.

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VIRTSTOR

VIRTSTOR
[MAP={YES|NO}]
[,DETAIL={YES|NO}]
[,JOBNAME=(*job*1,...,*job*25)]

Overview

The VIRTSTOR control statement requests the Virtual Storage Activity Report discussed in “Virtual Storage Activity Report” on page 3-226.

The VIRTSTOR statement uses data collected by the VSMDATA Extractor control statement (see “VSMDATA” on page 1-79).

Parameters

Parameters for the VIRTSTOR control statement are

MAP= Specifies whether to generate the Virtual Storage Map. The default is YES; the Virtual Storage Map is generated.

DETAIL= Specifies whether to produce summary or detail reports. The detail report for common area data includes a breakdown of SQA by subpool and CSA by subpool and storage key. The detail report for private area data includes a breakdown of the private area data by subpool. The default is NO; only summary reports are produced.

JOBNAME= Specifies the jobname for which reports are to be produced. The default is to produce a report for every job for which data is encountered. Specifying jobnames in this field limits reporting to the specified job. To report on all jobs (the default), omit the JOBNAME parameter or leave it blank.

Note: If JOBNAME=ALL is specified, the Analyzer tries to print a report for a job named ALL and will suppress reporting for any other jobs.
Private area data is available for this report only for the job names specified on the VSMDATA sampler. If no job names are specified for the Extractor control statement, no private area data is available for this report (see “VSMDATA” on page 1-79 for more information).

Examples

```
VIRTSTOR
```

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Produces the Virtual Storage Map, Common Storage Summary Reports, and summary reports for all jobs sampled.

```
VIRTSTOR MAP=NO,DETAIL=YES
```

Produces the Common Storage Summary and Detail Reports, and summary and detail reports for all jobs sampled.

```
VIRTSTOR DETAIL=YES,JOBNAME=(CICSPROD)
```

Produces the Virtual Storage Map, Common Storage Summary and Detail Reports, and the Private Area Summary and Detail Reports for job CICSPROD.

```
VIRTSTOR JOBNAME=(########)
```

Produces the Virtual Storage Map and Common Storage Summary Report. Because ######## is not a valid jobname, private area reports are not produced.

Note: Any invalid or nonexistent jobname can be used to suppress private area reports.

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VOLSER

VOLSER *volser1,...,volser255*

Overview

The VOLSER control statement may be used with the DASD control statement to request the Direct Access Report Plot of Volume discussed in “Direct Access Report Plot of Volume” on page 3-114. The VOLSER statement must immediately follow the DASD statement.

Parameters

The VOLSER control statement has one parameter

volser*n* Up to 255 six-character volume serial numbers can be specified. If a VOLSER control statement is used without a volume serial list (the default), all volumes monitored during the measurement interval are listed.

Note: This plot requires records written at CMF MONITOR Extractor initialization. To obtain the desired report, make certain the input data includes the records written when the extraction began. It is not necessary to include the reporting period of these records in the DATETIME or SHIFT ranges.

Example

```
DASD
VOLSER MVS001,SYSPK1,PAGE01
```

Produces a volume activity plot of the Direct Access Report showing data for the volumes MVS001, SYSPK1, and PAGE01.

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WKLDCHAR

WKLDCHAR
[CPUBASE]
[,IOBASE]
[,CPUCAP]
[,IOCAP]

Note: This statement provides MACS Projected output. Please refer to "Workload Characterization Report" on page 3-235 before using this statement.

Overview

The WKLDCHAR control statement requests the Workload Characterization Report (see Figure 3-80 on page 3-236).

Note: This statement does not function when SHIFT RPTS=INTERVAL is defined. If this statement is defined in conjunction with a SYSPLEX statement that specifies multiple SYSNAMES on the SUBPLEX parameter, an error message is issued.

The WKLDCHAR statement uses data collected by the following Extractor control statements:

- CPU (see page 1-14)
- DEVICE (see page 1-23)
- MACSCHAR (see page 1-48)
- WORKLOAD (see page 1-82)

Parameters

Four parameters may be specified with this control statement

CPUBASE Causes the Workload Characterization Report to be generated with the output line, CPU % (SU). This setting shows the workload CPU busy percentages directly proportional to the workload's TCB and SRB service units. This value is the default. CPUBASE may be abbreviated to CPU or C.

IOBASE Causes the Workload Characterization Report to be generated with the output line, CPU % (IO). This setting shows the workload CPU busy percentages calculated using a formula predicated on the CPU Service Unit Adjustment factor, and includes an accommodation of CPU busy time relating to I/O service units. IOBASE may be abbreviated to IO or I.

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CPUCAP Causes the Workload Characterization Report to be generated with the output line, CAP % (SU). This setting shows the workload CPU busy percentage directly proportional to the workload's TCB and SRB service units, adjusted by the LPAR's cap (weighting factor). CPUCAP may be abbreviated to CPUC or CC.

IOCAP Causes the Workload Characterization Report to be generated with the output line CAP % (IO). This setting shows the workload CPU busy percentages calculated using a formula predicated on the CPU Service Unit Adjustment factor and includes an accommodation of CPU busy time relating to I/O service units, adjusted by the LPAR's cap (weighting factor). IOCAP may be abbreviated to IOC or IC.

Example

If only the CPUBASE operand is defined, or if neither of the operands is defined in the WKLDCHAR control statement, the CPU % (SU) line is included in the report output. You can obtain this output line by defining the WKLDCHAR control statement in one of the following two ways:

```
WKLDCHAR
```

or

```
WKLDCHAR CPUBASE
```

To obtain only the CPU % (IO) report output line, specify the WKLDCHAR control statement as

```
WKLDCHAR IOBASE
```

To obtain all four output lines on the report, specify the WKLDCHAR control statement as

```
WKLDCHAR CPUBASE,IOBASE,CPUCAP,IOCAP
```

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WLMGL

```
WLMGL
[UNUSED=(SUPPRESS|PRINT)]
[,TYPE=(DETAIL|ACTIVITY|DELAY|ALL)]
[,PERIOD=(DAY|WEEK|MONTH)]
```

Overview

The WLMGL control statement requests the Workload Manager Report discussed in “Workload Manager Goal Mode Report” on page 3-240. The PERFORM statement can be defined with the WLMGL control statement to include or exclude service classes. See “PERFORM” on page 2-77 for more information. To collect synchronous data from all systems in the sysplex, BMC Software recommends using the SYNCH=SMF parameter of the Extractor REPORT control statement.

Parameters

Parameters for the WLMGL control statement are

UNUSED= Specifies whether reports are printed for service classes that report no work.

- **SUPPRESS** Prevents the generation of reports for service classes that report no work. This is the default.
- **PRINT** Requests that reports for all service classes be generated.

TYPE= Specifies the type or types of reports to be generated. Allowable values are

- **DETAIL** Generates the Detail section.
- **ACTIVITY** Generates the Goal Activity Map section.
- **DELAY** Generates the Goal Mode Delay Map section.
- **ALL** Generates all three reports.

Note: If you do not specify the TYPE parameter, only the Detail section of the Goal Mode Report is produced.

PERIOD Specifies the granularity of the ACTIVITY and DELAY MAPS.

- **DAY** Requests that the map represent processing for each 15-minute period of a day. If the data from more than one day is processed, the map shows the combined activity for all days. This value is the default.

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WEEK Requests that the map represent processing for each two-hour period of a week.

MONTH Requests that the map represent processing for each eight-hour period of a month.

Examples

```
WLMGL
```

Produces the Goal Activity Map section of the Workload Manager Goal Mode Activity Report.

```
WLMGL TYPE=ALL,PERIOD=WEEK
```

Produces all sections of the Workload Manager Goal Mode Activity Report. The Goal Activity Map section and the Goal Mode Delay Map section are produced with values averaged over each two-hour period of the week.

```
WLMGL TYPE=DELAY,PERIOD=MONTH
```

Produces the Goal Mode Delay Map section of the Workload Manager Goal Mode Activity Report. This map is produced with values averaged over each eight-hour period of the month.

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WORKLOAD

```
WORKLOAD
[TYPE=(DOMAIN,SUMMARY,PERFGRP,TSGRP)]
[,GROUP=(SU,PI,TR,ST,TI)]
[,EMPHASIS={1|2}]
[,ZERO={YES|NO}]
```

Overview

The WORKLOAD control statement requests the System Workload Activity Report discussed in “System Workload Activity Report” on page 3-211.

The System Workload Activity Report has been expanded to measure additional fields introduced by MVS/ESA SP4. The SP4 report also provides special emphasis support for printers (for more information, see *CMF MONITOR Batch User Guide*, “Laser Printer Support”).

The WORKLOAD statement can be used only when report data has been gathered under the Extractor CPM mode.

The PERFORM control statement (see “PERFORM” on page 2-77) can be defined with the WORKLOAD control statement to exclude or include performance group data.

The WORKLOAD Analyzer statement uses data collected by the WORKLOAD Extractor control statement (see “WORKLOAD” on page 1-82).

Parameters

The parameters for the WORKLOAD control statement are

TYPE= Designates the order of information in the report. The default is DOMAIN.

- **DOMAIN** Orders the workload report information by domain.
- **SUMMARY** Orders the workload report information as a service usage summary by domain.
- **PERFGRP** Orders the workload report information by performance group.
- **TSGRP** Orders the workload report information by time slice group.

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GROUP= Designates the contents of each report. If you do not specify one or more groups, all groups are included in the report.

- **SU** Includes service unit information.
- **PI** Includes page-in information.
- **TR** Includes transaction information.
- **ST** Includes storage information.
- **TI** Includes information about transaction times.

EMPHASIS= Designates the special emphasis field parameter. An acceptable EMPHASIS value for this report is either 1 or 2. The EMPHASIS value controls whether bolded and special emphasis fields are overstruck on an impact printer.

Note: Currently, this support does not include the LASER option for special emphasis fields, so special emphasis fields do not appear differently when this report is produced on a laser printer. For more information, see *CMF MONITOR Batch User Guide*, Chapter 8, “Laser Printer Support”.

When 1 is selected as the EMPHASIS option, no bold type is used in the report. Option 1 is useful if bold type is causing printer delays and does not produce any meaningful clarification of the data.

Selecting 2, the default, causes the special emphasis fields to appear the same as all bolded fields when printed on an impact printer because both field types are overstruck twice.

ZERO= Specifies whether to print all detail line-groups or to suppress printing those groups for which all the values are zero. A line-group is a group of from one to six detail lines corresponding to the detail header lines (see “System Workload Activity Report” on page 3-211). Allowable values are

- **YES** Specifies printing all line-groups.
- **NO** Specifies printing of only those line-groups for which there is at least one non-zero value.

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Examples

```
WORKLOAD
```

Generates the System Workload Activity Report by domain.

```
WORKLOAD    TYPE=(DOMAIN,PERFGRP)
```

Generates the System Workload Activity Report by domain and by performance group.

```
WORKLOAD  TYPE=(SUMMARY),GROUP=(SU,PI,ST),EMPHASIS=2
```

Generates the System Workload Activity Report summarizing service unit values, page-in information, and storage information by domain. Special emphasis fields are overstruck on an impact printer.

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XCF

XCF
[TYPE={SUMMARY|DETAIL|BOTH}]
[,ORDER=(SYSTEM, GROUP, MEMBER)]

Overview

The XCF Analyzer control statement requests the Cross-System Coupling Facility (XCF) Report discussed in “Cross-System Coupling Facility Report” on page 3-102. The XCF report shows the activity of the Cross-System Coupling Facility.

The information may be summarized for the system and presented individually by member.

The report is divided into three sections:

System Summary Contains information about XCF activity for each pairing of source and target systems. This summary includes activity within each system.

Path Utilization Contains information about XCF activity for each path between or within systems.

Detail Report Contains information about XCF activity for each member. You can sort the information in this section by using the ORDER parameter.

Note: Information that is not available for an inbound path is marked with <INBOUND> in that column for all inbound paths.

The XCF statement uses data collected by the XCFDATA Extractor control statement (see “XCFDATA” on page 1-84).

Parameters

Parameters for the XCF Analyzer control statement are

TYPE= Specifies the type of reports to be generated as one of the following values. BOTH is the default.

- **SUMMARY** Specifies a report of the system usage of XCF and buffer utilization.
- **DETAIL** Specifies a report of XCF usage by member.

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BOTH Specifies reports of the system usage of XCF, buffer utilization, and XCF usage by member.

ORDER= Specifies the ordering of the information displayed in the DETAIL report. This operand has no effect on the SUMMARY reports. The DETAIL report contains a summary line which is calculated based on the first parameter of ORDER. For example, if you specify ORDER=GROUP,SYSTEM,MEMBER, the values on the summary line are calculated based on groups.

If all three values are specified, the order of display for the DETAIL report follows the sequence in which the values are defined. If one or two values are specified, the order of display for the DETAIL report starts with the value or values specified, and follows with the remaining values in the default order.

Examples

These examples show what reports are generated given the parameters that are specified in the control statement:

```
XCF
```

Produces SUMMARY and DETAIL reports. The DETAIL report is ordered SYSTEM, GROUP, and MEMBER, with summary lines for SYSTEM.

```
XCF   TYPE=DETAIL,ORDER=(GROUP,SYSTEM)
```

Produces the DETAIL report. The DETAIL report is ordered GROUP, SYSTEM, and MEMBER with summary lines for GROUP.

```
XCF   ORDER=MEMBER
```

Produces SUMMARY and DETAIL reports. The DETAIL report is ordered MEMBER, SYSTEM, and GROUP, with summary lines for MEMBER.

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Chapter 3 CMF MONITOR Reports

Whenever CMF MONITOR produces reports, it can also produce other preliminary reporting information. This information is optional and can be affected by Analyzer JCL (see “Preliminary Reporting Information” on page 3-4 for more information).

CMF MONITOR reports are listed alphabetically in this chapter. Samples of each CMF MONITOR report are illustrated, and field descriptions are explained. Information about the fields in the heading section of each report and how report data is formatted within report fields is found in *CMF MONITOR Batch User Guide* (see the chapter on “Producing and Using Reports).

Table 3-1 provides an alphabetical listing of the CMF MONITOR reports. The table shows the required control statements for each report or log, and specifies the page number where each report is discussed.

Table 3-1 CMF MONITOR Reports and Control Statements (Part 1 of 4)

Report or Log Title	Page	Analyzer Statement	Extractor Statement
Auxiliary Storage Report	3-6	AUXSTOR	ASMDATA PAGING
Cache Subsystem Counts Report	3-11	CACHE TYPE=COUNT	CACHE
Cache Subsystem Detail Report	3-14	CACHE	CACHE
Cache Subsystem Percent Report	3-24	CACHE TYPE=PERCENT	CACHE
Cache Subsystem Summary Report	3-27	CACHE	CACHE
Cache Subsystem Transfer Report	3-29	CACHE TYPE=TRANSFER	CACHE
Cache Subsystem Overview Report	3-32	CACHEACT	CACHE
Cache Subsystem Activity Report	3-35	CACHEACT REPORT=SUBSYS	CACHE

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Table 3-1 CMF MONITOR Reports and Control Statements (continued) (Part 2 of 4)

Report or Log Title	Page	Analyzer Statement	Extractor Statement
Cache Device Activity Report	3-41	CACHEACT REPORT=DEVICE	CACHE
CMF Record Statistics Report	3-44	CMFSTAT	None required
CMF Summary Report	3-46	CMFSUM	CHANNEL, CPU, DEVICE, IOQ, PAGING, TSODATA, VSMDATA, WORKLOAD
Collection Phase Log	3-51	None required	None required
Combinations of Configuration Activity Report	3-65	COMBCONF	GBLS=YES on REPORT statement
Common Storage Usage Detail Report	3-67	COMMSTOR REPORT=DETAIL	CSMON
Common Storage Usage Summary Report	3-70	COMMSTOR	CSMON
Coupling Facility Activity Report	3-71	CFACT	CFDATA
CPU and Channel Path Activity Report	3-81	CPUCHAN	CPU, CHANNEL
CPU Utilization Report	3-85	CPU	CPU
CPU Utilization by Protect Key Report	3-100	PROTKEY	CPU
Cross-System Coupling Facility Report	3-102	XCF	XCFDATA
Cryptographic Hardware Activity Report	3-106	CRYPTO	CRYPTO
Device Activity Report	3-109	DEVACT	DEVICE
Direct Access Report	3-112	DASD	DEVICE, HEADMOVE
Direct Access Report Plot of Volume	3-114	DASD, VOLSER	DEVICE, HEADMOVE
Disabled Delay Report	3-116	None required	DISTIM
Distribution Graph	3-119	GRAPH TYPE=DISTRIB	Depends on data to be graphed
Domain Delay Analysis Report	3-122	PGDDLAY	PGDDLAY
Enqueue Conflict Report	3-125	ENQUEUE	ENQUEUE
Exception Subreport	3-127	EXCEPTS	Depends on data requested on report
Exception Trace Detail Report	3-128	EXCEPTS TRACE=YES	TRACE76
Extractor Summary Report	3-129	None required	EXTSUM
Graphics Trace Detail Report	3-135	GRAPH TYPE=TRACE	TRACE76
HFS Statistics Report	3-137	HFS	HFS
HTTP Server Summary Report	3-141	HTTP	None required
HTTP Server Detail Report	3-142	HTTP	None required
I/O Queuing Activity Report	3-146	IOQ	IOQ, DEVICE

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Table 3-1 CMF MONITOR Reports and Control Statements (continued) (Part 3 of 4)

Report or Log Title	Page	Analyzer Statement	Extractor Statement
Interval Bar Graph	3-150	GRAPH TYPE=PLOT	Depends on data to be graphed
Kiviat Graph	3-152	GRAPH TYPE=KIVIAT	Depends on data to be graphed
Link Pack Area Report	3-154	LINKPACK	LINKMAP and GBLS=YES on REPORT statement
Logical Partition Report	3-158	PRSM	CPU
LOTUS DOMINO Server Report	3-161	DOMINO	None required
LOTUS DOMINO Database Activity Report	3-165	DOMINO	None required
LOTUS DOMINO Database Activity Report	3-167	DOMINO	None required
MDF Report	3-169	MDF	CPU
OMVS Kernel Activity Report	3-172	OMVS	OMVS
Performance Objectives by Domain Graph	3-175	GRAPH TYPE=DOMAIN	None required
Performance Summary Report	3-175	PERFSUM, PERFORM	ASMDATA, CHANNEL, CPU, DEVICE, ENQUEUE, EXTSUM, IOQ, PAGING, TSODATA, WORKLOAD
Pie Chart	3-182	GRAPH TYPE=PIE	Depends on data to be graphed
Processor Concurrency Report	3-185	CPUCON	CPU
Profile Bar Graph	3-188	GRAPH TYPE=PROFILE	Depends on data to be graphed
Report Table of Contents	3-190	//RPTCONTS DD statement	None required
Shared Device Activity Report	3-191	SHARDEV	DEVICE
Storage Management Report	3-195	STORAGE	PAGING
System Resources Manager Report	3-201	SRM	CPU, PAGING
System Workload Activity Report	3-211	WORKLOAD, PERFORM	WORKLOAD
Tabular Subreport	3-215	GRAPH TYPE=TAB	Depends on data to be graphed
Trace Report	3-217	TRACE	TRACE
TSO Command Summary Report	3-220	TSOPERF TYPE=CMD	TSODATA, CPU
TSO Interval Summary Report	3-222	TSOPERF TYPE=INT	TSODATA,CPU
TSO User Summary Report	3-223	TSOUSER	TSODATA
Virtual Storage Activity Report	3-226	VIRTSTOR	VSMDATA

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Table 3-1 CMF MONITOR Reports and Control Statements (continued) (Part 4 of 4)

Report or Log Title	Page	Analyzer Statement	Extractor Statement
Workload Characterization Report (formerly the MACS Automatic Characterization Report)	3-235	WKLDCHAR	CPU, DEVICE, MACSCHAR, and WORKLOAD
Workload Manager Goal Mode Report	3-240	WLMGL	WORKLOAD

Preliminary Reporting Information

Whenever CMF MONITOR reports are requested, preliminary reporting information can be generated. This information includes log reports that are automatically generated about the system, the records, Analyzer processing, Extractor operation, and a table of contents.

Spinoff reports and preliminary reporting information generated include

- A table of contents listing the requested reports.

  Note: The Report Table of Contents is generated only if the //RPTCONTS DD JCL statement is specified in the Analyzer JCL (see the chapter on “Producing and Using Reports in *CMF MONITOR Batch User Guide* for more information).

- A copy of the Analyzer control statements used to request the reports, including any syntax error messages generated during control statement scanning (see “Control Card Log” on page 3-51 for more information).
- A collection of log reports showing extraction characteristics, installation performance specifications (IPS), SRM constants, and input record type counts for the collection phase (see “About Extractor Log Reports” for more information).
- A report summarizing Extractor interval activity (see “Extractor Summary Report” on page 3-129 for more information).

  Note: The Analyzer output for all spinoff reports can be directed to another data set by defining the //CMFLOG DD JCL control statement (see the chapter on “Producing and Using Reports in *CMF MONITOR Batch User Guide* for more information).

- If you want to store the Analyzer report in a new data set, the data set should be allocated with

  RECFM=FBM
  LRECL=133
  DSORG=PS

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About Extractor Log Reports

Extractor log reports can be directed to a specific location by using the Analyzer //CMFLOG DD statement.

There are five log reports about Extractor operation during data collection, the report records, SRM constants, IPS, and other processing data. Reports produced are as follows:

- "Data Distribution and DATETIME Chart" on page 3-62
- "Extraction Characteristics Report" on page 3-53
- "Installation Performance Specification Report" on page 3-56
- "RMF/CMF Input Record Type Counts Report" on page 3-61
- "System Resources Manager Constants Report" on page 3-58

Note: If either RPTS=INTERVAL or RPTS=DAILY is specified on a SHIFT control statement, the above five reports are not produced.

If multiple systems are being reported or if PARM=NLOG is used in the //CMFRPTS EXEC statement of the Analyzer JCL, the Extraction Characteristics, Installation Performance Specification, and System Resources Manager Constants reports are not produced.

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Auxiliary Storage Report

The Auxiliary Storage Report provides information about the I/O activity of page and swap data sets, and data constants for the Auxiliary Storage Manager.

The Auxiliary Storage Report is produced by using the AUXSTOR Analyzer control statement (see “AUXSTOR” on page 2-8). The data for this report is obtained by using the ASMDATA (see “ASMDATA” on page 1-6) and PAGING (see “PAGING” on page 1-52) Extractor control statements.

The report is divided into five sections.

Cross Reference

Contains general information about the page and swap data sets, and the devices they reside on.

Page Data Set Data

Lists more detailed information about the page data sets, such as start I/O rates and slots in use.

Swap Data Set Data

Lists detailed information about the swap data sets. If your system does not have swap data sets defined, this report section is not produced.

ASM Data

Lists the constants for the Auxiliary Storage Manager.

Page Data Set Slot Count

Summarizes local page data set slot usage.

Note: The PAGING Extractor control statement must have been defined to the Extractor control statement set when data was collected for the reporting period; otherwise, this report section is not produced. The PAGING statement causes the Extractor to collect SMF type 71 records, which are required for this section of the report.

Each of the report sections is discussed in the following sections. A sample of the Auxiliary Storage Report is shown in Figure 3-1.

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Figure 3-1 Auxiliary Storage Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    AUXILIARY STORAGE REPORT                        RPTSEQ     3 PAGE     12
BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-2/28/25.1K/7  240-9/28/25.1K/7  75-1/112/25.1K/7  71-1/28/420/7
-------------------------------------------------------  CROSS REFERENCE SECTION  ------------------------------------------------
                 INDEX         ADDR      DEVICE TYPE        VOLUME   VIO  ASM SERVICE  DATA SET NAME
                                                                         BURST PAGES
                   1           858C         33903           SAEPG1                30  PAGE.SJSE.COMMON
                   2           858C         33903           SAEPG1   YES          30  PAGE.SJSE.LOCAL1
                   3           858C         33903           SAEPG1   YES          30  PAGE.SJSE.LOCAL2
                   4           858C         33903           SAEPG1                30  PAGE.SJSE.PLPA
-------------------------------------------------------  PAGE DATA SET DATA SECTION  ----------------------------------------------
                                                                          DATASET  PERCENT    PERCENT      TOTAL   TOTAL
                          AVG I/O  AVG  XFER PAGES PER BURST    PAGES    TOTAL SSCH  SSCH   DATA SET SLOTS-IN-USE    SLOTS   BAD
       INDEX   CLASS     TIME MSEC TIME MSEC    AVG     MAX  TRANSFERRED   ISSUED   PER SEC  IN USE    AVG    MAX    ALLOC   SLOTS
         1     COMMON        0.00      23.51    1.5       9        725       477       0.0    0.1     1.2    1.2    18000       0
         2     LOCAL        18.74      3.68     9.9      66      28580      2888       0.1    0.4    85.6  100.0    18000       0
         3     LOCAL         2.17      0.65    31.5     388     560131     17807       0.7    1.4    16.8   44.8   405540       0
         4     PLPA          0.00      6.63     5.8      30      12856      2227       0.1    0.3    38.1   38.1    36000       0
               TOTAL                                          602292     23399                                        477540       0
-------------------------------------------------------  ASM DATA SECTION  ---------------------------------------------------
                                                                                          TOTAL
            ASM--QUEUE--DEPTH     PCT        AVERAGE       LOCAL--SLOTS--RESERVED         LOCAL          ILRSLOTC      ILRSLOTV
              AVG       MAX      QUEUED        UIC          AVG              MAX          SLOTS          CONSTANT      CONSTANT
         UNAVAILABLE WITH MVS 3.1.3+        2384.6     UNAVAILABLE WITH MVS 3.1.0+      423540        NOT ACTIVE    NOT ACTIVE
-------------------------------------------------------  PAGE DATA SET SLOT COUNT SECTION  ----------------------------------------
                                 AVAILABLE       %         VIO       %     NON-VIO       %      BAD        TOTAL
                     MINIMUM -     243,304    57.4           0     0.0      12,458     2.9        0      423,540
                     MAXIMUM -     411,082    97.1           0     0.0     180,236    42.6        0      423,540
                     AVERAGE -     340,376    80.4           0     0.0      83,163    19.6        0      423,540
```

Cross Reference Section Field Descriptions

Each field in the Cross Reference section of the Auxiliary Storage Report is described in Table 3-2.

Table 3-2 Field Descriptions for the Cross Reference Section

Field	Description
INDEX	Internally generated index number for referencing data sets in this report.
ADDR	Address of the device on which the data set resides.
DEVICE TYPE	Type of the device on which the data set resides.
VOLUME	Serial number of the volume on which the data set resides.
VIO	Word YES is displayed if the local page data set accepts VIO pages.
ASM SERVICE BURST PAGES	Number of pages per I/O burst.
DATA SET NAME	Name of the data set in question.

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Page Data Set Data Section Field Descriptions

Each field in the Page Data Set Data section of the Auxiliary Storage Report is described in Table 3-3.

Table 3-3 Field Descriptions for the Page Data Set Data Section

Field	Description
INDEX	Index number corresponding to the data sets in the Cross Reference section of this report. The index is followed by an asterisk (*) if the data set was brought online during the sampling session.
CLASS	Page space type, which can be one of the following: PLPA Pageable link pack area pages. COMMON Common system area pages. DUPLEX Duplicate PLPA pages; used only if duplexing is active. LOCAL Private area (address space) pages. SWAP Address space pages that were swapped out. NOGOOD Warning that the data set is unusable for paging or swapping by the ASM; the page data set must be reformatted. Note: If marked with an asterisk (*), the volume for the page data set came online during the Extractor session.
AVG I/O TIME MSEC	Average time in milliseconds to perform an I/O operation transferring a single page. This field is applied only to LOCAL page data sets.
AVG XFER TIME MSEC	Average time in milliseconds to transfer a page. This value differs from AVG I/O TIME, in that it is the average of all of the paging I/O rather than the average of samples that transferred single pages. A value greater than AVG I/O TIME can indicate a high level of contention for access to the data set.
PAGES PER BURST – AVG	Average number of pages transferred to the page data set in one I/O burst.
PAGES PER BURST – MAX	Maximum number of pages transferred to the page data set in one I/O burst.
PAGES TRANSFERRED	Number of pages transferred between storage and page data set.
TOTAL SSCH ISSUED	Total number of SSCH requests by the ASM for the indicated data set.
DATASET SSCH PER SEC	Rate at which SSCH requests were issued to the data set.
PERCENT DATA SET IN USE	Percentage of time that the data set was observed to be in use by the ASM (an IORB for that data set was busy).
PERCENT SLOTS-IN-USE – AVG	Average percentage of total slots allocated that were used for this data set.
PERCENT SLOTS-IN-USE – MAX	Maximum percentage of total slots allocated that were used for this data set.
TOTAL SLOTS ALLOC	Total number of slots allocated for this data set.
TOTAL BAD SLOTS	Total number of slots that encountered permanent I/O errors on this data set.

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Swap Data Set Data Section Field Descriptions

Each field in the Swap Data Set Data section of the Auxiliary Storage Report is described in Table 3-4.

Table 3-4 Field Descriptions for the Swap Data Set Data Section

Field	Description
INDEX	Internally generated index number for referencing data sets in this report.
CLASS	Page space type, which can be one of the following: PLPA Pageable link pack area pages. COMMON Common system area pages. DUPLEX Duplicate PLPA pages; used only if duplexing is active. LOCAL Private area (address space) pages. SWAP Address space pages that were swapped out. NOGOOD Warning that the data set is unusable for paging or swapping by the ASM; the page data set must be reformatted.
AVG SERV TIME MSEC	Average time, in milliseconds, to complete one I/O request to the page data set.
TOTAL SSCH ISSUED	Total number of SSCH requests by the ASM for the indicated data set.
DATASET SSCH PER SEC	Rate at which SSCH requests were issued to the data set.
PERCENT DATA SET IN USE	Percentage of time that the data set was observed to be in use by the ASM (an IORB for that data set was busy).
PERCENT SLOTS-IN-USE – AVG	Average percentage of total slots allocated that were used for this data set.
PERCENT SLOTS-IN-USE – MAX	Maximum percentage of total slots allocated that were used for this data set.
TOTAL SLOTS ALLOC	Total number of slots allocated for this data set.
TOTAL BAD SLOTS	Total number of slots that encountered permanent I/O errors on this data set.

ASM Data Section Field Descriptions

Each field in the ASM Data section of the Auxiliary Storage Report is described in Table 3-5.

Table 3-5 Field Descriptions for the ASM Data Section (Part 1 of 2)

Field	Description
ASM-QUEUE-DEPTH – AVG	Average queue depth indicated in this column comes from the RCVASMQA field of the RCT.
ASM-QUEUE-DEPTH – MAX	Maximum RCVASMQA value seen during sampling.
PCT QUEUED	Percentage of samples queued. In the ASM section, the percentage of samples queued, where RCVASMQA was greater than zero.
AVERAGE UIC	Average page frame unreferenced interval count (UIC) indicates the amount of time since an address space referenced the page frame.

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Table 3-5 Field Descriptions for the ASM Data Section (Part 2 of 2)

Field	Description
LOCAL-SLOTS-RESERVED – AVG	ASM reserves slots in anticipation of future address spaces being created. Refer to the explanation of the ILRSLOTC CONSTANT field in this list for more information.
LOCAL-SLOTS-RESERVED – MAX	Maximum amount of slots reserved by the ASM.
TOTAL LOCAL SLOTS	Total number of local slots allocated.
ILRSLOTC CONSTANT	ASM divides this constant into the average private area size (also calculated by the ASM), and then subtracts this quotient from the reserve value. When the reserve value equals zero, the ASM issues an error message; no more address spaces are created until more space becomes available. For further information, refer to the *IBM Initialization and Tuning* manual.
ILRSLOTV CONSTANT	Constant used to calculate the amount of VIO space currently in use.

Page Data Set Slot Count Section Field Descriptions

Table 3-6 describes each field in the Page Data Set Slot Count section of the Auxiliary Storage Report. Minimum, maximum, and average values are shown for each field in this section of the report. Each row is labeled with its appropriate value description.

Table 3-6 Field Descriptions for the Page Data Set Slot Count Section

Field	Description
AVAILABLE %	Minimum, maximum, and average number of page data set slots available for use (that do not contain any data pages). This value also is expressed as a percentage of the total number of local page data set slots.
VIO %	Minimum, maximum, and average number of page data set slots that contain pages for VIO data sets. This value is also expressed as a percentage of the total number of local page data set slots.
NON-VIO %	Minimum, maximum, and average number of page data set slots that contain pages for virtual storage associated with an address space. This value is also expressed as a percentage of the total number of local page data set slots.
BAD	Minimum, maximum, and average number of page data set slots that are unusable. The Auxiliary Storage Manager (ASM) encountered a permanent I/O error accessing it.
TOTAL	Minimum, maximum, and average number of all local page data set slots.

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Cache Reports(from CMF type 240-27 records)

The CACHE Extractor control statement (see “CACHE” on page 1-8) is used to gather data for a series of Cache Reports. The CACHE Analyzer control statement (see “CACHE” on page 2-9) is used to specify any combination of the following five reports, all generated from CMF type 240-27 records:

“Cache Subsystem Counts Report” on page 3-11: Shows the actual count of cache events in your system, providing information about the total throughput of cache data. You can use this raw data to perform your own calculations of percentages.

“Cache Subsystem Detail Report” on page 3-14: Shows information about each DASD device attached to a Cache controller. This report, which can be customized to suit your needs, provides detailed information in the form of counts, percentages, or histograms, or any combination of these.

“Cache Subsystem Percent Report” on page 3-24: Shows the proportions of different types of cache activity in your system, including information about the ratio of cache hits to misses.

“Cache Subsystem Summary Report” on page 3-27: Shows an overview of caching activity at the controller level; gives you a rough idea of how your cache system is performing, and provides information about where to look for specific performance problems.

“Cache Subsystem Transfer Report” on page 3-29: Shows information about the transfer of information to and from cache, as well as information about volatile and non volatile storage.

Cache Subsystem Counts Report

The CACHE Analyzer control statement with either the TYPE=COUNT or the TYPE=ALL parameter defined generates the Cache Subsystem Counts Report (see “CACHE” on page 2-9 for more information). The data for this report is obtained by using the CACHE Extractor control statement (see “CACHE” on page 1-8).

The Cache Subsystem Counts Report summarizes subsystem cache information and displays the information in measurement counts. Use this report to examine the exact number of cache events recorded during the recording interval.

An example of the Cache Subsystem Counts Report is shown in Figure 3-2.

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Figure 3-2 Cache Subsystem Counts Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    CACHE SUBSYSTEM COUNTS REPORT                    RPTSEQ     5 PAGE     14
BMC SOFTWARE, INC.                                              XYZ COMPANY                           REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-27/308/0/7  74-1/112/25.1K/7
 SUB-    CONTROL                                          NORMAL                    SEQUENTIAL                        TOTAL
SYSTEM   UNIT ID    TYPE                          NORMAL    HITS       SEQUENTIAL     HITS          TOTAL          HITS
------  ---------  -------                     -----------  -----------  -----------  -----------  -----------  -----------
 AC03     C100     2105-20              READS:     250,858      250,846       44,281       44,280      295,139      295,126
                                      WRITES:      13,288       13,288        6,333        6,333       19,621       19,621
                                DASD FAST WRITES:  13,288       13,288        6,333        6,333       19,621       19,621
                         CACHE FAST DATA - READS:   - -          - -          - -          - -            0            0
                        CACHE FAST DATA - WRITES:   - -          - -          - -          - -            0            0

                                 SUBSYSTEM TOTAL:   264,146      264,134       50,614       50,613      314,760      314,747

          REC CACHE READ MISSES:            0
     REC CACHE WRITE PROMOTIONS:        2,698

 0140     8300     3990-06              READS:   1,546,652    1,502,753      201,843      198,641    1,748,495    1,701,394
                                      WRITES:     989,931      863,578       21,741       20,292    1,011,672      883,870
                                DASD FAST WRITES:  989,931      863,578       21,741       20,292    1,011,672      883,870
                         CACHE FAST DATA - READS:   - -          - -          - -          - -            0            0
                        CACHE FAST DATA - WRITES:   - -          - -          - -          - -            0            0

                                 SUBSYSTEM TOTAL:  2,536,583    2,366,331      223,584      218,933    2,760,167    2,585,264

          REC CACHE READ MISSES:            0
     REC CACHE WRITE PROMOTIONS:            0

 0141     8340     3990-06              READS:   3,640,052    3,583,082      295,125      281,535    3,935,177    3,864,617
                                      WRITES:     270,416      232,896      114,084      101,484      384,500      334,380
                                DASD FAST WRITES:  270,416      232,896      114,084      101,484      384,500      334,380
                         CACHE FAST DATA - READS:   - -          - -          - -          - -            0            0
                        CACHE FAST DATA - WRITES:   - -          - -          - -          - -            0            0

                                 SUBSYSTEM TOTAL:  3,910,468    3,815,978      409,209      383,019    4,319,677    4,198,997

          REC CACHE READ MISSES:            0
     REC CACHE WRITE PROMOTIONS:            0

 0142     8380     3990-06              READS:   4,404,342    4,371,721       49,649       48,869    4,453,991    4,420,590
                                      WRITES:     180,878      169,961       76,686       69,802      257,564      239,763
                                DASD FAST WRITES:  180,878      169,961       76,686       69,802      257,564      239,763
                         CACHE FAST DATA - READS:   - -          - -          - -          - -            0            0
                        CACHE FAST DATA - WRITES:   - -          - -          - -          - -            0            0

                                 SUBSYSTEM TOTAL:  4,585,220    4,541,682      126,335      118,671    4,711,555    4,660,353

TOTAL                                             23,140,723   21,582,960    1,303,801    1,241,022   24,444,524   22,823,982
```

Cache Subsystem Counts Report Field Descriptions

Each field that is displayed in the Cache Subsystem Counts Report is described in Table 3-7.

Table 3-7 Field Descriptions for the Cache Subsystem Counts Report (Part 1 of 3)

Field	Description
SUBSYSTEM	Identification of the cache subsystem.
CONTROL UNIT ID	Identification of the control unit.
TYPE	Controller device type.
NORMAL: READS	Number of Normal Cache Reads requested during the recording interval.
NORMAL HITS: READS	Number of Normal Cache Reads requested during the recording interval that were satisfied in cache.
SEQUENTIAL: READS	Number of Sequential Cache Reads requested during the recording interval.
SEQUENTIAL HITS: READS	Number of Sequential Cache Reads requested during the recording interval that were satisfied in cache.

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Table 3-7 Field Descriptions for the Cache Subsystem Counts Report (continued) (Part 2 of 3)

Field	Description
TOTAL: READS	Total number of Cache Reads requested during the recording interval.
TOTAL HITS: READS	Total number of Cache Reads requested during the recording interval that were satisfied in cache.
NORMAL: WRITES	Number of Normal Cache Writes requested during the recording interval.
NORMAL HITS: WRITES	Number of Normal Cache Writes requested during the recording interval that were satisfied in cache.
SEQUENTIAL: WRITES	Number of Sequential Cache Writes requested during the recording interval.
SEQUENTIAL HITS: WRITES	Number of Sequential Cache Writes requested during the recording interval that were satisfied in cache.
TOTAL: WRITES	Total number of Cache Writes requested during the recording interval.
TOTAL HITS: WRITES	Total number of Cache Writes requested during the recording interval that were satisfied in cache.
NORMAL: DASD FAST WRITES	Number of Normal Cache DASD Fast Writes (DFWs) requested during the recording interval (3990-03 devices only).
NORMAL HITS: DASD FAST WRITES	Number of Normal Cache DFWs requested during the recording interval that were satisfied in cache (3990-03 devices only).
SEQUENTIAL: DASD FAST WRITES	Number of Sequential Cache DFWs requested during the recording interval (3990-03 devices only).
SEQUENTIAL HITS: DASD FAST WRITES	Number of Sequential Cache DFWs requested during the recording interval that were satisfied in cache (3990-03 devices only).
TOTAL: DASD FAST WRITES	Total number of Cache DFWs requested during the recording interval (3990-03 devices only).
NORMAL: CACHE FAST DATA – READS	Number of Normal Cache Fast Data (CFD) Reads requested during the recording interval (3990-03 devices only).
NORMAL HITS: CACHE FAST DATA – READS	Number of Normal CFD Reads requested during the recording interval that were satisfied in cache. (3990-03 devices only).
SEQUENTIAL: CACHE FAST DATA – READS	Number of Sequential CFD Reads requested during the recording interval (3990-03 devices only).
SEQUENTIAL HITS: CACHE FAST DATA –READS	Number of Sequential CFD Reads requested during the recording interval that were satisfied in cache (3990-03 devices only).
TOTAL: CACHE FAST DATA – READS	Total number of CFD Reads requested during the recording interval (3990-03 devices only).
TOTAL HITS: CACHE FAST DATA – READS	Total number of CFD Reads requested during the recording interval that were satisfied in cache (3990-03 devices only).
TOTAL HITS: DASD FAST WRITES	Total number of Cache DFWs requested during the recording interval that were satisfied in cache (3990-03 devices only).
NORMAL: CACHE FAST DATA – WRITES	Number of Normal Cache Fast Data (CFD) Writes requested during the recording interval (3990-03 devices only).
NORMAL HITS: CACHE FAST DATA – WRITES	Number of Normal CFD Writes requested during the recording interval that were satisfied in cache (3990-03 devices only).
SEQUENTIAL: CACHE FAST DATA – WRITES	Number of Sequential CFD Writes requested during the recording interval (3990-03 devices only).

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Table 3-7 Field Descriptions for the Cache Subsystem Counts Report (continued) (Part 3 of 3)

Field	Description
SEQUENTIAL HITS: CACHE FAST DATA –WRITES	Number of Sequential CFD Writes requested during the recording interval that were satisfied in cache (3990-03 devices only).
TOTAL: CACHE FAST DATA – WRITES	Total number of CFD Writes requested during the recording interval (3990-03 devices only).
TOTAL HITS: CACHE FAST DATA – WRITES	Total number of CFD Writes requested during the recording interval that were satisfied in cache (3990-03 devices only).
REC CACHE READ MISSES	Record Caching read misses (3990-06 devices only).
REC CACHE WRITE PROMOTIONS	Record Caching write promotions (3990-06 devices only).

Cache Subsystem Detail Report

The CACHE Analyzer control statement with either the TYPE=DETAIL or the TYPE=ALL parameter defined generates the Cache Subsystem Detail Report (see “CACHE” on page 2-9 for more information). Both this report and the Cache Subsystem Summary Report are produced as the default reports of the CACHE Analyzer control statement.

Data is gathered for this report by using the CACHE Extractor control statement (see “CACHE” on page 1-8).

The Cache Subsystem Detail Report contains information about devices attached to the caching subsystem. You can select up to 32 field names to appear in the report, and define histogram symbols and lengths through the CACHE Analyzer control statement.

Note: Each CACHE Analyzer control statement requesting the Cache Subsystem Detail Report generates one report for each device on your system. The default reports generated when the control statement is submitted without parameters look different for different device types.

See “CACHE” on page 2-9 for information about changing the default parameter settings on the CACHE Analyzer control card.

See “Cache Subsystem Detail Report Field Descriptions” on page 3-20 for information about all the possible fields you can generate by specifying parameters on the CACHE Analyzer control card.

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About Display Types

The Cache Subsystem Detail Report that is produced depends on how the Analyzer statement is coded. Values in reports can be shown as counts, percentages, or histograms. If shown as a histogram, a report field corresponds to a default symbol, unless a different symbol was defined in the Analyzer statement.

Percents: Percents are based on the device for the Cache Subsystem Detail Report.

Counts: Values that are raw measurement values or averages. Symbols are used when account value exceeds the amount of space in the field. The following symbols are used for non memory count values:

K Value is in thousands (1,000).
M Value is in millions (1,000,000).
G Value is in billions (1,000,000,000).
T Value is in trillions (1,000,000,000,000).
The symbols used with memory values are displayed differently where
K Value is in 1024 byte units.
M Value is in 1024 kilobyte units.
G Value is in 1024 megabyte units.
T Value is in 1024 gigabyte units.

Histograms

A default histogram symbol is assigned to almost every field in the Cache Subsystem Reports. These default symbols are shown in Table 3-9 on page 3-20. A default symbol may be overwritten by defining a different symbol in the CACHE Analyzer statement. Values that are not available for histogram display are ignored.

Total I/O consists of all reads, all writes, plus ICL and BYPASS requests. Most histogram values are percents of total I/O for the device.

The first histogram request encountered begins a histogram. Any requests that follow the initial request are displayed in the same histogram until the

- requests end
- first non histogram request is encountered
- histogram value is higher than can be displayed

Note: If a histogram value is higher than can be displayed in the report, the last symbol continues one character position to the right of the end of the histogram and all other symbol generation is terminated for that device in the histogram.

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The length of any histogram may be specified in the first histogram in the group. Any length specification that is not the first in the group is ignored. The minimum length request is 11 and the maximum is 118. If the first histogram request in the group does not have a length specified, the length is determined by starting with 21 positions for the first histogram and adding 10 positions for each subsequent histogram request in the group, until the maximum length value is displayed.

Histogram values are displayed consecutively or are overlaid, depending on the hierarchy of the values selected or their relationships with one another. If values in a histogram are unrelated, their hierarchy is ignored and all values are displayed consecutively. If values are related, they are either stacked on top of each other (overlaid) or displayed consecutively in the histogram, depending upon each value's position in the hierarchy.

The hierarchy of histogram values consists of a base value, secondary values that are subsets of the base value, and tertiary values that are subsets of secondary subset values, allowing up to three levels of values to be overlaid in a single histogram.

A histogram value at the base level means that the value is not a subset of any other value. Base values can be overlaid by one or more subset values when displayed in a report.

A secondary value is a value that is a subset of a base value. When reported with its base value, a secondary value is displayed on top of its base value. It is possible for secondary values to completely overlay their base value when the sum of the secondary values equals or exceeds the base value.

This is true of tertiary values as well. A tertiary value is a value that is a subset of a secondary value and its base value. When reported with its secondary or base value, a tertiary value is displayed on top of its secondary or base value. It is possible for tertiary values to completely overlay their secondary value in a report when the sum of the tertiary values equals or exceeds the secondary value.

Example 1: If READ, NREAD, and NREADHIT are requested in one histogram, the READ value is the base value, and the other two fields are subset values. These three values are all related in a hierarchical structure.

NREAD (normal reads) is a secondary value to READ (all reads). The NREAD histogram symbol overlays some READ symbol positions when they are reported together. These two values are linked by a hierarchy and would never appear as consecutive values in a histogram.

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NREADHIT (normal read hits) is a tertiary value. NREADHIT is a subset of both READ and NREAD values. The NREADHIT histogram symbol overlays some NREAD symbol positions, some READ symbol positions, or both, when reported together.

Example 2: If READ, NREAD, SREAD, NREADHIT, and SREADHIT are requested in one histogram, the READ value is the base value, and all the other fields are subset values.

The READ value is linked in one hierarchy to NREAD and NREADHIT values and in another hierarchy to SREAD and SREADHIT values. Even though READ is a common base value to both hierarchies, the NREAD and NREADHIT values and the SREAD and SREADHIT values are not linked to each other through a hierarchy. In fact, these values are unrelated to each other.

NREAD (normal reads) and SREADs (sequential reads) are both secondary values. Reporting only one of these values with READ would overlay the READ value. Using both of these values with READ would cause no histogram symbols for READ (the base value) to appear, since any READ value is either an NREAD (normal) value or an SREAD (sequential) value (a single symbol may appear due to rounding). If reported with just each other, without READ values, they would appear consecutively in the histogram because they are unrelated.

NREADHIT (normal read hits) and SREADHIT (sequential read hits) are tertiary values to READ and subsets of NREAD and SREAD, respectively. NREADHIT symbols overlay NREAD symbols when reported together, and SREADHIT symbols overlay SREAD symbols when reported together. If reported with just each other, NREADHIT and SREADHIT symbols would appear consecutively in the histogram because they are unrelated. If reported with NREAD and SREAD, NREADHIT symbols would overlay NREAD symbols and SREADHIT symbols would overlay SREAD symbols, but the combined NREADHIT and NREAD symbols would be reported consecutively with the combined SREADHIT and SREAD symbols, since they are all unrelated values.

An example of the Cache Subsystem Detail Report is shown in Figure 3-3.

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Figure 3-3 Cache Subsystem Detail Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    CACHE SUBSYSTEM DETAIL REPORT                      RPTSEQ     8 PAGE     22
BMC SOFTWARE, INC.                                          XYZ COMPANY                                 REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-27/308/0/7  74-1/112/25.1K/7
SUBSYSTEM ID: AC03  TYPE: 2105-20  CONTROL UNITS: C100           CONFIGURED STORAGE:   3,221M          CACHING STATUS: ACTIVE
                                                                  AVAILABLE STORAGE:   2,690M     NON-VOLATILE STATUS: NV ACT
                                                               NON-VOLATILE STORAGE: 201,327K       FAST WRITE STATUS: ACTIVE

                                 I/O      I/O      READ      READ     READ      READ     WRITE    WRITE     WRITE    WRITE
DEV  VOLSER        STATUS       RATE     RATE %    HITS     HIT %   MISSES    MISS %    HITS     HIT %   MISSES   MISS %
---- ------   ---------------  ---------  ------  ---------  ------  ---------  ------  ---------  ------  ---------  ------
C100 SHK000   ACTIVE  DFW ACT       0.14     1.1      3,581   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C101 SHK001   ACTIVE  DFW ACT       0.24     1.9      3,616   100.0          0     0.0      2,446   100.0          0     0.0
              DUP AVL NO PIN
C102 SHK002   ACTIVE  DFW ACT       0.13     1.1      3,371   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C103 SHK003   ACTIVE  DFW ACT       0.12     0.9      2,951   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C104 SHK004   ACTIVE  DFW ACT       0.11     0.9      2,741   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C105 SHK005   ACTIVE  DFW ACT       2.35    18.8     49,959   100.0          0     0.0      9,165   100.0          0     0.0
              DUP AVL NO PIN
C106 SHK006   ACTIVE  DFW ACT       0.12     0.9      2,951   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C107 SHK007   ACTIVE  DFW ACT       0.12     0.9      2,951   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C108 SHK008   ACTIVE  DFW ACT       0.27     2.2      6,761    99.8         13     0.2         55   100.0          0     0.0
              DUP AVL NO PIN
C109 SHK009   ACTIVE  DFW ACT       0.12     0.9      2,951   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C10A SHK010   ACTIVE  DFW ACT       0.11     0.9      2,741   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C10B SHK011   ACTIVE  DFW ACT       0.12     0.9      2,951   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C10C SHK012   ACTIVE  DFW ACT       0.15     1.2      3,791   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN
C10D SHK013   ACTIVE  DFW ACT       0.13     1.0      3,161   100.0          0     0.0          0     0.0          0     0.0
              DUP AVL NO PIN

  SUBSYSTEM                        112.11   100.0  1,701,394    97.3     47,101     2.7    883,870    87.4    127,802    12.6
```

Cache Subsystem Detail Report Default Field Descriptions

Each field that is displayed in the default Cache Subsystem Detail Report is described in Table 3-8. If you specified different fields on your CACHE Analyzer control statement, the report appearance is different. For an explanation of fields not shown in this report, see “Cache Subsystem Detail Report Field Descriptions” on page 3-20.

Table 3-8 Field Descriptions for the Cache Subsystem Detail Report (Part 1 of 2)

Field	Description
SUBSYSTEM ID	Identification of the cache subsystem.
TYPE	Controller device type.
CONTROL UNITS	Control unit addresses.
CONFIGURED STORAGE	Total amount of cache storage configured for the subsystem.
AVAILABLE STORAGE	Amount of cache storage currently available in the subsystem.
NON-VOLATILE STORAGE	Amount of nonvolatile storage currently available in the subsystem.

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Table 3-8 Field Descriptions for the Cache Subsystem Detail Report (continued) (Part 2 of 2)

Field	Description
CACHING STATUS	Overall status of caching subsystem. Possible values for this field are ACTIVE Cache is online. P ACT Subsystem is in the process of bringing cache online. OFFLINE Internal error stopped cache, bringing it offline. DEACT Cache has been deactivated because of a host program or support facility request. P DEACT Command request was made to deactivate caching, but destaging is still in progress. P FAIL Command request was made to deactivate caching, but destaging has failed. NO IML IML device not available. NO CFW Cache fast write is deactivated.
NON-VOLATILE STATUS	Overall status of nonvolatile storage. Possible values for this field are NV ACT Nonvolatile storage is active. NV FAIL Internal error stopped nonvolatile storage availability. NV OFF Nonvolatile storage is unavailable because of an explicit host or support facility request, or a failure. NV PEND Request to make nonvolatile storage unavailable has been received, but destaging is still in progress or has failed. NV ERR Nonvolatile storage is pending because of an error.
FAST WRITE STATUS	Status of the Cache Fast Write controller. See the CACHING STATUS field for a list of possible values for this field.
DEV	Device identification number.
VOLSER	Volser for the device.
STATUS	Status of the device. This field can have up to four values for each device. See “STATUS Field Values for the Cache Subsystem Detail Report” on page 3-23 for an explanation of all possible values for the STATUS field.
I/O RATE	Number of I/O requests per second during the interval for the device.
I/O RATE %	Percentage of all I/0 requests that were I/O requests for the device.
READ HITS	Number of Read requests that were satisfied in cache during the recording interval.
READ HIT %	Percentage of all Read requests that were satisfied in cache during the interval.
READ MISSES	Number of Read requests that were not satisfied in cache during the interval.
READ MISS %	Percentage of all Read requests that were not satisfied in cache during the interval.
WRITE HITS	Number of Write requests that were satisfied in cache during the recording interval.
WRITE HIT %	Percentage of all Write requests that were satisfied in cache during the recording interval.
WRITE MISSES	Number of Write requests that were not satisfied during the recording interval.
WRITE MISS %	Percentage of all Write requests that were not satisfied in cache during the recording interval.

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Cache Subsystem Detail Report Field Descriptions

Possible fields that might appear in your Cache Subsystem Detail Report are described in Table 3-9.

- **Analyzer Field** column**:** Shows the value that was requested for the Cache Subsystem Detail Report.
- **Description** column: Contains information about the field if *count* is requested.
- **Calculation** column: Contains information about the field if *percent* is requested.
- **Default Symbol** column: Contains the default histogram symbol if *histogram* is requested.
- **Histogram Level** column: Contains information about other histogram values of which the specified value is a subset. If this level is *base*, the value is not a subset of any other values. If the level is *secondary* or *tertiary*, this column also lists the fields of which the specified field is a subset.

Note: Fields that cannot be displayed as a percentage value or in a histogram contain information in the **Description** column only.

Table 3-9 Cache Subsystem Detail Report Field Descriptions (Part 1 of 4)

Analyzer Field	Description	Calculation	Default Symbol	Histogram Level
BYPASS	All I/O requests that bypassed caching for this device.	(bypass requests * 100) / (total I/O)	B	base
CACHETYP	Model number of the cache device. This field is redundant when using ORDER=SUBSYS. It is useful for ORDER=DEVICE DETAIL reports.			
DEVTYP	DASD device type.			
DFNWRITE	All normal DASD Fast Write requests for this device.	(normal DASD fast write requests * 100) / (total writes)	@	secondary WRITE
DFNWRTHT	All normal DASD Fast Write requests for this device satisfied in cache.	(normal DASD fast write hits * 100) / (normal DASD fast writes)	$	tertiary DFNWRITE ---> WRITE
DFNWRTMS	All normal DASD Fast Write requests for this device not satisfied in cache.	((normal DASD fast write requests - normal DASD fast write hits) * 100) / (normal DASD fast writes)	K	tertiary DFNWRITE ---> WRITE
DFSWRITE	All sequential DASD Fast Write requests for this device.	(seq DASD fast write requests * 100) / (total writes)	#	secondary WRITE

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Table 3-9 Cache Subsystem Detail Report Field Descriptions (Part 2 of 4)

Analyzer Field	Description	Calculation	Default Symbol	Histogram Level
DFSWRTHT	All sequential DASD Fast Write requests for this device satisfied in cache.	(seq DASD fast write hits * 100) / (total seq DASD fast writes)		tertiary DFSWRITE ---> WRITE
DFSWRTMS	All sequential DASD Fast Write requests for this device not satisfied in cache.	((seq DASD fast write requests - seq DASD fast write hits) * 100) / (total seq DASD fast writes)	A	tertiary DFSWRITE ---> WRITE
FREAD	All Cache Fast Read requests for this device.	(fast read requests * 100) / (total reads)	E	secondary READ
FREADHIT	All Cache Fast Read requests for this device satisfied in cache.	(fast read hits * 100) / (fast reads)	F	tertiary FREAD ---> READ
FREADMS	All Cache Fast Read requests for this device not satisfied in cache.	((fast read requests - fast read hits) * 100) / (fast reads)	Y	tertiary FREAD ---> READ
FWRITE	All Cache Fast Write requests for this device.	(fast write requests * 100) / (total writes)	G	secondary WRITE
FWRITEHT	All Cache Fast Write requests for this device satisfied in cache.	(fast write hits * 100) / (fast writes)	D	tertiary FWRITE ---> WRITE
FWRITEMS	All Cache Fast Write requests for this device not satisfied in cache.	((fast write requests - fast write hits) * 100) / (fast writes)	Y	tertiary FWRITE ---> WRITE
ICL or INHIBIT	All I/O operations utilizing Inhibit Cache Loading for this device.	(ICL requests * 100) / (total I/O)	L	base
IORATE	Number of I/O requests per second. IORATE is not calculated on the same base as other histogram values. Plotting IORATE with other measures in a histogram may result in the value displayed exceeding 100%. It is recommended that IORATE be displayed in a histogram by itself.	(number of I/O requests per second for the device) * 100 / (number of I/O requests for the subsystem)	I	base
NREAD	All normal read requests.	(normal read requests * 100) / (total reads)	N	secondary READ
NREADHIT	All normal read requests for this device satisfied in cache.	(normal read hits * 100) / (normal reads)	M	tertiary NREAD ---> READ
NREADMS	All normal read requests for this device not satisfied in cache.	((normal read requests - normal read hits) * 100) / (normal reads)	V	tertiary NREAD ---> READ
NVSOVER	All nonvolatile storage overflows for this device.	(NVSOVER * 100) / (total reads)	-	base

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Table 3-9 Cache Subsystem Detail Report Field Descriptions (Part 3 of 4)

Analyzer Field	Description	Calculation	Default Symbol	Histogram Level
NWRITE	All normal write requests for this device.	(normal write requests * 100) / (total writes)	O	secondary WRITE
NWRITEHT	All normal write requests for this device satisfied in cache.	(normal write hits * 100) / (normal writes)	P	tertiary NWRITE ---> WRITE
NWRITEMS	All normal write requests for this device not satisfied in cache.	((normal write requests - normal write hits) * 100) / (normal writes)	U	tertiary NWRITE ---> WRITE
READ	All read requests for this device.	(read requests * 100) / (total I/O)	R	base
READHIT	All read requests for this device satisfied in cache.	(read hits * 100) / (read requests)	<	secondary READ
READMS	All read requests for this device not satisfied in cache.	((read requests - read hits) * 100) / (total I/O)	!	secondary READ
RWRATIO	Ratio of reads to writes for this device. RWRATIO value is not displayed in PERCENT or HISTOGRM forms.			
RWHIT	Total read or write requests for this device satisfied in cache.	(hits * 100) / (total I/O)	+	base
SHARE	Percent of the elapsed time that this DASD device was attached to this cache device.			
SREAD	All sequential read requests for this device.	(sequential read requests * 100) / (total reads)	(	secondary READ
SREADHIT	All sequential read requests for this device satisfied in cache.	(seq read hits * 100) / (seq reads)	)	tertiary SREAD ---> READ
SREADMS	All sequential read requests for this device not satisfied in cache.	((seq read requests - seq read hits) * 100) / (seq reads)	Q	tertiary SREAD ---> READ
SWRITE	All sequential write requests for this device.	(sequential write requests * 100) / (total writes)	S	secondary WRITE
SWRITEHT	All sequential write requests for this device satisfied in cache.	(seq write hits * 100) / (seq writes)	T	tertiary SWRITE ---> WRITE
SWRITEMS	All sequential write requests for this device not satisfied in cache.	((seq write requests - seq write hits) * 100) / (seq writes)	J	tertiary SWRITE ---> WRITE

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Table 3-9 Cache Subsystem Detail Report Field Descriptions (Part 4 of 4)

Analyzer Field	Description	Calculation	Default Symbol	Histogram Level
STATUS	Status of the device. If a negative state has occurred during the interval being reported, the STATUS display reflects the negative state, regardless of the portion of the time spent in that negative state or any positive state. Possible values for STATUS are described in Table 3-10 on page 3-23. (No value is displayed on the SUBSYSTEM, CONTROLLER, or TOTAL lines for the STATUS field.)			
SUBSYS	Subsystem or controller ID. This field is redundant when using ORDER=SUBSYS. It is useful for ORDER=DEVICE DETAIL reports.			
WRITE	All write requests for this device.	(write requests * 100) / (total I/O)	W	base
WRITEHIT	All write requests for this device satisfied in cache.	(write hits * 100) / (write requests)	>	secondary WRITE
WRITEMS	All write requests for this device not satisfied in cache.	((write requests - write hits) * 100) / (total I/O)	Z	secondary WRITE

STATUS Field Values for the Cache Subsystem Detail Report

Each value that can display in the STATUS field of the Cache Subsystem Detail Report is described in Table 3-10.

Table 3-10 Values for the STATUS Field of the Cache Subsystem Detail Report (Part 1 of 2)

Value	Description
ACTIVE	No limitations are reflected in the status bits.
DEACT	Caching is deactivated for this device or for the caching subsystem.
DFW ACT	DASD Fast Write was active for this device throughout the sample interval displayed.
DFW OFF	At least once during the sample interval displayed, DASD Fast Write was deactivated.
DFW PIN	At least once during the sample interval displayed, data was pinned and DASD Fast Write was suspended.
DUP AVL	Duplex pair was available during the sample interval displayed.
DUP MAP	At least once during the sample interval displayed, duplex primary mapping was active.

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Table 3-10 Values for the STATUS Field of the Cache Subsystem Detail Report (Part 2 of 2)

Value	Description
DUP NO	At least once during the sample interval displayed, duplex primary mapping was deactivated.
FULL	Device was full during the interval.
NO CFW	At least once during the sample interval displayed, Cache Fast Write was deactivated.
NO IML	At least once during the sample interval displayed, the storage controller IML device was not available.
NO PIN	No data pinning occurred during the sample interval displayed.
NV ACT	Non volatile storage was active throughout the interval displayed.
NV ERR	At least once during the sample interval displayed, nonvolatile storage suffered a pending offline error.
NV FAIL	At least once during the sample interval displayed, nonvolatile storage failed.
NV OFF	At least once during the sample interval displayed, nonvolatile storage was made unavailable.
NV PEND	At least once during the sample interval displayed, nonvolatile storage was pending being moved offline.
OFFLINE	At least once during the sample interval displayed, the caching subsystem was placed offline.
P ACT	At least once during the sample interval displayed, the subsystem was pending active.
P DEACT	At least once during the sample interval displayed, the subsystem was pending deactivation.
P DFW	At least once during the sample interval displayed, DASD Fast Write was pending deactivation.
P DUP	At least once during the sample interval displayed, a duplex pair copy was pending.
P FAIL	At least once during the sample interval displayed, the subsystem failed while pending activation or deactivation.
PINNED	At least once during the sample interval displayed, data pinning occurred but DASD Fast Write was not suspended.
PRIMARY	Device was the primary of a duplex pair.
SECOND	Device was the secondary of a duplex pair.

Cache Subsystem Percent Report

The CACHE Analyzer control statement with either the TYPE=PERCENT or the TYPE=ALL parameter defined generates the Cache Subsystem Percent Report (see “CACHE” on page 2-9. for more information). The data for this report is obtained by using the CACHE Extractor control statement (see “CACHE” on page 1-8).

The Cache Subsystem Percent Report summarizes subsystem cache information and displays the information in measurement percentages and ratios.

An example of the Cache Subsystem Percent Report is shown in Figure 3-4.

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Figure 3-4 Cache Subsystem Percent Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                CACHE SUBSYSTEM PERCENT REPORT                    RPTSEQ     6 PAGE     17
BMC SOFTWARE, INC.                                          XYZ COMPANY                            REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00          WORLDWIDE HEADQUARTERS                     SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-27/308/0/7  74-1/112/25.1K/7
 SUB-    CONTROL                                   NORMAL                SEQ                TOTAL     READ/WRITE   READ/WRITE
SYSTEM   UNIT ID    TYPE                       NORMAL     HITS       SEQ       HITS      TOTAL     HITS        RATIO      HIT RATIO
------  ---------  -------                     -------   -------   -------    -------   -------   -------    ----------   ----------
 AC03     C100     2105-20             READS:    85.0     100.0      15.0      100.0      93.8     100.0
                                     WRITES:    67.7     100.0      32.3      100.0       6.2     100.0
                              DASD FAST WRITES:  67.7     100.0      32.3      100.0       6.2     100.0
                       CACHE FAST DATA - READS:   - -       - -       - -        - -       0.0       0.0
                      CACHE FAST DATA - WRITES:   - -       - -       - -        - -       0.0       0.0

                               SUBSYSTEM TOTAL:  83.9      83.9      16.1       16.1     100.0     100.0         15.04        15.04

 0140     8300     3990-06             READS:    88.5      97.2      11.5       98.4      61.9      97.3
                                     WRITES:    97.9      87.2       2.1       93.3      35.8      87.4
                              DASD FAST WRITES:  97.9      87.2       2.1       93.3      35.8      87.4
                       CACHE FAST DATA - READS:   - -       - -       - -        - -       0.0       0.0
                      CACHE FAST DATA - WRITES:   - -       - -       - -        - -       0.0       0.0

                               SUBSYSTEM TOTAL:  89.8      83.8       7.9        7.7      97.7      91.5          1.73         1.92

 0141     8340     3990-06             READS:    92.5      98.4       7.5       95.4      77.3      98.2
                                     WRITES:    70.3      86.1      29.7       89.0       7.6      87.0
                              DASD FAST WRITES:  70.3      86.1      29.7       89.0       7.6      87.0
                       CACHE FAST DATA - READS:   - -       - -       - -        - -       0.0       0.0
                      CACHE FAST DATA - WRITES:   - -       - -       - -        - -       0.0       0.0

                               SUBSYSTEM TOTAL:  76.9      75.0       8.0        7.5      84.9      82.5         10.23        11.56


 0142     8380     3990-06             READS:    98.9      99.3       1.1       98.4      94.5      99.3
                                     WRITES:    70.2      94.0      29.8       91.0       5.5      93.1
                              DASD FAST WRITES:  70.2      94.0      29.8       91.0       5.5      93.1
                       CACHE FAST DATA - READS:   - -       - -       - -        - -       0.0       0.0
                      CACHE FAST DATA - WRITES:   - -       - -       - -        - -       0.0       0.0

                               SUBSYSTEM TOTAL:  97.3      96.4       2.7        2.5     100.0      98.9         17.29        18.44

 0143     83C0     3990-06             READS:    98.3      96.6       1.7       98.0      74.3      96.6
                                     WRITES:    96.1      85.5       3.9       94.6      25.3      85.9
                              DASD FAST WRITES:  96.1      85.5       3.9       94.6      25.3      85.9
                       CACHE FAST DATA - READS:   - -       - -       - -        - -       0.0       0.0
                      CACHE FAST DATA - WRITES:   - -       - -       - -        - -       0.0       0.0

                               SUBSYSTEM TOTAL:  97.3      91.3       2.3        2.2      99.6      93.5          2.94         3.31

TOTAL                                            91.0      84.9       5.1        4.9      96.2      89.8          3.40         4.36
```

Cache Subsystem Percent Report Field Descriptions

Each field that is displayed in the Cache Subsystem Percent Report is described in Table 3-11.

Table 3-11 Field Descriptions for the Cache Subsystem Percent Report (Part 1 of 3)

Field	Description
SUBSYSTEM	Identification of the cache subsystem.
CONTROL UNIT ID	Identification of the control unit.
TYPE	Controller device type.
NORMAL: READS	Percentage of all Cache Reads (Normal, Sequential, and Cache Fast Data (CFD)) requested during the recording interval that were Cache Normal Read requests.
NORMAL HITS: READS	Percentage of all Cache Normal Reads requested during the recording interval that were satisfied in cache.

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Table 3-11 Field Descriptions for the Cache Subsystem Percent Report (Part 2 of 3)

Field	Description
SEQUENTIAL: READS	Percentage of all Cache Reads (Normal, Sequential, and CFD) requested during the recording interval that were Cache Sequential Read requests.
SEQUENTIAL HITS: READS	Percentage of all Cache Sequential Reads requested during the recording interval that were satisfied in cache.
TOTAL: READS	Percentage of all Cache requests during the interval that were either Cache Normal Reads or Cache Sequential Reads.
TOTAL HITS: READS	Percentage of all Cache Reads (Normal, Sequential, and Cache Fast Data (CFD)) that were satisfied in cache.
NORMAL: WRITES	Percentage of all Cache Writes (Normal, Sequential, and CFD) requested during the recording interval that were Cache Normal Write requests.
NORMAL HITS: WRITES	Percentage of all Cache Normal Writes requested during the recording interval that were satisfied in cache.
SEQUENTIAL: WRITES	Percentage of all Cache Writes (Normal, Sequential, and CFD) requested during the recording interval that were Cache Sequential Write requests.
SEQUENTIAL HITS: WRITES	Percentage of all Cache Sequential Writes requested during the recording interval that were satisfied in cache.
TOTAL: WRITES	Percentage of all Cache requests during the interval that were either Cache Normal Writes or Cache Sequential Writes.
TOTAL HITS: WRITES	Percentage of all Cache Writes (Normal, Sequential, and CFD) that were satisfied in cache.
NORMAL: DASD FAST WRITES	Percentage of all Cache Writes (Normal, Sequential, and CFD) that were Normal DASD Fast Writes (DFWs).
NORMAL HITS: DASD FAST WRITES	Percentage of all Normal DFW requests that were satisfied in cache.
SEQUENTIAL: DASD FAST WRITES	Percentage of all Cache Write requests (Normal, Sequential, and CFD) that were Sequential DFWs.
SEQUENTIAL HITS: DASD FAST WRITES	Percentage of all Sequential DFW requests that were satisfied in cache.
TOTAL: DASD FAST WRITES	Percentage of all Cache Write requests that were Normal DFWs or Sequential DFWs satisfied in cache.
TOTAL HITS: DASD FAST WRITES	Percentage of all Cache Write requests that were met by either Normal DFWs or Sequential DFWs.
NORMAL: CACHE FAST DATA – READS	Percentage of all Cache Read requests (Normal, Sequential and CFD) that were CFD Read requests.
NORMAL HITS: CACHE FAST DATA - READS	Percentage of Normal CFD Read requests that were satisfied in cache.
TOTAL: CACHE FAST DATA – READS	Percentage of all Cache requests that were CFD Read requests.
TOTAL HITS: CACHE FAST DATA – READS	Percentage of all Cache Read requests that were CFD satisfied in cache.
NORMAL: CACHE FAST DATA – WRITES	Percentage of all Cache Write requests (Normal, Sequential, and CFD) that were CFD Write requests.
NORMAL HITS: CACHE FAST DATA – WRITES	Percentage of CFD Write requests that were CFD satisfied in cache.

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Table 3-11 Field Descriptions for the Cache Subsystem Percent Report (Part 3 of 3)

Field	Description
TOTAL: CACHE FAST DATA – WRITES	Percentage of all Cache requests that were CFD Write requests.
TOTAL HITS: CACHE FAST DATA – WRITES	Percentage of all Cache Write requests that were CFD satisfied in cache.
NORMAL: SUBSYSTEM TOTAL	Percentage of all I/Os for the subsystem that were Normal I/Os.
NORMAL HITS: SUBSYSTEM TOTAL	Percentage of all Normal I/Os for the subsystem that were satisfied in cache.
SEQUENTIAL: SUBSYSTEM TOTAL	Percentage of all I/Os for the subsystem that were Sequential I/Os.
SEQUENTIAL HITS: SUBSYSTEM TOTAL	Percentage of all Sequential I/Os for the subsystem that were satisfied in cache.
TOTAL: SUBSYSTEM TOTAL	Percentage of all I/Os to the subsystem, excluding Inhibit Cache and Bypass Cache.
TOTAL HITS: SUBSYSTEM TOTAL	Percentage of all I/Os to the subsystem that were satisfied in cache, excluding Inhibit Cache and Bypass Cache.
READ/WRITE RATIO: SUBSYSTEM TOTAL	Number of all Cache Read requests divided by the number of all Cache Write requests.
READ/WRITE HIT RATIO: SUBSYSTEM TOTAL	Number of all Cache Read requests that were satisfied in cache divided by the number of all Cache Write requests that were satisfied in cache.

Cache Subsystem Summary Report

The CACHE Analyzer control statement with either the TYPE=SUMMARY or the TYPE=ALL parameter defined generates the Cache Subsystem Summary Report (see “CACHE” on page 2-9 for more information). Both this report and the Cache Subsystem Detail Report are produced as the default reports to the CACHE Analyzer control statement.

The data for this report is obtained by using the CACHE Extractor control statement (see “CACHE” on page 1-8).

The Cache Subsystem Summary Report contains overall summary information for each type of cache being measured. Subsystems are grouped by type of cache controller. Use this report to see an overview of all subsystem activity or to find out if a particular subsystem is either under- or overutilized.

An example of the Cache Subsystem Summary Report is shown in Figure 3-5.

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Figure 3-5 Cache Subsystem Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    CACHE SUBSYSTEM SUMMARY REPORT                      RPTSEQ     4 PAGE     13
BMC SOFTWARE, INC.                                              XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-27/308/0/7  74-1/112/25.1K/7
            CONTROL                          TOTAL     READ    WRITE        READ     READ      WRITE     WRITE   TOTAL       TOTAL
SUBSYSTEM   UNIT ID     TYPE    STATUS      STORAGE   MISS %  MISS %       HITS     HIT %      HITS     HIT %   HIT %     REQUESTS
---------   ---------   -------  -------    -------   -----   -----    ----------  -----   ----------  -----   -----    -----------
  AC03       C100      2105-20  ACTIVE      3,221M     0.0     0.0       295,126  100.0       19,621  100.0   100.0        314,760
  0140       8300      3990-06  ACTIVE     11,652M     2.7    12.6     1,701,394   97.3      883,870   87.4    93.7      2,825,173
  0141       8340      3990-06  ACTIVE     11,652M     1.8    13.0     3,864,617   98.2      334,380   87.0    97.2      5,087,821
  0142       8380      3990-06  ACTIVE     11,652M     0.7     6.9     4,420,590   99.3      239,763   93.1    98.9      4,711,769
  0143       83C0      3990-06  ACTIVE     11,652M     3.4    14.1     1,979,241   96.6      598,607   85.9    93.9      2,756,431
  0144       870A      3990-06  ACTIVE     11,652M     0.0    42.2     2,428,604  100.0    1,267,613   57.8    80.0      4,622,348
  0240       8500      3990-06  ACTIVE     11,652M     2.4     5.1     1,980,033   97.6      383,279   94.9    97.2      2,441,034
  0241       8540      3990-06  ACTIVE     11,652M     3.0    12.4     1,380,179   97.0      370,939   87.6    94.8      1,869,068
  0242       8580      3990-06  ACTIVE     11,652M     1.9     3.5       432,391   98.1      160,096   96.5    97.6        706,798
  0243       85C0      3990-06  ACTIVE     11,652M     1.2     0.0        83,639   98.8            0    0.0    98.8         84,665

 TOTAL                                        108G     1.7    23.4    18,565,814   98.3    4,258,168   76.6    93.4     25,419,867
```

Cache Subsystem Summary Report Field Descriptions

Table 3-12 describes each field that is displayed in the Cache Subsystem Summary Report.

Table 3-12 Field Descriptions for the Cache Subsystem Summary Report (Part 1 of 2)

Field	Description
SUBSYSTEM	Identification of the cache subsystem.
CONTROL UNIT ID	Control unit addresses.
TYPE	Controller device type.
STATUS	Status of the subsystem. Possible values for this field are ACTIVE Cache is online. P ACT Subsystem is in the process of bringing cache online. OFFLINEInternal error stopped cache, bringing it offline. DEACT Cache has been deactivated because of a host program or support facility request. P DEACT Command request was to deactivate caching, but destaging is still in progress. P FAIL Command request was to deactivate caching, but destaging has failed. NO IML IML device not available. NO CFW Cache fast write is deactivated.
TOTAL STORAGE	Total configured storage on the cache device.
READ MISS %	Percentage of all Cache Read requests that were not satisfied in cache.
WRITE MISS %	Percentage of all Cache Write requests that were not satisfied in cache.
READ HITS	Total number of Cache Read requests that were satisfied in cache.
READ HIT %	Percentage of Cache Read requests that were satisfied in cache.
WRITE HITS	Total number of Cache Write requests that were satisfied in cache.
WRITE HIT %	Percentage of Cache Write requests that were satisfied in cache.

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Table 3-12 Field Descriptions for the Cache Subsystem Summary Report (Part 2 of 2)

Field	Description
TOTAL HIT %	Percentage of all Cache requests (Read and Write) that were satisfied in cache.
TOTAL REQUESTS	Total number of Cache requests (Reads, Writes, Inhibit Cache Loading, and Bypass) of the subsystem during the recording interval.

Cache Subsystem Transfer Report

The CACHE Analyzer control statement with either the TYPE=TRANSFER or the TYPE=ALL parameter defined generates the Cache Subsystem Transfer Report (see “CACHE” on page 2-9 for more information). Data is gathered for this report by using the CACHE Extractor control statement (see “CACHE” on page 1-8).

The Cache Subsystem Transfer Report summarizes subsystem information and subsystem data transfer and staging information.

An example of the Cache Subsystem Transfer Report is shown in Figure 3-6.

Figure 3-6 Cache Subsystem Transfer Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                CACHE SUBSYSTEM TRANSFER REPORT                RPTSEQ     7 PAGE     19
BMC SOFTWARE, INC.                                          XYZ COMPANY                         REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00          WORLDWIDE HEADQUARTERS                    SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-27/308/0/7  74-1/112/25.1K/7
------------------------------------------------------- STORAGE SECTION -------------------------------------------------------

                                                   VOLATILE STORAGE                                  NON-VOLATILE STORAGE
                                  ----------------------------------------------------------------  -------------------------
 SUB-    CONTROL
SYSTEM   UNIT ID    TYPE       PINNED         BOUND        OFFLINE      AVAILABLE    CONFIGURED         PINNED      CONFIGURED
------  ---------  -------   -----------   -----------   -----------   -----------  -----------    -----------   -----------
 AC03     C100     2105-20            0      - -                  0    2,689,860K    3,221,225K                0      201,327K
 0140     8300     3990-06            0      - -                  0   11,652,237K   11,652,237K                0    4,294,967K
 0141     8340     3990-06            0      - -                  0   11,652,237K   11,652,237K                0    4,294,967K
 0142     8380     3990-06            0      - -                  0   11,652,237K   11,652,237K                0    4,294,967K
 0143     83C0     3990-06            0      - -                  0   11,652,237K   11,652,237K                0    4,294,967K
 0144     870A     3990-06            0      - -                  0   11,652,237K   11,652,237K                0    4,294,967K

 TOTAL                                0      - -                  0      107,560M      108,091M                0   38,856,032K

------------------------ 3990-06 ------------------------ TRANSFER SECTION ------------------------ 3990-06 ------------------------

                                 DASD
                        DASD    FAST WRITE                    NORMAL      SEQUENTIAL      TOTAL        NORMAL      SEQ       TOTAL
 SUB-    CONTROL     FAST WRITE  RETRIES     WRITE FROM     READ TO       READ TO       READ TO       STAGES     STAGES     STAGES
SYSTEM   UNIT ID      RETRIES    PER SEC     CACHE TRANS   CACHE TRANS   CACHE TRANS   CACHE TRANS    PER SEC    PER SEC    PER SEC
------  ---------    ----------  --------    -----------   -----------   -----------   -----------   --------   --------   --------
 0140     8300           1,102     0.044        210,595        40,085        13,509        53,594      1.591      0.536      2.127
 0141     8340               0     0.000        145,508        38,301       117,550       155,851      1.520      4.665      6.185
 0142     8380               0     0.000         70,028        21,389         4,046        25,435      0.849      0.161      1.009
 0143     83C0               0     0.000         75,988        50,071         9,095        59,166      1.987      0.361      2.348
 0144     870A               0     0.000          2,403             0             0             0      0.000      0.000      0.000
 0240     8500               0     0.000         76,424        25,092        15,854        40,946      0.996      0.629      1.625
 0241     8540              22     0.001        157,876        23,257        42,594        65,851      0.923      1.690      2.613
 0242     8580          59,534     2.362        245,945         9,288         4,611        13,899      0.369      0.183      0.552
 0243     85C0               0     0.000              0           873             0           873      0.035      0.000      0.035

 TOTAL                   60,658     2.407        988,869       208,374       207,306       415,680      8.269      8.226     16.495
```

Cache Subsystem Transfer Report Field Descriptions

Table 3-13 describes each field that is displayed in the Cache Subsystem Transfer Report.

Table 3-13 Field Descriptions for the Storage Section

Field	Description
SUBSYSTEM	Identification of the cache subsystem.
CONTROL UNIT ID	Control unit addresses.
TYPE	Controller device type.
VOLATILE STORAGE – PINNED	Average amount of pinned storage.
VOLATILE STORAGE – BOUND	Average amount of bound storage (3880-13 only).
VOLATILE STORAGE – OFFLINE	Average amount of storage moved offline.
VOLATILE STORAGE – AVAILABLE	Average amount of storage available to the cache subsystem.
VOLATILE STORAGE – CONFIGURED	Average amount of storage configured to the cache subsystem.
NON-VOLATILE STORAGE – PINNED	Average amount of pinned nonvolatile storage.
NON-VOLATILE STORAGE – CONFIGURED	Average amount of nonvolatile storage configured on the cache subsystem.

Table 3-14 describes each field that is displayed in the Transfer Section of the Cache Subsystem Transfer Report.

Table 3-14 Field Descriptions for Transfer Section

Field	Description
SUBSYSTEM	Identification of the cache subsystem.
CONTROL UNIT ID	Control unit addresses.
DASD FAST WRITE RETRIES	Number of times DASD Fast Write had to retry a write operation to the DASD device. This represents DFW writes to DASD due to nonvolatile storage limitations.
DASD FAST WRITE RETRIES PER SEC	Rate of DASD Fast Write retries per second.
WRITE FROM CACHE TRANS	Number of destages to the DASD device from cache.
NORMAL READ TO CACHE TRANS	Number of normal I/O transfers of data to cache from the DASD device.
SEQUENTIAL READ TO CACHE TRANS	Number of sequential I/O transfers of data to cache from the DASD device.
TOTAL READ TO CACHE TRANS	Number of destages to cache from the DASD device.

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Table 3-14 Field Descriptions for Transfer Section

Field	Description
NORMAL STAGES PER SEC	Rate of normal I/O data transfers up to cache from the DASD device in transfers (stages) per second.
SEQ STAGES PER SEC	Rate of sequential I/O data transfers up to cache from the DASD device in transfers (stages) per second.
TOTAL STAGES PER SEC	Rate of all data transfers to cache from the DASD device in transfers (stages) per second.

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Cache Reports (from SMF type 74-5 records)

The CACHE Analyzer control statement (see “CACHE” on page 2-9) is used to gather data for the following reports:

“Cache Subsystem Overview Report” on page 3-32: Shows an overview of caching activity at the subsystem level; gives you a rough idea of how your cache subsystems are performing, and provides information about where to look for specific performance problems. It consists of a summary line of information for each cache subsystem and for the most active devices (activity by total I/O rate and by DASD I/O rate).

“Cache Subsystem Activity Report” on page 3-35: Shows detail information about every cache subsystem and an overview of activity on its attached DASD devices. For each subsystem, the report contains 1 page of detail subsystem information, plus 1 or more pages of device information consisting of a summary line of information for each device. Additionally, if applicable, there is detail information about RAID rank activity in the subsystem.

“Cache Device Activity Report” on page 3-41: Contains detail information about every cache subsystem and detail information about every logical DASD device attached to a subsystem. For each cache subsystem, this report has 1 page of detail subsystem information, and one or more pages of detail device information, 1 device per page. The fields in this report are similar to those in the Cache Subsystem Activity report, except that this report shows the data for one particular device rather than for a subsystem.

Note: NOTE: this report can be quite voluminous, so BMC suggests you only request it for specific devices or ranges, or when troubleshooting cache subsystem problems.

Ordering and Filtering: The above reports can be ordered and filtered in different ways (see “CACHEACT” on page 2-14) , so your report may not look exactly like the sample reports shown below.

Cache Subsystem Overview Report

This is the report produced by the CACHEACT Analyzer control statement when the REPORT= parameter is either omitted or specified as REPORT=OVERVIEW. Use this report to see an overview of each subsystem's activity or to find out if a particular subsystem is either under or over utilized.

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By default, subsystems are ordered by ID but the order can be changed by the ORDER= parameter. The report can be filtered by cache subsystem model ID.

An example of the Cache Subsystems Overview Report is shown in Figure 3-7.

Figure 3-7 Cache Subsystem Overview Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                CACHE SUBSYSTEMS OVERVIEW REPORT                    RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                      BMC SOFTWARE, INC.                           REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                HOUSTON, TX.                              SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                          REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5

              CTRL        STORAGE(MB)  --I/O RATE-  --CACHE HIT RATE-  -----DASD I/O RATE-----------  ASYNC  -----% HITS------    %
SSID    TYPE  UNIT STATUS CACHE   NVS  CACHE   OFF   READ   DFW   CFW  STAGE DFWBP   ICL   BYP OTHER   RATE  TOTAL  READ WRITE  READ
----  ------- ---- ------ ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
0027  3990-03 5590 ACTIVE 1,024     8   0.4     0   0.4     0     0     0     0     0     0     0     0   99.9  99.9     0 100.0
0140  3990-06 8350 ACTIVE 28.1K   192 640.4     0 564.1  61.1     0   9.3     0   0.2   5.7     0  18.2  97.6  98.4  99.9  90.4
0144  3990-06 8733 ACTIVE 28.1K   192 192.5     0  97.9  94.4     0   0.2     0     0     0     0     0  99.9  99.8 100.0  51.0
0240  3990-06 8573 ACTIVE 28.1K   192 340.0     0 274.7  45.0     0   7.1     0     0  13.5     0  14.4  94.0  97.6  99.3  86.2
A300  2105-20 A333 ACTIVE 4,096   192   8.1     0   2.9   5.1     0     0     0     0     0     0   1.4 100.0  99.9 100.0  36.4
AC03  2105-20 C103 ACTIVE 4,096   192  25.8     0  25.6   0.1     0     0     0     0     0     0   0.1 100.0 100.0 100.0  99.4


PRODUCED BY CMF ANALYZER (5.5.00)                CACHE SUBSYSTEMS OVERVIEW REPORT                    RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                      BMC SOFTWARE, INC.                           REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                HOUSTON, TX.                              SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                          REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5

---------------------------------- MOST ACTIVE DEVICES -- IN DESCENDING ORDER BY TOTAL I/O RATE ----------------------------------

 DEV  VOLUME        ----STATUS---     %     I/O   -CACHE HIT RATE-  --------DASD I/O RATE--------  ASYNC  -------% HITS------     %
 NUM  SERIAL  SSID  CACHE  DASDFW    I/O   RATE   READ   DFW   CFW  STAGE DFWBP   ICL   BYP OTHER   RATE  TOTAL   READ  WRITE  READ
----  ------  ----  ------ ------  -----  -----  ----- ----- -----  ----- ----- ----- ----- -----  -----  -----  ----- -----  -----
8710  TSG337  0144  ACTIVE ACTIVE   87.7  168.9   84.5  84.4     0      0     0     0     0     0      0  100.0  100.0  100.0   50.0
8368  BAB319  0140  ACTIVE ACTIVE    6.9   44.4   43.8   0.1     0    0.5     0     0     0     0      0   98.9   98.9  100.0   99.7
83AE  TSG322  0140  ACTIVE ACTIVE    6.9   44.2   43.7   0.4     0      0     0     0     0     0    0.1   99.9   99.9  100.0   99.0
83AC  TSG320  0140  ACTIVE ACTIVE    4.2   27.0   26.6   0.1     0    0.2     0     0     0     0      0   99.3   99.3  100.0   99.5
83A2  TSG310  0140  ACTIVE ACTIVE    3.3   20.9   20.8     0     0    0.1     0     0     0     0      0   99.7   99.7  100.0  100.0
8525  SAZ12I  0240  ACTIVE ACTIVE    6.1   20.6   20.4     0     0    0.2     0     0     0     0      0   99.1   99.1      0  100.0
8712  TSG339  0144  ACTIVE ACTIVE   10.4   20.1   10.1  10.0     0      0     0     0     0     0      0  100.0  100.0  100.0   50.1
8526  SAZ12J  0240  ACTIVE ACTIVE    5.7   19.5   19.4     0     0      0     0     0     0     0      0   99.7   99.7      0  100.0
C11A  SHK026  AC03  ACTIVE ACTIVE   73.5   18.9   18.9     0     0      0     0     0     0     0      0  100.0  100.0      0  100.0
85E9  TSG324  0240  ACTIVE ACTIVE    5.0   17.0   14.3   2.7     0    0.1     0     0     0     0    0.1   99.6   99.6   99.8   84.2
8552  APD282  0240  ACTIVE ACTIVE    4.7   15.9    7.8   7.6     0      0     0     0   0.5     0    0.3   96.9   99.7   99.9   50.6
8330  TSG301  0140  ACTIVE ACTIVE    2.5   15.7   14.2   0.2     0    1.3     0     0     0     0    0.1   91.5   91.5   99.1   98.8
8360  BAB311  0140  ACTIVE ACTIVE    2.2   14.1   13.9   0.2     0    0.1     0     0     0     0      0   99.5   99.4  100.0   98.9
8311  SYM030  0140  ACTIVE ACTIVE    2.1   13.7   11.0   2.7     0      0     0     0     0     0    0.1   99.8   99.9   99.7   80.6
8367  BAB318  0140  ACTIVE ACTIVE    2.0   13.1   12.9   0.1     0    0.1     0     0     0     0    0.1   99.0   99.0   99.2   99.5
8306  SYSP14  0140  ACTIVE ACTIVE    1.9   12.4   11.9   0.5     0      0     0     0     0     0    0.1   99.9   99.9  100.0   96.1
8308  SYSP15  0140  ACTIVE ACTIVE    1.9   12.2   11.9   0.3     0      0     0     0     0     0    0.1   99.7   99.7   99.8   97.9
83A0  TSG308  0140  ACTIVE ACTIVE    1.9   12.1   11.5   0.6     0      0     0     0     0     0    0.2   99.9   99.9  100.0   95.3

---------------------------------- MOST ACTIVE DEVICES -- IN DESCENDING ORDER BY DASD I/O RATE ----------------------------------

 DEV  VOLUME        ----STATUS---     %     I/O   -CACHE HIT RATE-  --------DASD I/O RATE--------  ASYNC  -------% HITS------     %
 NUM  SERIAL  SSID  CACHE  DASDFW    I/O   RATE   READ   DFW   CFW  STAGE DFWBP   ICL   BYP OTHER   RATE  TOTAL   READ  WRITE  READ
----  ------  ----  ------ ------  -----  -----  ----- ----- -----  ----- ----- ----- ----- -----  -----  -----  ----- -----  -----
858C  SAEPG1  0240  ACTIVE ACTIVE    2.5    8.4    0.2   0.1     0      0     0     0   8.1     0    1.2    3.3   99.7  100.0   66.5
833B  SAEPG2  0140  ACTIVE ACTIVE    0.4    2.3    0.1     0     0      0     0     0   2.3     0    1.6    2.5   98.1      0  100.0
850F  SHRA06  0240  ACTIVE ACTIVE    0.6    2.1    0.3     0     0      0     0     0   1.8     0      0   16.4   99.3  100.0   96.2
8572  SANWK1  0240  ACTIVE ACTIVE    1.2    4.2    0.8   1.6     0      0     0     0   1.7     0    0.4   58.6   99.5   99.9   34.3
8330  TSG301  0140  ACTIVE ACTIVE    2.5   15.7   14.2   0.2     0    1.3     0     0     0     0    0.1   91.5   91.5   99.1   98.8
851B  BAB303  0240  ACTIVE ACTIVE    2.6    8.9    4.9   2.8     0    0.3     0     0   0.9     0    0.1   85.9   93.9  100.0   65.3
830B  SMFE36  0140  ACTIVE ACTIVE    0.4    2.6    0.1   1.6     0      0     0     0   0.9     0    0.9   63.1   97.8  100.0    3.1
8307  PAGF49  0140  ACTIVE ACTIVE    0.2    1.0    0.1     0     0      0     0     0   0.9     0    1.4    8.3  100.0  100.0   81.6
85C7  BAB367  0240  ACTIVE ACTIVE    1.3    4.5    3.6   0.2     0    0.7     0     0     0     0      0   84.4   83.8   99.4   96.0
85BE  SMS005  0240  ACTIVE ACTIVE    0.4    1.3    0.8     0     0    0.5     0     0     0     0      0   60.6   60.6  100.0  100.0
8552  APD282  0240  ACTIVE ACTIVE    4.7   15.9    7.8   7.6     0      0     0     0   0.5     0    0.3   96.9   99.7   99.9   50.6
8368  BAB319  0140  ACTIVE ACTIVE    6.9   44.4   43.8   0.1     0    0.5     0     0     0     0      0   98.9   98.9  100.0   99.7
85C8  BAB368  0240  ACTIVE ACTIVE    1.5    5.0    4.5   0.1     0    0.4     0     0     0     0      0   91.8   91.6   99.6   97.4
83AF  HSM300  0140  ACTIVE ACTIVE    1.6   10.0    9.3   0.4     0    0.4     0     0     0     0    0.3   96.0   95.9  100.0   96.3
83F3  FAT307  0140  ACTIVE ACTIVE    0.5    3.4    2.9   0.1     0    0.4     0     0     0     0      0   88.2   88.0  100.0   98.1
8369  BAB320  0140  ACTIVE ACTIVE    1.3    8.4    6.9   1.1     0    0.4     0     0     0     0    0.3   95.5   94.8  100.0   86.3
85C6  BAB366  0240  ACTIVE ACTIVE    1.4    4.8    4.4   0.1     0    0.4     0     0     0     0    0.1   92.6   92.5   99.2   98.6
856C  FAT312  0240  ACTIVE ACTIVE    1.5    5.0    4.5   0.1     0    0.3     0     0     0     0    0.1   93.2   93.1  100.0   97.4
```

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Cache Subsystem Overview Report Field Descriptions

Table 3-13 describes each field that is displayed in the Cache Subsystem Overview Report.

Table 3-15 Field Descriptions for the Cache Subsystems Overview Report (Part 1 of 2)

Field	Description
First section of the report	
SSID	The 4-digit hexadecimal identifier that uniquely identifies the cache subsystem.
TYPE	The cache subsystem type.
CTRL UNIT	Physical control unit number of the caching subsystem. This is equal to the lowest device number for the subsystem.
STATUS	The caching status of the entire subsystem.
STORAGE (MB)	Storage amounts, in megabytes:
CACHE	The amount of storage configured for caching in the subsystem.
NVS	The amount of Non-Volatile Storage (NVS) storage in the subsystem.
I/O RATE	I/O requests per second, by type:
CACHE	Number of cacheable I/O requests to cache devices.
OFF	Number of I/O requests to non-cache devices.
CACHE HIT RATE	I/O requests per second that completed without accessing DASD, by type:
READ	Number of READ requests.
DFW	Number of DFW (DASD Fast Write) requests.
CFW	Number of CFW (Cache Fast Write) requests.
DASD I/O RATE	I/O requests per second that accessed DASD, by type:
STAGE	Number of normal or sequential requests.
DFWBP	Number of requests that caused DFW to be bypassed.
ICL	Number of ICL (Inhibit Cache Load) requests.
BYP	Number of requests that explicitly bypassed the cache.
OTHER	Number of requests that were either CFW BYPASS or DFW INHIBIT requests.
ASYNC RATE	Number of tracks asynchronously written to DASD in order to release space in cache or NVS storage. A high rate indicates storage may be over-committed.
% HITS	I/O requests serviced from the cache, as percentages of all I/O requests:
TOTAL	Percentage of READ and WRITE requests serviced from the cache.
READ	Percentage of READ requests serviced from the cache.
WRITE	Percentage of WRITE requests serviced from the cache.
READ	READ requests as a percentage of all I/O requests.
MOST ACTIVE DEVICES page	
DEV NUM	The 4-digit device number that uniquely identifies the DASD device.
VOLUME SERIAL	The volume serial number.

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Table 3-15 Field Descriptions for the Cache Subsystems Overview Report (Part 2 of 2)

Field	Description
SSID	Physical control unit number of the cache subsystem.
STATUS	Cache status of the DASD device:
CACHE	Caching status.
DASDFW	DASD Fast Write (DFW) status.
% I/O	I/O requests to this DASD volume, as a percentage of all I/O requests to the cache subsystem it belongs to.
I/O RATE	I/O requests per second to the volume.
CACHE HIT RATE	I/O requests per second that completed without accessing DASD, by request type:
READ	Number of READ requests.
DFW	Number of DFW (DASD Fast Write) requests.
CFW	Number of CFW (Cache Fast Write) requests.
DASD I/O RATE	I/O requests per second that accessed DASD, by request type:
STAGE	Normal or sequential requests.
DFWBP	Requests that caused DFW to be bypassed.
ICL	ICL (Inhibit Cache Load) requests.
BYP	Requests that explicitly bypassed the cache.
OTHER	Requests that were either CFW BYPASS or DFW INHIBIT requests.
ASYNC RATE	Number of tracks asynchronously written to the DASD device in order to release space in the cache or NVS storage. A high rate indicates that storage may be over-committed.
% HITS	I/O requests serviced from the cache, as percentages of all I/O requests:
TOTAL	Percentage of READ and WRITE requests serviced from the cache.
READ	Percentage of READ requests serviced from the cache.
WRITE	Percentage of WRITE requests serviced from the cache.
READ	READ requests as a percentage of all I/O requests.

Cache Subsystem Activity Report

This is the report produced by the CACHEACT Analyzer control statement when REPORT=SUBSYS is specified.

By default, the report is ordered by subsystem ID but the order can be changed by the ORDER= parameter. The report can be filtered by model, subsystem ID, and a threshold value. Specific subsystems may be selected and/or excluded.

An example of the Cache Subsystem Activity Report is shown in Figure 3-8.

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Figure 3-8 Cache Subsystem Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                  CACHE SUBSYSTEM ACTIVITY REPORT                      RPTSEQ     4 PAGE     28
BMC SOFTWARE, INC.                                        BMC SOFTWARE, INC.                            REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                  HOUSTON, TX.                              SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                            REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5

------------------------------------ SUBSYSTEM ID: A300   MODEL: 2105-20   CONTROL UNIT: A333 -------------------------------------

   SUBSYSTEM STORAGE       NON-VOLATILE STORAGE        S U B S Y S T E M     S T A T U S         I/O TOTALS              HIT %
----------------------  -------------------------   ----------------------------------------   ----------------      ----------------
CONFIGURED       4.1GB  CONFIGURED          192MB   CACHING              - ACTIVE             CACHE     14,555      CACHE      100.0
AVAILABLE        3.4GB  PINNED                  0   NON-VOLATILE STORAGE - ACTIVE             OFFLINE        0      TOTAL      100.0
PINNED               0                              CACHE FAST WRITE     - ACTIVE             NONCACHE       0
OFFLINE              0                              IML DEVICE AVAILABLE - YES                TOTAL     14,555

CACHE I/O    -------------READ I/O REQUESTS-------------     ----------------------WRITE I/O REQUESTS----------------------       %
REQUESTS       COUNT     RATE      HITS     RATE   HIT %       COUNT     RATE      FAST     RATE       HITS    RATE   HIT %     READ

NORMAL         4,851      2.7     4,851      2.7   100.0         223      0.1       223      0.1        223     0.1   100.0     95.6
SEQUENTIAL       442      0.2       437      0.2    98.9       9,039      5.0     9,039      5.0      9,039     5.0   100.0      4.7
CFW DATA           0        0         0        0       0           0        0         0        0          0       0       0        0

TOTAL          5,293      2.9     5,288      2.9    99.9       9,262      5.1     9,262      5.1      9,262     5.1   100.0     36.4

----------------------CACHE MISSES----------------------            ------------MISC------------          ------NON-CACHE I/O-----
REQUESTS      READ    RATE   WRITE    RATE  TRACKS    RATE                            COUNT   RATE                        COUNT   RATE

NORMAL           0       0       0       0       3       0            DFW BYPASS          0      0          ICL             0      0
SEQUENTIAL       5       0       0       0     463     0.3            CFW BYPASS          0      0          BYPASS          0      0
CFW DATA         0       0       0       0                            DFW INHIBIT         0      0
                                                                      ASYNC (TRKS)    2,480    1.4          TOTAL           0      0
TOTAL CACHE MISSES        5   RATE       0
TOTAL CACHE HITS     14,555   RATE    8.09

---CKD STATISTICS---     ---RECORD CACHING---

WRITE              0     READ MISSES        0
WRITE HITS         0     WRITE PROM     7,746


PRODUCED BY CMF ANALYZER (5.5.00)                  CACHE SUBSYSTEM ACTIVITY REPORT                      RPTSEQ     4 PAGE     29
BMC SOFTWARE, INC.                                        BMC SOFTWARE, INC.                            REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                  HOUSTON, TX.                              SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                            REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5

------------------------------------ SUBSYSTEM ID: A300   MODEL: 2105-20   CONTROL UNIT: A333 -------------------------------------

 DEV  VOLUME        ----STATUS---      %     I/O   -CACHE HIT RATE-  --------DASD I/O RATE--------  ASYNC  -------% HITS------     %
 NUM  SERIAL  RRID  CACHE  DASDFW    I/O   RATE   READ   DFW   CFW  STAGE DFWBP   ICL   BYP OTHER   RATE  TOTAL   READ  WRITE   READ
----  ------  ----  ------ ------  -----  -----  ----- ----- -----  ----- ----- ----- ----- -----  -----  -----  -----  -----  -----
A300  APD28G  0100  ACTIVE ACTIVE   11.2    0.9      0   0.9     0      0     0     0     0     0    0.9  100.0  100.0  100.0    2.9
A301  SMFT01  0100  ACTIVE ACTIVE    0.4      0      0     0     0      0     0     0     0     0      0  100.0  100.0      0  100.0
A302  SMFT02  0100  ACTIVE ACTIVE    0.4      0      0     0     0      0     0     0     0     0      0  100.0  100.0      0  100.0
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
A303  SMFT03  0100  ACTIVE ACTIVE   22.5    1.8      0   1.8     0      0     0     0     0     0    0.2  100.0  100.0  100.0    2.2
A313  SMFT28  0100  ACTIVE ACTIVE    0.4      0      0     0     0      0     0     0     0     0      0  100.0  100.0      0  100.0
A36F  --A36F  0101  ACTIVE ACTIVE    0.1      0      0     0     0      0     0     0     0     0      0  100.0  100.0      0  100.0

TOTALS FOR 112 DEVICES:            100.0    8.1    2.9   5.1     0      0     0     0     0     0    2.8  100.0   99.9  100.0   36.4

---------------------------------------------------- RAID RANK ACTIVITY ----------------------------------------------------

                          ---------READ REQUESTS---------   --------WRITE REQUESTS---------
  ID   TYPE     DA   HDD  COUNT  RATE AVG SZ BYTE/S RTIME   COUNT  RATE AVG SZ BYTE/S RTIME  ------ HIGHEST ACTIVITY VOLUMES--------
 ----  -------  --   ---  ----- ----- ------ ------ -----   ----- ----- ------ ------ -----
 0100  RAID-5   11     7     39     0  53.1K  1,151     4     139   0.1  76.3K  5,899    26   FTP109  SMFT03  APD28G  PAGC32  FTP103
 0101  RAID-5   11     7    101   0.1  38.3K  2,150    10       0     0      0      0     0   --A34E  FTP111  FTP112  --A338  --A339

 TOTAL                14    140   0.1  42.4K  3,301     8     139   0.1  76.3K  5,899    26
```

Cache Subsystem Activity Report Field Descriptions

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Table 3-13 describes each field that is displayed in the Cache Subsystem Activity Report.

Table 3-16 Field Descriptions for the Cache Subsystem Activity Report (Part 1 of 5)

Field	Description
Subsystem Status Page	
SUBSYSTEM ID	Physical control unit number of the cache subsystem.
MODEL	Hardware model ID.
CONTROL UNIT	Physical control unit number of the caching subsystem. This is equal to the lowest device number for the subsystem.
SUBSYSTEM STORAGE	Cache storage status, in megabytes:
CONFIGURED	Amount installed.
AVAILABLE	Amount available.
PINNED	Amount pinned in cache - DASD failure prevents data destaging.
OFFLINE	Amount offline, possibly due to error.
NON-VOLATILE STORAGE	Non-volatile storage (NVS) status, in megabytes:
CONFIGURED	Amount installed.
PINNED	Amount pinned in NVS - DASD failure prevents data destaging.
SUBSYSTEM STATUS	The caching status of the entire subsystem:
CACHING	ACTIVE - Caching is online and usable PENDING ACTIVE - Cache is being brought online INTERNAL ERROR - Internal error stopped caching HOST TERMINATION - Host deactivated caching CACHE SUSPENDED - Caching suspended PENDING OFFLINE - Cache deactivation is pending PENDING OFF FAIL - Cache deactivation failed IN MAINTENANCE - Cache disabled for maintenance ????? - Unknown status
NON-VOLATILE STORAGE	ACTIVE - NVS caching is online and usable INTERNAL ERROR - Internal error stopped NVS cache HOST TERMINATION - Host deactivated NVS caching DFW SUSPENDED - DFW inhibited - battery failure PENDING OFFLINE - NVS cache deactivation pending IN MAINTENANCE - NVS disabled for maintenance ????? - Unknown status
CACHE FAST WRITE	ACTIVE - CFW is active DEACTIVATED - CFW has been deactivated
IML DEVICE AVAILABLE	YES - IML device is operational NO - IML device is not operational
I/O TOTALS	Number of I/O requests:
CACHE	Cacheable I/O requests to cached devices
OFFLINE	I/O requests to non-cached devices
NONCACHE	Sum of INHIBIT CACHE LOAD and CACHE BYPASS requests
TOTAL	Sum of all I/O requests

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Table 3-16 Field Descriptions for the Cache Subsystem Activity Report (Part 2 of 5)

Field	Description
HIT %	Cache hits, as percentages of all I/O requests:
CACHE	Percentage of cacheable I/O requests serviced from cache
TOTAL	Percentage of all I/O requests serviced from cache
Subsystem Details Page	
CACHE I/O REQUESTS	Specified by the DEFINE EXTENT command. It categorizes the way cache is managed, as one of 3 classes:
NORMAL	Use the normal LRU algorithm to make cache space available
SEQUENTIAL	Preload of tracks from DASD for sequential I/O requests
CFW DATA	Handle WRITE and READ-AFTER-WRITE requests in cache
TOTAL	Totals or averages for the 3 classes defined above
READ I/O REQUESTS	I/O requests that had at least one SEARCH or READ command and no WRITE command. Only requests to cached devices are counted.
COUNT	Total number of SEARCH/READ requests
RATE	SEARCH/READ requests per second
HITS	SEARCH/READ requests handled without accessing DASD
RATE	SEARCH/READ requests handled w/o accessing DASD, per second
HIT %	SEARCH/READ cache hits, as a percentage of all such requests
WRITE I/O REQUESTS	I/O requests that had at least one WRITE command. Only requests to cached devices are counted.
COUNT	Total number of WRITE requests
RATE	WRITE requests per second
FAST	CACHE/DASD FAST WRITE (CFW and DFW) requests
RATE	CFW/DFW requests per second
HITS	CFW/DFW requests handled without accessing DASD
RATE	CFW/DFW requests processed without accessing DASD, per second
HIT %	CFW/DFW cache hits, as a percentage of all WRITE requests
% READ	READ requests as a percentage of all READ and WRITE requests.
CACHE MISSES	A cache miss occurs when: • Data to be read or written are not found in the cache. This causes the track or tracks containing the data to be read from DASD and placed in the cache. • A lack of NVS storage causes the data to be written to DASD immediately· • For some reason or other, DASD FAST WRITE (DFW) is inhibited
READ	SEARCH/READ requests that accessed DASD
RATE	SEARCH/READ requests that accessed DASD, per second
WRITE	WRITE requests that accessed DASD
RATE	WRITE requests that accessed DASD, per second

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Table 3-16 Field Descriptions for the Cache Subsystem Activity Report (Part 3 of 5)

Field	Description
TRACKS	Number of tracks transferred from DASD to cache
RATE	Number of tracks transferred from DASD to cache, per second
MISC	
DFW BYPASS	Number of DASD FAST WRITE (DFW) requests that might have been written to NVS, except that NVS was over committed. This forced the writes to be sent directly to DASD.
COUNT	Total number of DFW BYPASS requests
RATE	DFW BYPASS requests per second
CFW BYPASS	The number of I/O requests with the CACHE FAST WRITE (CFW) attribute that went directly to DASD because the cache was full. No waiting for destaging is done for these requests.
COUNT	Total number of CFW BYPASS requests
RATE	CFW BYPASS requests per second
DFW INHIBIT	If DASD FAST WRITE (DFW) is active, this is the number of WRITE requests that inhibited DFW. If DFW is inactive, this is just the number of WRITE requests that directly accessed the DASD.
COUNT	Total number of DFW INHIBIT requests
RATE	DFW INHIBIT requests per second
ASYNC (TRKS)	Number of tracks asynchronously transferred from cache to DASD, in order to free space in the cache and the NVS. For a duplex pair, this is the number of transfers from the primary cache to the secondary. A high number of ASYNC I/Os indicates an over-committed cache or NVS.
COUNT	Number of tracks asynchronously transferred from cache to DASD
RATE	Number of tracks asynchronously transferred, per second
NON-CACHE I/O	
ICL	Inhibit cache load (ICL). Number of I/O requests that inhibited load of data into cache, even though the data was not found in the cache.
COUNT	Total number of ICL requests
RATE	ICL requests per second
BYPASS	Number of I/O requests that explicitly bypassed the cache, whether the data were in the cache or not.
COUNT	Total number of BYPASS requests
RATE	BYPASS requests per second
TOTAL	Total number of I/O requests that bypassed the cache.
COUNT	Number of I/O requests that bypassed the cache
RATE	Number of I/O requests that bypassed the cache, per second
TOTAL CACHE MISSES	Count and rate of I/O requests that were not serviced from cache
TOTAL CACHE HITS	Count and rate of I/O requests that were serviced from cache
CKD STATISTICS	Count-Key-Data (CKD) track format requests.

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Table 3-16 Field Descriptions for the Cache Subsystem Activity Report (Part 4 of 5)

Field	Description
WRITE	Number of CKD WRITE requests (also in total WRITE count)
WRITE HITS	CKD WRITE requests handled in cache
RECORD CACHING	Dynamic record caching counts. Normally, only whole tracks are cached.
READ MISSES	Count of records to be read that were not in the cache
WRITE PROM	Count of records to be written that needed to access DASD
Device Overview Pages	
DEV NUM	The 4-digit device number that uniquely identifies the DASD device.
VOLUME SERIAL	The volume serial number.
RRID	RAID rank identifier.
STATUS	Cache status of the DASD device:
CACHE	Caching status.
DASDFW	DASD Fast Write (DFW) status.
% I/O	I/O requests to this DASD volume, as a percentage of all I/O requests to the cache subsystem it belongs to
I/O RATE	I/O requests per second to the volume.
CACHE HIT RATE	I/O requests per second that completed without accessing DASD, by request type:
READ	Number of READ requests.
DFW	Number of DFW (DASD Fast Write) requests.
CFW	Number of CFW (Cache Fast Write) requests.
DASD I/O RATE	I/O requests per second that accessed DASD, by request type:
STAGE	Normal or sequential requests.
DFWBP	Requests that caused DFW to be bypassed.
ICL	ICL (Inhibit Cache Load) requests.
BYP	Requests that explicitly bypassed the cache.
OTHER	Requests that were either CFW BYPASS or DFW INHIBIT requests.
ASYNC RATE	Number of tracks asynchronously written to the DASD device in order to release space in the cache or NVS storage. A high rate indicates that storage may be over-committed.
% HITS	I/O requests serviced from the cache, as percentages of all I/O requests:
TOTAL	Percentage of READ and WRITE requests serviced from the cache.
READ	Percentage of READ requests serviced from the cache.
WRITE	Percentage of WRITE requests serviced from the cache.
READ	READ requests as a percentage of all I/O requests.
RAID rank activity section	
ID	RAID rank identifier.

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Table 3-16 Field Descriptions for the Cache Subsystem Activity Report (Part 5 of 5)

Field	Description
TYPE	RAID rank type.
DA	Device adapter identifier.
HDD	Number of hard disk drives (HDD) in the RAID rank.
READ REQUESTS	READ I/O requests.
COUNT	Number of READ requests
RATE	Number of READ requests, per second
AVG SZ	Average number of bytes transferred per READ request
BYTE/S	Average number of bytes read, per second
RTIME	Average response time, in milliseconds, to an HDD READ I/O request
WRITE REQUESTS	WRITE I/O requests.
COUNT	Number of WRITE requests
RATE	Number of WRITE requests, per second
AVG SZ	Average number of bytes transferred per WRITE request
BYTE/S	Average number of bytes written, per second
RTIME	Average response time, in milliseconds, to an HDD WRITE I/O request
HIGHEST ACTIVITY VOLUMES	Top five (5) volumes sorted in descending order by I/O activity.

Cache Device Activity Report

This is the report produced by the CACHEACT Analyzer control statement when REPORT=DEVICE is specified.

By default, the report is ordered by subsystem ID/device ID, but the order can be changed by the ORDER= parameter. The report can be filtered by model, subsystem ID, device ID, and a threshold value. Specific subsystems and/or devices may be selected and/or excluded.

An example of the Cache Device Activity Report is shown in Figure 3-9.

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Figure 3-9 Cache Device Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    CACHE DEVICE ACTIVITY REPORT                        RPTSEQ     5 PAGE     35
BMC SOFTWARE, INC.                                        BMC SOFTWARE, INC.                             REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                  HOUSTON, TX.                               SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                             REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5
------------------------------------ SUBSYSTEM ID: 0027   MODEL: 3990-03   CONTROL UNIT: 5590 -------------------------------------

   SUBSYSTEM STORAGE       NON-VOLATILE STORAGE        S U B S Y S T E M     S T A T U S        I/O TOTALS              HIT %
----------------------  -------------------------   ---------------------------------------   -----------------      ----------------
CONFIGURED         1GB  CONFIGURED          8.2MB   CACHING              - ACTIVE             CACHE        782      CACHE       99.9
AVAILABLE          1GB  PINNED                   0   NON-VOLATILE STORAGE - ACTIVE             OFFLINE        0      TOTAL       99.9
PINNED               0                              CACHE FAST WRITE     - ACTIVE             NONCACHE       0
OFFLINE              0                              IML DEVICE AVAILABLE - YES                TOTAL        782

CACHE I/O    -------------READ I/O REQUESTS-------------     ----------------------WRITE I/O REQUESTS----------------------        %
REQUESTS       COUNT     RATE      HITS     RATE   HIT %       COUNT     RATE      FAST     RATE       HITS    RATE   HIT %     READ

NORMAL           782      0.4       781      0.4    99.9           0        0         0        0          0       0       0    100.0
SEQUENTIAL         0        0         0        0       0           0        0         0        0          0       0       0        0
CFW DATA           0        0         0        0       0           0        0         0        0          0       0       0        0

TOTAL            782      0.4       781      0.4    99.9           0        0         0        0          0       0       0    100.0

----------------------CACHE MISSES----------------------            ------------MISC------------          ------NON-CACHE I/O-----
REQUESTS      READ    RATE   WRITE    RATE  TRACKS    RATE                              COUNT   RATE                      COUNT   RATE

NORMAL           1       0       0       0       1       0            DFW BYPASS          0      0          ICL             0      0
SEQUENTIAL       0       0       0       0       0       0            CFW BYPASS          0      0          BYPASS          0      0
CFW DATA         0       0       0       0                            DFW INHIBIT         0      0
                                                                      ASYNC (TRKS)        0      0          TOTAL           0      0
TOTAL CACHE MISSES        1   RATE       0
TOTAL CACHE HITS        782   RATE    0.43

---CKD STATISTICS---     ---RECORD CACHING---

WRITE              0     READ MISSES        0
WRITE HITS         0     WRITE PROM         0

PRODUCED BY CMF ANALYZER (5.5.00)                    CACHE DEVICE ACTIVITY REPORT                        RPTSEQ     5 PAGE    710
BMC SOFTWARE, INC.                                        BMC SOFTWARE, INC.                             REPORT DATE: 12 JUN 03 16.44
REQD 10 JUN 03 09.50.00  10 JUN 03 10.20.00                  HOUSTON, TX.                               SYSTEM ID: SJSE     Z 1.02.0
ACTL 10 JUN 03 09.50.00  10 JUN 03 10.20.00                                                             REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-5/24/0/0.5

--------------- VOLSER: APD28G    DEVICE NUMBER: A300    RAID RANK: 0100    SUBSYSTEM ID: A300    MODEL: 2105-20 -------------------

      C A C H E    S T A T U S                      D U P L E X    S T A T U S                      I/O TOTALS            HIT %
-------------------------------------------     -------------------------------------------    -----------------    ----------------
CACHING         - ACTIVE                        DUPLEX PAIR      - NOT ESTABLISHED             CACHE       1,625    CACHE      100.0
DASD FAST WRITE - ACTIVE                        STATUS           - N/A                         OFFLINE         0    TOTAL      100.0
PINNED DATA     - NONE                          DUAL COPY VOLUME - N/A                         TOTAL       1,625

CACHE I/O    -------------READ I/O REQUESTS-------------     ----------------------WRITE I/O REQUESTS----------------------        %
REQUESTS       COUNT     RATE      HITS     RATE   HIT %       COUNT     RATE      FAST     RATE       HITS    RATE   HIT %     READ

NORMAL            47        0        47        0   100.0           1        0         1        0          1       0   100.0     97.9
SEQUENTIAL         0        0         0        0       0       1,577      0.9     1,577      0.9      1,577     0.9   100.0        0
CFW DATA           0        0         0        0       0           0        0         0        0          0       0       0        0

TOTAL             47        0        47        0   100.0       1,578      0.9     1,578      0.9      1,578     0.9   100.0      2.9

----------------------CACHE MISSES----------------------            ------------MISC------------          ------NON-CACHE I/O-----
REQUESTS      READ    RATE   WRITE    RATE  TRACKS    RATE                              COUNT   RATE                      COUNT   RATE

NORMAL           0       0       0       0       2       0            DFW BYPASS          0      0          ICL             0      0
SEQUENTIAL       0       0       0       0       0       0            CFW BYPASS          0      0          BYPASS          0      0
CFW DATA         0       0       0       0                            DFW INHIBIT         0      0
                                                                      ASYNC (TRKS)    1,583    0.9          TOTAL           0      0
TOTAL CACHE MISSES        0   RATE       0
TOTAL CACHE HITS      1,625   RATE    0.90

---CKD STATISTICS---     ---RECORD CACHING---

WRITE              0     READ MISSES        0
```

Cache Device Activity Report Field Descriptions

The Cache Device Activity Report consists of the following sections and fields:

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- The first page, for each subsystem, is the same as the first page of the Cache Subsystem Activity report. The fields in that report are described in Table 3-13 on page 3-30.

- The following pages, for each subsystem, contain device detail information, 1 page per device. This page consists of 2 sections: a status section and an activity section.

The fields in the status section of the Cache Device Activity Report are described below in Table 3-17.

Table 3-17 Field Descriptions for the Cache Device Activity Report

Field	Description
CACHE STATUS	
CACHING	ACTIVE - Caching is active. I/O requests to the device can be handled in cache. DEACTIVATION PENDING - Caching has been deactivated but not all modified data has been transferred to DASD DEACTIVATED - Caching has been deactivated for this device
DASD FAST WRITE	ACTIVE - DASD FAST WRITE (DFW) I/O requests to the device can be processed. DEACTIVATE PENDING - DASD FAST WRITE has been stopped but not all modified data has been transferred to DASD DEACTIVATED - DASD FAST WRITE has been stopped for this device
PINNED DATA	NONE - No data are pinned for this device EXISTS - DFW SUSPENDED - Pinned data are present and DASD FAST WRITE has been suspended. EXISTS - DFW ACTIVE - Pinned data are present but DASD FAST WRITE has NOT been suspended.
DUPLEX STATUS	
DUPLEX PAIR	NOT ESTABLISHED - The device is not part of a duplex pair. ACTIVE - The device is active as either the primary or secondary of a duplex pair. PENDING - The device is part of a duplex pair being established. SUSPENDED - The duplexing has been suspended due to error in one or the other device of the duplex pair.
STATUS	N/A - The device is not part of a duplex pair. PRIMARY - The device is the primary device of a duplex pair. SECONDARY - The device is the secondary device of a duplex pair.
DUAL COPY VOLUME	N/A - The device is not part of a duplex pair. nnnn - The device address of the other device which is part of the duplex pair.
I/O TOTALS	
CACHE	Number of cacheable I/O requests to the device
OFFLINE	Number of non-cacheable I/O requests to the device
TOTAL	Number of I/O requests to the device
HIT %	
CACHE	Cache hits, as percentages of all cacheable I/O requests
TOTAL	Cache hits, as percentages of all I/O requests

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CMF Record Statistics Report

The CMF Record Statistics Report may be useful to verify the validity of the input data. The CMF Record Statistics Report is produced by using the CMFSTAT Analyzer control statement (see “CMFSTAT” on page 2-19). No Extractor control statement is required to collect data for this report.

The CMF Record Statistics Report records the following data for each record type accepted for processing:

- Sum of the interval durations
- Number of records
- Sum of samples for all intervals
- Earliest date and time interval
- Latest date and time interval

An example of the CMF Record Statistics Report is shown in Figure 3-10.

Figure 3-10 CMF Record Statistics Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    CMF RECORD STATISTICS REPORT                        RPTSEQ    10 PAGE     68
BMC SOFTWARE, INC.                                          XYZ COMPANY                                  REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 08.17.19  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0
```

CMF/RMF/SMF RECORD ID MAJOR MINOR	COUNT OF RECORDS	TOTAL SAMPLES	TOTAL RECORD TIME VALUE DDD.HH.MM.SS	START DATE OF RECORD DD.MMM.YY	START TIME OF RECORD HH.MM.SS	END DATE OF RECORD DD.MMM.YY	END TIME OF RECORD HH.MM.SS
70-01	28	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
71-01	28	420	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
72-03	1,176	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
73-01	28	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-01	112	100,380	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-02	28	840	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-03	28	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-04	28	2,506	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-05	308	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
74-06	28	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
75-01	112	100,512	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
76-01	28	25,108	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
77-01	28	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
78-02	28	5,012	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
78-03	28	8,390	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-00	28	28	07.00.04	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-01	28	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-02	28	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-03	28	420	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-05	112	100,380	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-06	28	25,128	07.00.01	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-09	28	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-11	224	24,907	07.00.00	10 JUN 03	09.00.00	10 JUN 03	15.59.59
240-12	1	1	00.00.00	10 JUN 03	08.17.19	10 JUN 03	08.17.19
240-13	393	25,128	07.00.00	10 JUN 03	09.00.00	10 JUN 03	15.59.59
240-16	5	0	00.00.00	10 JUN 03	08.17.33	10 JUN 03	08.17.33
240-19	418	1,680	07.00.00	10 JUN 03	09.00.00	10 JUN 03	15.59.59
240-20	28	25,156	07.00.01	10 JUN 03	09.00.00	10 JUN 03	16.00.00
240-21	28	0	07.00.00	10 JUN 03	09.00.00	10 JUN 03	16.00.00

Note: The counts in this report represent what was selected by specifying the DATETIME range.

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CMF Record Statistics Report Field Descriptions

Table 3-18 describes each field in the CMF Record Statistics Report.

Table 3-18 Field Descriptions for the CMF Record Statistics Report

Field	Description
CMF/RMF RECORD ID MAJOR-MINOR	SMF record ID and subtype.
COUNT OF RECORDS	Count of record types encountered in the DATETIME range. Multiple records for the same record type with the same date and time are counted as one record; for example, SMF type 72 workload records.
TOTAL SAMPLES	Total number of samples encountered in the DATETIME range.
TOTAL RECORD TIME VALUE	Total elapsed measurement interval.
START DATE OF RECORD	Start date of the first record.
START TIME OF RECORD	Start time of the first record.
END DATE OF RECORD	End date of the last record.
END TIME OF RECORD	End time of the last record.

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CMF Summary Report

The CMF Summary Report shows an overview of system performance. The same information that is produced in the RMF Summary Report can appear in this report, as well as additional CMF MONITOR information that RMF does not report.

The CMF Summary Report is produced by using the CMFSUM Analyzer control statement (see “CMFSUM” on page 2-20). The data is obtained by using the following Extractor control statements (see Chapter 1, “Extractor Control Statements,” for more information):

- CHANNEL
- CPU
- DEVICE
- IOQ
- PAGING
- TSODATA
- VSMDATA
- WORKLOAD

An example of the CMF Summary Report is shown in Figure 3-11.

Figure 3-11 CMF Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                        CMF SUMMARY REPORT                          RPTSEQ    11 PAGE     69
BMC SOFTWARE, INC.                                           XYZ COMPANY                             REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-6/28/25.1K/7  240-20/28/25.2K/7  70-1/28/25.1K/7  71-1/28/420/7  72-3/1,176/0/7
73-1/28/0/7  74-1/112/25.1K/7  78-2/28/5,012/7  78-3/28/8,390/7
 DATE/    INTERVAL    CPU   DASD   DASD   TAPE  BTCH  BTCH   TSO   TSO   STC   STC  APPC  APPC  OMVS  OMVS  SWAP  DEMAND  SERVICE
  TIME    HH.MM.SS   BUSY   RESP   RATE   RATE   MAX   AVG   MAX   AVG   MAX   AVG   MAX   AVG   MAX   AVG  RATE  PAGING     RATE

10JUN 03  07.00.00    6.2      9   72.3    2.1     5     0    31    25   125   117     0     0     1     1  0.01    1.67   290706

09.00.00  00.15.00    5.4      8   92.0   59.7     0     0    17    16   106   106     0     0     1     1  0.00    0.18   129951
09.15.00  00.15.00    4.7      8   52.0    0.0     0     0    20    19   107   106     0     0     1     1  0.00    0.03    95872
09.30.00  00.15.00    4.8      7   58.7    0.0     2     0    21    21   109   107     0     0     1     1  0.01    0.33   103837
09.45.00  00.15.00    4.6      9   51.2    0.0     0     0    19    19   106   104     0     0     1     1  0.00    0.04    99501
10.00.00  00.15.00    4.6     10   47.8    0.0     1     0    19    18   106   106     0     0     1     1  0.00    0.01    95111
10.15.00  00.15.00    5.5      7   72.5    0.0     0     0    24    21   113   109     0     0     1     1  0.01    0.07   113826
10.30.00  00.15.00    4.6     10   51.7    0.0     0     0    26    26   113   113     0     0     1     1  0.00    0.04    94459
10.45.00  00.15.00    6.2      9   89.3    0.0     1     0    29    28   120   116     0     0     1     1  0.01    0.29   139075
11.00.00  00.15.00    5.1     13   55.3    0.1     1     0    29    29   119   119     0     0     1     1  0.00    0.21   109092
11.15.00  00.15.00    4.7      7   57.1    0.0     0     0    30    29   121   119     0     0     1     1  0.00    0.12    94018
11.30.00  00.15.00    6.8      6   95.9    0.0     1     0    31    31   123   122     0     0     1     1  0.00    0.16   174335
11.45.00  00.15.00    5.7      9   49.7    0.0     0     0    30    30   123   123     0     0     1     1  0.00    0.02   124648
12.00.00  00.15.00    5.6      7   68.3    0.0     1     0    30    30   123   123     0     0     1     1  0.00    0.12   109128
12.15.00  00.15.00    5.7     10   57.5    0.0     1     0    30    30   123   122     0     0     1     1  0.00    0.31   114212
12.30.00  00.15.00    7.8     13   84.4    0.0     1     0    30    29   125   123     0     0     1     1  0.07   12.23   650506
12.45.00  00.15.00    6.6     16   58.8    0.0     0     0    29    29   121   120     0     0     1     1  0.00    8.68   356857
13.00.00  00.15.00    5.5     13   37.7    0.0     0     0    29    29   119   119     0     0     1     1  0.00    0.79    98832
13.15.00  00.15.00    7.0      7   56.5    0.0     0     0    30    29   119   119     0     0     1     1  0.00    1.35   638135
13.30.00  00.15.00    8.7      6  150.1    0.0     4     0    29    28   120   119     0     0     1     1  0.00    2.68   452641
13.45.00  00.15.00    8.6      9  135.1    0.0     1     0    29    28   123   121     0     0     1     1  0.05    9.82   725672
14.00.00  00.15.00    7.4      7   85.7    0.0     1     0    28    26   122   122     0     0     1     1  0.00    2.34   423713
14.15.00  00.15.00    6.9      6   90.8    0.3     1     0    26    25   122   122     0     0     1     1  0.00    0.90   542137
14.30.00  00.15.00    8.1     10   78.2    0.0     1     0    27    26   122   121     0     0     1     1  0.00    2.79   802765
14.45.00  00.15.00    7.9      7   72.1    0.0     1     0    26    25   120   120     0     0     1     1  0.00    0.30   777218
15.00.00  00.15.00    5.7     11   45.8    0.0     1     0    25    24   120   120     0     0     1     1  0.00    1.64   299051
15.15.00  00.15.00    8.4     14  114.9    0.0     5     2    23    22   121   118     0     0     1     1  0.00    0.59   286286
15.30.00  00.15.00    5.1     13   33.7    0.0     1     0    21    21   119   119     0     0     1     1  0.00    0.12   239000
15.45.00  00.15.00    5.6      8   83.0    0.0     2     0    22    21   121   120     0     0     1     1  0.00    0.45   249893
```

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CMF Summary Report Field Descriptions

Table 3-19 describes each field in the CMF Summary Report. (Abbreviated field names are shown in parentheses.)

Fields that appear in both CMF MONITOR and RMF are the default fields. Additional fields can be specified with the MEASURE parameter of the CMFSUM Analyzer control statement.

See “CMFSUM” on page 2-20 for more information about including these fields in the CMF Summary Report.

These fields appear only in CMF MONITOR reports; these fields do not appear in RMF reports.

Table 3-19 Field Descriptions for the CMF Summary Report (Part 1 of 4)

Field	Measure Name	Description
DATE/TIME	default	Indicates day for the report data and start time of each interval being summarized. Date is specified as *ddmmmyy* and time as *hh:mm:ss.*
INTERVAL HH.MM.SS	INTERVAL *default*	Actual length of each interval included in the CMF Summary Report. This field cannot report an interval length that spans more than 24 hours. No value is reported if MEASURE=INTERVAL is defined on the Analyzer CMFSUM report control statement, and INTERVAL= parameter specifies more than a 24 hour period, such as WEEKLY, MONTHLY, QTRLY, SEMIANNL, or FOREVER.
CHANNEL PATH BUSY (CP BUSY)	CHPBUSY	Percent of time a channel was busy for the whole complex. For FICON channels, this is a measure of how busy the channel processor was.
CPU BUSY	CPUBUSY (*default*)	PR/SM, MDF, or MLPF environment: LPAR CPU busy percentage during the specified interval. It is the percentage processor online time used by the home partition (the partition on which records were extracted). The formula is **Wait completion on:** (dispatch time - wait time) / online time **Wait completion off:** dispatch time / online time **Native mode:** Average CPU busy percentage during the specified interval. The formula is (interval - wait time) / interval. In this environment, this measure has the same meaning as CPUBZMVS.
MVS CPU BUSY	CPUBZMVS	MVS CPU busy percentage during the specified interval. The formula is (online time - wait time) / online time
LPAR DISPATCH PERCENTAGE (LPAR DISP)	LPARDISP	CPU average dispatch percentage for all logical processors for the logical partition on which records were extracted during the specified interval.

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Table 3-19 Field Descriptions for the CMF Summary Report (Part 2 of 4)

Field	Measure Name	Description
DASD RESPONSE TIME (DASD RESP)	DASDRESP (*default*)	Average number of milliseconds required to complete an I/O request for all direct access storage devices (DASD) active during the specified interval. Range is from 0 to 99999.
DASD RATE	DASDRATE (*default*)	Rate of activity per second for all direct access storage devices (DASD) during specified interval. This measure is accumulation of rate per second at which SSCH instructions were completed successfully for all DASDs. Range is from 0.0 to 999.9.
TAPE RATE	TAPERATE (*default*)	Rate of activity per second for all magnetic tape devices during specified interval. This measure is an accumulation of rate per second at which SSCH instructions completed successfully for all magnetic tape devices. Range is from 0.0 to 999.9.
BATCH MAXIMIUM (BTCH MAX)	BATCHMAX (*default*)	Maximum number of batch jobs active during specified interval. Range is from 0 to 999.
BATCH AVERAGE (BTCH AVG)	BATCHAVG (*default*)	Average number of batch jobs active during specified interval. Range is from 0 to 999.
TSO MAXIMUM (TSO MAX)	TSOMAX (*default*)	Maximum number of TSO sessions active during specified interval. Range is from 0 to 999.
TSO AVERAGE (TSO AVG)	TSOAVG (*default*)	Average number of TSO sessions active during specified interval. Range is from 0 to 999.
STC MAXIMUM (STC MAX)	STCMAX (*default*)	Maximum number of started tasks and mount tasks active during specified interval. Range is from 0 to 999.
STC AVERAGE (STC AVG)	STCAVG (*default*)	Average number of started tasks and mount tasks active during specified interval. Range is from 0 to 999.
APPC MAXIMUM (APPC MAX)	APPCMAX (*default*)	Maximum number of APPC address spaces active during specified interval. Range is from 0 to 999.
APPC AVERAGE (APPC AVG)	APPCAVG (*default*)	Average number of APPC address spaces active during specified interval. Range is from 0 to 999.
SWAP RATE	SWAPRATE (*default*)	Average rate per second of all swaps during specified interval. Range is from 0.00 to 99.99.
SWAP PAGE RATE (SWAP PAGES)	SWAPPAGS	Rate per second of all swap-in and swap-out pages during specified interval. Range is from 0.00 to 99.99.
DEMAND PAGING	DPAGING (*default*)	Rate per second of all demand paging requests during specified interval. Value reported is total number of non IO, non swap page-ins divided by the interval. Range is 0.00 to 99.99.
SERVICE RATE	SRVRATE (*default*)	Rate per second at which I/O service, CPU service, and central storage service units were consumed during specified interval. Range is 0 to 9999999.
TRANSACTION RATE (TRANS RATE)	TRANRATE (*default*)	Average number of transactions that ended during each second of specified interval. Range is 0.000 to 99.999.
OMVS AVERAGE (OMVS AVG)	OMVSAVG (*default*)	Average number of OMVS address spaces active during specified interval. Range is 0 to 999.
OMVS MAXIMUM (OMVS MAX)	OMVSMAX (*default*)	Maximum number of OMVS address spaces active during specified interval. Range is 0 to 999.

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Table 3-19 Field Descriptions for the CMF Summary Report (Part 3 of 4)

Field	Measure Name	Description
SPOOL UTILIZATION	SPOOLUTL	Average JES spool space utilization expressed as a percentage. Percentage is carried to one decimal place, in the format *nn.n.*
TSO TRANSACTION RATE (TSO TRNS)	TSOTRANS	Average number of TSO transactions that ended during each second of specified interval. Range is 0.00 to 99.99.
CHANNEL PATH UTILIZATION RATE (CP RATE)	CHPUTIL	Average rate per second at which I/Os used a channel path for all channel paths during specified interval. The value is calculated by dividing the path taken count by the interval. Range is 0.00 to 999.99.
AVERAGE CSA ALLOCATED (CSA AVG)	CSALLOC	Average CSA allocated below 16 megabytes expressed as a percentage of the total CSA available below the 16 megabyte line. Percentage is carried to one decimal place, in the format *nn.n.*
AVERAGE SQA ALLOCATED (SQA AVG)	SQALLOC	Average SQA allocated below 16 megabytes expressed as a percentage of the total SQA available below the 16 megabyte line. Percentage is carried to one decimal place, in the format *nn.n.*
AVERAGE ECSA ALLOCATED (ECSA AVG)	ECSALLOC	Average CSA allocated above 16 megabytes expressed as a percentage of the total CSA available above the 16 megabyte line. Percentage is carried to one decimal place, in the format *nn.n.*
AVERAGE ESQA ALLOCATED (ESQA AVG)	ESQALLOC	Average SQA allocated above 16 megabytes expressed as a percentage of the total SQA available above the 16 megabyte line. Percentage is carried to one decimal place, in the format *nn.n.*
AVERAGE READY QUEUE (READY AVG)	AVGREADY	Average ready queue including jobs in and ready, out and ready, and logical out and ready during specified interval. Range is 0 to 999.
MIGRATION AGE (MIGR AGE)	MIGRAGE	Migration age is average number of seconds an unreferenced page remained in expanded storage before being migrated to auxiliary storage during specified interval. Range is 0.0 to 999999.9.
MIGRATION RATE (MIGR RATE)	MIGRATE	Migration rate is average number of pages per second migrated from expanded storage to auxiliary storage during specified interval. Range is 0.00 to 999.99.
HIGH UNREFERENCED INTERVAL COUNT (HIGH UIC)	HIGHUIC	High Unreferenced Interval Count (UIC) during specified interval. Range is 1 to 2540.
AVERAGE EXCPs RATE (EXCP RATE)	EXCPRATE	Average number of EXCPs per second during specified interval. Range is 0 to 9999999.
AVERAGE CAPTURE RATIO (CAP RATIO)	CAPRATIO	Average capture ratio during specified interval. Capture ratio is an indication of the percentage of the CPU resources that are actually directed toward the processing of workloads. The ratio, expressed as a percentage, is calculated by determining the total amount of CPU time used to process workloads, and dividing it by the actual CPU time consumed. Percentage is carried to one decimal place, in the format 99.9.

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Table 3-19 Field Descriptions for the CMF Summary Report (Part 4 of 4)

Field	Measure Name	Description
AVERAGE FIXED FRAMES (FIX FRAME)	FIXFRAME	Average number of fixed frames during specified interval expressed as a percentage of the average total number of frames. Percentage is carried to one decimal place, in the format 99.9.
AVERAGE AVAILABLE FRAMES QUEUE (AVAIL FRAME)	AFQUEUE	Average number of page frames available in central storage during specified interval. Range is 0 to 999999.
AVERAGE HIPERSPACE FRAMES (H.S. FRAME)	HSFRAME	Average number of hiperspace page frames in expanded storage during specified interval expressed as a percentage of the total number of expanded storage frames online. Percentage is carried to one decimal place, in the format 99.9.
AVERAGE VIO FRAMES (VIO FRAME)	VIOFRAME	Average number of VIO page frames in expanded storage during specified interval expressed as a percentage of the total number of expanded storage frames online. Percentage is carried to one decimal place, in the format 99.9.
EXPANDED STORAGE FRAMES (ESTOR FRAME)	ESFRAME	Average number of available expanded storage frames during specified interval, expressed as a percentage of the total number of expanded storage frames online. Percentage is carried to one decimal place, in the format 99.9.
CPU SERVICE RATE (CPU SERVICE)	CPUSERV	Rate per second at which TCB and SRB service units were consumed during specified interval. Range is 0 to 9999999.
MSO SERVICE RATE (MSO SERVICE)	MSOSERV	Rate per second at which central storage service units were consumed during specified interval. Range is 0 to 9999999.
I/O SERVICE RATE (I/O SERVICE)	IOSERV	Rate per second at which I/O service units were consumed during specified interval. Range is 0 to 9999999.
EXPANDED STORAGE PAGE RATE (ESTOR PG RATE)	EPGRATE	Rate per second at which pages moved from central storage to expanded storage during specified interval. Range is 0 to 9999.
SUMMARY	(*default*)	Average value for all intervals for each field.

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Collection Phase Log

The Collection Phase Log immediately follows the Report Table of Contents, which is always the first page produced during an Analyzer job.

This log is divided into six parts:

- “Control Card Log” on page 3-51
- “Extraction Characteristics Report” on page 3-53
- “Installation Performance Specification Report” on page 3-56
- “System Resources Manager Constants Report” on page 3-58
- “RMF/CMF Input Record Type Counts Report” on page 3-61
- “Data Distribution and DATETIME Chart” on page 3-62

Control Card Log

The Control Card Log lists all Analyzer control statements used for the report run.

There are no Analyzer or Extractor control statements required to produce the Control Card Log. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job (see “Preliminary Reporting Information” on page 3-4 for more information).

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An example of the Control Card Log is shown in Figure 3-12.

Figure 3-12 Control Card Log

```
PRODUCED BY CMF ANALYZER (5.5.00)                        CONTROL CARD LOG                          RPTSEQ     1 PAGE      1
BMC SOFTWARE, INC.                                                                                 REPORT DATE: 12 JUN 03 13.40
  HEADERS  TITLE='XYZ COMPANY',LOCATION='WORLDWIDE HEADQUARTERS'
  REPORTS  RPTGROUP=RPTSTMT,DDGROUP=RPTSTMT
  AUXSTOR
  CACHE    TYPE=ALL
  CFACT
  CMFSTAT
  CMFSUM   - MEASURE=ALL
* COMBINE
* COMBCONF
  COMMSTOR
  COMMSTOR REPORT=DETAIL
  CPU
  CPUCHAN
  CPUCON
  DASD
  VOLSER   FAT900,TSG900
  DEVACT
  ENQUEUE
* EXCEPTS
  GRAPH    TYPE=TRACE,MEASURE=(CCVUTILP)
* GRAPH    TYPE=TRACE,MEASURE=(ASMIORQC,ASMIORQR,CCVCPUCT,CCVUTILP,
*          DMDTCMPL,DMDTRUA,MCVSTCRI,MCVMGAGE,RCEAFC,RCETOTFX,
*          RCVPTR,RCVUICA,RMCATISC,SMCARCWT)
  IOQ
  LINKPACK
  OMVS
  PERFSUM
  PGDDLAY
  PRSM
  SHARDEV
  SRM
  STORAGE
  TSOPERF
  TSOUSER
  VIRTSTOR
  WORKLOAD
  WLMGL    TYPE=ALL
  XCF      TYPE=BOTH,ORDER=(GROUP,MEMBER,SYSTEM)
```

- Analyzer control statements and parameters are explained in Chapter 2, “Analyzer Control Statements,”.
- Analyzer syntax error messages are explained in CMF MONITOR messages. (See “Related Documentation” on page -xviii for more information).

Control Card Log Field Descriptions

Descriptions of the fields in the Control Card Log are listed in Table 3-20.

Table 3-20 Field Descriptions for the Control Card Log

Field	Description
* GENERAL CONTROL STATEMENTS	Each general control statement used to specify global data collection and reporting parameters is listed in this area of the Control Card Log.
* REPORT CONTROL STATEMENTS	Each report control statement used to specify a desired report is listed in this area of the Control Card Log.
ERROR MESSAGES	Any errors encountered with the control card syntax are listed in this area of the Control Card Log.

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Extraction Characteristics Report

The Extraction Characteristics Report is a Collection Phase Log report (see “Preliminary Reporting Information” on page 3-4 for more information) that lists the parameters used by the Extractor each time it is run. Since the Analyzer produces combined reports for multiple extractions, you must know the sample rates and types. Mixing Extractor data that contains unlike parameters can produce distorted results.

This report is produced only for extractions that occur within the overall DATETIME range. If no DATETIME is specified, the Analyzer produces one report for each extraction run. This report is not produced if RPTS=INTERVAL or RPTS=DAILY is specified on the SHIFT control statement.

There are no Analyzer or Extractor control statements required to produce the Extraction Characteristics Report. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job.

The Extractor characteristics that produced the data set read by the Analyzer are shown. One page is generated each time the Extractor is run.

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An example of the Extraction Characteristics Report is shown in Figure 3-13.

Figure 3-13 Extraction Characteristics Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COLLECTION PHASE LOG                          RPTSEQ     2 PAGE      3
BMC SOFTWARE, INC.                                                                                 REPORT DATE: 12 JUN 03 13.40
                                                  EXTRACTION CHARACTERISTICS
                                        (IN EFFECT FROM 10 JUN 03 09.15.00 TO 10 JUN 03 16.00.00)
 EXTRACTOR VERSION NUMBER (5.3.2)
 SU'S IN EFFECT =  0,1,4,5,6,7,8,9,10,11,13,15,16,17,21,24,25,27,29,30,32,33,37,39,42,43,47,
                   48,50,51,55,56,57,58,60,61,63,64,65,72,74,78
  SAMPLER NAME           SAMPLE RATE      SAMPLE COUNTS      SAMPLE COUNTS      SAMPLE COUNTS
                          IN MSECS          UNDER DIE          UNDER SRB          UNDER SRM
  ------------          -----------      -------------      -------------      -------------

      ASMS                 1,000               27,679             27,679                  0
      CA03                 1,000               27,679                  0                  0
      CA20                 1,000               27,679                  0                  0
      CFTS                     0                2,762                  0                  0
      CHNS                     0                   32                  0                  0
      CPUS                 1,000               27,679                  0                  0
      CSMS                 1,000               27,679                  0                  0
      DEVS                 1,000               27,679                 31                  0
      DEVS                 1,000               27,679              5,579                  0
      EQES                     0                   32                  0              8,718
      EXTS                 1,000               27,679                  0                415
      GBLS                 1,000               27,435                  0                  0
      HFSS                     0                   32                  0                  0
      HMOV                 1,000               27,679                402                  0
      IOQS                     0                  464                  0                  0
      IOWS                     0                1,851              1,851                  0
      LPAM                     0                2,776                  0                  0
      OMVS                 1,000               27,679                  0                  0
      PAGS                 6,000                4,626                464              1,966
      PGDS                     0                1,851                 32                  0
      RECD                   15M                   31              1,143                  0
      RUNT                  720M                    0                  0                  0
      TRAS                 1,000               27,679                  0                  0
      TSOS                 1,000               27,679                  0             53,702
      VSMS                 5,000                5,551                 31                  0
      WLMS                 2,000               13,848                  0                  0
      XCFS                     0                  926                  0                  0
      TOTALS                                  422,044             37,212             64,801
EXTRACTOR CONTROL CARDS

                    REPORT   CPM,CSA=512,DISP=NEW,GBLS=YES,                                 00140009
                             INTERVAL=15,                                                   00140009
                             RUNTIME=720                                                    00140009
                  *
                  * EVERYTHING CHECK OMVS AND HFS
                  *
                    ASMDATA  SAMPLE=1000                                                    00150009
                    CACHE    CMFREC=74                                                      00160009
                    CFDATA
                    CHANNEL                                                                 00170000
                    CPU      SAMPLE=1000
                    CSMON                                                                   00190000
                    DEVICE   CLASS=DASD,SAMPLE=1000
                    DEVICE   CLASS=TAPE,SAMPLE=1000
                  **DEVICE   CLASS=COMM,SAMPLE=1000
                  **DEVICE   CLASS=GRAPH,SAMPLE=1000
                  **DEVICE   CLASS=UNITR,SAMPLE=1000
                    ENQUEUE
                    HEADMOVE ALL,SAMPLE=1000,VTOC=YES
                    HFS      FSNLIST=(USS.SJSE.TMP,
                             USS.SJSE.ETC,
                             USS.SJSE.VAR,
                             USS.SJSE.DEV,
                             USS.SHRD.ROOT.ZOS101A)
                    IOQ
                    LINKMAP  INITRECS=EACHDS                                                00270000
                    MACSCHAR IOWSAMP=15000                                                  00280001
                    OMVS     SAMPLE=1000
                    PAGING   SAMPLE=6000                                                    00290005
                    PGDDLAY  ALLPGS                                                         00300000
                  * TRACE    SAMPLE=60,SYSEVENT=(73,74,75,76,77,79)                         00310000
                    TRACE76  SAMPLE=1000,FIELD=(CCVUTILP)
                  * TRACE76  SAMPLE=1000,FIELD=(ASMIORQC,ASMIORQR,CCVCPUCT,CCVUTILP,
                  *          DMDTCMPL,DMDTRUA,MCVSTCRI,MCVMGAGE,RCEAFC,RCETOTFX,
                  *          RCVPTR,RCVUICA,RMCATISC,SMCARCWT)
                    TSODATA  SAMPLE=1000,USERS=YES                                          00330009
                    VSMDATA  SAMPLE=1000,JOBNAME=(GRS)                                      00340001
                    WORKLOAD                                                                00350009
                    XCFDATA  SAMPLE=1000                                                    00360001
                  *
                    EXTSUM   SAMPLE=1000,
                             INITRECS=EACHDS,                                               00270000
                             SPINOFF=NO,
                             JES=YES
```

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Extraction Characteristics Report Field Descriptions

Descriptions of the fields in the Extraction Characteristics Report are listed in Table 3-21.

Table 3-21 Field Descriptions for the Extraction Characteristics Report

Field	Description
EXTRACTOR VERSION NUMBER	Version and release of the CMF MONITOR Extractor.
SU'S IN EFFECT	Selectable units on the system.
SAMPLER NAME	Names of samplers. Valid names are shown in Table 3-22.
SAMPLE RATE IN MSECS	Sample rate in milliseconds. If the letter M follows sample rate, the value is in minutes.
SAMPLE COUNTS UNDER DIE	Number of samples taken under DIE (Disabled Interrupt Exit).
SAMPLE COUNTS UNDER SRB	Number of samples taken under a global SRB. The sample count for the SRB is always equal to or less than the DIE sample count.
SAMPLE COUNTS UNDER SRM	Number of samples taken running under SVC 95 (SYSEVENT).
EXTRACTOR CONTROL CARDS	Extractor control cards used for this set of input data (see Chapter 1, "Extractor Control Statements," for more information).

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Sampler Names for the Extraction Characteristics Report

Sampler names that can be listed in this report are shown in Table 3-22.

Table 3-22 Sampler Names for the Extraction Characteristics Report

Sampler	Description	Sampler	Description
ASMS	ASMDATA sampler	LPAM	LINKMAP sampler
CACH	CACHE sampler	PAGS	PAGING sampler
CA93	CACHE sampler	PGDS	PGDDLAY sampler
CHNS	CHANNEL sampler	RECD	REPORT sampler
CPUS	CPU sampler	TRAS	TRACE76 sampler
CSMS	CSMON sampler	TRCE	TRACE sampler
DEVS	DEVICE sampler (more than one sampler can be present)	TSOS	TSODATA sampler
EQES	ENQUEUE sampler	USER	USER sampler
EXTS	EXTSUM sampler	VSMS	VSMDATA sampler
GBLS	REPORT sampler	WLMS	WORKLOAD sampler
HMOV	HEADMOVE sampler	WLMS	WORKLOAD sampler (MVS 5.1)
IOQS	IOQ sampler	XCFS	XCFDATA sampler
IOWS	MACSCHAR sampler		

Installation Performance Specification Report

The Installation Performance Specification (IPS) Report is a Collection Phase Log report (see “Preliminary Reporting Information” on page 3-4 for more information) that shows all installation performance specifications in effect during the measurement interval.

There are no Analyzer or Extractor control statements required to produce the IPS Report. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job. This report is not produced if RPTS=INTERVAL or RPTS=DAILY is specified on the SHIFT control statement.

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The IPS Report contains five sections. The data from each section is explained in Table 3-23 on page 3-57. Figure 3-14 shows the IPS report.

Figure 3-14 Installation Performance Specification Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COLLECTION PHASE LOG                        RPTSEQ     2 PAGE      5
BMC SOFTWARE, INC.                                                                               REPORT DATE: 12 JUN 03 10.51
                                              INSTALLATION PERFORMANCE SPECIFICATION
                                     (IN EFFECT FROM 10 JUN 03 11.45.00 TO 10 JUN 03 13.11.29)

-----------------------------------------------  SERVICE DEFINITION COEFFICIENTS  -----------------------------------------------
                                 CPU =10.0     IOC = 5.0     MSO = 0.0010  SRB =10.0     SU/SEC= 2326.6
-----------------------------------------------------------  SRM PARMLIB MEMBERS  -----------------------------------------------
                                 IPS MEMBER = IEAIPSF1   ICS MEMBER = IEAICSF1    OPT MEMBER = IEAOPTF1
```

IPS Report Field Descriptions

Descriptions of the fields in the IPS Report are listed in Table 3-23.

Table 3-23 Field Descriptions for the IPS Report

Field	Description
SERVICE DEFINITION COEFFICIENT	Defines the coefficients specified for CPU, I/O, main storage, and SRB service units. SU/SEC=*xxxx.x* reflects the total service unit rate for the CPUs where the system is running.
SRM PARMLIB MEMBERS	IPS member used by the operating system. ICS member used by the operating system. OPT member used by the operating system.
PERFORMANCE OBJECTIVES	Lists the performance objectives and their workload levels. Values listed are defined in the *IBM Initialization and Tuning Guide*.
DOMAIN CONSTRAINTS	Lists the domain number, minimum and maximum multiprogramming levels, fixed workload level, and average and total performance objectives.
PERFORMANCE GROUPS BY DOMAIN	Lists information about performance group periods by domain. Data includes the • Performance objective number • Automatic priority group specified • Duration value • Interval service value • Dispatching control value • Dispatching priority • Time slice dispatching priority • Time slice group number • Units value where S: Equals service units R: Equals real time in seconds Values listed are defined in the *IBM Initialization and Tuning Guide*. Response throughput bias (RTB) where 0: Ignore load adjusting recommendation 1: CPU, I/O, and storage load adjusting recommendations are used I: I/O load balancing is used C: CPU load balancing is used S: Storage balancing is used

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System Resources Manager Constants Report

The System Resources Manager Constants (SRM Constants) Report is a Collection Phase Log report (see “Preliminary Reporting Information” on page 3-4 for more information) that displays the control block-related symbolic name, the value, and the related function of each SRM constant.

There are no Analyzer or Extractor control statements required to produce the System Resources Manager Constants Report. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job. This report is not produced if RPTS=INTERVAL or RPTS=DAILY is specified on the SHIFT control statement.

Using the calculation methods of the System Resources Manager and the information provided in this report, installation performance standards can be tuned to improve performance.

An example of the SRM Constants Report is shown in Figure 3-15.

Figure 3-15 SRM Constants Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COLLECTION PHASE LOG                        RPTSEQ     2 PAGE      6
BMC SOFTWARE, INC.                                                                               REPORT DATE: 12 JUN 03 13.40
                                                SYSTEM RESOURCES MANAGER CONSTANTS
                                       (IN EFFECT FROM 10 JUN 03 09.00.00 TO 10 JUN 03 12.00.00)
-------------------------------------------------------  CONSTANTS  -------------------------------------------------------
CONSTANT     VALUE          RELATED FUNCTION                    CONSTANT     VALUE          RELATED FUNCTION
CCCAPMET       755          MIN USR EXEC INTVL FOR MTW COMP     CCCMNSIN        17          MIN INT COMPUTING SYS CPU UTIL
CCCSIGUR       339          SIGNIF. MTW IN MS                   CCCAPDIV        33          RANGE OF SUBGRP WITHIN MTW GRP
CCCAPGHI         0          APG HIGH VALUE                      CCCAPLDP         1          DP UNDISPATCHED APG USERS
CCCAPGLO         0          APG LOW VALUE                       ICCTPILO         0          LOW THLD FOR PERCENT TPI
ICCTPIHI         0          HIGH THLD FOR PERCENT TPI           MCCPLUS         10          AVL FRM Q DELTA FOR STEALING
MCCASMT1        70          AUX STRGE SHORTAGE THRSHLD          MCCASMT2        85          CRITICAL ASM SHORTAGE THRSHLD
MCCSTLCT         4          NO PAGES TO STEAL EACH ADRSPC       MCCSIPRT     10000          TIME BETWEEN PG-RATE CALC
MCCSIWDL         3          TWSS DELTA % DECREASE               MCCSIWDI         7          TWSS DELTA % INCREASE
MCCSIETH         3          EXC TME THOLD PG RATE CALC          MCCAFCLO        50          AVAIL FRAME QUE LOW THOLD
MCCAFCOK       100          AVAIL FRAME QUE OK THOLD            MCCFXTPR        80          % LOGICAL STORAGE THLD
MCCFXEPR        92          % PHYSICAL STORAGE THLD             RCCUICTL         2          UIC LO THRSHLD
RCCUICTH         4          UIC HI THRSHLD                      RCCCPUTL      2048          CPU LO THRSHLD
RCCCPUTH      2048          CPU HI THRSHLD                      RCCPTRTL        50          PAGING RATE LO THLD
RCCPTRTH        80          PAGING RATE HI THLD                 RCCFXTTH        72          % LOGICAL HIGH MPL THLD
RCCFXTTL        66          % LOGICAL LOW MPL THLD              RCCFXETH        88          % PHYSICAL HIGH MPL THLD
RCCFXETL        82          % PHYSICAL LOW MPL THLD              LSCTUCTL         2          UIC LOW THRESHOLD
LSCTUCTH        15          UIC HIGH THRESHOLD                  LSCTASTL      1000          ASM QUEUED REQ LOW THRESHOLD
LSCTASTH      1000          ASM QUEUED REQ HIGH THRSHOLD        LSCTMTEL      2000          THINK TIME LOW THRESHOLD
LSCTMTEH     60000          THINK TIME HIGH THRESHOLD           LSCTMTEI       500          THINK TIME INCREMENT
LSCTMTED      1000          THINK TIME DECREMENT                LSCTFTTL        58          LOGICAL LOW FIXED FRAME THLD
LSCTFTTH        66          LOGICAL HIGH FIXED FRAME THLD       LSCTFETL        76          PHYSICAL LOW FIXED FRAME THLD
LSCTFETH        82          PHYSICAL HIGH FIXED FRAME THLD      RMPTXCHT       256          EXCHG SWAP THRSHLD
RMPTSAET      1000          SWAP EVALUATION THRSHLD             RMPTWMET        10          WLM EVALUATION THRESHOLD
RMPTERV         65          ENQ RESIDENCY CPU SERVICE           RMPTTOM          7          TOLERANCE FOR TIME PERIOD
RMCTADJC      1420          CPU RATE ADJUSTMENT                 RMCTTAPE                    TAPE SELECTION
```

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SRM Constants Report Field Descriptions

Descriptions of the fields in the SRM Constants Report are listed in Table 3-24.

Table 3-24 Field Descriptions for the SRM Constants Report

Field	Description
CONSTANT	Symbolic name of the control block-related constant. See Table 3-25 on page 3-59 for more information.
VALUE	Value of the constant.
RELATED FUNCTION	Function of the constant.

Valid Constants Names for the SRM Constants Report

Each SRM constant value has a name. Constants that can appear in the SRM Constants Report are listed in Table 3-25.

Table 3-25 Names and Functions of SRM Constants Values (Part 1 of 2)

Constant	Function
CCCAPMET	Minimum execution time before a new dispatching priority is computed for the user.
CCCMNSIN	Minimum interval for computing system CPU usage.
CCCSIGUR	Minimum mean-time-to-wait to be considered a heavy CPU user, in milliseconds.
CCCAPDIV	Range of a subgroup within the mean-time-to-wait group.
CCCAPGHI	APG high value.
CCCAPLDP	DP undispatched APG user.
CCCAPGLO	APG low value.
ICCTPILO	Low threshold for the percentage of TPI.
ICCTPIHI	High threshold for the percentage of TPI.
MCCPLUS	Available frame queue delta for stealing.
MCCASMT1	Shortage threshold for auxiliary storage.
MCCASMT2	Critical shortage threshold for auxiliary storage.
MCCSTLCT	Number of pages to steal from each address space.
MCCSIPRT	Time between page-rate calculation.
MCCSIWDL	TWSS delta percent decrease.
MCCSIWDI	TWSS delta percent increase.
MCCSIETH	Execution time threshold for page-rate calculation.
MCCAFCLO	Low threshold for available frame queue.
MCCAFCOK	OK threshold for available frame queue.
MCCFXTPR	Percentage of logical storage threshold.

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Table 3-25 Names and Functions of SRM Constants Values (Part 2 of 2)

Constant	Function
MCCFXEPR	Percentage of physical storage threshold.
RCCUICTL	UIC low threshold.
RCCUICTH	UIC high threshold.
RCCCPUTL	Low threshold for CPU usage.
RCCCPUTH	High threshold for CPU usage.
RCCPTRTL	Low threshold for paging rate.
RCCPTRTH	High threshold for paging rate.
RCCFXTTH	Percentage of high logical MPL threshold.
RCCFXTTL	Percentage of low logical MPL threshold.
RCCFXETH	Percentage of high physical MPL threshold.
RCCFXETL	Percentage of low physical MPL threshold.
LSCTUCTL	UIC low threshold value by which the system think time is decremented.
LSCTUCTH	UIC high threshold value by which the system think time is decremented.
LSCTASTL	Low threshold for ASM queued requests.
LSCTASTH	High threshold for ASM queued requests.
LSCTMTEL	Low think time threshold
LSCTMTEH	High think time threshold.
LSCTMTEI	Think time increment.
LSCTMTED	Think time decrement.
LSCTETD	Check think time delta (MVS SP4.0 or earlier).
LSCTFTTL	Logical low fixed frame threshold.
LSCTFTTH	Logical high fixed frame threshold.
LSCTFETL	Physical low fixed frame threshold.
LSCTFETH	Physical high fixed frame threshold.
RMPTXCHT	Exchange swap threshold.
RMPTSAET	Swap evaluation threshold.
RMPTWMET	WLM evaluation threshold.
RMPTERV	Enqueue residency for CPU service.
RMPTTOM	Minimum SRM invocation interval.
RMCTADJC	CPU rate adjustment value.
RMCTTAPE	Tape selection.

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RMF/CMF Input Record Type Counts Report

The RMF/CMF Input Record Type Counts Report is a Collection Phase Log report (see “Preliminary Reporting Information” on page 3-4 for more information) that lists information about the input data set records.

There are no Analyzer or Extractor control statements required to produce the RMF/CMF Input Record Type Counts Report. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job. This report is not produced if RPTS=INTERVAL or RPTS=DAILY is specified on the SHIFT control statement.

A five-digit ID is used for records unique to CMF MONITOR. The first three digits of the ID match the user-specified SMFRECID value from the Extractor REPORT control statement; the last two digits are an internal ID. An example of this report is shown in Figure 3-16.

Figure 3-16 RMF/CMF Input Record Type Count Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COLLECTION PHASE LOG                    RPTSEQ     2 PAGE      9
BMC SOFTWARE, INC.                                                                           REPORT DATE: 12 JUN 03 13.40
RMF/CMF INPUT RECORD TYPE COUNTS
   RECORD TYPE  COUNTS - RMF         CPM         IPM     RECORD DEFINITION
    SMF  70-01            0          28           0     CPU ACTIVITY
    SMF  71-01            0          28           0     PAGING ACTIVITY
    SMF  72-03            0       1,176           0     WORKLOAD ACTIVITY BY SERVICE CLASS
    SMF  73-01            0          28           0     CHANNEL PATH ACTIVITY
    SMF  74-01            0         112           0     DEVICE ACTIVITY
    SMF  74-02            0          28           0     XCF ACTIVITY
    SMF  74-03            0          28           0     OMVS KERNEL ACTIVITY
    SMF  74-04            0          28           0     COUPLING FACILITY ACTIVITY
    SMF  74-05            0         308           0     CACHE SUBSYSTEM DEVICE ACTIVITY
    SMF  74-06            0          28           0     HFS STATISTICS
    SMF  75-01            0         112           0     PAGE/SWAP DATA SET ACTIVITY
    SMF  76-01            0          28           0     TRACE RECORD
    SMF  77-01            0          28           0     ENQUEUE DATA
    SMF  78-02            0          28           0     VIRTUAL STORAGE DATA
    SMF  78-03            0          28           0     309X I/O QUEUEING DATA
    SMF 240-00            0          28           0     SRM CONSTANTS, IPS, EXTRACTOR CTL CARDS
    SMF 240-01            0          28           0     CPU DATA
    SMF 240-02            0          28           0     ASM DATA
    SMF 240-03            0          28           0     PAGING DATA
    SMF 240-05            0         112           0     DEVICE DATA
    SMF 240-06            0          28           0     EXTRACTOR SUMMARY
    SMF 240-09            0          28           0     ASM DATA
    SMF 240-11            0         224           0     GLOBAL BIT MAP
    SMF 240-12            0           1           0     DASD HEAD MOVEMENT (MOUNT DATA)
    SMF 240-13            0         393           0     DASD HEAD MOVEMENT (SEEK DATA)
    SMF 240-16            0           5           0     LPA MAPPING DATA
    SMF 240-19            0         418           0     IO WORKLOAD RECORD
    SMF 240-20            0          28           0     TSO COMMAND SUMMARY RECORD
    SMF 240-21            0          28           0     TSO USER SUMMARY RECORD
    SMF 240-27            0         308           0     CACHE DATA RECORD
    SMF 240-29            0       1,342           0     CS MONITOR RECORD
    SMF 240-50            0          28           0     OUTPUT WRITER STATISTICS DATA
    TOTAL RECORDS         0       5,099           0
REPORTS WILL BE GENERATED USING ONLY CPM DATA
```

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RMF/CMF Input Record Type Count Report Field Descriptions

Descriptions of the fields in the RMF/CMF Input Record Type Count Report are listed in Table 3-26.

Table 3-26 Field Descriptions for the RMF/CMF Input Record Type Count Report

Field	Description
RECORD TYPE	SMF record type.
COUNTS - RMF	Number of records in the input data set created by RMF.
CPM	Number of records in the input data set created by CPM mode.
IPM	Number of records in the input data set created by IPM mode.
RECORD DEFINITION	Type of data the record contains.
TOTAL RECORDS	Total number of records of the type specified encountered in the input data set.
REPORTS WILL BE GENERATED USING ONLY *xxx* DATA	Monitoring mode reported on in this Analyzer run: CPM, IPM, or RMF.

Data Distribution and DATETIME Chart

The Data Distribution and DATETIME Chart is a Collection Phase Log report (see “Preliminary Reporting Information” on page 3-4 for more information) that graphically reports the relationship between the date range specified in the Analyzer DATETIME statement and the distribution of data records. The date range in this chart is defined by the range specified in the DATETIME control statement, the data itself, or both.

There are no Analyzer or Extractor control statements required to produce the Data Distribution and DATETIME Chart. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job.

Data records excluded from reports (because they were extracted before or after the time of day constraints of the DATETIME range) still appear in the column for their day. No indication is given in this chart that these records are outside the DATETIME range. This chart reflects relationships based only on extraction and DATETIME dates, not on time.

An example of this report is shown in Figure 3-17.

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Figure 3-17 Data Distribution and DATETIME Chart

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COLLECTION PHASE LOG                        RPTSEQ     2 PAGE     10
BMC SOFTWARE, INC.                                                                               REPORT DATE: 12 JUN 03 13.40
                                                 DATA DISTRIBUTION AND DATETIME CHART
         +         +
   5130  +         +    5130
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
   3762  +    C    +    3762
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
   2394  +    C    +    2394
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
   1026  +    C    +    1026
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
         |    C    |
       0 +----+----+
         |         |
 09JUN 03>+         +<11JUN 03
LEGEND:  * DELIMITS THE DATETIME RANGE        R REPRESENTS RMF RECORDS         I REPRESENTS IPM RECORDS
         C REPRESENTS CPM RECORDS      EACH LINE REPRESENTS   114 RECORDS     EACH '+' COLUMN POSITION REPRESENTS   1 DAYS
```

Data Distribution and DATETIME Chart Field Descriptions

Descriptions of the fields in the Data Distribution and DATETIME Chart are listed in Table 3-27.

Table 3-27 Field Descriptions for the Data Distribution and DATETIME Chart (Part 1 of 2)

Field	Description
*	Delimits the DATETIME range.
C	Represents CPM records, when present.
R	Represents RMF records, when present.

Table 3-27 Field Descriptions for the Data Distribution and DATETIME Chart (Part 2 of 2)

Field	Description
I	Represents IPM records, when present.
+	Plus sign (+) in each column position represents at least one day. The exact number of days for each + is shown in the legend information. Each line represents the number of records, as indicated in the report legend.

The characters used in the chart are defined in the legend. The value of each line of data and the column positions vary depending on

- amount of data being reported
- DATETIME range
- date range of the data

The numbers along the vertical axis vary depending on the amount of data being reported; they are reference points for reading column totals.

Each + (plus sign) in the horizontal axis can represent a day or a group of days, as indicated in the legend. Dashes between plus signs are for spacing purposes only. The data records are aligned only over plus signs.

The columns of * (asterisks) at either side of the chart represent the start of the DATETIME period (left column) and the end of the DATETIME period (right column). A single column of asterisks indicates a DATETIME range that falls within one day. If no columns of asterisks appear, no DATETIME range was specified.

Note: The data symbols for records collected on the day of the start or end of the DATETIME range overlay the asterisks in that column.

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Combinations of Configuration Activity Report

The Combinations of Configuration Activity Report shows the percentages of time that specific system component activity combinations existed during the measurement interval.

The Combinations of Configuration Activity Report is produced by using the COMBCONF Analyzer control statement (see “COMBCONF” on page 2-24). The data is obtained by using the REPORT Extractor control statement with the parameter GBLS=YES specified (see “REPORT” on page 1-58).

The system component activity shown in the Combinations of Configuration Activity Report is derived from the COMBINE Analyzer control statement (see “COMBINE” on page 2-25). Combination IDs appear in the left column, and match the label field or the COMBINE statement. These IDs identify the combinations defined for plots, exception reports, and kiviat graphs.

The data in this report can be used to investigate areas of contention not given in other CMF MONITOR reports. The measures can be correlated to determine cause and effect relationships, common characteristics, and trends across hardware.

An example of the Combinations of Configuration Activity Report is shown in Figure 3-18.

Figure 3-18 Combinations of Configuration Activity Report

```
PRODUCED BY CMF MONITOR (5.5.00)              COMBINATIONS OF CONFIGURATION ACTIVITY REPORT          RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                          XYZ COMPANY                          REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00             WORLDWIDE HEADQUARTERS                   SYSTEM ID: SYSB   SP4.3.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-11/40/6723/2.00
       COMB   PERCENT OF     COMBINATIONS
        ID    TOTAL TIME
        01         .00       ANY CHANNELS BUSY ON CPU/0
        02       57.59       ANY CHANNELS BUSY ON CPU/2
        03         .00       CPU/0 WAIT AND ANY CHANNELS BUSY ON CPU/0
        04         .00       CPU/0 BUSY AND ANY CHANNELS BUSY ON CPU/0
        05       14.10       CPU/2 WAIT AND ANY CHANNELS BUSY ON CPU/2
        06       43.49       CPU/2 BUSY AND ANY CHANNELS BUSY ON CPU/2
        07         .00       CPU/0 WAIT
        08       21.29       CPU/2 WAIT
        09         .00       CPU/0 WAIT AND NO CHANNELS BUSY ON CPU/0
        10        7.18       CPU/2 WAIT AND NO CHANNELS BUSY ON CPU/2
        11         .00       CPU/0 BUSY AND NO CHANNELS BUSY ON CPU/0
        12       35.22       CPU/2 BUSY AND NO CHANNELS BUSY ON CPU/2
        13       78.71       CPU 0 BUSY AND CPU 2 BUSY
```

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Combinations of Configuration Activity Report Field Descriptions

Table 3-28 describes each field in the Combinations of Configuration Activity Report.

Table 3-28 Field Descriptions for the Combinations of Configuration Activity

Field	Description
COMB ID	Combination ID which matches a corresponding COMBINE Analyzer control statement.
PERCENT OF TOTAL TIME	Percentage of time each system component activity combination was observed.
COMBINATIONS	System component activity combinations.

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Common Storage Usage Detail Report

The Common Storage Usage Detail Report provides a detail view of the average, minimum, and maximum values of the common storage data collected in CMF type 240-29 user records. This data is obtained using the CSMON Extractor control statement (see “CSMON” on page 1-20).

This report is produced by using the COMMSTOR Analyzer control statement (see “COMMSTOR” on page 2-28) and specifying the REPORT=DETAIL parameter. There also is a Common Storage Usage Summary Report (see “Common Storage Usage Summary Report” on page 3-69), which is the default report that the COMMSTOR statement produces. The Common Storage Usage Summary Report provides a summary view of the common storage data collected in CMF type 240-29 user records.

The common storage records contain a very detailed level of data. A sample SAS routine is distributed in the BBSAMP data set member, CSMAPSAS, to use as a guide for writing customized in-house reports. The data in the CMF type 240-29 user record is documented in the BBSAMP data set member, CMFREC29 (see *CMF MONITOR Batch User Guide*, “Mapping CMF Records Created by CMF MONITOR” for more information).

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Figure 3-19 is an example of the Common Storage Usage Detail Report.

Figure 3-19 Common Storage Usage Detail Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                COMMON STORAGE USAGE REPORT                    RPTSEQ    13 PAGE     79
BMC SOFTWARE, INC.                                          XYZ COMPANY                         REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00        WORLDWIDE HEADQUARTERS                      SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-29/1,342/0/7

---------------------------------------------- DETAIL REPORT SORTED BY JOBNAME          ----------------------------------------
```

JOBNAME		AVG STOR	MAX STOR	DATE	TIME	MIN STOR	DATE	TIME
BCVKSR4	CSA BELOW 16M	136	136	1.215	9:15:00	136	1.215	9:15:00
	CSA ABOVE 16M	5,440	10,264	1.215	9:15:00	2,224	1.215	9:44:59
	CSA TOTAL	5,576	10,400	1.215	9:15:00	2,360	1.215	9:44:59
	SQA BELOW 16M	38	96	1.215	9:15:00	0	1.215	9:44:59
	SQA ABOVE 16M	112	280	1.215	9:15:00	0	1.215	9:44:59
	SQA TOTAL	150	376	1.215	9:15:00	0	1.215	9:44:59
BCVSCAS	CSA BELOW 16M	69	944	1.215	9:15:00	0	1.215	10:30:00
	CSA ABOVE 16M	196,068	2,907,856	1.215	9:15:00	4,096	1.215	10:30:00
	CSA TOTAL	196,137	2,908,800	1.215	9:15:00	4,096	1.215	10:30:00
	SQA BELOW 16M	0	0	1.215	9:15:00	0	1.215	9:15:00
	SQA ABOVE 16M	22	640	1.215	9:15:00	0	1.215	9:15:00
	SQA TOTAL	22	640	1.215	9:15:00	0	1.215	9:15:00
BCVSPASE	CSA BELOW 16M	16,239	54,392	1.215	9:15:00	1,680	1.215	9:15:00
	CSA ABOVE 16M	72,621	526,896	1.215	9:15:00	256	1.215	9:15:00
	CSA TOTAL	88,860	581,288	1.215	9:15:00	1,936	1.215	9:15:00
	SQA BELOW 16M	0	0	1.215	9:15:00	0	1.215	9:15:00
	SQA ABOVE 16M	93	2,672	1.215	9:29:59	0	1.215	9:15:00
	SQA TOTAL	93	2,672	1.215	9:29:59	0	1.215	9:15:00
BKSPRMP4	CSA BELOW 16M	0	0	1.215	16:00:00	0	1.215	16:00:00
	CSA ABOVE 16M	520	520	1.215	16:00:00	520	1.215	16:00:00
	CSA TOTAL	520	520	1.215	16:00:00	520	1.215	16:00:00
	SQA BELOW 16M	64	64	1.215	16:00:00	64	1.215	16:00:00
	SQA ABOVE 16M	256	256	1.215	16:00:00	256	1.215	16:00:00
	SQA TOTAL	320	320	1.215	16:00:00	320	1.215	16:00:00
BKSPRMP5	CSA BELOW 16M	0	0	1.215	16:00:00	0	1.215	16:00:00
	CSA ABOVE 16M	520	520	1.215	16:00:00	520	1.215	16:00:00
	CSA TOTAL	520	520	1.215	16:00:00	520	1.215	16:00:00
	SQA BELOW 16M	64	64	1.215	16:00:00	64	1.215	16:00:00
	SQA ABOVE 16M	256	256	1.215	16:00:00	256	1.215	16:00:00
	SQA TOTAL	320	320	1.215	16:00:00	320	1.215	16:00:00
BMCPXK2	CSA BELOW 16M	1,013	4,232	1.215	14:45:00	136	1.215	9:15:00
	CSA ABOVE 16M	3,827	10,264	1.215	14:45:00	2,072	1.215	9:15:00
	CSA TOTAL	4,841	14,496	1.215	14:45:00	2,208	1.215	9:15:00
	SQA BELOW 16M	85	96	1.215	9:15:00	0	1.215	15:29:59
	SQA ABOVE 16M	293	408	1.215	15:29:59	280	1.215	9:15:00
	SQA TOTAL	379	408	1.215	15:29:59	376	1.215	9:15:00
BMCPXK3	CSA BELOW 16M	22,654	28,280	1.215	10:30:00	136	1.215	9:15:00
	CSA ABOVE 16M	88,740	119,648	1.215	10:30:00	2,112	1.215	9:15:00
	CSA TOTAL	111,394	147,928	1.215	10:30:00	2,248	1.215	9:15:00
	SQA BELOW 16M	85	96	1.215	9:15:00	0	1.215	15:29:59
	SQA ABOVE 16M	1,053	1,464	1.215	10:30:00	0	1.215	15:29:59
	SQA TOTAL	1,139	1,560	1.215	10:30:00	0	1.215	15:29:59

Common Storage Usage Detail Report Column Field Descriptions

Table 3-29 describes each column field in the Common Storage Usage Detail Report.

Table 3-29 Column Descriptions for the Common Storage Usage Detail Report

Field	Description
JOBNAME	Name of address space in control when the common storage was obtained.
AVG STOR	Average amount of specified common storage held by the jobname.

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Table 3-29 Column Descriptions for the Common Storage Usage Detail Report

Field	Description
MAX STOR	Maximum amount of specified common storage held by jobname in a single record interval.
MAX STOR – DATE	Date of record interval when maximum amount of specified common storage was held.
MAX STOR – TIME	Time of record interval when maximum amount of specified common storage was held.
MIN STOR	Minimum amount of specified common storage held by jobname in a single record interval.
MIN STOR – DATE	Date of record interval when minimum amount of specified common storage was held.
MIN STOR – TIME	Time of record interval when minimum amount of specified common storage was held.

Common Storage Usage Detail Report Row Field Descriptions

Table 3-30 describes each row field in the Common Storage Usage Detail Report.

Table 3-30 Row Descriptions for the Common Storage Usage Detail Report

Field	Description
CSA BELOW 16M	Row containing the amount of CSA below the 16MB line that the jobname held.
CSA ABOVE 16M	Row containing the amount of CSA above the 16MB line that the jobname held.
CSA TOTAL	Row containing the amount of all CSA that the jobname held.
SQA BELOW 16M	Row containing the amount of SQA below the 16MB line that the jobname held.
SQA ABOVE 16M	Row containing the amount of SQA above the 16MB line that the jobname held.
SQA TOTAL	Row containing the amount of all SQA that the jobname held.

Common Storage Usage Summary Report

The Common Storage Usage Summary Report provides a summary view of the average values of the common storage data collected in CMF type 240-29 user records. This data is obtained using the CSMON Extractor control statement (see “CSMON” on page 1-20).

This report is produced by using the COMMSTOR Analyzer control statement (see “COMMSTOR” on page 2-28). There also is a Common Storage Usage Detail Report (see “Common Storage Usage Detail Report” on page 3-67), but the default COMMSTOR statement produces the Common Storage Usage Summary Report.

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Figure 3-20 is an example of the Common Storage Usage Summary Report.

Figure 3-20 Common Storage Usage Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    COMMON STORAGE USAGE REPORT                        RPTSEQ    12 PAGE     73
BMC SOFTWARE, INC.                                          XYZ COMPANY                                 REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-29/1,342/0/7

-------------------------------------------- SUMMARY REPORT SORTED BY JOBNAME            ----------------------------------------
```

JOBNAME	AVG CSA BELOW 16M	AVG CSA ABOVE 16M	AVERAGE CSA TOTAL	AVG SQA BELOW 16M	AVG SQA ABOVE 16M	AVERAGE SQA TOTAL
DC$RES	4,136	520	4,656	0	512	512
DC$RMM	8,864	285,584	294,448	2,312	10,355	12,667
DC$TCPIP	136	2,447,261	2,447,397	0	8,104	8,104
DC$ZSSI	288	0	288	0	0	0
DMRCASQA	56	180,512	180,568	0	0	0
DMRCA6KC	653	2,326,108	2,326,762	0	473	473
DMRCA6KP	56	180,296	180,352	0	0	0
DMRPASQA	25,176	61,336	86,512	0	0	0
DMRPA6KC	29,371	514,192	543,563	0	2,004	2,004
DMRPR1	0	13,653	13,653	0	0	0
DMRTMO1	0	4,096	4,096	0	0	0
DMRUPD3	0	4,096	4,096	0	0	0
DMRXCASE	864	3,070,672	3,071,536	0	640	640
DOMHHH1	9,288	953,626	962,914	4,480	2,457	6,937
DUMPSRV	0	4,664	4,664	64	89,457	89,521
GRS	0	0	0	48	12,631	12,679
I@61REPT	0	80	80	0	0	0
IEFSCHAS	0	0	0	0	16	16
IMSIR22	43,312	189,704	233,016	256	2,880	3,136
INIT	0	1,008	1,008	0	261	261
IOSAS	47	0	47	64	400	464
IRRDPTAB	0	59,976	59,976	0	0	0
IXGLOGR	0	32,608	32,608	64	2,352	2,416
I6AMP1	0	80	80	0	0	0
I6AM2PCT	608	69,632	70,240	1,496	8	1,504
I6AM32DL	0	0	0	304	0	304
JESXCF	0	329,560	329,560	64	8,904	8,968
JES2	28,240	539,224	567,464	64	1,616	1,680

Common Storage Usage Summary Report Field Descriptions

Table 3-31 describes each field in the Common Storage Usage Summary Report.

Table 3-31 Field Descriptions for the Common Storage Summary Usage Report

Field	Description
JOBNAME	Name of the address space in control when the common storage was obtained.
AVG CSA BELOW 16M	Average amount of CSA storage below the 16MB line held by the specified jobname.
AVG CSA ABOVE 16M	Average amount of CSA storage above the 16MB line held by the specified jobname.
AVERAGE CSA TOTAL	Average amount of all CSA storage held by the specified jobname.
AVG SQA BELOW 16M	Average amount of SQA storage below the 16MB line held by the specified jobname.
AVG SQA ABOVE 16M	Average amount of SQA storage above the 16MB line held by the specified jobname.
AVG SQA TOTAL	Average amount of all SQA storage held by the specified jobname.

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Coupling Facility Activity Report

The Coupling Facility Activity Report provides information about the following coupling facility components:

- activity against structures at both structure and system levels
- storage allocation and usage
- CPU utilization
- path and subchannel configuration

The Coupling Facility Activity Report is produced by using the CFACT Analyzer control statement (see “CFACT” on page 2-17). The data for this report is obtained by using the CFDATA Extractor control statement (see “CFDATA” on page 1-10). One report is produced for each coupling facility found in the input data.

This multipage report consists of four summary sections and two detail sections.

- Summary sections:

Processor Displays Processor utilization of the coupling facility.

Storage Displays storage allocation and usage.

Connectivity Displays the name of connected system members.

Note: This section allows you to verify that data from all systems connected to the coupling facility is accounted for and that the data from each connected system covers the same time window. If data from one or more connected systems is missing, or if the data from the connected systems does not cover the same time frame, then the coupling-facility-wide activity information is incomplete or skewed. If data from one connected system is missing, warning message CMF07440 is issued. If data from all systems is available but does not cover the same time frame, warning message CMF07441 is issued.

Structure Summarizes the attributes of each structure and its activities from all systems. The structures are grouped by type in the following order: list, cache, and lock. Structures of the same type are ordered by name.

Figure 3-21 on page 3-72 shows an example of the four summary sections of the Coupling Facility Activity Report.

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- Detail Sections

Subchannel Activity section

Displays the path and subchannel configuration of each connected system and its activity. Figure 3-22 on page 3-76 shows an example of the Subchannel Activity section of the Coupling Facility Activity Report.

Structure Activity section

Displays request activity against each structure, viewed by system. The structures are grouped by type in the following order: list, cache, and lock. Structures of the same type are ordered by name. Figure 3-23 on page 3-78 shows an example of the Structure Activity section of the Coupling Facility Activity Report.

Figure 3-21 on page 3-72 shows an example of the Summary sections of the Coupling Facility Activity Report.

Figure 3-21 Summary Sections of the Coupling Facility Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                  COUPLING FACILITY ACTIVITY REPORT                    RPTSEQ     4 PAGE     91
BMC SOFTWARE, INC.                                          XYZ COMPANY                                 REPORT DATE: 12 JUN 03 13.26
ACTL 10 JUN 03 17.00.00  11 JUN 03 16.59.59             WORLDWIDE HEADQUARTERS                         SYSTEM ID: **ALL**  COMB-MVS

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-4/187/16.7K/46.39
COUPLING FACILITY = CF01      ---------------------  PROCESSOR SUMMARY SECTION  ---------------------------------------------------
                                                                                   MODEL    VERSION    CFLEVEL
  # LOGICAL PROCESSORS   =     2                                                 ------    -------    -------
  # PROCESSORS EFFECTIVE =   2.0                                                 009672        Z57          9
  AVERAGE UTILIZATION    =   2.6%
  MAXIMUM UTILIZATION    =   3.7%   (PROCESSOR NUMBER = 00000001, FROM 10 JUN 03  21.00.00    TO 10 JUN 03  21.15.00)
---------------------------------------------------  STORAGE SUMMARY SECTION  ---------------------------------------------------
              --- SIZE ----  -% OF DUMP--                                       -- DEFINED --  -- ALLOCATED --
  STORAGE     AMOUNT  % OF   USED    MAX                          STORAGE        SIZE   % OF    SIZE   % OF
  ALLOCATION          CF             REQ                          ORGANIZATION          CF             DEFINED
  ----------  ------  -----  -----  -----                         ------------  ------  -----  ------  -------
  STRUCTURES    156M    7.7                                       CONTROL        1009M   49.6  72244K      7.0
  DUMP            4M    0.2    0.0    0.0                         DATA           1024M   50.4  91516K      8.7
  AVAILABLE    1873M   92.1
  ----------  ------  -----
  TOTAL        2033M  100.0
---------------------------------------------------  CONNECTIVITY SUMMARY SECTION  ---------------------------------------------------
   SYSTEM     DURATION        START TIME            END TIME
    NAME    DDD.HH.MM.SS
  --------  ------------  -------------------  -------------------
  SJSC          23.29.11  10 JUN 03  17.00.00  11 JUN 03  16.45.00
  SJSE          22.53.56  10 JUN 03  17.00.00  11 JUN 03  16.59.59

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-4/187/16.7K/46.39
COUPLING FACILITY = CF01      ---------------------  STRUCTURE SUMMARY SECTION  ---------------------------------------------------
  TYPE        NAME       STATUS  --- SIZE --- -------------------- REQUESTS ---------------------- LST/DIR DATA    LOCK
                                  AMOUNT % OF  ---- PER SEC -----  COUNT  % OF  -- SERVICE TIME -- ENTRIES ELEMENT ENTRIES  DIRECTORY
                                         CF                                CF                      TOT/CUR TOT/CUR TOT/CUR  RECLAIMS
  ----- ---------------- ------  ------ ----- -------- ---------- ------- ----- ------- ---------- ------- ------- -------  -------
  LIST  MVIQA_MSGQO      INACTV*     1M   0.0
  LIST  MVIQA_MSGQO      INACTV*     1M   0.0
  LOCK  DBGH_LOCK1       ACTIVE      6M   0.3     0.6             50290   0.2    15.8              24160       0 1048576      N/A
                                                                                                        0       0       0
  LOCK  DBGJ_LOCK1       ACTIVE      6M   0.3     1.4            118570   0.4    32.0              24160       0 1048576      N/A
                                                                                                        1       0       0
  LOCK  DBGK_LOCK1       ACTIVE      6M   0.3     0.9             73144   0.3    31.5              24160       0 1048576      N/A
                                                                                                        2       0       0
  LOCK  DBGP_LOCK1       ACTIVE      6M   0.3     0.0                 0   0.0     0.0              24160       0 1048576      N/A
                                                                                                        0       0       0
  LOCK  IGWLOCK00        ACTIVE      4M   0.2     0.0               137   0.0    20.9              11849       0  262144      N/A
                                                                                                        0       0      13
  LOCK  IMS_LOCKTAB01    ACTIVE      4M   0.2     0.0                 0   0.0     0.0              11977       0 1048576      N/A
                                                                                                        0       0       0
  LOCK  ISGLOCK          ACTIVE      4M   0.2     0.7             54383   0.2    29.1                 0       0  262144      N/A
                                                                                                        0       0      54
  CACHE DBGJ_GBP0        ACTIVE      1M   0.0     0.0              1490   0.0   123.2 +             876     175     N/A        0
                                                                                                        0       0     N/A
  CACHE DBGK_GBP0        ACTIVE*     1M   0.0     0.0              2031   0.0    68.2               877     174     N/A        0
                                                                                                        1       0     N/A
  SUMMARY                            N/A   N/A   332.7           2.7E+07 100.0   390.0
```

Field Descriptions of the Summary Sections of the Coupling Facility Activity Report

Table 3-32 describes each field on the summary Sections of the Coupling Facility Activity Report.

Table 3-32 Field Descriptions of the Summary Sections (Part 1 of 4)

Field	Description
COUPLING FACILITY	Coupling facility name. Note: This field is displayed in the first section header on every page of this report.
# LOGICAL PROCESSORS	Number of logical processors if the coupling facility is a partition in a PR/SM environment, or the number of physical processors if the coupling facility is standalone.
# PROCESSORS EFFECTIVE	Number of available logical processors, effectively, if the coupling facility is a partition in a PR/SM environment. This value is a ratio of the total LPAR dispatch time (sum of CFCC execute time and wait time for all processors) over the interval duration. For a coupling facility that is ICMF LPAR, refer to “CPU Utilization Report” on page 3-85.
AVERAGE UTILIZATION	Average CPU utilization of the coupling facility.
MAXIMUM UTILIZATION, PROCESSOR NUMBER, FROM, TO	Maximum utilization of any processor during all recording intervals. PROCESSOR NUMBER identifies the processor; FROM and TO identify the recording interval.
STORAGE ALLOCATION	Possible values for this field are STRUCTURES:Storage allocated and partitioned into structures. Note: The amount of storage allocated to structures reported here can exceed the TOTAL SIZE of all structures in the STRUCTURE SUMMARY SECTION because some amount of overhead is not attributable to any structure. DUMP Storage reserved for dumping data. AVAILABLE Storage allocated to neither structures nor dump. TOTAL Total storage of the coupling facility.
SIZE – AMOUNT	Storage in the coupling facility is allocated in blocks of 4K bytes. The unit is either kilobytes (K) or megabytes (M), if the size in K is a multiple of 1024 or greater than 99999.
SIZE – % OF CF	Percentage of the total coupling facility storage allocated to structures, dump space, or available.
% OF DUMP – USED	Percentage of dump space in use, observed at end of interval.
% OF DUMP – MAX REQ	Percentage of the largest amount of dump space requested compared with the dump space size. This largest requested amount is a high water mark since coupling facility initialization or dump space reinitialization. If this value exceeds 100, at least 1 dump has been lost or truncated. Note: The recommended size of dump space equals that of the largest structure, or 5% of the coupling facility storage, whichever is larger.
STORAGE ORGANIZATION	Structure and dump storage in the coupling facility occupies both CONTROL and DATA area.

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Table 3-32 Field Descriptions of the Summary Sections (Part 2 of 4)

Field	Description
DEFINED – SIZE	For control area, this value is the maximum amount it can occupy. Data area, on the other hand, is not restricted to this size. When exhausted, data storage can be allocated from control area. Note: The control area can be defined equalling the total coupling facility storage. In other words, there is no restriction on the size of the control area; the entire coupling facility is shared between control and data areas. In this case, NOT DEFINED SEPARATELY FROM CONTROL is printed on the DATA line.
DEFINED – % OF CF	Percentage of coupling facility storage allocated to control or data area.
ALLOCATED - SIZE	Amount of control or data area allocated to structures or dump. Note: The allocated size of data area can exceed defined size (% OF DEFINED then exceeds 100), indicating that the data storage has been exhausted and data has been allocated from the control area.
ALLOCATED – % OF DEFINED	Percentage of defined control or data area allocated to structures or dump.
SYSTEM NAME	Name of the system connected to the coupling facility. Note: If no records from a system are found in the input data, *** NO DATA *** is printed after the system name.
DURATION	Total recording intervals of records produced on system.
START TIME	Start date and time of the first record.
END TIME	End date and time of the last record.
TYPE	First user connecting to a structure specifies its type. Possible values for this field are LIST: List structures allows users to share data organized as entries in a set of lists. CACHE: Cache structure allows sharing of frequently referenced data. LOCK: Lock structure allows serializing on shared resources, including list and cache structures. Note: If there is no activity against a structure from any connected system, its type is listed as UNK (for unknown).
NAME	Name of the structure, up to 16 characters long. A structure, and its attributes (maximum size, for example), is specified in the coupling facility resource management (CFRM) policy. The first subsystem or application connecting to the structure allocates it in the coupling facility. Note: When there are multiple instances of the same structure, each instance is considered unique and listed separately in the Structure Summary section. In the Structure Activity section, the activity data of all instances of a structure are combined.

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Table 3-32 Field Descriptions of the Summary Sections (Part 3 of 4)

Field	Description
STATUS	Status of the structure, observed at end of interval. Possible values for this field are ACTIVE: At the end of at least one interval, at least one system is connected to the structure. INACTV: The structure is allocated in the coupling facility, but is not connected to any system at the end of any interval. UNALLO: No system is connected to the structure at the end of interval and the structure is no longer allocated in the coupling facility. The existence of the structure is known because it was active earlier in the recording interval. Note: If the structure becomes active during the report interval, an asterisk is also printed.
SIZE – AMOUNT	Size of the structure, allocated in blocks of 4K bytes. The unit is in either kilobytes (K) or megabytes (M) if the size in K is a multiple of 1024 or greater than 99999. Note: The structure size is either the value specified in the coupling facility resource management (CFRM) policy or the value specified at allocation time, whichever is greater.
SIZE – % OF CF	Percentage of total coupling facility storage allocated to the structure.
REQUESTS – PER SEC	Rate per second of completed requests directed to the structure. Graph is scaled such that the bar of the structure having the highest rate occupies the full width of the column.
REQUESTS – COUNT	Number of completed requests directed to the structure.
REQUESTS – % OF CF	Percentage of completed requests against the structure compared with the total number of requests against all structures.
REQUESTS – SERVICE TIME	Average number of microseconds required to complete a request (excluding queue time). Graph is scaled such that the bar of the structure having the longest service time occupies the full width of the column.
LST/DIR ENTRIES TOT/CUR	Pair of numbers that provide information about list entries or cache directory entries. For list or lock structures, the first number is the total number of list entries in the structure. For cache structures, the first number is the total number of directory entries in the structure. For list or lock structures, the second number is the average number of list entries in use at the end of the interval. For cache structures, the second number is the average number of directory entries in use at the end of the interval. Note: If a field contains N/A, the data is not applicable to this structure type.
DATA ELEMENT – TOT/CUR	Pair of numbers that provide information about list and cache data elements. For list or lock structures, the first number is the total number of list elements in the structure. For cache structures, the first number is the total number of data elements in the structure. For list or lock structures, the second number is the average number of list elements in use at the end of the interval. For cache structures, the second number is the average number of data elements in use at the end of the interval. Note: If a field contains N/A, the data is not applicable to this structure type.

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Table 3-32 Field Descriptions of the Summary Sections (Part 4 of 4)

Field	Description
LOCK ENTRIES – TOT/CUR	Pair of numbers that provide information about lock table entries for lock structures or serialized list structures. The first number is the total number of lock table entries for the structure. The second number is the average non zero lock table entry count at the end of the interval. Note: If a field contains N/A, the data is not applicable to this structure type.
DIRECTORY RECLAIMS	Number that provides the average number of directory reclaims for a cache structure. Directory reclaim activity indicates a shortage of directory entries. A shortage of directory entries causes the coupling facility to *reclaim* already used directory entries that are associated with unchanged data. As a result, the copy of the data in the coupling facility is invalidated, and must be re-read from DASD and registered to the coupling facility again. Note: If a field contains N/A, the data is not applicable to this structure type.
SUMMARY	Values on this line are either the total or the average of values of all instances of all structures. Note: If different structure instances exist at different ends of interval, totaling their sizes and percentages of coupling facility storage is meaningless. In this case, N/A is printed.

Figure 3-22 shows an example of the Subchannel Activity section of the Coupling Facility Activity Report.

Figure 3-22 Subchannel Activity Section of the Coupling Facility Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                  COUPLING FACILITY ACTIVITY REPORT                    RPTSEQ     4 PAGE     96
BMC SOFTWARE, INC.                                            XYZ COMPANY                               REPORT DATE: 10 JUN 03 16.58
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                         SYSTEM ID: **ALL**  COMB-MVS


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-4/43/3,767/10.5
COUPLING FACILITY = CF01     ---------------------  SUBCHANNEL ACTIVITY SECTION  ------------------------------------------------
 SYSTEM  ----------------- REQUESTS ------------------  -------------- QUEUED REQUESTS ---------------  REJECTED   -- CONFIG --
  NAME    TYPE    PER     COUNT  % OF  -SERVICE TIME--           #       %     -- DELAY TIME ---        REQUESTS   RESOURCE CNT
                  SEC            ALL    AVG   STD DEV           REQ     REQ   /REQ    S DEV   /ALL     RES  CNT
-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------  ---- ----  -------- ---

SJSC     ALL       313.4 3948804  37.7   268.6   545.5                                                  PATH    0  PATH       3
           SYNC      2.4   30684   0.3    24.9    22.5  SYNC        3842  12.5      13      11       2  SCH  3842  SCH GEN    6
           ASYNC   186.4 2348065  22.4   271.8   548.3  ASYNC     939567  40.0    1102    1316     441             SCH USE    6
           CNVAS     0.0      63   0.0                  TOTAL     943409  39.7                                     SCH OPT    6
           UNSUC     0.0       0   0.0     0.0     0.0

SJSE     ALL       250.5 6538033  62.3   531.4  2738.0                                                  PATH    0  PATH       2
           SYNC      7.3  189363   1.8    32.3    28.8  SYNC        6759   3.6      14      20       0  SCH  6759  SCH GEN    4
           ASYNC   144.7 3775349  36.0   556.4  2803.5  ASYNC    2766229  73.3    2055    7213    1506             SCH USE    4
           CNVAS     0.0      45   0.0                  TOTAL    2772988  69.9                                     SCH OPT    4
           UNSUC     0.0       0   0.0     0.0     0.0

-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------  ---- ----
SUMMARY  ALL       542.0 1.0E+07 100.0   432.9  2193.9                                                  PATH    0
           SYNC     11.4  220047   2.1    31.2    28.1  SYNC       10601   4.8      14      17       1  SCH 10601
           ASYNC   316.5 6123414  58.4   447.3  2231.6  ASYNC    3705796  60.5    1813    6281    1097
           CNVAS     0.0     108   0.0                  TOTAL    3716397  58.6
           UNSUC     0.0       0   0.0     0.0     0.0
```

Field Descriptions of the Subchannel Activity Section

Table 3-33 describes each field on Subchannel Activity section of the Coupling Facility Activity Report.

Table 3-33 Field Descriptions for the Subchannel Activity Section (Part 1 of 2)

Field	Description
SYSTEM NAME	Name of the system connected to the coupling facility. Note: If no records from a system are found in the input data, *** NO DATA *** is printed after the system name.
REQUESTS – TYPE	Type of requests. Possible values for this field are SYNC: Synchronous requests directed to structures. ASYNC: Asynchronous requests directed to structures. CNVAS: Requests directed to structures originated as synchronous but converted to asynchronous. A synchronous request is converted to asynchronous if the buffer size is greater than 4K bytes or if multiple buffers are passed. UNSUC: Not completed due to hardware problems. ALL: Total of all request types. Note: The ALL field value may exceed the sum of the values for SYNC, ASYNC, CNVS, and UNSUC because it also includes coupling-facility-managing requests and requests directed to structures no longer active at the end of the interval.
REQUESTS – PER SEC	Rate per second of requests originated from the system, viewed by request type. Note: The rate and count of requests from all systems in the SUMMARY section exceeds the TOTAL rate and count in the Structure Summary section, because the former include unsuccessful requests and coupling-facility-managing requests.
REQUESTS – COUNT	Number of requests originated from a system.
REQUESTS – % OF ALL	Percentage of requests of a type originated from a system compared with the total number of requests from all systems.
REQUESTS – SERVICE TIME - AVG, STD DEV	Average number of microseconds required to complete a request (excluding queue time) and its standard deviation. Service time of synchronous-converted-to-asynchronous (CNVAS) requests is included in that of asynchronous (ASYNC) requests. The service time of coupling-facility-managing (GLOBL) requests is not available.
QUEUED REQUESTS – # REQ	Total number of requests to this coupling facility that were delayed in this interval.
QUEUED REQUESTS – % REQ	Percentage of requests to this coupling facility that were delayed in this interval.
DELAY TIME / REQ	Average delay time for each delayed request in microseconds.
DELAY TIME S DEV	Standard deviation of the average delay time for delayed requests.
DELAY TIME / ALL	Average delay time for all requests to the coupling facility in microseconds. This number helps indicate how delays are affecting overall request activity to the coupling facility.

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Table 3-33 Field Descriptions for the Subchannel Activity Section (Part 2 of 2)

Field	Description
REJECTED REQUESTS – RES, CNT	Number of requests rejected due to a temporary lack of resource: path (PATH) or subchannel (SCH).
CONFIG – RESOURCE, CNT	Number of paths or coupling facility subchannels for each of the following resources: PATH: Number of paths connecting the system and the coupling facility. SCH GEN: Number of GENed coupling facility subchannels. SCH USE: Number of coupling facility subchannels currently in use. SCH OPT: Number of coupling facility subchannels this system can optimally use to satisfy its requests.

Figure 3-23 shows an example of the Structure Activity section of the Coupling Facility Activity Report.

Figure 3-23 Structure Activity Section of the Coupling Facility Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                  COUPLING FACILITY ACTIVITY REPORT                    RPTSEQ     4 PAGE     98
BMC SOFTWARE, INC.                                          XYZ COMPANY                                 REPORT DATE: 10 JUN 03 16.58
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: **ALL**  COMB-MVS

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-4/43/3,767/10.5
COUPLING FACILITY = CF01      ---------------------  STRUCTURE ACTIVITY SECTION  ---------------------------------------------------
------------------------------------------------------ STRUCTURE = DBGK_SCA         ---------------------------------------------------
TYPE = LIST    SIZE = 16640K
 SYSTEM  ---------------- REQUESTS ------------------  -------------- QUEUED REQUESTS ---------------
  NAME    TYPE    PER     COUNT  % OF  -SERVICE TIME--  DELAY    #       %     -- DELAY TIME ---
                  SEC            ALL     AVG   STD DEV  REASON   REQ     REQ   /REQ    S DEV   /ALL
-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SJSC     ALL         0.0       0   0.0     0.0     0.0  NO SCH         0   0.0       0       0       0
           SYNC      0.0       0   0.0     0.0     0.0
           ASYNC     0.0       0   0.0     0.0     0.0  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

SJSE     ALL         2.0   51810 100.0   565.1  1059.1  NO SCH       858   1.7    1843   12101      31
           SYNC      0.0       1   0.0    61.0     0.0
           ASYNC     2.0   51809 100.0   565.1  1059.2  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SUMMARY  ALL         2.7   51810 100.0   565.1  1059.1  NO SCH       858   1.7    1843   12101      31
           SYNC      0.0       1   0.0    61.0     0.0
           ASYNC     2.7   51809 100.0   565.1  1059.2  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

------------------------------------------------------ STRUCTURE = IMS_CQS_EMHLOG2  ---------------------------------------------------
TYPE = LIST    SIZE =     1M
 SYSTEM  ---------------- REQUESTS ------------------  -------------- QUEUED REQUESTS ---------------
  NAME    TYPE    PER     COUNT  % OF  -SERVICE TIME--  DELAY    #       %     -- DELAY TIME ---
                  SEC            ALL     AVG   STD DEV  REASON   REQ     REQ   /REQ    S DEV   /ALL
-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SJSC     ALL         0.0      49 100.0   242.3   368.2  NO SCH         0   0.0       0       0       0
           SYNC      0.0      22  44.9    36.8    11.7
           ASYNC     0.0      27  55.1   409.8   428.4  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

SJSE     ALL         0.0       0   0.0     0.0     0.0  NO SCH         0   0.0       0       0       0
           SYNC      0.0       0   0.0     0.0     0.0
           ASYNC     0.0       0   0.0     0.0     0.0  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SUMMARY  ALL         0.0      49 100.0   242.3   368.2  NO SCH         0   0.0       0       0       0
           SYNC      0.0      22  44.9    36.8    11.7
           ASYNC     0.0      27  55.1   409.8   428.4  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

------------------------------------------------------ STRUCTURE = IMS_CQS_MSGLOG2  ---------------------------------------------------
TYPE = LIST    SIZE =     1M
 SYSTEM  ---------------- REQUESTS ------------------  -------------- QUEUED REQUESTS ---------------
  NAME    TYPE    PER     COUNT  % OF  -SERVICE TIME--  DELAY    #       %     -- DELAY TIME ---
                  SEC            ALL     AVG   STD DEV  REASON   REQ     REQ   /REQ    S DEV   /ALL
-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SJSC     ALL         0.0     189 100.0   109.1   229.2  NO SCH         0   0.0       0       0       0
           SYNC      0.0     154  81.5    28.2    17.5
           ASYNC     0.0      35  18.5   464.7   356.4  DUMP           0   0.0       0       0       0
```

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```
           CNVAS     0.0       0   0.0

SJSE     ALL         0.0       0   0.0     0.0     0.0  NO SCH         0   0.0       0       0       0
           SYNC      0.0       0   0.0     0.0     0.0
           ASYNC     0.0       0   0.0     0.0     0.0  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0

-------- ------- ------- ------- ----- ------- -------  -------- ------- ----- ------- ------- -------
SUMMARY  ALL         0.0     189 100.0   109.1   229.2  NO SCH         0   0.0       0       0       0
           SYNC      0.0     154  81.5    28.2    17.5
           ASYNC     0.0      35  18.5   464.7   356.4  DUMP           0   0.0       0       0       0
           CNVAS     0.0       0   0.0
```

Field Descriptions of the Structure Activity Section

Table 3-34 describes each field on the Structure Activity section of the Coupling Facility Activity Report.

Table 3-34 Field Descriptions for the Structure Activity Section (Part 1 of 2)

Field	Description
STRUCTURE	Name of the structure, up to 16 characters long. Note: When there are multiple instances of the same structure, the activity data of all instances is combined.
TYPE	First user connecting to a structure specifies its type. Possible values for this field are LIST: List structures allows users to share data organized as entries in a set of lists. CACHE: Cache structure allows sharing of frequently referenced data. LOCK: Lock structure allows serializing on shared resources, including list and cache structures. Note: If there is no activity against a structure from any connected system, its type is listed as UNK (for unknown).
SIZE	Structure size in either K or M if the size in K is a multiple of 1024 or greater than 99999.
SYSTEM NAME	Name of the system originating the requests against this structure.
REQUESTS – TYPE	Type of requests: synchronous (SYNC), asynchronous (ASYNC), originated as synchronous but converted to asynchronous (CNVAS). ALL is the total for all request types.
REQUESTS – PER SEC	Rate per second of requests originated from a system against this structure, viewed by request type.
REQUESTS – COUNT	Number of requests originated from a system against this structure, viewed by request type.
REQUESTS – % OF ALL	Percentage of requests of a type originated from a system compared with the total number of requests from all systems against this structure.
REQUESTS – SERVICE TIME – AVG, STD DEV	Average number of microseconds required to complete a request (excluding queue time) and its standard deviation. The service time of synchronous-converted-to-asynchronous (CNVAS) requests is included in that of asynchronous (ASYNC) requests.
QUEUED REQUESTS – DELAY REASON	Reason a request gets queued. Possible values for this field are NO SCH: No coupling facility subchannel is available. DUMP: The structure is being dumped.

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Table 3-34 Field Descriptions for the Structure Activity Section (Part 2 of 2)

Field	Description
QUEUED REQUESTS – # REQ	Total number of requests to this structure delayed in this interval.
QUEUED REQUESTS – % REQ	Percentage of requests to this structure delayed in this interval.
DELAY TIME / REQ	Average delay time for each delayed request in microseconds.
DELAY TIME S DEV	Standard deviation of the average delay time for delayed requests.
DELAY TIME / ALL	Average delay time for all requests to the structure in microseconds. This number indicates how delays are affecting overall request activity to the structure.
EXTERNAL CONTENTION – REQ TOTAL	Total number of requests to the structure. Note: This field is applicable only to serialized list or lock structures.
EXTERNAL CONTENTION – REQ DEFERRED	Number of requests to the structure that were unable to be completed within the request issuer's thread. Note: This field is applicable only to serialized list or lock structures.
EXTERNAL CONTENTION – TRUE CONT	Number of requests to the structure delayed due to lock contention. This number is a subset of REQ DEFERRED. Note: This field is applicable only to lock structures.
EXTERNAL CONTENTION – FALSE CONT	Number of requests to the structure delayed due to false lock contention. False lock contention occurs when a user-supplied hash value is used to map a lock request to a lock entry and multiple unique lock requests hash to a single lock table entry. This number is a subset of -CONT, the total lock contention count. Note: This field is applicable only to lock structures. A high false lock contention count indicates either a poor hashing algorithm or an inadequate number of lock table entries.
DATA ACCESS – READS	Total number of read hits for a cache structure read request for the interval. Note: This field is applicable only to cache structures.
DATA ACCESS – WRITES	Total number of write hits for a cache structure write request for the interval. Note: This field is applicable only to cache structures.
DATA ACCESS – CASTOUTS	Total number of castouts for a cache structure for the interval. Castouts occur when changed data is written to DASD. The castout count can indicate the volume of changed data being removed from a store-in cache structure, such as the DB2 global buffer pool structures. Note: This field is applicable only to cache structures.
DATA ACCESS – XI's	Number of times a data item residing in a local buffer pool was marked invalid by the coupling facility. The XI count indicates the amount of data sharing among the users of the cache structure and the amount of write or update activity against the cache data. Note: This field is applicable only to cache structures.

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CPU and Channel Path Activity Report

The CPU and Channel Path Activity Report shows channel path busy and CPU time for each CPU. The first header line of the report contains the CPU model and version numbers in the form (mmmm-vv). If the report contains data from multiple CPU configurations, the model and version numbers are replaced with (****-**).

The CPU and Channel Path Activity Report is produced by using the CPUCHAN Analyzer control statement (see “CPUCHAN” on page 2-33). The data is obtained by using both the CPU and CHANNEL Extractor control statements (see “CPU” on page 1-14 and “CHANNEL” on page 1-12).

This report has three major sections:

System Profile Shows the time percentages for CPU and channel path combinations for the entire system (all CPUs and all channel paths).

Note: If PR/SM or MDF are active, the information in this report may not be accurate.

CPU Summary Shows the time percentages for each CPU in individual sections.

Note: The CPU BUSY values displayed in this section are applicable for non PR/SM environments only. The calculations for these values are not adjusted for the PR/SM environment.

Channel Profile Shows specific information for each channel path.

An example of the CPU and Channel Path Activity Report is shown in Figure 3-24.

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Figure 3-24 CPU and Channel Path Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)          CPU AND CHANNEL PATH ACTIVITY REPORT  (2064-00)            RPTSEQ    15 PAGE    105
BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/28/25.1K/7  70-1/28/25.1K/7  73-1/28/0/7
-------------------------------------------------------  SYSTEM PROFILE  -------------------------------------------------------
                ANY CPU BUSY                          =    6.6        ANY CHANNEL BUSY                          =   34.3
                ANY CPU BUSY AND ANY CHANNEL BUSY     =    2.8        ALL CPU'S WAITING AND ANY CHANNEL BUSY=   31.5
                ANY CPU BUSY AND NO CHANNEL BUSY      =    3.7        ALL CPU'S WAITING AND NO CHANNEL BUSY =   61.9
                AVERAGE SYSTEM I/O INTERRUPT RATE     =   35.4        % I/O INTERRUPTS HANDLED VIA TPI      =    0.7
                SYSTEM IDLE - CPU'S,CHANNELS          =   84.5        CPMF RESTART COUNT                    =      0
                LAST CPMF SAMPLE COUNT                =      0
-------------------------------------------------------  CPU 0 SUMMARY   -------------------------------------------------------
                CPU BUSY                              =    6.8        ANY CHANNEL BUSY                          =   34.4
                CPU BUSY AND ANY CHANNEL BUSY         =    2.9        CPU WAITING AND ANY CHANNEL BUSY          =   31.5
                CPU BUSY AND NO CHANNEL BUSY          =    3.9        CPU WAITING AND NO CHANNEL BUSY           =   61.4
                TOTAL I/O INTERRUPT RATE              =   30.2        % I/O INTERRUPTS HANDLED VIA TPI          =    0.8
-------------------------------------------------------  CPU 1 SUMMARY   -------------------------------------------------------
                CPU BUSY                              =    6.7        ANY CHANNEL BUSY                          =   34.5
                CPU BUSY AND ANY CHANNEL BUSY         =    3.0        CPU WAITING AND ANY CHANNEL BUSY          =   31.5
                CPU BUSY AND NO CHANNEL BUSY          =    3.7        CPU WAITING AND NO CHANNEL BUSY           =   62.5
                TOTAL I/O INTERRUPT RATE              =   33.8        % I/O INTERRUPTS HANDLED VIA TPI          =    0.7
------------------------------------------------------- OVERVIEW OF DCM CHANNELS -------------------------------------------------------
         CHANNEL                     UTILIZATION %     READ(MB/SEC)   WRITE(MB/SEC)
      GROUP  G    NO            PART  TOTAL    BUS     PART  TOTAL     PART  TOTAL
     CNC?M         2            0.01   0.02
------------------------------------------------------- CHANNEL PROFILE -------------------------------------------------------
 ID  CHANNEL G   SHR  HISTORY       UTILIZATION %     READ(MB/SEC)   WRITE(MB/SEC)            CHANNEL PATH
        TYPE                     PART  TOTAL    BUS     PART  TOTAL     PART  TOTAL             DESCRIPTION
 A6  CNC_S       YES            0.10   0.39                                          ESCON SWITCHED POINT TO POINT
 A7  CNC_S       YES            0.10   0.36                                          ESCON SWITCHED POINT TO POINT
 A8  CNC_S       YES            0.01   2.05                                          ESCON SWITCHED POINT TO POINT
 AA  CNC_S       YES            0.02   0.07                                          ESCON SWITCHED POINT TO POINT
 AB  CNC_S       YES            0.01   0.05                                          ESCON SWITCHED POINT TO POINT
 AE  CNC_S       YES            0.01   0.04                                          ESCON SWITCHED POINT TO POINT
 B0  CNC_S       YES            0.02   2.05                                          ESCON SWITCHED POINT TO POINT
 B2  CNC_S       YES            0.03   0.08                                          ESCON SWITCHED POINT TO POINT
 B8  CNC_S       YES            0.03   0.23                                          ESCON SWITCHED POINT TO POINT
 BD  CNC_S       YES            0.76   2.72                                          ESCON SWITCHED POINT TO POINT
 C6  CNC_P       YES            2.65   2.65                                          ESCON POINT TO POINT
 F8  OSD         YES            0.21   2.78   8.61     0.00   0.05     0.00   0.04  OSA DIRECT EXPRESS
 F9  OSD         YES            2.69   2.71   8.42     0.00   0.00     0.00   0.00  OSA DIRECT EXPRESS
 FD  CBP         YES            ----   0.00                                          INTEGRATED CLUSTER BUS PEER
 FE  CBP         YES            ----   0.00                                          INTEGRATED CLUSTER BUS PEER
------------------------------------------------------- HIPERSOCKETS CHANNELS -------------------------------------------------------
 ID  CHANNEL G   SHR         --------------------- MESSAGES ---------------------  ------ FAILED/SEC -------
        TYPE                ---BYTES/SEC----  ----MSGS/SEC----  --AVG MSG SIZE--     SEND  ----RECEIVE-----
                               PART    TOTAL     PART    TOTAL     PART    TOTAL     PART     PART    TOTAL
 F7  IQD         YES           77.46    79.74        0        0      ---   143.4K        0        0        0
```

CPU and Channel Path Activity Report Field Descriptions

Table 3-35 describes each field in the CPU and Channel Path Activity Report.

Table 3-35 Field Descriptions for the CPU and Channel Path Activity Report (Part 1 of 3)

Field	Description
System Profile Section:	
ANY CPU BUSY	Average number of samples where the CPU was busy for all CPUs expressed as a percentage.
ANY CPU BUSY AND ANY CHANNEL BUSY	Average time that any CPU was busy and any channel was busy.
ANY CPU BUSY AND NO CHANNEL BUSY	Average time that any CPU was busy and no channels were busy.
AVERAGE I/O INTERRUPT RATE	Rate per second at which a CPU in the system handled all I/O interrupts, averaged across CPUs.
SYSTEM IDLE – CPU'S, CHANNELS	Amount of time that all CPUs and channels were idle.

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Table 3-35 Field Descriptions for the CPU and Channel Path Activity Report (Part 2 of 3)

Field	Description
ANY CHANNEL BUSY	Average number of samplers where any channel was busy.
ALL CPU'S WAITING ANY CHANNEL BUSY	Average time that any channel was busy and all CPUs were waiting.
ALL CPU'S WAITING NO CHANNEL BUSY	Average time that no channels were busy and all CPUs were waiting.
% I/O INTERRUPTS HANDLED VIA TPI	Percent of I/O interrupts that were handled through the Test Pending Interrupt (TPI) instruction.
CPMF RESTART COUNT	Number of times the Channel Path Measurement Facility (CPMF) has restarted since IPL.
LAST CPMF SAMPLE COUNT	Total number of CPMF samples since IPL.
CPU Summary Section: Note: The CPU Summary section does not contain adjusted values for MDF, MLPF, or PR/SM environments.	
CPU BUSY	Average number of samples where the CPU was busy; expressed as a percentage.
CPU BUSY AND ANY CHANNEL BUSY	Average time that CPU was busy and any channel was busy.
CPU BUSY AND NO CHANNEL BUSY	Average time that CPU was busy and no channels were busy.
TOTAL I/O INTERRUPT RATE	Rate per second at which this processor handled I/O interrupts.
ANY CHANNEL BUSY	Average time that any channel was busy.
CPU WAITING AND ANY CHANNEL BUSY	Average time that any channel was busy and the CPU was waiting.
CPU WAITING AND NO CHANNEL BUSY	Average time that no channels were busy and the CPU was waiting.
% I/O INTERRUPTS HANDLED VIA TPI	Percent of I/O interrupts that were handled through the Test Pending Interrupt (TPI) instruction, averaged across CPUs.
Overview of DCM Channels section:	
CHANNEL GROUP G NO	For each channel type which is managed by DCM a summary line is shown with the average values for all channels in this group. G indicates the generation and is used to differntiate between channels of the same channel type, when one has significant differences from the other. The number of channels of the group is given in column NO.
Channel Profile Section:	
ID	Hexadecimal channel path ID.
CHANNEL TYPE	Type of channel; a longer description of channel type is on the CHANNEL PATH DESCRIPTION column. If the last character is 'M', the channel is managed by Dynamic Channel Path Management (DCM) (for example, CNCSM is a managed channel of type CNC_S).
SHR	Indication of whether the channel path is shared between logical partitions. This field contains YES if the channel path is shared; it is blank if the channel path is not shared.

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Table 3-35 Field Descriptions for the CPU and Channel Path Activity Report (Part 3 of 3)

Field	Description
STATUS	Indication of whether the channel was offline or online at the end of the reporting interval. This field is blank if online, it contains OFFLINE if offline.
HISTORY	Indicates any changes to the status that occurred to the channel path. The following list shows the values that can be displayed: V: Varied online or offline M: Modified A: Added D: Deleted
UTILIZATION % - PART	Percent of time a shared channel was busy for the home partition. For FICON channels, this is a measure of how busy the channel processor was. For an unshared channel, the value is identical to that of the UTILIZATION % - TOTAL.
UTILIZATION % - TOTAL	Percent of time a channel was busy for the whole complex. For FICON channels, this is a measure of how busy the channel processor was. For an unshared channel, the value is identical to that of the UTILIZATION % - PART.
UTILIZATION % - BUS	Utilization of the internal PCI bus of FICON channels. It is the percentage of the cycles per second used for I/O operations over the maximum internal bus cycles per second.
READ (MB/SEC) - PART	Rate per second of megabytes read using the channel for the home partition. Note: This column is applicable only to FICON channels.
READ (MB/SEC) - TOTAL	Rate per second of megabytes read using the channel for the entire complex. Note: This column is applicable only to FICON channels.
WRITE (MB/SEC) - PART	Rate per second of megabytes written using the channel for the home partition. Note: This column is applicable only to FICON channels.
WRITE (MB/SEC) - TOTAL	Rate per second of megabytes written using the channel for the entire complex. Note: This column is applicable only to FICON channels.
CHANNEL PATH DESCRIPTION	Long description of channel type, also displayed by the system command D M=CHP.
Hipersockets Channels Section:	
MESSAGES BYTES/SEC	PART Rate of messages sent by programs for the partition. TOTAL Rate of messages sent by programs for the entire complex.
MESSAGES MSGS/SEC	PART Rate of messages sent by programs for the partition. TOTAL Rate of messages sent by programs for the entire complex.
MESSAGES AVG MSG SIZE	PART Average size of messages sent for the partition. TOTAL Average size of messages sent for the entire complex.
FAILED/SEC SEND	PART Rate of messages sent by the partition that failed, excluding the attempts failed due to unavailable buffers in the receiving partition.
FAILED/SEC RECEIVE	PART Rate of messages sent by the partition that failed due to unavailable buffers in the receiving partition. TOTAL Rate of messages sent by the entire complex that failed due to unavailable buffers in the receiving partition.

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CPU Utilization Report

The CPU Utilization Report provides information about CPU busy times, CPU online and offline times, and CPU queue lengths.

The CPU Utilization Report is produced by using the CPU Analyzer control statement (see “CPU” on page 2-31). The data is obtained by using the CPU Extractor control statement (see “CPU” on page 1-14).

This report consists of these sections:

Summary Describes the activity of all CPUs in the system.

CPU Shows each CPU that was online during the measurement interval. It lists critical information by CPU and produces two graphs that visually represent the listed information. Each CPU's ID and serial number is shown at the beginning of this section.

Partition Data Produced if the Extractor records were gathered in a system running in a PR/SM, MLPF, or MDF environment. This section shows logical and physical processor utilization and configuration information by partition (see “Partition Data Section for PR/SM Environments” on page 3-90 for more information).

LPAR Cluster Produced if at least one LPAR cluster is defined on the physical processor. While repeating some of the information available in the Partition Data section, this section provides additional information about partition attributes managed by Workload Manager and summarizes data at the LPAR cluster level.

LPAR Combination This section displays combinations of LPARs and their highest rolling 4-hour MSU per hour. This value helps assess the license charge of Variable Workload License Charge (VWLC) products that are active either all the time or during periods of peak CPU utilization.
To add combinations to the LPAR Combination section or to suppress this section, see the LPARCOMB control statement discussed in “LPARCOMB” on page 2-70.

Rolling 4-Hour MSU Usage Distribution
This section helps determine the defined capacity of an LPAR and evaluates the current defined capacity to help decide if capacity should be increased or decreased.

MSU Usage Detail Produced if the parameter MSUDETAIL and MSUDIST=YES is specified. With Variable Workload License Charges (VWLC), the capacity for an LPAR is defined in terms of Millions of Service Units (MSUs). This section shows the distribution of 4-hour MSU per hour usage.

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All CPU times reported in the CPU Utilization Report are based on measured values.

Note: Other CMF MONITOR reports that contain CPU times base their calculations on sampled values, so the CPU-related sample counts may be low in the CPU Utilization Report compared to the other reports. As the number of samples increases, however, the values in all the reports converge (see Statistical Considerations in *CMF MONITOR Batch User Guide* for more information.).

Other reports that provide CPU times based on sampled values are

- “Combinations of Configuration Activity Report” on page 3-65
- “CPU and Channel Path Activity Report” on page 3-81
- “Extractor Summary Report” on page 3-129
- All graphics reports:
  - “Distribution Graph” on page 3-119
  - “Graphics Trace Detail Report” on page 3-135
  - “Interval Bar Graph” on page 3-150
  - “Kiviat Graph” on page 3-152
  - “Performance Summary Report” on page 3-175
  - “Pie Chart” on page 3-182
  - “Profile Bar Graph” on page 3-188
  - “Tabular Subreport” on page 3-215

Figure 3-25 shows an example of the Summary and CPU sections of the CPU Utilization Report.

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Figure 3-25 CPU Utilization Report Summary and CPU sections

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ     3 PAGE     22
BMC SOFTWARE, INC.                                          XYZ COMPANY                                REPORT DATE: 12 JUN 03 14.08
ACTL 10 JUN 03 16.15.00  11 JUN 03 16.30.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/192/17.2K/23.87
-------------------------------------------------------  SUMMARY SECTION  -------------------------------------------------------
                          CPU FAMILY: 2064  VERSION: 00  MODEL: 114
                          A CPU QUEUE EXISTED (EXECUTABLE ASIDS)(PCT OF EXT. TIME)                = 100.0
                                       (AVERAGE QUEUE DEPTH =  1.3, MAXIMUM QUEUE SIZE = 31)
                          SYSTEM IDLE - NO CPU BUSY AND NO CHANNEL BUSY       (PCT OF EXT. TIME)  =  78.9
                          % OF TOTAL FOR BATCH         =     .4   % OF CPU BUSY FOR BATCH         =   6.6
                          % OF TOTAL FOR TSO           =     .2   % OF CPU BUSY FOR TSO           =   3.5
                          % OF TOTAL FOR STARTED TASKS =    5.2   % OF CPU BUSY FOR STARTED TASKS =  89.4
          LPAR CPU UTILIZATION PERCENTAGE        =       5.7      CMF EXTRACTOR OVERHEAD (PCT OF EXT. TIME)  =    0.00
          MVS  CPU UTILIZATION PERCENTAGE        =       6.4      ALL CPU'S BUSY (PCT OF EXT. TIME)          =      .1
-------------------------------------------------------  CPU 0 (089321) SECTION  -------------------------------------------------
CPU UTILIZATION
  ONLINE            100.0
  BUSY PERCENT        5.9                                          CPU BUSY PERCENT                        CPU BUSY DISTRIBUTION
                   % OF TOTAL TIME      % OF CPU BUSY
  TCB MODE                 3.2                53.7    .********************                        100 |
     SUPVR ENABLED      .6                   9.7     .++++                                            |
     SUPVR DISABLED    2.5                  41.6     .+++++++++++++++                          P     |
     PROB PROG          .1                   2.4     .+                                        C     |
  LOCAL SRB MODE            2.7                45.4    .******************                        T     |
     ENABLED            .3                   4.9     .++                                          75 |
     DISABLED          2.4                  40.5     .++++++++++++++++                         O     |
  GLOBAL SRB MODE            .0                   .0    .                                        F     | *
     ENABLED            .0                    .0     .                                              | *
     DISABLED           .0                    .0     .                                        O     | *
                                                     .                                        C  50 | *
  TOTAL ENABLED TIME        1.0                17.0    .*******                                 C     | *
  TOTAL DISABLED TIME       4.9                82.1    .*********************************      U     | *
  TOTAL PROB PROG TIME       .1                 2.4    .*                                       R     | *
  TOTAL SUPVR TIME          5.8                96.8    .****************************************R     | **
                                                     .                                        E  25 | **
% USED FOR BATCH             .4                 6.1    .**                                      N     | **
% USED FOR TSO               .2                 3.2    .*                                       C     | **
% USED FOR STARTED TASKS    5.3                89.0    .************************************     E     | **
                                                     .                                              | ***
  AVERAGE DISABLE DELAY (SECONDS)                    ----------------------------------------         ----------------------
          DIE DELAY           =    .000819           0       2       4       6       8       1          0   1   3   5   7   8
          SIG DELAY           =    .000595                   0       0       0       0       0              7   5   3   1   9
          AVG FOR THIS CPU    =    .000669                                                   0
                                                                                                         BUSY PERCENT
  VECTOR FACILITY IS OFF                                                                        EACH '*' REPRESENTS 5 %
```

Summary Section Field Descriptions

Table 3-36 describes each field in the Summary section of the CPU Utilization Report.

Table 3-36 Field Descriptions for the Summary Section (Part 1 of 2)

Field	Description
CPU FAMILY VERSION MODEL	CPU family, version, and model.
A CPU QUEUE EXISTED	Percentage of time that address spaces were found dispatchable and waiting for CPU.
AVERAGE QUEUE DEPTH	Average number of dispatchable address spaces waiting for CPU.
MAXIMUM QUEUE SIZE	Maximum number of dispatchable address spaces waiting for CPU.
SYSTEM IDLE	Percentage of time that no CPU was busy.
% OF TOTAL FOR BATCH	For all CPUs, percentage of CPU time used for batch.
% OF TOTAL FOR TSO	For all CPUs, percentage of CPU time used for TSO.
% OF TOTAL FOR STARTED TASKS	For all CPUs, percentage of CPU time used for started tasks.

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Table 3-36 Field Descriptions for the Summary Section (Part 2 of 2)

Field	Description
% OF CPU BUSY FOR BATCH	Average CPU busy time for all CPUs used for batch.
% OF CPU BUSY FOR TSO	Average CPU busy time for all CPUs used for TSO.
% OF CPU BUSY FOR STARTED TASKS	Average CPU busy time for all CPUs used for started tasks.
LPAR CPU UTILIZATION PERCENTAGE	LPAR CPU busy percentage during the specified interval. It is the percentage of processor online time used by the home partition (the partition on which the records were extracted). The formula is **Wait completion on:** (dispatch time - wait time) / online time **Wait completion off:** dispatch time / online time
MVS CPU UTILIZATION PERCENTAGE	MVS CPU average busy percentage during the specified interval. The formula is (online time - wait time) / online time
CMF EXTRACTOR OVERHEAD	Percentage of time used by the CMF MONITOR Extractor.
ALL CPU'S BUSY	Percentage of time all CPUs in the system were busy simultaneously. This value is produced only in multiple processor environments.

CPU Section Field Descriptions

There are two graphs included in the CPU section of the CPU Utilization Report:

- The graph at the center of the CPU section shows the amount of CPU time spent in states, such asTCB, Local SRB, Global SRB, Supervisor, Problem program, Enabled, Disabled, and others.
- The graph at the left of the CPU section is a distribution graph showing the frequency of occurrence of each percentage busy. The horizontal axis represents the percent busy for this CPU. The vertical axis represents the frequency of that condition. This graph can be used to determine the stability of CPU usage during the sampling period.

Table 3-37 describes each field in the CPU section of the CPU Utilization Report.

Table 3-37 Field Descriptions for the CPU Section (Part 1 of 3)

Field	Description
ONLINE	Percentage of time this CPU was online. This value is always 100% in a single processor environment.
BUSY PERCENT	Percentage of time this CPU was busy.
% OF TOTAL TIME	Portion of the total time elapsed the CPU was online and in the indicated state.
% OF CPU BUSY	Portion of the CPU busy time spent in the indicated state.

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Table 3-37 Field Descriptions for the CPU Section (Part 2 of 3)

Field	Description
TCB MODE	Sum of the percentages of time spent in supervisor state enabled, disabled, or in problem program state while running under a TCB.
SUPVR ENABLED	Percentage of time spent in supervisor state enabled while running under a TCB.
SUPVR DISABLED	Percentage of time spent in supervisor state disabled while running under a TCB.
PROB PROG	Percentage of time spent in problem program state while running under a TCB.
LOCAL SRB MODE	Sum of the percentages of time the system was enabled or disabled while running under a local SRB.
LOCAL SRB MODE - ENABLED	Percentage of time the system was enabled while running under a local SRB.
LOCAL SRB MODE - DISABLED	Percentage of time the system was disabled while running under a local SRB.
GLOBAL SRB MODE	Sum of the percentages of time the system was enabled or disabled while running under a global SRB.
GLOBAL SRB MODE - ENABLED	Percentage of time the system was enabled while running under a global SRB.
GLOBAL SRB MODE - DISABLED	Percentage of time the system was disabled while running under a global SRB.
TOTAL ENABLED TIME	Total percentage of time the system was enabled.
TOTAL DISABLED TIME	Total percentage of time the system was disabled. All measured disabled time values are elevated in PR/SM, MLPF, or MDF environments due to CPU switching.
TOTAL PROB PROG TIME	Total percentage of time the system spent in a problem program state.
TOTAL SUPVR TIME	Total percentage of time the system spent in a supervisor state.
% USED FOR BATCH	Percentage of time on this CPU spent on batch.
% USED FOR TSO	Percentage of time on this CPU spent on TSO.
% USED FOR STARTED TASKS	Percentage of time on this CPU spent on started tasks.
DIE DELAY	Average time the Extractor was delayed in getting control of this CPU because another disabled function was running.
SIG DELAY	Average time the Extractor was delayed in getting control of another CPU in the system because a disabled function was running on that CPU. This value is produced only in a multiple processor environment.

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Table 3-37 Field Descriptions for the CPU Section (Part 3 of 3)

Field	Description
AVG FOR THIS CPU	Average time the Extractor was delayed in beginning and completing a sample while executing on this CPU, where Delay in Beginning: Is the DIE delay time on this CPU. Delay in Completing:Is the SEGL delay time waiting to sample the status of another CPU. This value is displayed only in a multiple processor environment. Examples of delays that can occur in the system are – The Extractor gains control under the DIE on CPU 0 after a delay of 300 microseconds. – CPU 1 is sampled by RISGNL. The sampling on CPU 1 is delayed by 100 microseconds. – The Extractor later gains control under the DIE on CPU 1 after a delay of 50 microseconds. – CPU 0 is sampled by RISGNL. The sampling on CPU 0 is delayed by 280 microseconds. Note: CMF MONITOR considers a CPU to be disabled in any of three cases: 1. A CPU is physically disabled whenever it masks off external and I/O interruptions. 2. A CPU is logically disabled whenever it holds a global spin lock. 3. A CPU is switched out of partition or domain and is unavailable to service the interrupt.
VECTOR FACILITY IS	ON indicates Vector Facility is online; OFF indicates Vector Facility is offline.
VECTOR FACILITY AFFINITY	Amount of Vector Facility used by the CPU for the specified interval.

Partition Data Section for PR/SM Environments

The CPU Utilization Report provides a Partition Data section if your records were generated in a PR/SM, MLPF, or MDF environment. It shows logical and physical processor utilization by partition. The partitions are grouped by the type of physical processors they use (CP, ICF, ...). The last partition reported for each processor type is always PHYSICAL. PHYSICAL is the PR/SM overhead that cannot be attributed to any individual partition.

Note: Configuration options may have changed during the requested report interval. While running under PR/SM, MLPF, or MDF, a new set of CPU Utilization Reports is generated for each detected configuration change encountered during analysis.
If a partition has a mixture of shared and dedicated processors, in addition to an existing line for each partition, there are two additional lines showing data similar to the partition level line but separately for shared and dedicated processors.

An example of the Partition Data section of the CPU Utilization Report for PR/SM or MLPF environments is shown in Figure 3-26.

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Figure 3-26 Partition Data Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                          XYZ COMPANY                                REPORT DATE: 11 JUN 03 14.08
ACTL 10 JUN 03 16.15.00  10 JUN 03 16.30.00           WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/192/17.2K/23.87
-----------------------------------------------------  PARTITION DATA SECTION  -----------------------------------------------------
                        MVS PARTITION NAME   =  SJSE                      NO. OF PARTITIONS    =       15
                        IMAGE CAPACITY       =    90                      DISPATCH INTERVAL    =  DYNAMIC
                        PHYSICAL PROCESSORS  =    15
                                 CP          =    14
                                 ICF         =     1
                            WAIT  -LOG PRCR-  ----- MSU ------  -CAPPING-   -% DISPATCHED-
PARTITION  STATUS  WEIGHT  COMP   CNT  TYPE   DEF  USED  %DEF  %WLM  HARD     LOG     PHY             CPU DISPATCH PERCENT
---------  ------  ------  ----  ----  ----  ----  ----  ----  ----  ----  ------  ------  ----------------------------------------
SYSM       ACTIVE     180  NO       3  CP     ---    38   ---   ---  NO      41.8     9.0  .PPPP
SYSI       ACTIVE      80  NO       2  CP     ---    27   ---   ---  NO      45.7     6.5  .PP
SYSN       ACTIVE     180  NO       4  CP     ---    22   ---   ---  NO      24.2     5.2  .PP
ESAJ       ACTIVE      60  NO       2  CP     ---    13   ---   ---  NO      22.3     3.2  .P
VMR        ACTIVE     150  NO       3  CP     ---    69   ---   ---  NO      76.5    16.4  .PPPPPP
DB2A       ACTIVE     100  NO       4  CP     ---    21   ---   ---  NO      22.9     4.9  .PP
ESAM       ACTIVE     100  NO       2  CP     ---     7   ---   ---  NO      11.9     1.7  .
SJSE       ACTIVE      30  NO     3.0  CP     ---     5   ---   ---  NO       5.7     1.2  .
SYSP       ACTIVE     400  NO       5  CP     ---    54   ---   ---  NO      36.0    12.8  .PPPPP
SJSA       ACTIVE     130  NO       3  CP     ---     7   ---   ---  NO       7.8     1.7  .
SDBZ       ACTIVE       2  NO       3  CP     ---     1   ---   ---  NO       1.9     0.3  .
DB2B       ACTIVE     100  NO       4  CP     ---    27   ---   ---  NO      29.7     6.4  .PP
SJSD       ACTIVE      30  NO     4.0  CP     ---     4   ---   ---  NO       3.3     0.9  .
PHYSICAL                                                                                3.8  .P
                                                                                     ------  .
                                                                            TOTAL    74.0  .PPPPPPPPPPPPPPPPPPPPPPPPPPPPPP
                                                                                           .
CF04       ACTIVE      30  NO       1  ICF    ---     9   ---   ---  NO      29.0    29.0  .PPPPPPPPPPPP
CF03       ACTIVE      70  NO       1  ICF    ---    20   ---   ---  NO      67.2    67.2  .PPPPPPPPPPPPPPPPPPPPPPPPPP
PHYSICAL                                                                                3.8  .P
                                                                                     ------  .
                                                                            TOTAL   100.0  .PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP
                                                                                           .
                                                                                           ----------------------------------------
                                                                                           0       2       4       6       8       1
                                                                                                   0       0       0       0       0
```

Partition Data Section Field Descriptions

Table 3-38 describes each field in the Partition Data section of the CPU Utilization Report.

Table 3-38 Field Descriptions for the Partition Data Section (Part 1 of 2)

Field	Description
MVS PARTITION NAME	Name of the home partition.
NO OF PARTITIONS	Number of PR/SM partitions defined for this processor complex.
IMAGE CAPACITY	CPU capacity in millions of service units (MSU) per hour.
DISPATCH INTERVAL	Time slice interval in milliseconds. The word DYNAMIC indicates a variable time slice interval.
PHYSICAL PROCESSORS	Number of physical processors in this processor complex. If processor types are identified by hardware (CP, ICF, IFL, ...), the next lines list the | number of physical processors of each type.
PARTITION	Up to eight-character partition name. Note: Partition PHYSICAL, if present, is actually not a logical partition; rather, it is a placeholder for PR/SM overhead that cannot be attributed to any individual partition.

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Table 3-38 Field Descriptions for the Partition Data Section (Part 2 of 2)

Field	Description
STATUS	State of the partition, either ACTIVE or INACTIVE, at the end of the report interval. If the partition was inactive at the end of the report interval but had been previously active, the rest of the line is blank except for the AVG % DISPATCHED columns.
WEIGHT	Dispatcher weight assigned to a partition. Possible values for this field are nnn: All logical processors are not dedicated; they have the same weight of nnn. MIX: All logical processors are not dedicated; they do not have the same weights. DED: All logical processors are dedicated. DNE: Partition has a mixture of dedicated and nondedicated processors; nondedicated processors have equal weights. DNN: Partition has a mixture of dedicated and nondedicated processors; nondedicated processors do not have equal weights.
WAIT COMP	Wait completion attribute of nondedicated logical processors assigned to a partition. Possible values for this field are YES: A processor dispatched to a partition remains dispatched until the time slice expires. NO: A processor dispatched to a partition is returned to PR/SM and becomes available to other partitions as soon as the partition enters an enabled wait state. MIX: Partition has a mixture of nondedicated logical processors with wait completion attributes of YES and NO. N/A: Partition has only dedicated processors.
LOG PRCRS	CNT: If partition is managed by WLM, the average number of online processors number of online processors. If partition is not managed, the number of logical processors defined for the partition. TYPE: Processor types are displayed if Identified by hardware.
MSU	DEF: Defined capacity of the partition in MSU/hour. Defined capacity can be specified for a partition running z/OS on a z900 machine. Three dashes (---) is displayed if the partition does not have defined capacity. USED: MSU per hour actually used %DEF: Percentage of used MSU/hour over defined capacity. Three dashes (---) is displayed if the partition does not have defined capacity.
CAPPING	%WLM: Percentage of time WLM capped the partition. Three dashes (---) is displayed if the partition does not have defined capacity. DEF: YES indicates hard cap was specified for the partition; NO indicates the partition was not hard capped.
% DISPATCHED	LOG: Percentage of dispatch time over online time of all logical processors defined for the partition. PHY: Percentage of dispatch time over online time of all physical processors in the complex.
CPU DISPATCH PERCENT	A graphic representation of the logical and physical processor dispatched percentage, where L shows the logical value and P shows the physical value.

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LPAR Cluster Section

The CPU Utilization Report provides an LPAR Cluster Section if at least one LPAR cluster is defined on the central processor complex (CPC). An LPAR cluster is a set of logical partitions resident on the same CPC and in the same parallel sysplex. Workload Manager (WLM) manages processor access based on workload goals by dynamically adjusting the weights of the partitions within an LPAR cluster and optimizing the number of online processors for each partition.

This section displays CPU utilization and the partition attributes managed by Workload Manager (weight and number of online processors) and summarizes data at the LPAR cluster level.

Note: This section only accounts for activity of partitions managed by WLM at the end of CMF MONITOR recording intervals.

An example of the LPAR Cluster section of the CPU Utilization Report is shown in Figure 3-27.

Figure 3-27 LPAR Cluster Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ    14 PAGE     99
BMC SOFTWARE, INC.                                           XYZ COMPANY                               REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/56/25.1K/7
-----------------------------------------------------  LPAR CLUSTER SECTION  ----------------------------------------------------
                              ----------- WEIGHT ------------  -------- PROCESSOR --------  - STORAGE (MB) --
                              -- DEFINED ---  --- ACTUAL ----  --- NUMBER ----  - % BUSY -  CENTRAL  EXPANDED
CLUSTER   PARTITION  SYSTEM    INIT  MIN  MAX  AVG  %MIN  %MAX  DEFINED  ACTUAL   LOG   PHY

BBPLEX01  SJSD       SJSD        30   10   40   30   0.0   0.0        5     4.0   3.6   1.0      768         0
          SJSE       SJSE        30   10   40   30   0.0   0.0        3     3.0   6.2   1.3      768         0
----------------------------  ------------------------------  --------------------------  -----------------
                     TOTAL       60                                                       2.4    1,536         0
                                                                                                                    0
```

LPAR Cluster Section Field Descriptions

Table 3-39 describes each field in the LPAR Cluster section of the CPU Utilization Report.

Table 3-39 Field Descriptions for the LPAR Cluster Section

Field	Description
CLUSTER	Name of the LPAR cluster.
PARTITION	Name of the partition.
SYSTEM	MVS system name.

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Table 3-39 Field Descriptions for the LPAR Cluster Section

Field	Description
WEIGHT - DEFINED	INIT: Initial weight the partition has when the system is IPLed. The TOTAL line shows the weight of the LPAR cluster. MIN, MAX: Minimum and maximum weight the partition can have. Three dashes (---) appear if the minimum or maximum weight is not defined.
WEIGHT - ACTUAL	AVG: Average weight of the partition %MIN: Percentage of time the actual weight was in the minimum bandwidth of minimum weight to minimum weight plus 10%. %MAX: Percentage of time the actual weight was in the maximum bandwidth of maximum weight minus 10% to maximum weight.
PROCESSOR - NUMBER	DEFINED: Maximum number of logical processors that can be online for the partition. ACTUAL: Average number of logical processors that were actually online for the partition.
PROCESSOR - % BUSY	LOG: Percentage of busy time over online time of logical processors. PHY: Percentage of busy time over online time of all physical processors. The TOTAL line shows the CPU utilization of the LPAR cluster.
STORAGE (MB) - CENTRAL EXPANDED	Central and expanded storage, in megabytes, assigned to the partition. The TOTAL line shows the total storage for the LPAR cluster.

LPAR Combination Section

This section displays the combination of LPARs specified on the LPARCOMB statement and their highest rolling 4-hour MSU per hour. This value helps assess the license charge of those Variable Workload License Charge (VWLC) products that are active either all the time or during periods of peak CPU utilization. The combination with the description 'ALL LPARS' consisting of all LPARs when present is displayed first. Other combinations are displayed in the same order as the LPARCOMB statements that specify the combinations.

An example of the LPAR Combination section of the CPU Utilization Report is shown in Figure 3-28. This sample section is produced by these control statements

```
CPU

LPARCOMB DESC=’DB2 SYSTEMS’,LPARS=(DB2A,DB2B)

LPARCOMB DESC=’SAN JOSE SYSTEMS’,LPARS=(SJSD,SJSE)
```

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Figure 3-28 LPAR Combination Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ     3 PAGE      8
BMC SOFTWARE, INC.                                       BMC SOFTWARE, INC.                            REPORT DATE: 12 JUN 03 17.01
ACTL 10 JUN 03 00.25.26  10 JUN 03 17.00.00                 HOUSTON, TX.                             SYSTEM ID: SJSE     Z 1.02.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/67/29.8K/16.58  70-1/67/29.8K/16.58
---------------------------------------------------  LPAR COMBINATION SECTION  ---------------------------------------------------
                                  -HIGH 4-HOUR MSU/HOUR-  ------------------------ LPAR ------------------------  --EXCLUDED LPARS--
    COMBINATION DESCRIPTION        MSU   TIME    DATE     LPAR     MSU  LPAR     MSU  LPAR     MSU  LPAR     MSU    LPAR     REASON
--------------------------------  ----  -----  ---------  ------------  ------------  ------------  ------------  --------  --------
ALL LPARS                          440  17:00  12 DEC 02  SYSI      41  SYSN      20  ESAJ      38  VMR       74  CF04      ICF PROC
                                                          DB2A      43  ESAM      21  SJSE      61  SYSP      79  CF03      ICF PROC
                                                          IMSA      18  DB2B      34  SJSD      11

DB2 SYSTEMS                         77  17:00  12 DEC 02  DB2A      43  DB2B      34

SAN JOSE SYSTEMS                    72  17:00  12 DEC 02  SJSD      11  SJSE      61                              SJSZ      ABSENT
```

LPAR Combination Section Field Descriptions

Table 3-40 describes each field in the LPAR Combination section of the CPU Utilization Report.

Table 3-40 Field Descriptions for the LPAR Combination Section

Field	Description
COMBINATION DESCRIPTION	Description of the LPAR combination. An asterisk (*) following this description indicates that the description is not unique among the listed LPAR combinations.
HIGH 4-HOUR MSU/HOUR	MSU: The highest 4-hour MSU/hour consumed by the LPAR combination. If the input records do not cover any 4-hour periods or no LPAR member of the combination had been active for 4 contiguous hours, 'NO 4-HOUR PERIODS' is displayed. TIME, DATE: The time and date when the highest 4-hour MSU/hour value occurred.
LPARS	LPAR: Name of the LPARs in the combination (including LPARs that were always inactive). MSU: The 4-hour MSU/hour of this LPAR at the time when the highest 4-hour MSU/hour of the LPAR combination occurred. If three dashes (---) are displayed, this LPAR had not been active for 4 hours.
EXCLUDED LPARS	The LPARs that were excluded from the calculation of the highest 4-hour MSU/hour.
LPAR	Name of LPAR
REASON	ABSENT: LPAR was not found in the input SMF type 70 records. ICF PROC: LPAR used ICF processors and hence is not MVS partitions DED PROC: A remote LPAR had dedicated processors; there is not enough information in the SMF type 70 CPU record to calculate MSU usage. WAIT YES: A remote LPAR had the attribute Wait Completion set to yes; there is not enough information in the SMF type 70 CPU record to calculate MSU usage. Note: If there is only one remote LPAR excluded because of DED PROC or WAIT YES, generate this report on the SMF records produced on the excluded LPAR. The LPAR will then be the local LPAR and MSU usage can then be calculated.

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Rolling 4-Hour MSU Usage Distribution Section

This section shows the distribution of 4-hour MSU per hour usage for the busiest 10% of rolling 4-hour periods.

If a partition does not have a defined capacity, this section helps you determine the partition value. For the listed MSU values, CMF MONITOR calculates the expected percent of time that soft capping is in effect for the partition if the defined capacity is set to one of these MSU values. To use this section, decide what percentage of time it is acceptable for Workload Manager to cap the partition, then look for that percentage on the PROJECTED % CAPPED BY WLM line. The MSUs line shows the MSU value to be used for the defined capacity. For example,

```
MSUs                                                   33
                                                      -----
% OF 4-HOUR PERIODS USING MORE THAN THE MSU AMOUNT    0.4
PROJECTED % CAPPED BY WLM                            0.8
```

In the preceding example, 0.4% of four-hour periods consumed more than 33 MSU/hour. If the defined capacity is set at 33 MSU/hour, it is projected that the partition is capped by Workload Manager 0.8% of the time. In other words, if you would like the partition to be capped 0.8% of the time, set the defined capacity of the partition at 33 MSU/hour.

If a partition already has defined capacity, you can adjust its value using this section and the % Capped by WLM column (% WLM) in the Partition Data section.

Calculation method for PROJECTED % CAPPED BY WLM

Every five minutes, Workload Manager calculates the MSU per hour usage average over the previous four-hour period. If the average exceeds the defined capacity, the partition is capped for the next five minutes; that is, it can only use as much as CPU as set by defined capacity. At the end of this (next) five-minute period, Workload Manager calculates the four-hr average again. If it drops below defined capacity, the capping is removed otherwise the partition stays capped.

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Similarly, CMF MONITOR calculates the four-hour MSU per hour average at the end of every recording interval n. If the average exceeds the tentative defined capacity, the partition is considered capped for the entire length of the next recording interval n+1 (If the partition used more than the defined capacity in this next interval, the excess usage is charged to the following interval n+2). At the end of the recording interval n+1, CMF MONITOR calculates 4-hr average again. If it drops below tentative defined capacity, the partition is no longer considered capped.

An example of the Rolling 4-Hour MSU Usage Distribution section of the CPU Utilization Report is shown in Figure 3-29.

Figure 3-29 Rolling 4-Hour MSU Usage Distribution Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                          XYZ COMPANY                                REPORT DATE: 10 JUL 03 14.46
ACTL 10 JUN 03 04.00.00  10 JUL 03 17.00.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSB     02.08.00

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/2,645/475K/659.7
----------------------------------------  ROLLING 4-HOUR MSU USAGE DISTRIBUTION SECTION  ----------------------------------------
CPU FAMILY: 9672  VERSION: A5  MODEL: Z57              CEC CAPACITY =    149
PARTITION = SJSC       NUMBER OF 4-HOUR PERIODS =   2,481
   CONSUMED MSU                                          45     44     43     42     41     40     39     38     37     36
                                                       -----  -----  -----  -----  -----  -----  -----  -----  -----  -----
   % OF 4-HOUR PERIODS USING MORE THAN THE CONSUMED MSU   0.2    0.2    0.4    0.6    0.8    0.8    1.1    2.1    3.1    3.3
   PROJECTED % CAPPED BY WLM                              0.2    0.2    0.4    0.5    0.7    0.8    1.1    2.2    3.1    3.7

   CONSUMED MSU                                          35     34     33     32     31     30     29     28     27     26
                                                       -----  -----  -----  -----  -----  -----  -----  -----  -----  -----
   % OF 4-HOUR PERIODS USING MORE THAN THE CONSUMED MSU   3.7    4.4    5.5    6.3    7.2    8.1    8.8    9.2    9.7   10.4
   PROJECTED % CAPPED BY WLM                              4.7    5.2    6.3    7.1    8.0    9.1   10.0   11.0   12.1   13.3

PARTITION = SJSD       NUMBER OF 4-HOUR PERIODS =   2,480
   CONSUMED MSU                                          19     18     17     16     15     14     13     12     11     10
                                                       -----  -----  -----  -----  -----  -----  -----  -----  -----  -----
   % OF 4-HOUR PERIODS USING MORE THAN THE CONSUMED MSU   0.4    0.6    1.0    1.1    1.3    1.5    1.7    2.3    3.7    5.5
   PROJECTED % CAPPED BY WLM                              0.3    0.6    0.9    1.1    1.3    1.5    1.7    2.4    3.8    6.8

   CONSUMED MSU                                           9      8
                                                       -----  -----
   % OF 4-HOUR PERIODS USING MORE THAN THE CONSUMED MSU   8.8   12.8
   PROJECTED % CAPPED BY WLM                             11.5   18.5

PARTITION = SJSG       NUMBER OF 4-HOUR PERIODS =   2,497
   CONSUMED MSU                                           5      4      3
                                                       -----  -----  -----
   % OF 4-HOUR PERIODS USING MORE THAN THE CONSUMED MSU   0.8    6.4   28.2
   PROJECTED % CAPPED BY WLM                              0.9    9.3   43.0
```

Rolling 4-Hour MSU Usage Distribution Section Field Descriptions

Table 3-41 describes each field in the Rolling 4-Hour MSU Usage Distribution section of the CPU Utilization Report.

Table 3-41 Field Descriptions for the Rolling 4-Hour MSU Usage Distribution Section (Part 1 of 2)

Field	Description
CPU FAMILY VERSION MODEL	CPU family, version, and model.
CEC CAPACITY	Capacity of all CP processors in Millions of Service Units (MSUs) per hour. CP processors are those available for MVS partitions.
PARTITION	Partition name.

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Table 3-41 Field Descriptions for the Rolling 4-Hour MSU Usage Distribution Section (Part 2 of 2)

Field	Description
NUMBER OF 4-HOUR PERIODS	Number of 4-hour periods.
CONSUMED MSU	MSUs per hour consumed by rolling 4-hour periods.
% OF PERIODS USING MORE THAN THE CONSUMED MSU	Percentage of rolling 4-hour periods consuming more than the MSU amount. Note: CMF MONITOR displays the MSU/hour values of the top 10% periods, not to exceed 20 values.
PROJECTED % CAPPED BY WLM	Percentage of time projected to be capped by Workload Manager if the defined capacity equals the MSU amount. Note: This field is shown only if the partition does not have defined capacity.

MSU Usage Detail Section

This optional section displays MSU usage at the recording interval level in order to identify peak CPU usage occurrences and patterns such as time of day, day of month, and so on. The intervals are ordered depending on the value of the MSUDTAIL parameter specified on the Analyzer CPU control statement:

- in decreasing 4-hour MSU/hour (MSU/hour consumed in the four-hour period up to the end of the recording interval) if MSUDTAIL=4HOURMSU is specified
- in decreasing interval MSU/hour (MSU/hour consumed during the recording interval) if MSUDTAIL=INTVLMSU is specified
- in decreasing % capped by WLM during the recording interval if MSUDTAIL=INTVLWLM is specified
- in increasing time order if MSUDTAIL=TIME is specified

An example of the MSU Usage Detail section of the CPU Utilization Report is shown in Figure 3-30.

Figure 3-30 MSU Usage Detail Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                      CPU UTILIZATION REPORT                          RPTSEQ     3 PAGE      9
BMC SOFTWARE, INC.                                           XYZ COMPANY                               REPORT DATE: 11 JUN 03 14.08
ACTL 10 JUN 03 16.15.00  11 JUN 03 16.30.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/192/17.2K/23.87
PARTITION: DB2A     ------------------------------------ MSU USAGE DETAIL -------------------------------------------------------
 --- INTERVAL ---  INTVL   4-HR   %CAP     --- INTERVAL ---  INTVL   4-HR   %CAP     --- INTERVAL ---  INTVL   4-HR   %CAP
   DATE      TIME    MSU    MSU    WLM       DATE      TIME    MSU    MSU    WLM       DATE      TIME    MSU    MSU    WLM
 11 JUN 03  16:30   43.6   40.0    ---     11 JUN 03  16:15   43.9   38.1    ---     11 JUN 03  16:00   49.0   36.5    ---
 11 JUN 03  15:45   40.0   34.5    ---     11 JUN 03  15:30   35.3   32.7    ---     11 JUN 03  15:15   44.0   31.2    ---
 11 JUN 03  15:00   45.9   29.8    ---     11 JUN 03  14:45   43.6   27.6    ---     11 JUN 03  14:30   44.7   26.1    ---
 11 JUN 03  11:15   22.3   25.0    ---
```

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MSU Usage Detail Section Field Descriptions

Table 3-42 describes each field in the MSU Usage Detail section of the CPU Utilization Report.

Table 3-42 Field Descriptions for the MSU Usage Detail Section

Field	Description
PARTITION	Partition name.
INTERVAL - DATE, TIME	Date and time at the end of the recording interval.
INTVL MSU	MSU/hour consumed during the recording interval.
4-HR MSU	MSU/hour consumed in the four-hour period up to the end of the recording interval.
INTVL %WLM	Percentage of of time capped by WLM during the recording interval. Three dashes (---) is displayed if the partition does not have defined capacity.

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CPU Utilization by Protect Key Report

The CPU Utilization by Protect Key Report shows CPU status by storage protection key.

The CPU Utilization by Protect Key Report is produced by using the PROTKEY Analyzer control statement (see “PROTKEY” on page 2-88). The data is obtained by using the CPU Extractor control statement (see “CPU” on page 1-14).

There are three sections in the CPU Utilization by Protect Key Report:

Sub System Gives information about protect keys 0 through 7.

V = V Shows all jobs running under key 8 for V=V.

V = R or Special V = V
Shows all protect keys that had either nonpageable jobs running under them or pageable jobs that were not in key 8. Keys 9 through F can appear in this section as well.

If dashes (---) appear for a given protect key under the CPU column, no activity information was encountered during sampling. If dashes appear for all protect keys under a given CPU, that CPU does not exist. For purposes of this report, you must specify the ID of the CPU to be examined.

Figure 3-31 shows an example of the CPU Utilization by Protect Key Report.

Figure 3-31 CPU Utilization by Protect Key Report

```
PRODUCED BY CMF ANALYZER (5.5.00)              CPU UTILIZATION BY PROTECT KEY REPORT                RPTSEQ     4 PAGE     25
BMC SOFTWARE, INC.                                        XYZ COMPANY                               REPORT DATE: 11 JUN 03 14.08
ACTL 10 JUN 03 16.15.00  11 JUN 03 16.30.00          WORLDWIDE HEADQUARTERS                      SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/96/17.2K/23.87
--------------------------------------------------   CPU  0: SUB SYSTEM SECTION  ------------------------------------------------
                                   KEY        SUB SYSTEM           BUSY        SUPRV        PROBL

                                    0         SUPERVISOR            5.5        100.0           .0
                                    1         SCHEDULER,JES          .0        100.0           .0
                                    3         RESERVED               .0           .0        100.0
                                    4         RESERVED               .5         98.8          1.2
                                    5         DATA MANAGEMENT        .0        100.0           .0
                                    6         TCAM/VTAM              .1        100.0           .0
                                    7         IMS/DB2                .2        100.0           .0
-------------------------------------------------------  CPU  0: V = V SECTION  ------------------------------------------------
                                   KEY        SUB SYSTEM           BUSY        SUPRV        PROBL

                                    8         V = V                  .2         19.4         80.6
-*****************************************************************************************************************************
--------------------------------------------------   CPU  1: SUB SYSTEM SECTION  ------------------------------------------------
                                   KEY        SUB SYSTEM           BUSY        SUPRV        PROBL

                                    0         SUPERVISOR            5.4        100.0           .0
                                    1         SCHEDULER,JES          .0        100.0           .0
                                    4         RESERVED               .7        100.0           .0
                                    5         DATA MANAGEMENT        .0        100.0           .0
                                    6         TCAM/VTAM              .1        100.0           .0
                                    7         IMS/DB2                .2        100.0           .0
```

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CPU Utilization by Protect Key Report Field Descriptions

Note: The same columns of data appear in each section of this report.

Table 3-43 describes each field in the CPU Utilization by Protect Key Report.

Table 3-43 Field Descriptions for the CPU Utilization by Protect Key Report

Field	Description
KEY	Protect key being measured; its value is 0 through F.
SUB SYSTEM	Name of the system function that usually resides in this protect key.
BUSY	Percentage of CPU time in this protect key.
SUPRV	Percentage of CPU busy time in this protect key in supervisor state.
PROBL	Percentage of CPU busy time in this protect key in a problem state.

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Cross-System Coupling Facility Report

The Cross-System Coupling Facility Report shows the activity of the Cross-System Coupling Facility (XCF). The information may be presented summarized for the system and individually by the member.

The Cross-System Coupling Facility Report is produced by using the XCF Analyzer control statement (see “XCF” on page 2-129). The data for this report is obtained by using the XCFDATA Extractor control statement (see “XCFDATA” on page 1-84).

There are three sections to this report:

- System Summary
- Path Utilization Section
- Detail Report

Figure 3-32 shows an example of the Cross-System Coupling Facility Report.

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Figure 3-32 Cross-System Coupling Facility Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                CROSS-SYSTEM COUPLING FACILITY REPORT                RPTSEQ     3 PAGE      5
 BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 11 JUN 03 17.41
 ACTL 10 JUN 03 09.00.00  10 JUN 03 12.30.00            WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSC     02.09.00

 BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-2/14/420/3.5
------------------------------------------------------ SYSTEM SUMMARY ------------------------------------------------------

                                                        -- BUFFER EFFICIENCY PERCENTAGES --
                                                                                                          MESSAGES
  FROM      TO        TRANSPORT     BUFFER    REQUESTS                MSG GT   MSG LT   MSG =     MIGRATED TO    MESSAGES
 SYSTEM   SYSTEM        CLASS       LENGTH   SATISFIED     DEGRADED   BUFFER   BUFFER   BUFFER      ALT PATH      REJECTED

 SJSA     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0
 SJSB     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0
 SJSC     SJSA        DEFAULT          956     41,574         93.0     14.8      0.0     85.2             0             0
 SJSC     SJSB        DEFAULT          956     34,791         90.4     17.6      0.0     82.4             0             0
 SJSC     SJSC        DEFAULT          956     34,438        100.0      7.8      0.0     92.2             0             0
 SJSC     SJSD        DEFAULT          956     43,061         97.1     15.9      0.0     84.1             0             0
 SJSC     SJSE        DEFAULT          956     70,362         93.8     17.8      0.0     82.2             0             0
 SJSC     SJSG        DEFAULT          956     38,687         96.4     12.6      0.0     87.4             0             0
 SJSC     SJSH        DEFAULT          956     22,166         95.0     15.9      0.0     84.1             0             0
 SJSD     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0
 SJSE     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0
 SJSG     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0
 SJSH     SJSC        <INBOUND>   <INBOUND>          0          0.0      0.0      0.0      0.0             0             0

 ---------------------------------------------------- PATH UTILIZATION SECTION ----------------------------------------------------

                                                                          -- RETRY --    - PERFORMANCE PERCENTAGES -
  FROM      TO       TRANSPORT  FROM-TO DEVICE/  REQUESTS    AVERAGE
 SYSTEM   SYSTEM       CLASS     STRUCTURE        SATISFIED  QUEUE LEN  LIMIT COUNT   REFUSED  APPENDED IMMEDIATE   MEMBER STATUS

 SJSE     SJSA      DEFAULT    IXCPATH1            14,441       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSA      DEFAULT    IXCPATH2            14,798       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSA      DEFAULT    IXCPATH3            12,026       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSA      DEFAULT    IXCPATH4            14,474       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSB      DEFAULT    IXCPATH1            11,826       0.01     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSB      DEFAULT    IXCPATH2            14,428       0.01     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSB      DEFAULT    IXCPATH3            13,156       0.01     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSB      DEFAULT    IXCPATH4            16,173       0.01     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSC      DEFAULT    IXCPATH1            49,274       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSC      DEFAULT    IXCPATH2            41,618       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSC      DEFAULT    IXCPATH3            29,388       0.00     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSC      DEFAULT    IXCPATH4            62,073       0.00     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSD      DEFAULT    IXCPATH1            15,368       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSD      DEFAULT    IXCPATH2            10,030       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSD      DEFAULT    IXCPATH3            18,364       0.00     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSD      DEFAULT    IXCPATH4            12,882       0.00     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSG      DEFAULT    IXCPATH1            12,702       0.01     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSG      DEFAULT    IXCPATH2            19,809       0.01     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSG      DEFAULT    IXCPATH3            19,089       0.01     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSG      DEFAULT    IXCPATH4            17,295       0.01     10     0       0.0       0.2      99.8   ACTIVE
 SJSE     SJSH      DEFAULT    IXCPATH1            10,613       0.02     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSH      DEFAULT    IXCPATH2            11,668       0.02     10     0       0.0       0.1      99.9   ACTIVE
 SJSE     SJSH      DEFAULT    IXCPATH3             4,002       0.02     10     0       0.0       0.0     100.0   ACTIVE
 SJSE     SJSH      DEFAULT    IXCPATH4             7,624       0.03     10     0       0.0       0.0     100.0   ACTIVE
 SJSG     SJSE      <INBOUND>  IXCPATH1            41,745       0.00     10     0       0.0       0.0       0.0   ACTIVE
 SJSG     SJSE      <INBOUND>  IXCPATH2            49,324       0.00     10     0       0.0       0.0       0.0   ACTIVE

 ------------------------------------------------------ DETAIL REPORT ------------------------------------------------------

                                          MESSAGES RECEIVED        MESSAGES SENT
                                         -------------------    -------------------
                                                   PERCENT                PERCENT
 SYSTEM     GROUP      MEMBER                 COUNT  OF TOTAL         COUNT  OF TOTAL       MEMBER STATUS

 SJSB       COFVLFNO   SJSB                   2,740       7.9         6,919      21.7       ACTIVE
 SJSB       DC$CAS     SJSB                  19,584      56.3        19,738      61.9       ACTIVE
 SJSB       EDML       CCD00001                   0       0.0             0       0.0       ACTIVE
 SJSB       EDML       EDML                       0       0.0             0       0.0       ACTIVE
 SJSB       EDML       EDMS                       0       0.0             0       0.0       ACTIVE
 SJSB       EZBTCPCS   SJSBDC$TCPIP               0       0.0             0       0.0       ACTIVE
 SJSB       IGWXSGIS   N200121522435437           0       0.0             0       0.0       ACTIVE
 SJSB       IMFOTMA    IMS51T                     0       0.0             9       0.0       ACTIVE
 SJSB       IXCLO03B   M5153                     25       0.1            12       0.0       ACTIVE
 SJSB       IXCLO038   M508                       0       0.0             0       0.0       ACTIVE
 SJSB       IXCLO039   M5114                      0       0.0             0       0.0       ACTIVE
 SJSB       SYSATB02   M416                       0       0.0             0       0.0       ACTIVE
 SJSB       SYSENF     SJSB                      10       0.0             0       0.0       ACTIVE
 SJSB       SYSGRS     SJSB                     663       1.9           663       2.1       ACTIVE
 SJSB       SYSIGW00   IGWCLM01SJSB              10       0.0            10       0.0       ACTIVE
 SJSB       SYSIGW01   IGWCLM01SJSB               0       0.0             0       0.0       ACTIVE
 SJSB       SYSIGW02   SMLS1SJSB                238       0.7           238       0.7       ACTIVE
 SJSB       SYSIGW03   IGWSHC00SJSB               0       0.0             0       0.0       ACTIVE
 SJSB       SYSMCS     SJSB                   7,558      21.7         1,764       5.5       ACTIVE
 SJSB       SYSMCS2    SJSB                       0       0.0             0       0.0       ACTIVE
 SJSB       SYSWLM     SJSB                   3,831      11.0         2,411       7.6       ACTIVE

  SYSTEM TOTAL                                 34,788       6.8        31,881       6.2
```

System Summary Section Field Descriptions

Table 3-44 describes each field in the System Summary section of the Cross-System Coupling Facility Report.

Table 3-44 Field Descriptions for the System Summary Section

Field	Description
FROM SYSTEM	System from which the message originated. (For internal messages this is the same as the TO SYSTEM.)
TO SYSTEM	System to which the message is sent. (For internal messages this is the same as the FROM SYSTEM.)
TRANSPORT CLASS	Transport class name as defined to XCF. Note: Information not available for an inbound path is marked with <INBOUND>.
BUFFER LENGTH	Size of the message buffer.
REQUESTS SATISFIED	Number of messages successfully sent where a TRANSPORT CLASS received a TO SYSTEM message that originated from its own FROM SYSTEM.
BUFFER EFFICIENCY PERCENTAGES	Information under this section head is related to buffer efficiency: DEGRADED: Percentage of MSG GT BUFFER that suffered degradation due to overhead incurred by XCF in finding a suitably large buffer. MSG GT BUFFER: Percentage of the messages satisfied that required a larger buffer length than defined for the Transport Class. MSG LT BUFFER: Percentage of the messages satisfied that required less buffer length than defined for the Transport Class. MSG = BUFFER: Percentage of the messages satisfied that required the same buffer length as defined for the Transport Class.
MESSAGES MIGRATED TO ALT PATH	Number of messages migrated to an alternate path because the designated primary path was not available.
MESSAGES REJECTED	Number of messages rejected due to an XCF failure to obtain sufficient buffer space.

Path Utilization Section Field Descriptions

Table 3-45 describes each field in the Path Utilization section of the Cross-System Coupling Facility Report.

Table 3-45 Field Descriptions for the Path Utilization Section (Part 1 of 2)

Field	Description
FROM SYSTEM	System from which the message originated. (For internal messages this is the same as the TO SYSTEM.)
TO SYSTEM	System to which the message is sent. (For internal messages this is the same as the FROM SYSTEM.)
TRANSPORT CLASS	Transport class name as defined to XCF. Information not available for an inbound path is marked with <INBOUND> in that column for all inbound paths.

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Table 3-45 Field Descriptions for the Path Utilization Section (Part 2 of 2)

Field	Description
FROM-TO DEVICE/ STRUCTURE	Address of the CTC devices from which and to which messages are sent along this path, or the name of the coupling facility structure used to send messages.
REQUESTS SATISFIED	Number of messages successfully sent on this path.
AVERAGE QUEUE LEN	Average number of messages that had to wait to be sent along this path.
RETRY	Information under this section is related to the number of times that XCF had to retry to send messages. LIMIT Maximum number of times XCF can retry to send a message. COUNT Number of times XCF had to retry to send messages.
PERFORMANCE PERCENTAGES	Information under this section is related to XCF message sending performance. REFUSED Percentage of all message requests refused because the maximum message limit had been reached. (Inbound only) APPENDED Percentage of all message requests appended to a message or messages already in the process of being sent over the path. (Outbound only) IMMEDIATE Percentage of all message requests sent over a path that was suspended (not busy) at the inception of the path request. (Outbound only)
MEMBER STATUS	Status of the member during the recording interval. Members may be Active, Partially Activated, Re-activated, or De-activated.

Detail Report Section Field Descriptions

Table 3-46 describes each field in the Detail Report section of the Cross-System Coupling Facility Report.

Table 3-46 Field Descriptions for the Detail Report Section

Field	Description
SYSTEM	System on which this path, group, and member is defined.
GROUP	Group to which the member is assigned.
MEMBER	Member name.
MESSAGES RECEIVED	Information under this section header is related to the number of XCF messages that were received by members. COUNT Number of messages received for this member. PERCENT OF TOTAL Percent of all messages received that were received for this member.
MESSAGES SENT	Information under this section header is related to the number of XCF messages that were sent for members. COUNT Number of messages sent for this member. PERCENT OF TOTAL Percent of all messages sent that were sent for this member.
MEMBER STATUS	Status of the member during the recording interval. Members may be Active, Partially Activated, Re-activated, or De-activated.

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Cryptographic Hardware Activity Report

The Cryptographic Hardware Activity Report shows the activity of cryptographic hardware features, including the standard Cryptographic Coprocessor Facility (CCF), and the optional adjunct features: PCI Cryptographic Coprocessor (PCICC) and PCI Cryptographic Accelerator (PCICA).

The Cryptographic Hardware Activity Report is produced by using the CRYPTO Analyzer control statement (see “CRYPTO” on page 2-35). The data for this report is obtained by using the CRYPTO Extractor control statement (see “CRYPTO” on page 1-18).

Figure 3-33 shows an example of the Cryptographic Hardware Activity Report.

Figure 3-33 Cryptographic Hardware Activity Report

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PRODUCED BY CMF ANALYZER (5.5.00)                CRYPTOGRAPHIC HARDWARE ACTIVITY REPORT                RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                                XYZ COMPANY                         REPORT DATE: 12 JUN 03 14.11
ACTL 10 JUN 03 00.15.00  10 JUN 03 00.30.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: SYSE     Z 1.02.0

 BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-2/4/0/0.25
------------------------------------------------ PCI CRYTOGRAPHIC ACCELERATOR (PCICA) ---------------------------------------------
     ------------ TOTAL --------  ----- 1024-BIT ME -----  ----- 2048-BIT ME -----  ----- 1024-BIT CRT ----  ----- 2048-BIT CRT ----
     ID   RATE  EXEC TIME  UTIL%   RATE  EXEC TIME  UTIL%   RATE  EXEC TIME  UTIL%   RATE  EXEC TIME  UTIL%   RATE  EXEC TIME  UTIL%
     --  -----  ---------  -----  -----  ---------  -----  -----  ---------  -----  -----  ---------  -----  -----  ---------  -----
      2  165.2        1.3   21.5  107.1        1.1   11.8    0.0        0.0    0.0   58.1        1.7    9.7    0.0        0.0    0.0
      3  269.9        1.8   48.6    0.0        0.0    0.0    0.0        0.0    0.0    0.0        0.0    0.0  269.9        1.8   48.6
         -----  ---------  -----  -----  ---------  -----  -----  ---------  -----  -----  ---------  -----  -----  ---------  -----
SUMMARY  435.1        1.6   35.0  107.1        1.1    5.9    0.0        0.0    0.0   58.1        1.7    4.8  269.9        1.8   24.3

------------------------------------------------ PCI CRYTOGRAPHIC COPROCESSOR (PCICC) ---------------------------------------------
     ------------ TOTAL --------  RSA KEY
     ID   RATE  EXEC TIME  UTIL%  GEN RATE
     --  -----  ---------  -----  --------

      0    0.1     3205.0   32.1       0.1
      1   83.0        1.1    8.8       0.0
         -----  ---------  -----      ----
SUMMARY   83.1        1.5   20.4       0.1

------------------------------------------------ CRYPTOGRAPHIC COPROCESSOR FACILITY (CCF) -----------------------------------------
         TOTAL   DES ENCRYPTION   DES DECRYPTION   ------ MAC -----    HASH   ------ PIN ------
                 SINGLE  TRIPLE   SINGLE  TRIPLE   GENERATE  VERIFY           TRANSLATE  VERIFY
         -----   ------  ------   ------  ------   --------  ------    ----   ---------  ------
   RATE    2.3     0.0     1.0      0.3     1.0        0.0     0.0     0.0         0.0     0.0
   SIZE    ---     0.0   209.3    176.0   297.3        0.0     0.0     0.0         ---     ---
```

Cryptographic Hardware Activity Report Field Descriptions

Table 3-47 describes each field in the Cryptographic Hardware Activity Report

Table 3-47 Field Descriptions for the Cryptographic Hardware Activity Report (Part 1 of 2)

Field	Description
PCI Cryptographic Accelerator (PCICA) Note: This section will appear only when PCI Cryptographic Accelerator hardware is installed.	
ID	PCICA index.
TOTAL	Rate Rate of all RSA operations per second. Exec time Execution time in milliseconds of all RSA operations. UTIL% Ratio of execution time of all RSA operations and elapsed time.
1024-BIT ME	Rate, execution time, and utilization for all RSA operations in 1024-bit ME format as defined above.
2048-BIT ME	Rate, execution time, and utilization for all RSA operations in 2048-bit ME format as defined above.
1024-BIT CRT	Rate, execution time, and utilization for all RSA operations in 1024-bit CRT format as defined above.
2048-BIT CRT	Rate, execution time, and utilization for all RSA operations in 2048-bit CRT format as defined above.
SUMMARY	RATE Rate per second of all RSA operations for all processors. EXEC TIME-Execution time in milliseconds of all RSA operations for all processors. UTIL% Ratio of execution time to elapsed time of all RSA operations for all processors.
PCI Cryptographic Coprocessor (PCICC) Note: This section will appear only when PCI Cryptographic Coprocessor hardware is installed.	
ID	PCICC index
TOTAL	RATE Rate of all operations per second EXEC TIME Average execution time in milliseconds of all operations. UTIL% Ratio of execution time for all operations to elapsed time.
RSA KEY GEN RATE	Rate for RSA-key-generation operations per second
SUMMARY	RATE Rate per second of all operations for all processors. EXEC TIME Execution time in milliseconds of all operations for all processors. UTIL% Ratio of execution time to elapsed time of all operations for all processors. RSA KEY GEN RATE-Rate per second of all RSA-key-generation operations for all processors.
Cryptographic Coprocessor Facility(CCF)	
TOTAL	RATE Rate of all the calls per second.
DES ENCRYPTION	SINGLE RATE Single DES: Number of calls to encipher per second . SINGLE SIZE Single DES: Average number of bytes of data enciphered. TRIPLE RATE Triple DES: Number of calls to encipher per second. TRIPLE SIZE Triple DES: Average number of bytes of data enciphered.

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Table 3-47 Field Descriptions for the Cryptographic Hardware Activity Report (Part 2 of 2)

DES DECRYPTION	SINGLE RATE Single DES: Number of calls to decipher per second. SINGLE SIZE Single DES: Average number of bytes of data deciphered. TRIPLE RATE Triple DES: Number of calls to decipher per second. TRIPLE SIZE Triple DES: Average number of bytes of data deciphered.
MAC	GENERATE RATE Rate of calls to MAC generate per second. GENERATE SIZE Average number of bytes of data MAC generated. VERIFY RATE Rate of call to MAC verify per second. VERIFY SIZE Average number of bytes of data MAC verified.
HASH	RATE Rate of calls to hash per second. SIZE Average number of bytes of data hashed.
PIN	TRANSLATE RATE Rate of calls to PIN translate per second. VERIFY RATE Rate of calls to PIN verify per second.

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Device Activity Report

The Device Activity report displays I/O activity by device number (see Figure 3-34). The report is formatted by device class. Device classes can be specifically requested or can default to whatever classes are found in the data. Within a device class, devices are sorted as specified by the ORDER parameter on the DEVACT control statement. When devices are sorted by LCU or storage group, there is a summary line for each LCU or storage group.

The Device Activity Report is produced by using the DEVACT Analyzer control statement (see “DEVACT” on page 2-43). The data for this report is obtained by using the DEVICE (see “DEVICE” on page 1-23) Extractor control statement.

Note: Data is displayed by device class regardless of how the device data was requested on the Extractor DEVICE control statement.

A sample of this report is shown in Figure 3-34.

Figure 3-34 Device Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    DEVICE ACTIVITY REPORT                        RPTSEQ    18 PAGE    131
BMC SOFTWARE, INC.                                         XYZ COMPANY                             REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00          WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-1/112/25.1K/7
                                            ------------ AVERAGE TIME IN MSEC ------------- --------- % OF TIME ---------
                                                          CU    DIR   DEV                          DEV                     AVG
DEV    DEVICE  VOLUME STORAGE  PAV    SSCH    TOTAL       BUSY  PORT  BUSY                    DEV   IN    DEV   DEV  MOUNT DSETS
NUM     TYPE   SERIAL  GROUP   MX    PER SEC  RESP  IOSQ  DELAY DELAY DELAY PEND  DISC  CONN  CONN   USE  RESV  ALLOC PEND  ALLOC
----  -------- ------ -------- ---  --------- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ------
859B  33903    ACFWK3                   0.008   5.5   0.0   0.2   0.2   0.0   3.3   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
859C  33903    APD28D                   0.008   7.2   0.0   0.1   0.5   0.2   4.9   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
859D  33903    APD28E                   0.008   5.1   0.0   0.0   0.1   0.1   2.9   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
859E  33903    APD27E                   0.008   5.1   0.0   0.0   0.2   0.0   2.9   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
859F  33903    APD26E                   0.008  10.8   4.9   0.0   0.2   0.1   3.6   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A0  33903    APD27D                   0.008   5.0   0.0   0.0   0.0   0.2   2.8   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A1  33903    APD26D                   0.008   5.7   0.0   0.0   0.2   0.0   3.5   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A2  33903    SMSA00 SGENG             0.017   4.5   0.0   0.0   0.3   0.0   2.9   0.1   1.4   0.0   0.0   0.0 100.0   0.0    2.0
85A3  33903    SMS011 SGSYS             0.147   3.3   0.3   0.0   0.2   0.2   1.5   0.3   1.2   0.0   0.0   0.0 100.0   0.0   18.0
85A4  33903    SY396G                   0.008   6.1   0.0   0.0   0.3   0.2   3.8   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A5  33903    SY396H                   0.008   5.7   0.0   0.0   0.3   0.1   3.4   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A6  33903    SY396C                   0.008   6.3   0.0   0.1   0.5   0.0   4.1   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A7  33903    ACFWRK                   0.008   5.9   0.0   0.0   0.4   0.0   3.6   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A8  33903    SA395M                   0.008   4.9   0.0   0.1   0.1   0.3   2.7   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85A9  33903    SA395N                   0.008   9.9   4.9   0.0   0.1   0.0   2.7   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AA  33903    SA395O                   0.008   5.8   0.0   0.1   0.2   0.1   3.6   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AB  33903    --85AB                   0.008   6.2   0.0   0.1   0.2   0.0   3.9   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AC  33903    SA399I                   0.008   5.9   0.0   0.0   0.2   0.2   3.7   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AD  33903    SA399J                   0.008   5.1   0.0   0.0   0.1   0.0   2.9   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AE  33903    SA399K                   0.008   6.0   0.0   0.2   0.3   0.1   3.8   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85AF  33903    SA399F                   0.008   4.8   0.0   0.0   0.1   0.0   2.6   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85B0  33903    SA39AI                   0.008   5.1   0.0   0.0   0.1   0.2   2.8   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85B1  33903    SA39AJ                   0.008  10.2   4.9   0.0   0.1   0.0   3.0   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85DD  33903    C4W901                   0.008   3.8   0.0   0.0   0.0   0.0   1.5   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85DE  33903    C4C901                   0.008   4.7   0.0   0.0   0.4   0.0   2.5   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85DF  33903    C4R903                   0.008   4.3   0.0   0.0   0.1   0.1   2.1   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85E0  33903    C4R902                   0.008   4.4   0.0   0.0   0.2   0.2   2.1   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85E1  33903    C4R901                   0.008   4.0   0.0   0.0   0.1   0.0   1.8   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
85E2  33903    --85E2                   0.008   3.8   0.0   0.0   0.1   0.0   1.6   0.1   2.1   0.0   0.0   0.0 100.0   0.0    0.0
. .
. .

LCU 00ED (240 ACTIVE)                  13.872   5.9   0.8   0.0   0.2   0.1   1.5   1.4   2.2   0.0   0.0   0.0 100.0   0.0 1561.5
```

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Device Activity Report Field Descriptions

Table 3-48 describes each field in the Device Activity Report.

Table 3-48 Field Descriptions for the Device Activity Report (Part 1 of 2)

Field	Description
DEV NUM	Four-digit hexadecimal number identifying this device. An asterisk (*) following this number indicates that the online/offline status of the device changed during the report interval.
DEVICE TYPE	Type of the physical I/O device on which the volume is mounted.
VOLUME SERIAL	Volume serial number of the last volume that was mounted on this device. Applicable only to DASDs and tape drives.
STORAGE GROUP	Name of the storage group the DASD is assigned to if it is managed by SMS.
PAV MX	Number of exposures (base and aliases) of a Parallel Access Volume (PAV) at the end of the report duration. Applicable only to DASDs. An asterisk (*) following this number indicates that the number of exposures changed during the report duration.
SSCH PER SEC	Rate per second at which SSCH instructions issued for this device completed successfully. OFFLINE is printed under this column if the device was offline during the entire report interval. If the online/offline status of a device changed during a recording interval, the device is considered offline, and its data is skipped for that particular interval. Note: In the LCU Summary Line, this field contains the average SSCH per second for all devices that are online to the LCU.
TOTAL RESP	Average number of milliseconds the device required to complete an I/O request (including IOSQ, pending, connect, and disconnect time), commonly known as response time.
IOSQ	Average number of milliseconds of delay an I/O request encountered because the device was busy performing an I/O from the local system.
CU BUSY DELAY	Average number of milliseconds of delay an I/O request encountered because control unit was busy. This delay is part of pending time.
DIR PORT DELAY	Average number of milliseconds of delay an I/O request encountered because the ESCON director port was busy.
DEV BUSY DELAY	Average number of milliseconds of delay an I/O request encountered because the device was busydue to I/O from another system. This delay is part of pending time.
PEND	Average number of milliseconds an I/O request must wait for hardware, such as an available channel path or control unit, as well as time between the SSCH pending at the channel and the device active on the subchannel. This time also includes delays caused by another processor reserving this device in a shared DASD environment.
DISC	Average number of milliseconds during which the device was processing an SSCH instruction but not transferring data.
CONN	Average number of milliseconds during which the device was processing an SSCH instruction and transferring data.
DEV CONN	Percent of time during the measurement interval that the device was connected to a channel path.

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Table 3-48 Field Descriptions for the Device Activity Report (Part 2 of 2)

DEV IN USE	Percent of time during the measurement interval that the device was in use. This includes device connect and disconnect time.
DEV RESV	Percent of time during the measurement interval that this device was reserved by the processor on which the CMF MONITOR Extractor was executing.
DEV ALLOC	Percent of time that the device was allocated to one or more data sets. DASD devices that are marked as permanently resident in the UCB always show 100% allocation. Not applicable to tape devices.
MOUNT PEND	Percent of time that the device had a mount pending request outstanding. This is reported only for DASD devices.
AVG DSETS ALLOC	Average number of data sets allocated on this device. This field reports only on DASDs.
NUM OF MOUNTS	Number of mounts for the tape device for the reporting interval. An asterisk (*) to the left of this value indicates that a mount pending condition existed at the start of the recording interval. An asterisk (*) to the right of the value indicates that a mount pending condition existed at the end of the recording interval. For the LCU, the field contains the total number of mounts for all devices on the LCU for the reporting interval.
AVG MOUNT TIME	Average mount pending time for the tape device. For the LCU, the field contains the average mount pending time for all devices on the LCU. The field is reported as *hh:mm:ss*; the maximum time reported in this field is 99:59:59.
TIME DEVICE ALLOC	Total time the tape device was allocated during the reporting interval. For the LCU, the field contains the average allocation time for all active devices on the LCU during the reporting interval. The field is reported as *hh:mm:ss*; the maximum time reported in this field is 99:59:59.
LCU	Total/summary line for all devices on this LCU.
n ACTIVE	Number of devices on this LCU that had some I/O activity.
NOT READY	Percent of time that the device was not ready for use. Not applicable to DASD or tape devices.

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Direct Access Report

The Direct Access Report summarizes activity on each volume. The amount of activity of each volume directly indicates the effect of each volume on system performance.

The Direct Access Report is produced by using the DASD Analyzer control statement (see “DASD” on page 2-39). The data for this report is obtained by using the DEVICE (see “DEVICE” on page 1-23) and HEADMOVE (see “HEADMOVE” on page 1-37) Extractor control statements.

Extractor overhead for this report is high because a high resolution sampling interval is required. However, information in the report can be used to reduce contention and improve the use of DASD resources.

A sample report is shown in Figure 3-35.

Figure 3-35 Direct Access Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    DIRECT ACCESS REPORT                        RPTSEQ    17 PAGE    113
 BMC SOFTWARE, INC.                                        XYZ COMPANY                           REPORT DATE: 12 JUN 03 13.40
 ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00         WORLDWIDE HEADQUARTERS                    SYSTEM ID: SJSE     Z 1.01.0

 BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-12/1/1/0  240-13/393/25.1K/7  74-1/112/25.1K/7
 ----------------------------------------------------  ACTIVITY BY VOLUME  ----------------------------------------------------
  VOLUME    DEVICE    TOTAL HEAD    MOVEMENTS TO          HEAD MOVEMENT TIME        ERROR       MOUNTED      ALLOC     DEVICE
   NAME      TYPE     MOVEMENTS    ALTERNATE CYLS     TOTAL (SEC)     AVG (MSEC)   RECOVERY     PERCENT     PERCENT    NUMBERS
  BAB310    33903            4        0                 0.112           28.00        0.00      100.00      100.00     835F
  BAB311    33903            2        0                 0.020           10.00        0.00      100.00      100.00     8360
  BAB312    33903            0        0                 0.000            0.00        0.00      100.00      100.00     8361
  BAB313    33903            4        0                 0.072           18.00        0.00      100.00      100.00     8362
  BAB314    33903           23        0                 0.285           12.39        0.00      100.00      100.00     8363
  BAB315    33903            4        0                 0.032            8.00        0.00      100.00      100.00     8364
  BAB316    33903            7        0                 0.057            8.14        0.00      100.00      100.00     8365
  BAB317    33903            9        0                 0.166           18.44        0.00      100.00      100.00     8366
  BAB318    33903            0        0                 0.000            0.00        0.00      100.00      100.00     8367
  BAB319    33903            0        0                 0.000            0.00        0.00      100.00      100.00     8368
  BAB320    33903            2        0                 0.056           28.00        0.00      100.00      100.00     8369
  BAB321    33903            9        0                 0.078            8.67        0.00      100.00      100.00     836A
  BAB322    33903           19        0                 0.286           15.05        0.00      100.00      100.00     836B
  BAB323    33903           71        0                 0.518            7.30        0.02      100.00      100.00     836C
  BAB324    33903           49        0                 0.697           14.22        0.00      100.00      100.00     836D
  BAB325    33903           29        0                 0.510           17.59        0.00      100.00      100.00     836E
  BAB326    33903           66        0                 0.766           11.61        0.00      100.00      100.00     836F
  BAB327    33903            1        0                 0.024           24.00        0.00      100.00      100.00     8370
  BAB328    33903           33        0                 0.689           20.88        0.01      100.00      100.00     8371
  BAB329    33903           10        0                 0.098            9.80        0.00      100.00      100.00     8372
  BAB330    33903            0        0                 0.000            0.00        0.00      100.00      100.00     8373
  BAB331    33903           59        0                 0.313            5.31        0.24      100.00      100.00     8374
  BAB332    33903          249        0                 2.694           10.82        0.00      100.00      100.00     8375
```

In this report, the time spent in error recovery includes both retries and permanent I/O errors. A bit in the IOSB is turned on whenever an error recovery procedure (ERP) gains control from IOS. This bit is sampled and a 1 is added to a counter each time it appears.

ERPs issue messages IEA00A through IEA005I: INTERVENTION REQUIRED, PATH INOPERATIVE, and PERMANENT I/O ERROR. All ERPs write records to the SYS1.LOGREC data set.

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An ERP is entered from a channel end appendage (CHE) or abnormal end appendage (ABE) if an exception condition is indicated in the IOSB and the device is accessible.

A CHE or ABE appendage is entered if the following conditions exist:

- The CSW status bits in the IOSB (IOSCSW) contain no status information other than a PCI, channel end, device end, attention, unit exception, or wrong length record indication.
- The CSW status bits contain a unit check, channel data check, channel control check, or interface control check.

Note: If error counts exist, but no ERP messages are issued, one of three causes can be responsible: logical error recovery, ISAM overflow, or successful retries.

Direct Access Report Field Descriptions

Table 3-49 describes each field in the Direct Access Report.

Table 3-49 Field Descriptions for the Direct Access Report

Field	Description
VOLUME NAME	Name of the volume that was measured.
DEVICE TYPE	Device type on which the volume was mounted.
TOTAL HEAD MOVEMENTS	Total number of head movements observed.
MOVEMENTS TO ALTERNATE CYLS	Total number of head movements observed to alternate cylinders.
HEAD MOVEMENT TIME	Total number of seconds the device spent in head movement time and average number of milliseconds devoted to each head movement.
ERROR RECOVERY	Percentage of time the device on which the volume was mounted spent in error recovery.
MOUNTED PERCENT	Percentage of time the device was mounted.
ALLOC PERCENT	Percentage of time at least one data set on the volume was allocated, or percentage of time the volume was marked permanently resident.
DEVICE NUMBERS	Four-digit addresses of the devices the volume was mounted on.

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Direct Access Report Plot of Volume

The Direct Access Report Plot of Volume graphically summarizes head movement activity for DASD volumes. A histogram is given for each volume. Each histogram shows where movement on a direct access volume is occurring. By knowing the region of the volume associated with a large amount of head movement, you can reorganize the data sets on the volume and decrease head movement time.

The Direct Access Report of Volume is produced by using the DASD (see “Direct Access Report” on page 3-112) and VOLSER (see “VOLSER” on page 2-121) Analyzer control statements. The data for this report is obtained by using the DEVICE (see “DEVICE” on page 1-23) and HEADMOVE (see “HEADMOVE” on page 1-37) Extractor control statements.

A sample of this report is shown in Figure 3-36. Column headings are explained in the legend.

Figure 3-36 Direct Access Report Plot of Volume

```
PRODUCED BY CMF MONITOR (5.5.00)                  DIRECT ACCESS REPORT PLOT OF VOLUME                RPTSEQ     3 PAGE     46
BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 10 JUN 03 10.08
ACTL 10 JUN 03 13.49.13  10 JUN 03 10.21.33           WORLDWIDE HEADQUARTERS                       SYSTEM ID: SYSB     SP4.3.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74/57/289K/21.44   240-12/10/10/.00   240-13/8021/288K/21.70

-----------------------------------------------  VOLUME BAB003 ACTIVITY PATTERN  ---------------------------------------------

    TOTAL HEAD MOVEMENT TIME    (56.688 SEC)    AVERAGE HEAD MOVEMENT TIME  (12.860 MSEC)     PHYSICAL HEAD MOVEMENTS     (4408)
       39.6 +                                          *
            I                                          *
            I                                          *
            I                                          *
            I                                          *
            I                                          *
            I                                          *
            I                                          *
       29.7 +                                          *
            I                                          *
    S       I                                          *
    A       I                                          *
    M       I                                          *
    P       I                                          *
    L       I                                          *
    E       I                                          *
       19.8 +                                          *
    P       I                                          *
    E       I                                          *
    R       I                                          *
    C       I                                          *
    E       I                                          *
    N       I                                          *                          *
    T       I                                          *                          *
        9.9 +                                          *                          *
            I                                          *                         **
            I                                          *                         **
            I                                          *                         **    *
            I                                     * *  *                         **    *
            I          *                          * *  *                         **    *
            I          *                          * *  *   *                     **    *
            I       *  **        *            *   * *  *   *      *       *   *  **    *
             ---------+---------+---------+---------+---------+---------+---------+---------+--------- (MAX =   886)

                      1         2         3         4         5         6         7         8
                      0         0         0         0         0         0         0         0
                      0         0         0         0         0         0         0         0
                                                ACTIVITY DISTRIBUTION BY CYLINDER CLASS
                                                      (CLASS WIDTH = 10 CYLINDERS)
```

The horizontal axis shows all possible cylinders on which head movement can occur. The vertical axis shows the percentage of time that head movement activity occurred. The upper limit of this axis is self-scaling; it represents the highest percentage of time observed for head movement activity on this particular volume.

Head movement activity is represented by columns of asterisks. The asterisks appear above cylinder classes that had head movement activity; one cylinder class is equal to 10 cylinders. Each vertical asterisk represents one percentage unit of head movement activity for that cylinder class.

Direct Access Report Plot of Volume Field Descriptions

Table 3-50 describes each field in the Direct Access Report Plot of Volume.

Table 3-50 Field Descriptions for the Direct Access Report Plot of Volume

Field	Description
TOTAL HEAD MOVEMENT TIME	Total number of seconds spent on head movements for this volume.
AVERAGE HEAD MOVEMENT TIME	Average number of milliseconds per head movement for this volume.
PHYSICAL HEAD MOVEMENTS	Total number head movements observed for this volume.

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Disabled Delay Report

The Disabled Delay Report is a two-page report that is produced by using the DISTIM Extractor control statement. No Analyzer control statement is required. This report is produced at the end of every interval, as specified in the REPORT Extractor control statement (see “REPORT” on page 1-58).

The first page of the report shows the values of the LODELAY and HIDELAY values used by the DISTIM control statement as well as a total count for the values below, within, and above these parameters. It also displays a graph of the frequency of occurrence for each value of disabled delay.

The horizontal axis of the graph shows the possible values (in microseconds) of the disabled delay. The vertical axis shows the number of times each particular value occurred. Each asterisk (*) represents one occurrence of a disabled delay of a particular value.

The shift parameter eliminates all values that fall below the value that you specify. If you specify SHIFT=20, for example, the values from 1 to 19 do not appear on the graph.

The second page of the report shows the number of times each address space was the last one dispatched before a sample is taken where the delay time falls in the range of LODELAY to HIDELAY.

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A sample of the Disabled Delay Report is shown in Figure 3-37.

Figure 3-37 Disabled Delay Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    DISABLED DELAY REPORT                          SYSTEM ID: SYSB      PAGE     1
BMC SOFTWARE, INC.                                       FOR  5 MINUTES                            INTERVAL: 10 JUN 03 17:50/17:55
-----------------------------------------------------< CONSTANTS  AND COUNTERS >-----------------------------------------------------
  LOW DELAY  HI DELAY   0 TO LO  LO TO HI   OVER HI          CPU BUSY %                                  CT OVFL   DL OVFL
         70       140       471      1032       367                 34                                         0       131
|
|
|
+
|
|
|                                                                   *
|                                                                   *
|                                                                   *
|                                                                   *
|                                                                 * *
|                                                                 * *
|                                                                 * *
+                                                                * *
|                                                                * *
|                                                                * *
|                                                                * *
|                                                                * *
|                                                                * *
|                                                              ** *
|                                                         *    ** *   *
|                                                         **   ** * *   **
+                                                         **   ** * *   **
|                                                         **  *** ***   **
|                         * *                             **  *** ***   **
|                         * *                             **  *** ****  **
|                     *   * * *                          **** ********* **
|                     *   * * *                          **** ********* **
|                     * * * * *                          ************** **
|                    ** * * * *                          ************** **
|                    ** * *** *                          ***************** *
|                    **** *****                          ***************** *   *
+                    *********                         * ***************** *   *
|                    **********  *                     * ***************** *  **
|                   ***********  *                     *************************
|                   ***********  *                     *************************  *
|                 * ***********  *                     *************************  *
|                 *************  *                    *************************  *
|                 ************* **                   ****************************** *
|                 *****************                  ********************************  *     *     *
|                 *****************                  ********************************* * *   *     *
|                ******************                  ********************************* * *   **   ** *
+              *  ******************                  ********************************* ***   **   ** *     *
|              *  ******************  *               ********************************* ***   **   ** *     * *
|              ** ******************  *               ************************************** ****  ** **    * *
|             ***********************  **             ************************************************ **    * * *    *
|             ***********************  ** **     *   ************************************************ **    * * *   * *  *
|             ********************** ******     * *  ******************************************************  *** *  ** *  *
|             ********************************   * *  ******************************************************  ****** ** ****   *
|             ************************************  ****************************************************** ************** * **
|        *   ************************************************************************************************************************ * **
| SHIFT     20  ***********************************************************************************************************************
+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+

PRODUCED BY CMF MONITOR (5.5.00)                    DISABLED DELAY REPORT                          STEM ID: SYSB      PAGE     2
BMC SOFTWARE, INC.                                       FOR  5 MINUTES                            INTERVAL: 10 JUN 03 17:50/17:55
-----------------------------------------------------< LAST ASID IN LO TO HI RANGE >-------------------------------------------------
      ASID   COUNT        ASID   COUNT        ASID   COUNT        ASID   COUNT        ASID   COUNT        ASID   COUNT
         1     255          10       6          14       2          18       4          23       1          24       1
        29       7          31       1          38      12          60       2          81       1          89       1
        92       1          99       4         111       1         116       2         151       2         172       4
       177       1         179       1         202       1         213       1         245       2         259       1
       284       1         288       2         362       4         365       1         367       1         509       3
```

Disabled Delay Report Field Descriptions

Table 3-51 describes each field in the Disabled Delay Report.

Table 3-51 Field Descriptions for the Disabled Delay Report

Field	Description
LOW DELAY	LODELAY value specified on the control card.
HI DELAY	HIDELAY value specified on the control card.
0 to LO	Number of samples that fell below the LODELAY value specified on the control card.
LO TO HI	Number of samples that fell into the range of LODELAY and HIDELAY values specified on the control card.
OVER HI	Number of samples that occurred above the HIDELAY value specified on the control card.
CPU BUSY %	Percentage of samples during which the CPU was running.
CT OVFL	Number of counters that went over 255, which is the maximum number of samples for a particular value.
DL OVFL	Number of delay samples that were over 512 microseconds.
ASID	ID number of the address space.
COUNT	Number of times a particular address space was the last one dispatched before a sample is taken where the delay time is in the range of LODELAY to HIDELAY.

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Distribution Graph

The Distribution Graph shows how frequently selected conditions exist during the measurement interval. The GRAPH TYPE=DISTRIB Analyzer control statement produces this graph (see “GRAPH” on page 2-56). Up to 16 measures can be specified in each GRAPH statement; each measure specified generates a new graph. No simultaneous graphing is permitted in distribution graphics.

The Extractor control statements required for the Distribution Graph are dependent upon the information to be graphed. (See *CMF MONITOR Batch User Guide*, the section “Numeric List of Record Types”, for information about the record types generated by each Extractor control statement, and a description of the specific type of data collected by each Extractor control statement.)

In data processing, frequency of occurrence of conditions generally cluster around a certain set of values. For this reason, distribution can be normalized; this is the default. The horizontal axis shows the percentage of CPU busy time. The vertical axis shows the percentage of time that the CPU had a specific percentage of activity. A range of 0 to 50%, in 5% increments, is displayed if the greatest percentage of occurrence is below 50%.

The first fill character is used for all measures no matter how many measures are requested.

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A sample Distribution Graph for CPU usage is shown in Figure 3-38.

Figure 3-38 Distribution Graph

```
PRODUCED BY CMF ANALYZER (5.5.00)                    DISTRIBUTION GRAPH OF CPU                        RPTSEQ    27 PAGE     62
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00           WORLDWIDE HEADQUARTERS                         SYSTEM ID: SYSB     SP4.3.0

                                                   P E R C E N T S   O F   A C T I V I T Y
                                 0        10        20        30        40        50        60        70        80        90       100
                                 +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
                              50.         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
 CPU ENVIRONMENT          P      .         .         .         .         .         .         .         .         .         .         .
       REQUESTED:  ALL        45.         .         .         .         .         .         .         .         .         .         .
                          E      .         .         .         .         .         .         .         .         .         .         .
 STANDARD                         .         .         .         .         .         .         .         .         .         .         .
 DEVIATION =     18.8     R      .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
   AVERAGE =       37     C     40.         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
    MEDIAN =       32     E      .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
      MODE =       25     N      .         .         .         .         .         .         .         .         .         .         .
                              35.         .         .         .         .         .         .         .         .         .         .
                          T      .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                          O     30.         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                          F      .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                                 .         .         .         .         .         .         .         .         .         .         .
                              25.         .         .         .         .         .         .         .         .         .         .
                          O      .         .         .   *****.         .         .         .         .         .         .         .
                                 .         .         .   *****.         .         .         .         .         .         .         .
                          C      .         .         .   *****.         .         .         .         .         .         .         .
                                 .         .         .   *****.         .         .         .         .         .         .         .
                          C     20.         .         .   *****.         .         .         .         .         .         .         .
                                 .         .         .   *****.         .         .         .         .         .         .         .
                          U      .         .         .   **********     .         .         .         .         .         .         .
                                 .         .         .   **********     .         .         .         .         .         .         .
                          R      .         .         .   **********     .         .         .         .         .         .         .
                              15.         .         .   **********     .         .         .         .         .         .         .
                          R      .         .         .   **********     .         .         .         .         .         .         .
                                 .         .         .   **********     .         .         .         .         .         .         .
                          E      .         *****     .   **********     .         .         .         .         .         .         .
                                 .         *****     .   **********     .         .         .         .         .         .         .
                          N     10.         *****     .   **********     .         .         .         .         .         .         .
                                 .         *****     .   **********     .         .         .         .         .         .         .
                          C      .         *****     .   **********     .         .         .         .         .         .         .
                                 .         *****     .   **********     .         .         .         .         .         .         .
                          E      .         ************************     ********************.         **********.         .         .
                                5.         ************************     ********************.         **********.         .         .
                                 .         ************************     ********************.         **********.         .         .
                                 .         ************************     ********************.         **********.         .         .
                                 .         ************************     ********************.         **********.         .         .
                                 .         ************************     ********************.         **********.         .         .
                                0+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
```

As shown, the CPU was never below 10% busy during the reporting period nor greater than 80% busy. A quarter of the time, the CPU was 25% to 30% busy.

A plateau in the graph represents an accumulated percentage of occurrence. The CPU ran at an accumulated busy rate of 40% to 60%, as shown in the example. The CPU ran at this rate 24% of the time, not 6% of the time.

For an explanation of mean, mode, and standard deviation, see Statistical Considerations in *CMF MONITOR Batch User Guide*.

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Distribution Graph Field Descriptions

Table 3-52 describes each field in the Distribution Graph.

Table 3-52 Field Descriptions for the Distribution Graph

Field	Description
CPU ENVIRONMENT REQUESTED:	CPU number or numbers selected in the GRAPH control statement.
STANDARD DEVIATION =	Standard deviation arrived at in calculating percentage of CPU busy time.
AVERAGE	Average value arrived at in calculating percentage of CPU busy time.
MEDIAN =	Median value arrived at in calculating percentage of CPU busy time.
MODE =	Indicates the recording mode under which the records were extracted. Note: An asterisk (*) printed before MODE= indicates that more modes were identified than could be reported. Up to the first three modes are reported.
PERCENT OF OCCURRENCE	Axis showing percentage of time that the measurement was at the indicated value.
PERCENTS OF ACTIVITY	Axis representing percentage of measured activity during the interval. Each column represents a normalized value, showing a grouping of measurement values (see breakdown in the description of the report).

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Domain Delay Analysis Report

The Domain Delay Analysis Report shows delay and storage utilization information for specified domains within specified performance groups.

This report is produced by using the PGDDLAY Analyzer control statement (see “PGDDLAY” on page 2-85). The data is obtained by using the PGDDLAY Extractor control statement (see “PGDDLAY” on page 1-54).

Note: This report is not produced in WLM goal mode.

The information in this report is reported either by performance group or by domain.

- If reported by performance group, specific domains can be selected for inclusion in the report. If all domains are selected for the report and the Extractor collected data for all domains, this report can be used to analyze delay and storage utilization for all performance groups.
- If reported by domain, the same subset of domains are reported on for all performance groups. Depending on the structure of the IPS, the report by domain can be useful in analyzing delay criteria for specified performance periods. This is accomplished by requesting a report with only those domains that pertain to a specific performance period.

Sample Domain Delay Analysis Reports are shown in Figure 3-39 and Figure 3-40 on page 3-123. Figure 3-39 is a domain version of this report shown in the summary display format. Figure 3-40 is a performance group version of this report shown in the detail display format.

Figure 3-39 Domain Delay Analysis Report (Domain Version)

```
PRODUCED BY CMF ANALYZER (5.5.00)                DOMAIN DELAY ANALYSIS REPORT                    RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                       XYZ COMPANY                             REPORT DATE: 10 JUN 03 10.47
ACTL 10 JUN 03 10.22.45  10 JUN 03 10.31.14         WORLDWIDE HEADQUARTERS                     SYSTEM ID: SJSF     02.10.00

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-2/3/30/0.14
```

	-- AVERAGE USERS --		------ AVERAGE DELAYS ------				------- AVERAGE FRAMES -------			
DOMAIN	ALL	ACTIVE	PAGING	SWAPPING	OUT AND READY	PAGE-IN RATE	ACTIVE	IDLE	DATA IN VIRTUAL	SLOTS USED
0	29.0	0.0	0.0	0.0	0.0	0.0	4,278.5	2,483.3	0.0	0.0
1	30.0	0.1	0.0	0.0	0.0	0.0	8,703.2	20,140.5	23.4	0.0
2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	313.2	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	15.0	0.1	0.0	0.0	0.0	0.0	1,849.4	25,777.6	0.0	0.0
20	3.0	0.0	0.0	0.0	0.0	0.0	36.3	3,551.5	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	67.5	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	78.0	0.3	0.0	0.0	0.0	0.0	14,900.7	52,333.6	23.4	0.0

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Figure 3-40 Domain Delay Analysis Report (Performance Group Version)

```
PRODUCED BY CMF ANALYZER (5.5.00)          PERFORMANCE GROUP/DOMAIN DELAY ANALYSIS REPORT            RPTSEQ     4 PAGE      6
BMC SOFTWARE, INC.                                       XYZ COMPANY                                 REPORT DATE: 10 JUN 03 10.47
ACTL 10 JUN 03 10.22.45  10 JUN 03 10.31.14            WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSF     02.10.00

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-2/3/30/0.14

                   -- AVERAGE USERS --    ------ AVERAGE DELAYS ------                 ------- AVERAGE FRAMES --------

 PERF                                                        OUT AND     PAGE-IN                                  DATA IN       SLOTS
GROUP    DOMAIN      ALL       ACTIVE      PAGING   SWAPPING   READY       RATE       ACTIVE      IDLE      VIRTUAL       USED
------   ------   --------   --------   --------  --------  --------   --------   ---------  ---------  ---------    ---------
     0        0       29.0        0.0        0.0       0.0       0.0        0.0     4,278.5    2,483.3        0.0          0.0
     1        1       17.0        0.0        0.0       0.0       0.0        0.0     6,392.3    9,976.7        0.0          0.0
     2       20        3.0        0.0        0.0       0.0       0.0        0.0        36.3    3,551.5        0.0          0.0
             21        0.0        0.0        0.0       0.0       0.0        0.0         0.0       67.5        0.0          0.0
             22        0.0        0.0        0.0       0.0       0.0        0.0        33.3        0.0        0.0          0.0
             23        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
     3       30        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
     4        1        2.0        0.1        0.0       0.0       0.0        0.0        98.4    1,186.9        0.0          0.0
     5        2        1.0        0.0        0.0       0.0       0.0        0.0         0.0      313.2        0.0          0.0
     6        1        2.0        0.0        0.0       0.0       0.0        0.0       141.1    1,794.9        0.0          0.0
    10       10       15.0        0.1        0.0       0.0       0.0        0.0     1,849.4   25,777.6        0.0          0.0
    30        1        9.0        0.0        0.0       0.0       0.0        0.0     2,071.4    7,181.9       23.4          0.0
    31        7        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
    40        4        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
    41        4        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
    99       99        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
   112       20        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             21        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             22        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             23        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
   270       20        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             21        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             22        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0
             23        0.0        0.0        0.0       0.0       0.0        0.0         0.0        0.0        0.0          0.0

   TOTAL               78.0        0.3        0.0       0.0       0.0        0.0    14,900.7   52,333.6       23.4          0.0
```

Domain Delay Analysis Report Field Descriptions

Table 3-53 describes each field in the Domain Delay Analysis Report.

Table 3-53 Field Descriptions for the Domain Delay Analysis Report

Field	Description
PERF GROUP	Performance group number.
DOMAIN	Domain number.
AVERAGE USERS – ALL	Average number of users for this performance group and domain per record interval.
AVG USERS – ACTIVE	Average number of active users for this performance group and domain per record interval. Active users are all processors, all devices, or any gathered resource, including those out and ready.
AVERAGE DELAYS – PAGING	Average number of page-delayed users per record interval. Non swappable page-ins, including VIO page-ins, are considered paging delays.
AVERAGE DELAYS – SWAPPING	Average number of delays pending swap-in per record interval.
AVERAGE DELAYS – OUT AND READY	Average number of address spaces on the out-and-ready queue.
PAGE-IN RATE	Average number of page-ins for all address spaces in the performance group/domain combination.

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Table 3-53 Field Descriptions for the Domain Delay Analysis Report (continued)

Field	Description
AVERAGE FRAMES – ACTIVE	Average number of frames assigned to all active address spaces in this performance group/domain combination. Note: Average user does not include users swapped out and ready.
AVERAGE FRAMES – ACTIVE (TYPE=USER)	Average number of frames assigned to a single active address space in this performance group/domain combination. Note: Average number does not include users swapped out and ready.
AVERAGE FRAMES – IDLE	Average number of frames assigned to all idle address spaces in this performance group/domain combination.
AVERAGE FRAMES – IDLE (TYPE=USER)	Average number of frames per user assigned to a single idle address space in this performance group/domain combination.
AVERAGE FRAMES – DATA IN VIRTUAL	Average number of DIV (data-in-virtual) frames assigned to all address spaces in this performance group/domain combination.
AVERAGE FRAMES – DATA IN VIRTUAL (TYPE=USER)	Average DIV frame utilization per user in this performance group/domain combination.
AVERAGE FRAMES – SLOTS USED	Average number of slots assigned to all address spaces in this performance group/domain combination.
AVERAGE FRAMES – SLOTS USED (TYPE=USER)	Average number of slots assigned to a single address space in this performance group/domain combination.

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Enqueue Conflict Report

The Enqueue Conflict report provides information about resources that build up queues greater than the threshold specified on the ENQUEUE Analyzer control statement (see “ENQUEUE” on page 2-49). Data is collected for this report by using the ENQUEUE Extractor control statement (see “ENQUEUE” on page 1-29). The information in this report can be helpful in locating bottlenecks.

The Enqueue Conflict report can be requested in detailed or summary formats. A sample including both formats is shown in Figure 3-41. The summary format does not include the OWNER OR REQUESTOR field.

Figure 3-41 Enqueue Conflict Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    ENQUEUE CONFLICT REPORT                        RPTSEQ    19 PAGE    136
BMC SOFTWARE, INC.                                         XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00          WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  77-1/28/0/7
GRS MODE: STAR ---------------------------------- ENQUEUE CONFLICT SUMMARY REPORT ----------------------------------------------
                                                   (THRESHOLD PERCENT =   .00 )
  CONFLICT   DURATION     (MAJOR)    (MINOR)                                                                    AVG        MAX
  PERCENT    HH.MM.SS      QNAME      RNAME                                                                 SCOPE     DEPTH      DEPTH

     .02     00.00.04     DSPURI01   AAO.IMS710.RECON1                                                     SYSTEM      1.0         1
     .14     00.00.35     ECMCONFL   A..O.                                                                 SYSTEM      1.0         1
                                     C07D3
                                     12560
     .13     00.00.33     IGDCDSXS   SYSI.IBMSMS.R150.COMMDS                                               SYSTEM      1.0         1
     .00     00.00.00     SYSDSN     BMCPXK.BBIJRNLL                                                       SYSTEM      1.0         1
     .06     00.00.15     SYSIEA01   DMPDSENQ                                                              SYSTEM      1.0         1
     .08     00.00.20     SYSIEA01   SDDSQ                                                                 SYSTEM      1.0         1
     .43     00.01.48     SYSIEA01   SDUMPENQ                                                              SYSTEM      3.1        4+
     .00     00.00.00     SYSIGGV2   CATALOG.ICF.MSTRA39A                                                  SYSTEM      1.4         3
    1.50     00.06.17     SYSIGGV2   ICFUCAT.VSYSP14                                                       SYSTEM      1.2        4+
     .09     00.00.23     SYSIGGV2   ICFUCAT.VSYSP15                                                       SYSTEM      1.2         2
     .00     00.00.00     SYSIGGV2   SYS1.VOLCAT.VA                                                        SYSTEM      1.0         1
     .00     00.00.00     SYSVSAM    AAO.IMS710.RECON1.DATAICFUCAT.VSYSP14...I                             SYSTEM      1.0         1
                                     CCD4CDEFFF4DCCDDF4CCECCCCECCE4EEEEDFF210C
                                     116B942710B953651B41319364313B528271496F9

GRS MODE: STAR ---------------------------------- ENQUEUE CONFLICT DETAIL REPORT ----------------------------------------------
                                                   (THRESHOLD PERCENT =   .00 )
  CONFLICT   DURATION     (MAJOR)    (MINOR)                                        OWNER OR       SYSTEM                AVG    MAX
  PERCENT    HH.MM.SS      QNAME      RNAME                                        REQUESTER       NAME        SCOPE   DEPTH  DEPTH

     .13     00.00.33     IGDCDSXS   SYSI.IBMSMS.R150.COMMDS                       MIMGR   -O/E   SJSE       SYSTEM     1.0     1
                                                                                   SMS     -W/E   SJSE       SYSTEM
     .06     00.00.15     SYSIEA01   DMPDSENQ                                      DUMPSRV -O/E   SJSE       SYSTEM     1.0     1
                                                                                   DUMPSRV -W/E   SJSE       SYSTEM
     .08     00.00.20     SYSIEA01   SDDSQ                                         DUMPSRV -O/E   SJSE       SYSTEM     1.0     1
                                                                                   DUMPSRV -W/E   SJSE       SYSTEM
     .42     00.01.46     SYSIEA01   SDUMPENQ                                      DUMPSRV -O/E   SJSE       SYSTEM     3.2    4+

     .01     00.00.01     SYSZMCS    SYSMCS#CL1                                    CONSOLE -O/E   SJSD       SYSTEMS    1.0     1
                                                                                   AAOSN61 -W/E   SJSC       SYSTEMS
     .00     00.00.00     SYSZMCS    SYSMCS#CL1                                    CONSOLE -O/E   SJSC       SYSTEMS    1.0     1
                                                                                   AAOSN62 -W/E   SJSC       SYSTEMS
     .00     00.00.00     SYSZMCS    SYSMCS#CL1                                    CONSOLE -O/E   SJSC       SYSTEMS    1.0     1
                                                                                   AAOSSEK2-W/E   SJSC       SYSTEMS
     .01     00.00.01     SYSZMCS    SYSMCS#CL1                                    CONSOLE -O/E   SJSD       SYSTEMS    1.0     1
                                                                                   I5APAS  -W/E   SJSD       SYSTEMS
```

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Enqueue Conflict Report Field Descriptions

Table 3-54 describes each field in the Enqueue Conflict Report.

Table 3-54 Field Descriptions for the Enqueue Conflict Report

Field	Description
GRS MODE	CMF MONITOR displays the GRS mode at the end of the most recently recorded interval. Possible values are STAR, RING, and NONE.
CONFLICT PERCENT	Percentage of time a conflict was observed for this enqueue request. To calculate the conflict percent: conflict time x 100 / measurement interval
DURATION	Length of time the conflict existed—reported in hours, minutes, seconds (hh.mm.ss). The duration of the conflicts reflects actual time. For example, if job B waits 10 minutes for a resource held exclusively by job A, and job C starts 5 minutes after job B but waits for the same resource held by job A, the duration reported would be 15 minutes (assuming jobs B and C could share the resource).
(MAJOR) QNAME	Major name used for the enqueue request; an * means the resource was still held when the measurement interval ended. This field works in combination with (MINOR) RNAME values.
(MINOR) RNAME	Minor name used for the enqueue request. Three messages can be produced by this report: no contention occurred no contention occurred above threshold warning - CMF table full, data was lost during extraction The last warning message indicates that enqueue conflict events during the interval exceeded the CMF MONITOR Extractor table capacity. The data in the report is accurate for the QNAME-RNAME combinations printed, but other QNAME-RNAME combinations occurred that were not printed.
THRESHOLD PERCENT	Value supplied in the ENQUEUE control statement, used to determine when the enqueue conflict occurred.
OWNER OR REQUESTOR	Jobname or started task name of the owner or requestor of the resource. During the contention event, CMF MONITOR selects the job or started task when the wait queue is the longest. Codes appear to the right of the owner or requestor name. Valid codes are O Requestor owned the resource. W Requestor was waiting for the resource. S Requestor made a shared request. E Requestor made an exclusive request.
SYSTEM NAME	Name of the system on which job is running; if a name is not available, this field contains NONAME.
SCOPE	Scope of the enqueue request. There are two values for this field: SYSTEM Indicates that a serially reusable resource is being shared among address spaces on this system. SYSTEMS Indicates that the resource is being shared among systems. Enqueue requests with a scope of STEP are not reported.
AVG DEPTH	Average of the longest wait queue from each contention event.
MAX DEPTH	Maximum queue depth observed for this major- or minor-name request. Note: The upper limit for values in this field is 4, since there are only 4 fields.

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Exception Subreport

The Exception Subreport lists the exceptional conditions defined by the EXCEPTS Analyzer control statement (see “EXCEPTS” on page 2-50). The listing shows the exceptional condition being reported and the time the condition was detected. Up to four fields can be measured for an exceptional condition.

The Extractor control statements required for the Exception Subreport are dependent upon the information to be reported. (See *CMF MONITOR Batch User Guide*, the section “Numeric List of Record Types” for information about the record types generated by each Extractor control statement and a description of the specific type of data collected by each Extractor control statement.)

A sample of the Exception Subreport is shown in Figure 3-42.

Figure 3-42 Exception Subreport

```
PRODUCED BY CMF ANALYZER (5.5.00)                        EXCEPTION SUBREPORT                        RPTSEQ     5 PAGE      8
BMC SOFTWARE, INC.                                           XYZ COMPANY                            REPORT DATE: 11 JUN 03 16.53
ACTL 10 JUN 03 09.00.00  10 JUN 03 12.45.00            WORLDWIDE HEADQUARTERS                     SYSTEM ID: SJSC     02.09.00


    EXCEPTIONAL CONDITION WHEN PAGESEC   LT         8  OR GT        20

   CPU ENVIRONMENT REQUESTED:  ALL CPU'S
   DATE     TIME                                  VALUE
                            PAGESEC        PAGEINS        PAGEOUTS

 10JUN 03    09.00.00           0.21         381.00           0.00
             09.30.00           0.44         791.00           0.00
             10.00.00           0.20         358.00           0.00
             10.30.00           0.06         103.00           0.00
             11.00.00           0.06         100.00           0.00
             11.30.00           0.02          28.00           0.00
             12.00.00           0.06          87.00          25.00
```

Exception Subreport Field Descriptions

Table 3-55 describes each field in the Exception Subreport.

Table 3-55 Field Descriptions for the Exception Subreport (Part 1 of 2)

Field	Description
EXCEPTIONAL CONDITION WHEN xxx	Measure name from EXCEPTS control statement (xxx).
LT	Minimum threshold value from EXCEPTS control statement or the default.
GT	Maximum threshold value from EXCEPTS control statement or the default.
CPU ENVIRONMENT REQUESTED	CPU in a multiprocessor system for which CPU-related measures are to be reported; from the EXCEPTS control statement.

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Table 3-55 Field Descriptions for the Exception Subreport (Part 2 of 2)

Field	Description
DATE TIME	Interval start date and time during which the exceptional condition occurred.
VALUE	Selected exception measures (from EXCEPTS control statement) are printed as column headings. Values of the exception measures fill the columns. Associated measures are printed when the exception measure is printed, if the ASSOC parameter of the EXCEPTS control statement is used.

Exception Trace Detail Report

The Exception Trace Detail Report is produced by using the Analyzer EXCEPTS control statement (see “EXCEPTS” on page 2-50). Data for this report is gathered by using the TRACE76 Extractor control statement (see “TRACE76” on page 1-71).

The report lists the exceptional conditions defined on the EXCEPTS control statement. The listing shows the exceptional condition being reported and the time the condition was detected. Up to four fields can be measured during an exceptional condition.

One line of values is produced for each date and time interval specified on the EXCEPTS command. If the default time interval is used, one line is produced for each sample cycle encountered in the input data record. These lines of data are printed only if they fall outside the exception limits specified in the control statement. Large amounts of input data require large amounts of storage for DMSS. Storage is defined by the REGION parameter of the //CMFRPTS EXEC control statement (see “DMSS” on page 2-47 for more information).

If the TRCETYPE parameter is not used in parallel with the TRACE=YES parameter, the value, AVG, is substituted in the list for each trace measure that does not have a corresponding characteristic value.

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A sample of the Exception Trace Detail Report is shown in Figure 3-43.

Figure 3-43 Exception Trace Detail Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    EXCEPTION TRACE DETAIL REPORT                    RPTSEQ     3 PAGE     14
BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 10 JUN 03 11.54
ACTL 10 JUN 03 11.25.46  10 JUN 03 11.45.01           WORLDWIDE HEADQUARTERS                        SYSTEM ID: SYSB     SP4.3.0

    EXCEPTIONAL CONDITION WHEN ASMIORQR  LT         0  OR GT         0
    CPU ENVIRONMENT REQUESTED:  CPU  0
   DATE     TIME                                    VALUE
                              ASMIORQR       RCEAFC         CCVUTILP       RCVPTR
                                 AVG            AVG            AVG            AVG
 10JUN 03    11.29.46        1.44E+06         185.80         102.50          33.70
             11.30.00        1.45E+06         251.95         102.77          34.17
             11.31.00        1.45E+06         207.83          93.45          31.85
             11.32.00        1.46E+06         285.03          47.82          22.83
             11.33.00        1.47E+06         246.98          89.60          49.45
             11.34.00        1.48E+06         277.43          86.28          30.28
             11.35.00        1.48E+06         272.10          99.18          23.85
             11.36.00        1.48E+06         393.67          89.78          14.23
             11.37.00        1.48E+06         327.67          87.17           9.93
```

Exception Trace Detail Report Field Descriptions

Measure values for the Exception Trace Detail Report are described in Appendix A, “Measure and Trace Values” 1.

Extractor Summary Report

The Extractor Summary Report shows a synopsis of system activity during the Extractor interval. This report is produced dynamically by the Extractor according to a user-definable interval.

There is no Analyzer control statement for the Extractor Summary Report. To produce this report, the required Extractor control statement is EXTSUM with the SPINOFF=*a*, where *a* is a valid output class (see “EXTSUM” on page 1-31).

The following control statements provide data used by this report:

- CHANNEL (see page 1-12)
- CPU (see page 1-14)
- IOQ (see page 1-44)
- PAGING (see page 1-52)
- TSODATA (see page 1-74)
- WORKLOAD (see page 1-82)

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The Extractor Summary Report is divided into five sections:

CPU Utilization

Lists the CPU busy percentages for each processor on the system.

Note: This information is accurate only if PR/SM or MDF is not active.

System Utilization

Shows the five busiest channel paths, along with spool space usage, page-in rate, swap rate, I/O rate, and TSO transaction rate.

Job Class Activity

Shows the average number of active jobs in a given job class along with the average amount of CPU used by that job class and the number of jobs active in that class at the end of the interval. The total number of jobs and job steps completed during the interval also are displayed. The job activity is also summarized by batch (all job classes), TSO, and started tasks.

Note: The job class and job class descriptions are taken from the user specification on the EXTSUM statement. If JES=NO is specified, no job class activity section is produced and no spool space usage is calculated

Performance Group Activity

Summarizes by performance group and period, the average response time, transaction rate, and CPU service rate during the Extractor interval. The performance group and periods to be summarized and their description are taken from the user specification on the EXTSUM statement. This section is produced only for systems running in compatibility mode. If no PERFORM parameter is specified on the EXTSUM statement, this section is not produced.

Service Class Activity

Summarizes, by service class and period during the Extractor interval, a variety of goal mode performance measures, including performance index and execution velocity. The service class and periods to be summarized are taken from the SRVCLASS parameter on the EXTSUM statement. If no SRVCLASS parameter is specified on the EXTSUM statement, this section is not produced. This section is produced only for systems running in goal mode.

An example of the Extractor Summary Report is shown in Figure 3-44.

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Figure 3-44 Extractor Summary Report

```
PRODUCED BY CMF MONITOR (5.5.00)                    EXTRACTOR SUMMARY REPORT                        SYSTEM ID: SJSE    PAGE     1
BMC SOFTWARE, INC.                                     FOR  5 MINUTES                               INTERVAL: 10 JUN 03 17:30/17:35
-------------------------------------------------<  CPU UTILIZATION  >-------------------------------------------------
           CPU ID       -0-   -1-   -2-
           % BUSY       7.7   7.4   6.9
-------------------------------------------------<  SYSTEM UTILIZATION  >-----------------------------------------------
     PERCENT UTILIZATION       CH PATH    AVG                                                          AVG     MIN     MAX
     FIRST  BUSIEST PATH          F6    18.63                        SPOOL SPACE USAGE    ( PERCENT )    51.5    51.5    51.5
     SECOND BUSIEST PATH          EC    17.79                        PAGE-IN RATE         (PAGES/SEC)     3.3     0.0    14.4
     THIRD  BUSIEST PATH          B4     1.06                        SWAP SEQUENCES       (SWAPS/MIN)     0.0     0.0    46.0
     FOURTH BUSIEST PATH          59     0.23                        I/O ACTIVITY RATE    (IO'S /SEC)     ---     ---     ---
     FIFTH  BUSIEST PATH          F8     0.08                        TSO TRANSACTION RATE (TRANS/MIN)     ---     ---     ---
-------------------------------------------------<  JOB CLASS ACTIVITY  >-----------------------------------------------
                              JOB       JOB CLASS           ACTIVE  JOBS                COMPLETED
                             CLASS     DESCRIPTION        AVG   END   %CPU             JOBS  STEPS
                             A         CLASSA             0.0     0    0.0                0      0
                             B         CLASSB             0.0     0    0.0                0      0
                             OTHER     ALL_OTHERS         5.1     5    6.2                3      3
                             BATCH     ALL_BATCH          5.1     5    6.2                3      3
                             TSO       ALL_TSO           14.0    14    0.0                0      0
                             STC       ALL_STC           24.9    29   93.8                0      0
                             TOTAL                       44.0    48  100.0                3      3

-------------------------------------------------<  SERVICE CLASS ACTIVITY  >-------------------------------------------

                POLICY: BBPLEX01               ACTIVATED:  06/10/03 AT 00:50:20               INTERVAL:   5 MINUTES


 SERVICE CLASS: BATNRM   DESCRIPTION: Batch Normal Jobs                  WORKLOAD: BATCH      RESOURCE GROUP:           PERIODS: 2

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    4    0.21        2.1      0.01       3                        8.01   10%     47.9%        57      62       3,159         947
 2    5    0.05        3.0                                                1%     20.3%        16      63       4,260       1,278

 SERVICE CLASS: STCLOW   DESCRIPTION: Low Priority STC's                 WORKLOAD: STC        RESOURCE GROUP:           PERIODS: 1

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    D               1.0                                                                         0       0           0           0

 SERVICE CLASS: STCNRM   DESCRIPTION: Normal STC's                       WORKLOAD: STC        RESOURCE GROUP:           PERIODS: 1

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    4    1.16       39.0                                                25%     21.6%       133     482      56,864      17,059

 SERVICE CLASS: STCPAS   DESCRIPTION: PAS STC's                          WORKLOAD: STC        RESOURCE GROUP: PASSTC    PERIODS: 1

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    3    2.16        2.0                                                60%     27.8%        20      52      26,066       7,819

 SERVICE CLASS: STCPROD  DESCRIPTION: Production STC's                   WORKLOAD: STC        RESOURCE GROUP:           PERIODS: 1

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    3               1.0                                                40%                     0       0           0           0

 SERVICE CLASS: TSONRM   DESCRIPTION: Normal TSO Users                   WORKLOAD: TSO        RESOURCE GROUP:           PERIODS: 4

PER  IMP   PERF    AVG NO     TRANSACTIONS            RESPONSE TIME     EXECUTION VELOCITY     CPU     EXE      TOTAL SERVICE UNITS
           INDX   ADR SPCS   PER/SEC / TOTAL         GOAL        AVERAGE   GOAL    ACTUAL     USING   DELAY     PER/SEC     SU/1000
 1    2    0.50       13.9      0.11      33      .50  90%            .03           25.0%         1       3         174          52
 2    3    0.50        0.0      0.02       5     2.00  80%            .07            0.0%         0       2           7           2
 3    4                0.0
 4    4                0.0
```

Extractor Summary Report Field Descriptions

Descriptions of the fields in the Extractor Summary Report are listed in Table 3-56. For more information about "Workload Measurement in Goal Mode", see *CMF MONITOR Batch User Guide*.

Table 3-56 Field Descriptions for the Extractor Summary Report

Field	Description
CPU ID	CPU ID for each CPU assigned to the partition from which the records were extracted.
% BUSY	For each CPU, the percentage of CPU busy.
CH PATH	Channel path number.
AVG	Average channel path utilization.
SPOOL SPACE USAGE	Average/minimum/maximum percent of JES spool space used.
PAGE-IN RATE	Average/minimum/maximum page-ins per second. The minimum/maximum values represent a period of one minute.
SWAP SEQUENCES	Average/minimum/maximum address space swap sequences per minute.
I/O ACTIVITY RATE	Average/minimum/maximum number of SSCH instructions per second. The minimum/maximum values represent a period of one minute. Note: Data for this field is not available on 3090 or later processors. When data is not available, this field contains dashes (---).
TSO TRANSACTION RATE	Average/minimum/maximum number of TSO transactions per minute.
JOB CLASS	Job class as specified on the EXTSUM statement.
JOB CLASS DESCRIPTION	Job class description as specified on the EXTSUM statement.
ACTIVE JOBS AVG	Average number of jobs active in a given class during the Extractor interval.
ACTIVE JOBS END	Number of jobs active in a given job class at the end of the Extractor interval.
ACTIVE JOBS % CPU	Average percent of CPU busy time used by a given job class during the Extractor interval.
COMPLETED JOBS	Total number of jobs completed for a given job class during the Extractor interval.
COMPLETED STEPS	Total number of job steps completed for a given job class during the Extractor interval.
PERFORMANCE GROUP	Performance group as specified on the EXTSUM PG parameter.
SUMMARY PERIODS	Performance periods as specified on the EXTSUM PP parameter.
WORKLOAD DESCRIPTION	Description as specified on the EXTSUM PD parameter.
RESPONSE TIME	Average response time for all transactions that ended in the specified period or periods.
TRANSACTIONS PER/SEC	Average number of transactions per second during the Extractor interval for the specified period or periods.

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Table 3-56 Field Descriptions for the Extractor Summary Report (continued)

Field	Description
TRANSACTIONS TOTAL	Total number of transactions during the Extractor interval for the specified period or periods; M indicates units of 1000.
EXECUTION VELOCITY	Rate at which transactions are executing.
CPU SERVICE PER/SEC	Average number of CPU service units per second used during the Extractor interval for the specified period or periods.
CPU SERVICE SU/1000	Total number of CPU service units, in thousands, used during the Extractor interval for the specified period or periods.
POLICY	Named set of performance goals workload manager uses as a guideline to match resources to work.
ACTIVATED	Date and time the service policy became active.
INTERVAL	Workload interval. This value usually is the same as the Extractor recording interval, but it may be shorter if the policy changed in the middle of an Extractor recording interval.
SERVICE CLASS	Group of work with the same performance goals, resource requirements, or business importance. Service class names are taken from the workload policy. For a service class to show up in this report, it must – be listed in the service policy. – be listed in the SRVCLASS parameter of the EXTSUM Extractor control statement. – have at least one active address space during the interval.
DESCRIPTION	Description given for the service class in the active policy, which is specified when the service class is defined. This field is blank if the service class description in the policy is blank.
WORKLOAD	Name given to the workload to which this service class belongs. A workload is a group of work that is tracked, managed, and reported as a unit. It is usually a grouping of similar service classes.
RESOURCE GROUP	Resource group defined for the service policy. The resource group determines the amount of processing capacity across one or more MVS images assigned for this service class. If no resource group is defined, this field is blank.
PERIODS	Number of periods defined for this service class. A service class can have up to 8 periods defined for it. This field shows the actual number of periods the service class contains, even if you did not specify all of those periods on the SRVCLASS parameter of the EXTSUM Extractor control statement.
PER	Service class period being reported on for the row of information that follows it. If an individual period has no active address spaces for the interval, it contains a zero, which is its average number of address spaces. If none of the periods for a service class has an active address space, the service class is not listed. For more information about service class periods, see Appendix A, Measure and Trace Values.
IMP	Importance level assigned to this goal.
PERF INDX	Performance index for this service class. The performance index is a relative calculation to determine how well your service classes are meeting their goals.

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Table 3-56 Field Descriptions for the Extractor Summary Report (continued)

Field	Description
AVG NO ADR SPCS	Average number of address spaces for the interval for the specific service class and period. If the value in this field is zero and no other data is printed in this row, no address spaces were active, and no other information for this period is printed. If this number is zero for all periods within a service class, no information about that service class is printed. The average number is based on the MVS WLM sampling rate, which is currently 250 milliseconds.
TRANSACTIONS – PER/SEC	Number of transactions executed for a period divided by the number of seconds in the workload interval. If this field contains a value of 0.0, it may indicate the service class includes started tasks or batch jobs, but there are not enough significant digits to display the true number. This field is blank only if no transactions executed.
TRANSACTIONS – TOTAL	Total number of transactions that executed during the workload interval.
RESPONSE TIME – GOAL	First column in this field contains the goal for the response time, in seconds. The second column in this field contains the percentage of jobs that should meet or exceed that goal. Note: For an average response time goal, only the first column (response time) contains information. For a percentage response time goal, both columns (response time and the percentage) contain information.
RESPONSE TIME – AVERAGE	Average response time for the goal. The value in this field is displayed as mmmm:ss.hh, where mmmm is minutes, ss is seconds, and hh is hundredths of seconds. This value may be quite large for a particular service class if the transaction length for a started task is the length of the started task. Asterisks (****) appear in this field if the number is too large to be printed.
EXECUTION VELOCITY – GOAL	Goal for the execution velocity of a service class that has been defined with an execution velocity goal. For service classes with goals other than execution velocity goals, this field is blank.
EXECUTION VELOCITY – ACTUAL	Actual execution velocity for the service class.
CPU USING	Number of samples during which this service class was using CPU.
EXE DELAY	Total number of samples during which an execution delay was detected.
TOTAL SERVICE UNITS – PER/SEC	Number of service units used per second. This value includes all service units collected by WLM (TCB, IOC, central storage, and SRB).
TOTAL SERVICE UNITS – SU/1000	Total number of service units used by the service class during the workload interval, divided by 1000.

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Graphics Trace Detail Report

The Graphics Trace Detail Report is produced by using the GRAPH TYPE=TRACE Analyzer control statement (see “GRAPH” on page 2-56). Up to 12 measures can be specified. If more than 12 are specified, only the first 12 measures are used. Data is gathered for the Graphics Trace Detail Report by using the TRACE76 Extractor control statement (see “TRACE76” on page 1-71).

Each measure selected is represented by a column in the report. The measures are printed in the same sequence as they appear in the GRAPH command.

One line of values is produced for each date and time interval specified on the GRAPH command. If the default time interval is used, one line is produced for each sample cycle section encountered in the input data record.

If the TRCETYPE parameter is not used in parallel with the TYPE=TRACE parameter, a separate report is generated with all six characteristics printed in the body of the report for each trace measure that does not have a corresponding characteristic value. Consequently you can generate 12 separate reports with 1 graph control statement.

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A sample of this report is shown in Figure 3-45.

Figure 3-45 Graphics Trace Detail Report

```
 PRODUCED BY CMF ANALYZER (5.5.00)                    GRAPHICS TRACE DETAIL REPORT                      RPTSEQ     3 PAGE      5
 BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 12 JUN 03 10.24
 ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


   CPU ENVIRONMENT REQUESTED:  CPU  0
   DATE     TIME    CCVUTILP CCVUTILP CCVUTILP CCVUTILP CCVUTILP CCVUTILP
                       MIN      AVG      MAX      END      STD      DIF
10JUN 03  09.00.00      0.00     8.65    38.00     3.00     9.23     0.00
          09.01.00      0.00     3.92    29.00     4.00     4.18     0.00
          09.02.00      0.00     7.43    38.00     4.00     8.39     0.00
          09.03.00      0.00     8.75    40.00    11.00     8.49     0.00
          09.04.00      2.00     8.43    38.00    14.00     6.44     0.00
          09.05.00      2.00     6.82    35.00     8.00     5.42     0.00
          09.06.00      0.00     6.32    38.00     8.00     6.55     0.00
          09.07.00      0.00     6.05    38.00    12.00     8.12     0.00
          09.08.00      0.00     4.42    21.00     3.00     4.79     0.00
          09.09.00      0.00     4.08    12.00    10.00     2.92     0.00
          09.10.00      0.00     3.98    28.00     2.00     4.21     0.00
          09.11.00      0.00     4.78    35.00    13.00     6.81     0.00
          09.12.00      0.00     4.72    51.00     3.00     7.86     0.00
          09.13.00      0.00     5.03    14.00     3.00     3.84     0.00
          09.14.00      0.00     6.26    67.00    67.00     9.49     0.00
          09.15.00      0.00     7.20    36.00     2.00     7.82     0.00
          09.16.00      0.00     9.27    41.00    10.00    10.37     0.00
          09.17.00      0.00     4.88    50.00     4.00     7.52     0.00
          09.18.00      0.00     5.33    37.00    37.00     7.14     0.00
          09.19.00      0.00     3.60    27.00    11.00     4.01     0.00
          09.20.00      0.00     4.22    24.00     2.00     3.93     0.00
          09.21.00      0.00     4.58    45.00     8.00     6.71     0.00
          09.22.00      0.00     3.77    34.00     0.00     5.22     0.00
          09.23.00      0.00     3.50    15.00     4.00     3.11     0.00
          09.24.00      0.00     5.28    38.00    12.00     6.34     0.00
          09.25.00      0.00     5.50    34.00     3.00     5.67     0.00
          09.26.00      0.00     4.93    35.00     4.00     5.00     0.00
          09.27.00      0.00     6.83    96.00     8.00    12.92     0.00
          09.28.00      0.00     5.20    36.00    14.00     6.61     0.00
          09.29.00      0.00     7.23   100.00   100.00    13.45     0.00
          09.30.00      0.00    12.62   100.00    12.00    17.92     0.00
          09.31.00      0.00     7.37    66.00    13.00    11.14     0.00
          09.32.00      0.00     8.72    56.00     3.00    11.48     0.00
          09.33.00      0.00     3.62    42.00    42.00     5.73     0.00
          09.34.00      0.00     5.52    60.00    10.00     9.04     0.00
          09.35.00      0.00     4.72    23.00    12.00     4.14     0.00
          09.36.00      0.00     3.33    14.00    12.00     3.16     0.00
          09.37.00      0.00     6.15    36.00     4.00     6.36     0.00
          09.38.00      0.00     5.22    32.00     3.00     4.98     0.00
          09.39.00      0.00     4.03    41.00     2.00     7.00     0.00
          09.40.00      0.00     4.58    30.00     4.00     5.82     0.00
```

Graphics Trace Detail Report Field Description

Table 3-57 describes the field in the Graphics Trace Detail Report.

Table 3-57 Field Description for the Graphics Trace Detail Report

Field	Description
CPU ENVIRONMENT REQUESTED	CPU selected in GRAPH control statement.

Measure values for the Graphics Trace Detail Report are described in *CMF MONITOR Batch User Guide*, “Measure and Trace Values”.

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HFS Statistics Report

The HFS Statistics Report provides information about caching by HFS buffer pools and mounted file systems.

The HFS Statistics Report is produced by using the HFS Analyzer control statement. The data for this report is obtained by using the HFS Extractor control statement.

This report consists of three sections:

Global Statistics
Displays storage used by all buffer pools and overall caching of metadata and the first page of files.

Buffer Pool Statistics
For each buffer pool, displays storage used and I/O activity between buffers and DASDs.

File System Statistics
For each mounted file system, displays storage used, I/O requests of files, caching of metadata, index, and the first page of files.

Note: This section is formatted only if the FSNLIST= parameter is specified on the HFS Extractor control statement.

The report may issue error message

```
ERROR: bad-data UNAVAILABLE RC=cccccccc-rrrrrrrr
```

where bad-data is BUFFER LIMITS, BUFFER STATS, or STATISTICS. The return code cccccccc and the last four digits of reason code rrrrrrrr are documented in the *OS/390 UNIX System Services Messages and Codes* manual.

An example of the HFS Statistics Report is shown in Figure 3-46.

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Figure 3-46 HFS Statistics Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                          HFS STATISTICS REPORT
 BMC SOFTWARE, INC.                                              XYZ COMPANIES
 ACTL 10 JUN 03 08.15.00  10 JUN 03 08.30.00               WORLDWIDE HEADQUARTERS

 BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74/1/0/.25
 ------------------------------------------------------ GLOBAL STATISTICS ----

 ---------- STORAGE (MB) -----------   ------------------------ I/O ACTIVITY ---
         -- LIMITS --   -- IN USE --           ----- FILE 1ST PAGE ------   ----
                                                 RATE    COUNT   HIT RATIO    RAT
 TOTAL   MAX       71          70.89   CACHE   0.330      297        56.3   2.73
 FIXED   MIN        0              0   DASD    0.257      231               0.26

 ------------------------------------------------------ BUFFER POOL STATISTICS -

                   -------------- STORAGE --------------   ------------- I/O ACT
 BUFFER     DATA   BUFFERS     PAGES     BYTES   % FIXED   --- TOTAL ----   ---
   SIZE   SPACES                                            RATE    COUNT    RAT
      1        1       365       365    1,460K         0   0.468      421
      4        1        14        56      224K         0   0.024       22
     16        1       176     2,816   11,264K         0   0.279      251
     64        1       233    14,912   59,648K         0   0.616      554   0.06

 ------------------------------------------------------ FILE SYSTEM STATISTICS -
 FILE SYSTEM - BMVPTR.I.WAS.NEVER.MOUNTED                      MOUNTED: ---

 FILE SYSTEM - BMVPTR.USS.FILE.SYSTEM                          MOUNTED: 06/14/199
 STORAGE     - ALLOCATED: 86,400K   USED: 83,440K   ATTR DIR:    132K   CACHED:

 ------- DATA I/O --------            -1ST PAGE I/O-   -METADATA I/O-   -- INDEX
             RATE    COUNT             RATE    COUNT    RATE    COUNT    RATE
 SEQUENTIAL 0.208      187   CACHE    0.103       93   0.003        3   1.150
 RANDOM         0        0   DASD     0.238      214       0        0   0.001
                            HIT RATIO 30.3              100             99.9

FILE SYSTEM - SYSI.IBMOEM.SMS.OS270.GLDE.ETC                  MOUNTED: 06/13/199
 STORAGE     - ALLOCATED:  5,040K   USED:    820K   ATTR DIR:     96K   CACHED:

 ------- DATA I/O --------            -1ST PAGE I/O-   -METADATA I/O-   -- INDEX
             RATE    COUNT             RATE    COUNT    RATE    COUNT    RATE
 SEQUENTIAL 0.008        7   CACHE    0.108       97   2.727    2,454   3.719
 RANDOM         0        0   DASD     0.006        5   0.238      214   0.094
                            HIT RATIO 95.1             92.0             97.5
```

HFS Statistics Report Field Descriptions

Table 3-58 describes each field in the Global Statistics section of the HFS Statistics Report.

Table 3-58 Field Descriptions for the Global Statistics section

Field	Description
STORAGE (MB)	Virtual storage (in megabytes) of HFS buffers at the end of the duration of the report.
TOTAL	LIMITS - MAX Maximum amount of virtual storage that HFS buffers should use. This value is specified by the VIRTUAL(max) parameter in BPXPRMxx member or the USS CONFIGHFS command. IN USE Total amount of virtual storage in use by all HFS buffer pools.
FIXED	LIMITS - MIN Minimum amount of fixed storage for HFS buffers. This value is specified by the FIXED(min) parameter in BPXPRMxx member or the USS CONFIGHFS command. IN USE Total amount of fixed storage in use by all HFS buffer pools.

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Table 3-58 Field Descriptions for the Global Statistics section (continued)

Field	Description
I/O ACTIVITY	I/O activity of metadata and the first page of files
FILE 1ST PAGE	CACHE - RATE Average number of times per second the first page of a data file was requested and found in virtual storage (cache). CACHE - COUNTNumber of times the first page of a data file was requested and found in cache. HIT RATIO Percentage of times the first page of a data file was requested and found in cache. DASD - RATE Average number of times per second the first page of a data file was requested and not found in cache and an I/O was necessary. DASD - COUNTNumber of times the first page of a data file was requested and not found in cache and an I/O was necessary.
METADATA	CACHE - RATE Average number of times per second metadata was found in cache during file lookup. CACHE - COUNTNumber of times metadata was found in cache during file lookup. HIT RATIO Percentage of times metadata was found in cache during file lookup. DASD - RATE Average number of times per second metadata was not found in cache during file lookup and an index call was necessary which can result in I/O. DASD - COUNT Number of times metadata was not found in cache during file lookup and an index call was necessary which can result in I/O.

Table 3-59 describes each field in the Buffer Pool Statistics section of the HFS Statistics Report.

Table 3-59 Field Descriptions for the Buffer Pool Statistics section

Field	Description
BUFFER SIZE	Size (in pages) of each buffer in the buffer pool
DATA SPACES	Number of data spaces allocated for the buffer pool.
STORAGE	BUFFERS PAGES BYTES Total amount of virtual storage in use by the HFS buffer pool in units of buffer, page, and byte. % FIXED Percentage of buffer pool in permanently fixed storage.
I/O ACTIVITY	I/O activity between buffer pools and DASDs. TOTAL Rate per second and count of all I/O requests. FIXED Rate per second and count of I/O requests where a buffer was already fixed prior to I/O. % FIXED Percentage of I/O requests where a buffer was already fixed prior to I/O.

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Table 3-60 describes each field in the File System Statistics section of the HFS Statistics Report.

Table 3-60 Field Descriptions for the File System Statistics section

Field	Description
FILE SYSTEM	Name of the MVS HFS data set containing the file system. MOUNTED Date and time (mm/dd/yyyy hh:mm:ss) when the file system was last mounted. If mount time changed (that is, the file system was remounted), an asterisk is displayed after the time. If the file system was never mounted, three dashes are printed. DURATION Sum of recording intervals (ddd.hh.mm.ss) during which statistics for the file system were collected. This is the divisor in the calculation of all Rate columns.
STORAGE	ALLOCATED Amount of storage on DASDs allocated to the file system. USED Amount of storage on DASDs actually used by the file system. ATTR DIR Amount of storage on DASDs used by the file system for attribute directory. CACHED Amount of storage in HFS buffer pools cached for this file system.
DATA I/O	Rate per second and count of sequential and random I/O requests of files.
1ST PAGE I/O	CACHE Rate per second and count of requests for the first page of a file where it was found in cache. DASD Rate per second and count of requests for the first page of a file where it was not found in cache and I/O was necessary. HIT RATIO Percentage of requests for the first page of a file where it was found in cache.
METADATA I/O	CACHE Rate per second and count of requests for metadata where it was found in cache during file lookup. DASD Rate per second and count of requests for metadata where it was not found in cache during file lookup. HIT RATIO Percentage of requests for metadata where it was found in cache during file lookup.
INDEX I/O	CACHE Rate per second and count of requests for index page where it was found in cache. DASD Rate per second and count of requests for index page where it was not found in cache. HIT RATIO Percentage of requests for index page where it was found in cache.
INDEX EVENTS	NEW LEVELS Number of times a new level was added to the index structure. SPLITS Number of times an index page was split into two pages. JOINS Number of times two index pages were combined into one page.

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HTTP Server Report

The HTTP Server Report provides information about the activities of HTTP servers. The information can be used to analyze problem servers and to view performance data.

The report consists of two parts:

HTTP Server Summary Report Summarizes the characteristics and activity for each server.

HTTP Server Details Report This part consists of these sections:

Server Characteristics (obtained from SMF type 103-1 record)

Server Activity (obtained from SMF type 103-2 record)

There is one Details report per server. Data in the subtype 1 records is reported in the Server Characteristics only if there is at least one corresponding subtype 1 record.

Note: In this report all rates are per second and all averages are based on counts divided by the number of samples taken during the report period.

Figure 3-47 HTTP Server Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    HTTP SERVER SUMMARY REPORT                        RPTSEQ     4 PAGE      6
BMC SOFTWARE, INC.                                           XYZ COMPANY                               REPORT DATE: 10 JUN 03  9.43
                                                       WORLDWIDE HEADQUARTERS                          SYSTEM ID: Z0       * N/A *

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  103-1/7/0/0  103-2/29/27/4.44
-----------------------------------------------------------------------------------------------------------------------------------
                                 AVAILABLE    REQUEST  RESPONSE  THROUGHPUT RATE    THREADS    CACHE SIZE   CACHE FILES  TIMEOUTS
SERVER NAME                      HHH.MM.SS      RATE     RATE       IN     OUT     MAX  USED    MAX  USED    MAX  USED

Z0EIP.PDL.POK.IBM.COM              1.20.33      4.21     4.21   860.70  19,151     200 64.67  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              0.17.43     20.59    20.59    4,087  103.3K     200 48.50  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              0.28.11     16.25    16.25    3,173  43,174     200 48.50  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              0.20.26     54.67    54.67   10,217  113.7K     200 48.50  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              0.48.41     11.23    11.23    2,003  21,195     200 24.25  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              1.25.46     16.00    16.00    2,948  32,755     200 16.17  5,120     0     NO     0         0
Z0EIP.PDL.POK.IBM.COM              0.00.00         0        0        0       0     200     0  5,120     0     NO     0         0
```

HTTP Server Summary Report Field Descriptions

Table 3-61 describes each field in the HTTP Server Summary Report.

Table 3-61 Field Descriptions for the HTTP Server Summary Report

Field	Description
SERVER NAME	Server name.
AVAILABLE	Total time (hhh.mm.ss) the server was available during the interval.

Table 3-61 Field Descriptions for the HTTP Server Summary Report (continued)

Field	Description
REQUEST RATE	Number of requests that the HTTP server has successfully served per second.
RESPONSE RATE	Number of successful responses sent per second.
THROUGHPUT RATE	Number of bytes received or sent by this server per second.
THREADS	MAX Maximum number of threads the server can have in the thread pool (or NO if no limit has been specified). USED Number of currently active threads of the server. This is an average for the report period.
CACHE SIZE	MAX Maximum cache size (KB) for this server. USED Average cache size used by this server. This is an average for the report period.
CACHE FILES	MAX Maximum number of files allowed in the cache of this server. USED Average number of files cached for this server. This is an average for the report period.
TIMEOUTS	Number of timeouts on the server.

Figure 3-48 HTTP Server Detail Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    HTTP SERVER DETAILS REPORT                        RPTSEQ     5 PAGE      7
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03  9.43
                                                      WORLDWIDE HEADQUARTERS                          SYSTEM ID: Z0       * N/A *

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  103-1/7/0/0  103-2/29/27/4.44
------------------------------------------------- SERVER CHARACTERISTICS SECTION -------------------------------------------------

NAME:       Z0EIP.PDL.POK.IBM.COM                SERVER ROOT IN HFS: /usr/lpp/internet/server_root
IP-ADDRESS: 9.12.17.38                           STARTUP:            06/10/2003-08.46.56
PORT:       80                                   SECURITY TYPE:      1
TYPE:       PROXY                                SSL-PORT:           443
APPL-LVL:   V5R3M0

--------- FLAGS ---------     ------- RESOURCES ------                        ------- CACHE -------     -- TIMEOUT THRESHOLDS --
DNS LOOKUP             NO     MAX BUFFER       102,400                        CACHE              NO     INPUT                330
ACL SETTINGS           NO     MAX THREADS          200                        MAX SIZE        5,120     OUTPUT             3,600
META FILE             YES                                                     MAX FILES          NO     SCRIPT               600
DIRECTORY ACCESS       NO     -- GARBAGE COLLECTION --                        LIMIT 1           200     IDLE THREADS           0
SERVER IMBEDS HTML    YES     ENABLED               NO                        LIMIT 2         4,000     CACHE LOCK         1,200
NORMAL MODE           YES     INTERVAL          10,800                        TIME MARGIN       120
GMT                    NO     MEMORY USE           500                        KEEP EXPIRED      YES
PROXY                 YES                                                     CONNECT            NO

------------------------------------------------------ SERVER ACTIVITY SECTION ------------------------------------------------

------------- ACTIVITY ------------     - REQUEST TYPES -     ------ THREADS ------     -- CACHE USAGE --  ---- MISCELLANEOUS ---
                   COUNT    RATE     GET        20,347     MAX               200     KBYTES READ     0  TIMEOUTS            0
REQUESTS          20,353    4.21     POST            0     USED            64.67     HITS            0  CONNECTIONS      4,561
REQUESTS DISCARDED     0       0     CGI         2,268     NON-SSL WAIT    16.17     IN USE          0
REQUESTS IN ERROR      0       0     GWAPI       6,776     SSL WAIT        80.83     FILES           0
RESPONSES         20,353    4.21                           ASYNC I/O WAIT      0
RESPONSES DISCARDED    0       0                           MSG QUEUE WAIT      0

----------- THROUGHPUT ------------     ------------- RESPONSE TIMES --------------     ------------- ERROR STATISTICS ----------
                   BYTES    RATE                        MIN      MAX      AVG       200 (OK)                            20,353
IN             4,159,740  860.70     DNS LOOKUP            0        0        0       302 (MOVED TEMPORARILY)                0
OUT           92,558.4K  19,151     SERVICE PLUGIN     0.002  230.629   39.097       401 (UNAUTHORIZED)                     0
UNKNOWN               0       0     CGI                1.304   56.539   14.319       403 (FORBIDDEN)                        0
                                    SSL HANDSHAKE         0        0        0       404 (NOT FOUND)                        0
                                    PROXY                 0        0        0       407 (PROXY UNAUTHORIZED)               0
                                                                                    500 (INTERNAL SERVER ERROR)            0
```

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HTTP Server Detail Report Field Descriptions

Table 3-62 describes each field in the HTTP Server Detail Report.

Table 3-62 Field Descriptions for the HTTP Server Detail Report

Field	Description
Server Characteristics - Configuration Data	
NAME	Server name
IP-ADDR	IP address of the host on which this HTTP server is executing.
PORT	Port number this HTTP server listens to.
TYPE	Server role. HTTP Simple or normal HTTP server PROXY Proxy server CACHING Caching server CACHING PROXY Caching proxy UNKNOWN Unknown server role
APPL-LVL	HTTP server version and release levels.
SERVER ROOT IN HFS	Directory path and filename for server_root.
STARTUP	Server startup date/time.
SECURITY TYPE	Security type.
SSL-PORT	Security (SSL) port.
Server Characteristics - Flags	
DNS LOOKUP	DNS lookup flag.
ACL SETTINGS	ACL settings.
META FILE	Meta file flag.
DIRECTORY ACCESS	Directory access flag.
SERVER IMBEDS HTML	Server embeds HTML flag.
NORMAL MODE	Normal mode flag.
GMT	GMT flag.
PROXY	Proxy flag.
Server Characteristics - Resources	
MAX BUFFER	Maximum size of content buffer.
MAX THREADS	Maximum number of threads the server can have in the thread pool.
Server Characteristics - Garbage Collection	
ENABLED	Indication whether garbage collection is enabled.
INTERVAL	Garbage collection interval in seconds.
MEMORY USE	Garbage collection memory usage.
Server Characteristics - Cache	
CACHE	Cache flag.

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Table 3-62 Field Descriptions for the HTTP Server Detail Report

Field	Description
MAX SIZE	Maximum cache size (KB).
MAX FILES	Maximum number of files in cache. NO indicates that there is no defined maximum.
LIMIT 1	Cache limit 1.
LIMIT 2	Cache limit 2.
TIME MARGIN	Cache time margin (seconds).
KEEP EXPIRED	Keep expired flag.
CONNECT	Cache connect flag.
Server Characteristics - Timeout Thresholds (in seconds)	
INPUT	Input timeout.
OUTPUT	Output timeout.
SCRIPT	Script timeout.
IDLE THREADS	Timeout for idle threads.
CACHE LOCK	Cache lock timeout.
Server Activity - Requests The fields are given as COUNT and RATE (COUNT per second).	
REQUESTS	Requests successfully processed by this server.
REQUESTS DISCARDED	Requests discarded as invalid by this server.
REQUESTS IN ERROR	Requests that this server responded to with an error.
RESPONSES	Number of responses successfully sent by this server.
RESPONSES DISCARDED	Responses this server was unable to send back to the client.
Server Activity - Request Types	
GET	Number of GET requests received by this server.
POST	Number of POST requests received by this server.
CGI	Number of CGI requests received by this server.
GWAPI	Number of GWAPI requests received by this server.
Server Activity - Threads	
MAX	Maximum number of threads as specified in the HTTP server configuration file on the MaxActiveThreads directive.
USED	Average number of threads used. This is an average for the report period.
NON-SSL WAITING	Number of non Secure Sockets Layer (SSL) threads available for use. If this value is 0, all non SSL threads are allocated.
SSL WAITING	Number of Secure Sockets Layer (SSL) threads available for use. If this value is 0, all SSL threads are allocated.
ASYNC I/O WAITING	If this server is running in Scalable Server mode, number of asynchronous I/O threads available for use. If this value is 0, all asynchronous I/O threads are allocated.

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Table 3-62 Field Descriptions for the HTTP Server Detail Report

Field	Description
MSG QUEUE WAITING	If this server is running in Scalable Server mode, number of message queue threads available for use. If this value is 0, all message queue threads are allocated.
Server Activity - Cache Usage	
KBYTES READ	Number of kilobytes read from the cache of this server.
HITS	Number of requests for files stored in the cache of this server.
IN USE	Average number of kilobytes (KB) of memory used by the cache for this server. This is an average for the report period.
FILES	Average number of files in the cache of this server. This is an average for the report period.
Server Activity - Miscellaneous	
TIMEOUTS	Number of timeouts on the server. This value is not affected by any configuration changes to this server.
CONNECTIONS	Number of connections this server has provided.
Server Activity - Throughput The fields are given as BYTES and RATE (BYTES per second).	
IN	Number of bytes sent to this server through requests.
OUT	Number of bytes sent by this server through responses.
UNKNOWN	Bytes that are not identified as part of a request.
Server Activity - Response Times (in seconds) The values are minimum, maximum and average response times.	
DNS LOOKUP	Time it takes to complete the search for a domain name in the Domain Name Server (DNS).
SERVICE PLUGINS	Time it takes to complete customized application functions.
CGI	Time it takes to complete Common Gateway Interface (CGI) programs.
SSL HANDSHAKE	Time it takes to complete the exchange of security information between the HTTP server and browser.
PROXY RESPONSE	If configured as a Proxy Web server: time it takes to complete a transaction between a browser, this proxy server, and the destination server.
Server Activity - Error Statistics Number of responses with a specific error code.	
ERROR	**Code Meaning** 200 OK 302 Moved temporarily 401 Unauthorized 403 Forbidden 404 Not found 407 Proxy unauthorized 500 Internal server error

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I/O Queuing Activity Report

The I/O Queuing Activity Report displays I/O configuration and activity data. It provides information about:

- The IODF (input/output definition file). This is a VSAM linear data set that contains I/O definition information.
- I/O processor utilization. One or more I/O processors are present for the channel subsystem. They manage and schedule I/O requests to devices within LCUs.
- For each Logical Control Unit or LCU, the mapping and activity of its channel paths and physical control units. For dynamically managed channel paths, additional information is available.

Use the IOQ (see “IOQ” on page 2-67) Analyzer control statement to produce the I/O Queuing Activity Report.

The data for this report is obtained by using the IOQ (see “IOQ” on page 1-44) and DEVICE (see “DEVICE” on page 1-23) Extractor control statements.

There are three sections to the I/O Queuing Activity Report:

- The IODF section
- The I/O Processor Utilization section
- The LCU Configuration and Activity section

Figure 3-49 shows an example of the I/O Queuing Activity Report.

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Figure 3-49 I/O Queuing Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    I/O QUEUING ACTIVITY REPORT                        RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                       BMC SOFTWARE, INC.                             REPORT DATE: 12 JUN 03 16.05
ACTL 10 JUN 03 16.57.26  10 JUN 03 18.25.00                 HOUSTON, TX.                               SYSTEM ID: SJSE     Z 1.02.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-3/18/1,748/1.46
------------------------------------------------------------ IODF SECTION -------------------------------------------------------

IODF = 68   CREATED = 06/10/2003-10.54.49   ACTION = POR

---------------------------------------------------- I/O PROCESSORS SECTION ----------------------------------------------------

        -INITIATIVE QUEUE-     ------ IOP UTILIZATION -------    -- % I/O REQUESTS RETRIED --    -------- RETRIES / SSCH ---------
         ACTIVITY    AVG Q     % IOP   I/O START    INTERRUPT           CP    DP    CU    DV              CP     DP     CU     DV
IOP        RATE      LNGTH      BUSY      RATE         RATE       ALL  BUSY  BUSY  BUSY  BUSY      ALL   BUSY   BUSY   BUSY   BUSY
---     ---------  -------     -----     -------      -------    ----  ----  ----  ----  ----    -----  -----  -----  -----  -----
 00        897.59     0.05      5.89      897.57       919.22    50.8  47.5   2.5   0.2   0.7     1.03   0.97   0.05      0   0.01
 01        391.36     0.03      2.84      391.36       431.54    46.0  42.0   3.4   0.1   0.6     0.85   0.78   0.06      0   0.01
 02      1,118.56     0.07      7.26     1,118.5      1,387.9    48.8  46.0   2.4   0.1   0.3     0.95   0.90   0.05      0   0.01

SUMMARY: 2,407.51     0.06      5.33     2,407.5      2,738.7    49.2  45.9   2.6   0.1   0.5     0.97   0.90   0.05      0   0.01

---------------------------------------------- LOGICAL CONTROL UNITS SECTION ----------------------------------------------

                           --- DCM ---  CHAN   CHPID    % DP   % CU  CONTNTN  DELAY Q  AVG SRVC  AVG IOQS
 LCU     CONTROL UNITS     MIN MAX DEF  PATH   TAKEN    BUSY   BUSY    RATE   LENGTH  TIME(MS)  TIME(MS)
----  --------------------  --- --- ---   --   -------  -----  -----  -------  -------  --------  --------
00DD  5505                                A8     0.034   3.19   0.53
      5506                                F4     0.012   8.45      0
      5505                                AC     OFFLINE
      5506                                F5     OFFLINE
                                         ****    0.047   2.91   0.13        0        0      27.7         0

00EC  8500                                EC     0.771  59.35   0.44
                                          F6     0.695  62.03   0.60
                                          97     1.988  55.07   0.20
                                          98     1.631  60.20   0.25
                                         ****    5.085  59.16   0.37    0.419    0.803      17.2       2.4

00EE  8700                                EC     4.651  19.79   0.10
                                          F6     3.623  23.01   0.06
                                          97     5.948  20.43   0.07
                                          98     5.000  22.11   0.11
                                         ****   19.221  21.34   0.09    0.428    0.121      67.6      16.1

00F9  A300                                F9     0.329   1.14      0
                                          FA     0.264   3.54      0
                                          F4     0.302      0      0
                                         ****    0.896   1.56      0        0        0

010E  C100                                47     0.123  46.38      0
                             1   1   2          0.440      0      0
                                         ****    0.562  23.19      0        0        0       5.6         0

011A  F800                                F8     0.129      0      0
                                         ****    0.129      0      0        0        0
```

I/O Queuing Activity Report Field Descriptions

Table 3-49 describes each field in the I/O Queuing Activity Report .

Table 3-63 Field Descriptions for the I/O Queuing Activity Report (Part 1 of 3)

Field	Description
IODF SECTION	
IODF	The two-character hexadecimal suffix for the IODF data set name.
CREATED	Date and time this IODF data set was created.
ACTION	Text indicating how this IODF data set was activated.
I/O PROCESSORS SECTION	
IOP	The I/O processor (IOP) numeric identifier. The IOP data section is sorted according ascending IOP numbers.

Table 3-63 Field Descriptions for the I/O Queuing Activity Report (Part 2 of 3)

Field	Description
Initiative Queue	For each IOP, there is one initiative queue.
ACTIVITY RATE	The rate, per second, at which the channel subsystem places requests on the I/O processor's initiative queue. Note that this rate may be greater than the actual I/O rate because of re-queued I/O requests.
AVG Q LNGTH	The average number of entries present on the initiative queue.
IOP Utilization	
% IOP BUSY	The ratio of the number of times the IOP was found busy and the total number of samples taken.
I/O START RATE	The rate, per second, at which I/O requests are initiated on this IOP.
INTERRUPT RATE	The rate, per second, at which interrupts are processed on this IOP.
% I/O Requests Retried	
ALL	The percentage of I/O requests that were retried for any reason. Includes all initial I/O requests and all requests that were retried.
CP BUSY	The percentage of I/O requests that were retried because of CHANNEL busy conditions. Includes all initial I/O requests and all requests that were retried.
DP BUSY	The percentage of I/O requests that were retried because of DIRECTOR PORT busy conditions. Includes all initial I/O requests and all requests that were retried.
CU BUSY	The percentage of I/O requests that were retried because of CONTROL UNIT busy conditions. Includes all initial I/O requests and all requests that were retried.
DV BUSY	The percentage of I/O requests that were retried because of DEVICE busy conditions. Includes all initial I/O requests and all requests that were retried.
Retries / SSCH	
ALL	The ratio of I/O requests that were retried for any reason vs. the number of initial I/O requests.
CP BUSY	The ratio of I/O requests that were retried because of CHANNEL busy conditions vs. the number of initial I/O requests
DP BUSY	The ratio of I/O requests that were retried because of DIRECTOR PORT busy conditions vs. the number of initial I/O requests
CU BUSY	The ratio of I/O requests that were retried because of CONTROL UNIT busy conditions vs. the number of initial I/O requests
DV BUSY	The ratio of I/O requests that were retried because of DEVICE busy conditions vs. the number of initial I/O requests
LOGICAL CONTROL UNITS SECTION	
LCU	The Logical Control Unit identifier is a 4-digit hexadecimal number. An LCU is a logical entity representing one or more physical control units.
CONTROL UNITS	The 4-digit hexadecimal number of each physical control unit pertaining to this LCU. An LCU may have up to four physical control units.

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Table 3-63 Field Descriptions for the I/O Queuing Activity Report (Part 3 of 3)

Field	Description
DCM MIN MAX DEF	The minimum and maximum number of DCM managed channels for this LCU for the reporting period. Also, the number of installation-defined managed channels for the LCU. These data are available only for LCUs with DCM managed channel paths. Additionally, for all DCM managed channel paths, the I/O activity rate, the director port contention, and the control unit contention are computed and shown. Note that these values may include managed channels that were only partially online.
CHAN PATH	The 2-digit hexadecimal number of each channel path assigned to this LCU. An LCU may have up to four channel paths. Four asterisks (****) in this column indicate a summary line for all channel paths connected to this LCU.
CHPID TAKEN	The rate, per second, of I/O requests handled by each CHPID during the reporting period. If a channel path was offline or moved offline or online during the reporting period, this column may contain the following:OFFLINENOW OFFLINENOW ONLINE
% DP BUSY	The percentage of I/O requests deferred because a director port was busy. This is a measure of director port contention.
% CU BUSY	The percentage of I/O requests deferred because the control unit was busy. This is a measure of control unit contention along each channel path.
CONTNTN RATE	The rate, per second, at which delayed I/O requests are placed on the Control Unit Header (CU-HDR) by the IOP
DELAY Q LENGTH	The average number of delayed I/O requests present on the CU-HDR.
The following are present only if SMF type 74-1 records are available	
AVG SRVC TIME (MS)	The average number of milliseconds it took to complete an I/O request for all devices attached to this LCU that were monitored by the device activity sampler.
AVG IOSQ TIME (MS)	The average number of milliseconds that I/O requests had to wait before a SSCH instruction was issued to queue the request, for all devices attached to this LCU that were monitored by the device activity sampler.

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Interval Bar Graph

The Interval Bar Graph (or histogram) is produced by using the GRAPH TYPE=PLOT Analyzer control statement (see “GRAPH” on page 2-56). The data in this graph can be used to pinpoint peaks and valleys in the performance of your system over time.

The Extractor control statements required for the Interval Bar Graph are dependent upon the information to be graphed. (See *CMF MONITOR Batch User Guide*, the section “Numeric List of Record Types” for information about the record types generated by each Extractor control statement and a description of the specific type of data collected by each Extractor control statement.)

The Interval Bar Graph is scaled to the largest LIMIT value specified in the Analyzer GRAPH statement. The default limit is 100. Up to 16 measures can be specified; each measure is represented on the graph by a different character.

One line on the graph is produced for each interval specified in the GRAPH statement. When more than one measure is represented, the character representing the smallest measure value during a single interval is displayed first on the line. If the interval default is used, one line is produced for each record interval encountered in the data.

The Interval Bar Graph is read from left to right. The value of each measure on the graph is determined by locating the rightmost character representing that measure; the value shown at that point is the value of the measure. For measures that have exactly the same value during a single interval, the character O is issued to indicate an overlap.

An example of the Interval Bar Graph is shown in Figure 3-50.

Figure 3-50 Interval Bar Graph

```
PRODUCED BY CMF ANALYZER (5.5.00)                    INTERVAL BAR GRAPH                        RPTSEQ    23 PAGE     58
BMC SOFTWARE, INC.                                       XYZ COMPANY                           REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00        WORLDWIDE HEADQUARTERS                    SYSTEM ID: SYSB     SP4.3.0


               * REPRESENTS TYP70CPU
               + REPRESENTS PAGESEC
               = REPRESENTS SWAPMIN
                 CPU ENVIRONMENT REQUESTED:  ALL CPU'S

  DATE     TIME                                          GRAPHIC DISPLAY OF INTERVAL TOTAL TIME

                              0        10        20        30        40        50        60        70        80        90       100
                             +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
10JUN 03 13.30.00             .++++++++++===================*****************.         .         .         .         .         .
         13.54.04             .++++++=======================*******************.         .         .         .         .         .
         14.00.00             .+++===============*****************************.         .         .         .         .         .
         14.30.00             .++++++===========================****************.         .         .         .         .         .
                             +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
```

Interval Bar Graph Field Descriptions

Table 3-64 describes each field in the Interval Bar Graph.

Table 3-64 Field Descriptions for the Interval Bar Graph Report

Field	Description
c REPRESENTS *xxxxxxx*	Character, *c*, used to represent various measures, *xxxxxxx*, selected in GRAPH statement.
DATE TIME	Date and time of intervals at which samplings of the measures were made.
GRAPHIC DISPLAY OF INTERVAL TOTAL TIME	Axis representing values for each measure, according to the far right character. This is not a continuum-type scale. Values may be percentages, numerical count, and so on, depending on the measure being scaled. See Appendix A, Measure and Trace Values for a description of each measure being reported.

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Kiviat Graph

The Kiviat Graph is produced by using the GRAPH TYPE=KIVIAT Analyzer control statement (see “GRAPH” on page 2-56). The shape inside the circle represents the overall performance of the measures specified in the GRAPH statement.

The Extractor control statements required for the Kiviat Graph are dependent upon the information to be graphed. (See *CMF MONITOR Batch User Guide*, the section titled “Record Types” for information about the record types generated by each Extractor statement and a description of the specific type of data collected by each Extractor statement.)

A sample of the Kiviat graph is shown in Figure 3-51. Each axis is labeled with the name specified on the GRAPH control statement. The actual value observed for each measure is printed as a number. A description of the value and a limit value (which corresponds to the circle for each measure) is also printed. If the graphed value exceeds the limit, the value is plotted on the circumference of the circle.

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A sample of the report is shown in Figure 3-51.

Figure 3-51 Kiviat Graph

```
PRODUCED BY CMF ANALYZER (5.5.00)                          KIVIAT GRAPH                                RPTSEQ    24 PAGE     59
BMC SOFTWARE, INC.                                          XYZ COMPANY                                REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SYSB     SP4.3.0

                 CPU ENVIRONMENT REQUESTED:  ALL CPU'S
                                                          TYP70CPU
                                        VAL =      39.12LIM =     100.00
                                                 ********.********
                                            ****                 ****
                                        *****                        *****
                                    *****                                ****
                                  **                                       **
                                 **                      .                   **
                                *                                              **
                               **                                                **
          SQA-AVG            **                                                  **   BTCH-MAX
          VAL =      34.49 .                                                     .  VAL =       5.00
          LIM =     100.00*                                .                      * LIM =     100.00
                          *                                                          *
                         *         .                                                  *
                        *                                                .            *
                       *                                                               *
                      *                                  *O                            *
                     *                    .             ****                 .          *
                     *                                 ******                            *
                    *                                 *********                           *
                    *                          .    ***********          .                *
                   *                            O**********.*                              *
                   *                            *************                              *
                   *                           ******.********   .                        *
                   *                           ***************                             *
                  *                           ***************O                            *
                  *                           *************+O                            *
                  *                          ******.**********     .                     *
                  *                        . O******************            .              *
                   *                 .       ******************                    .       *
                   *        .               **********.*******.                       .    *
CSA-AVG            .                         ********************                            *
VAL =      35.24  *                          ********************                          .    BTCH-AVG
LIM =     100.00  *                          ********************                          *    VAL =       2.77
                   *                         *********************                         *    LIM =     100.00
                   *                         ******.*************.*                         *
                    *                        ************************                        *
                     *                       ************************                       *
                      *                      ************************                      *
                       *                      *.**********************.                    *
                        *                     O*************************                   *
                         *                                ************O                   *
                          **                                                            **
                            **            .                          .              **
                              **                                                    *
                                **                                                **
                                                                                **
                       STC-AVG         *.                                     .***
                       VAL =      67.87  *****                        *****    STC-MAX
                       LIM =     100.00       ****                 ****         VAL =      70.00
                                                  *****************             LIM =     100.00
```

Kiviat Graph Field Description

Table 3-65 describes the field in the Kiviat Graph.

Table 3-65 Field Description for the Kiviat Graph

Field	Description
CPU ENVIRONMENT REQUESTED	CPU selected in GRAPH control statement.

Measure values for the Kiviat Graph are described in Appendix A, Measure and Trace Values.

Link Pack Area Report

The Link Pack Area report provides information about the use of the modified, fixed, and pageable link pack areas. This report can be used as a guide for determining where a link pack area module should reside and for packing the PLPA and MLPA to reduce page faults.

The Link Pack Area Report is produced by using the LINKPACK Analyzer control statement (see “LINKPACK” on page 2-69). The data for this report is obtained by using the LINKMAP (see “LINKMAP” on page 1-46) Extractor control statement and defining GBLS=YES to the REPORT Extractor control statement (see “REPORT” on page 1-58).

The Link Pack Area Report is divided into four sections with an optional fifth section:

Performance Statistics: Lists module counts for the MLPA, FLPA, and PLPA, in both the lower and extended areas. It also shows the user-supplied threshold rank for the run.

Link Pack Area Module Mapping: Lists LPA modules sorted by page address. The action flag included in this section marks LPA pages, which contain modules with different levels of activity. Such modules often are candidates for inclusion in the packlist.

Portion of the Link Pack Areas Selected for Potential Substitution into the Packlist: Lists all modules with a busy rank greater than the threshold rank, sorted in descending order by busy rank.

Time in Use: Lists all modules with a busy rank greater than zero. (One section each for the MLPA, FLPA, and PLPA.) You can use these reports to make decisions regarding packlist inclusion and FLPA module placement.

Map Error Log: This report is generated only when errors occur. Any of the following errors may be reported:

module name mismatch: More than one entry was found for the same location, but the module names were not the same.

module length mismatch: More than one entry was found for the same location, but the module length was not the same.

address mismatch: More than one entry was found for the same location, but the entry points were not the same.

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lower flag mismatch: More than one entry was found for the same location, but the characteristics of the entry were not the same. (State indicators.)

extended flag mismatch: More than one entry was found for the same location, but the extended characteristics of the entry were not the same. (Location and type indicators.)

unknown: A mismatch between at least two entries was found, but it could not be resolved into one of the previous categories.

If the LPA configuration was changed during the interval covered by the input data, two or more Link Pack Area reports are produced.

Note: This report requires the *xxx*-16 records written at CMF MONITOR Extractor initialization, where *xxx* is the SMF ID for the CMF MONITOR user records (the default is 240). To obtain the desired report, ensure that the input data includes the records written when extraction began. It is not necessary to include the reporting period of these records in the DATETIME or SHIFT ranges.

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An example of the Link Pack Area Report is shown in Figure 3-52.

Figure 3-52 Link Pack Area Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    LINKPACK AREA REPORT                        RPTSEQ    22 PAGE    164
BMC SOFTWARE, INC.                                        XYZ COMPANY                            REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 15.59.59         WORLDWIDE HEADQUARTERS                      SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-11/224/24.9K/6.99  240-16/5/0/0
-------------------------------------------------  PERFORMANCE STATISTICS  ---------------------------------------------
 MODULE COUNT:     PLPA    FLPA      MLPA       CSA                                  THRESHOLD RANK
    BELOW 16M     (339)     (0)       (1)      (24)                                        (0)
    ABOVE 16M     (873)     (2)       (6)      (36)

-------------------------------------------  LINKPACK AREA MODULE MAPPING SECTION  -------------------------------------
    ACTION  BUSY  MODULE  MODULE    PAGE      ACTION  BUSY  MODULE  MODULE    PAGE      ACTION  BUSY  MODULE  MODULE    PAGE
     FLAG   RANK   NAME   LENGTH   ADDRESS     FLAG   RANK   NAME   LENGTH   ADDRESS     FLAG   RANK   NAME   LENGTH   ADDRESS
               0 ISPKEY     1C68   54FE000               0 FLMXI     731C0   54D5000               0 FLMXI     731C0   54A6000
               0 IKJIFR00    C90   54FD000               0 FLMXI     731C0   54D4000               0 FLMXI     731C0   54A5000
               0 ISPISM     2358   54FD000               0 FLMXI     731C0   54D3000               0 FLMXI     731C0   54A4000
               0 ISPISM     2358   54FC000               0 FLMXI     731C0   54D2000               0 FLMXI     731C0   54A3000
               0 ISPISM     2358   54FB000               0 FLMXI     731C0   54D1000               0 FLMXI     731C0   54A2000
               0 IEAETEQ     428   54FA000               0 FLMXI     731C0   54D0000               0 FLMXI     731C0   54A1000
               0 ISPDTWIN   4BD8   54FA000               0 FLMXI     731C0   54CF000               0 FLMXI     731C0   54A0000
               0 ISPDTWIN   4BD8   54F9000               0 FLMXI     731C0   54CE000               0 FLMXI     731C0   549F000
               0 ISPDTWIN   4BD8   54F8000               0 FLMXI     731C0   54CD000               0 FLMXI     731C0   549E000
               0 ISPDTWIN   4BD8   54F7000               0 FLMXI     731C0   54CC000               0 FLMXI     731C0   549D000
               0 ISPDTWIN   4BD8   54F6000               0 FLMXI     731C0   54CB000               0 FLMXI     731C0   549C000
               0 IGWAMCS3    9D8   54F5000               0 FLMXI     731C0   54CA000               0 FLMXI     731C0   549B000

----------------------  PORTION OF LINKPACK AREAS SELECTED FOR POTENTIAL SUBSTITUTION INTO THE PACKLIST  ----------------------
                                          (MODULES WHOSE RANK EXCEED THE THRESHOLD RANK)
    MODULE    MODULE     BUSY         MODULE    MODULE     BUSY         MODULE    MODULE     BUSY         MODULE    MODULE     BUSY
     NAME     LENGTH     RANK          NAME     LENGTH     RANK          NAME     LENGTH     RANK          NAME     LENGTH     RANK
   ECNDLL     462C48      34         ACYAPCNP     7260       3         IKJEFT04     AFA8       2         IGC0002F     4120       1
   CSVEXPR      73F0      20         BPXINLPA    8E338       3         IKTLTERM     17D0       2         IGC00020     F510       1
   EUVPDLL    8CA658      18         EUVFDLL     F1638       3         IRRMNGR     26FA0       2         IGC00030     1008       1
   IEFW21SD    965D0      17         IGC0003E     B518       3         ISGLRELS     11D8       2         IGC0005E    135C8       1
   PSCLBSXP    1CF80      17         IGFDI0       A150       3         ISRPLEX      E748       2         IGC0009C     77E8       1
   ISPSUBS     DC8B0      14         IGG019BO      3A0       3         ISRPX        A0F8       2         IGG019BB      740       1
   IEFJRASP     1830      13         IGWBBMF1    641D0       3         IWMI2LPA    19750       2         IGG019FL      370       1
-----------------------------------------  MLPA MODULES BY TIME IN USE  ---------------------------------------------------
 % MLPA   MODULE    MODULE     LOAD     PAGE    FRAME  % MLPA      % MLPA   MODULE    MODULE     LOAD     PAGE    FRAME   % MLPA
ACTIVITY   NAME     LENGTH    ADDRESS  FIXED    USAGE   PAGE       ACTIVITY  NAME     LENGTH    ADDRESS  FIXED    USAGE    PAGE
                                        PCT            FAULTS                                                  PCT             FAULTS
100.00   XDC31      48B60    5BEEB18    0.0      4.0    0.0
----------------------------------------  PLPA MODULES BY TIME IN USE  ---------------------------------------------------
 % PLPA   MODULE    MODULE     LOAD     PAGE    FRAME  % PLPA      % PLPA   MODULE    MODULE     LOAD     PAGE    FRAME   % PLPA
ACTIVITY   NAME     LENGTH    ADDRESS  FIXED    USAGE   PAGE       ACTIVITY  NAME     LENGTH    ADDRESS  FIXED    USAGE    PAGE
                                        PCT            FAULTS                                                  PCT             FAULTS
  8.21   ECNDLL    462C48    2B5C000    0.0      7.0   16.7         0.72   IXGINLPA   E66E0    4CDA000    0.0      3.0    1.5
  4.83   CSVEXPR     73F0    2AE7000    0.0      1.0    0.0         0.48   EAGRTLIB   42508    5AF9000    0.0      1.0    0.0
  4.35   EUVPDLL   8CA658    30CE000    0.0     15.0    8.8         0.48   GDEIGCS    28980    3D5E000    0.0      2.0    1.0
  4.11   IEFW21SD   965D0    4141000    0.0     13.0    1.5         0.48   ICEMAN     11200     C7B000    0.0      2.0    1.0
  4.11   PSCLBSXP   1CF80     C4B000    0.0      1.0    8.3         0.48   IDA0192A   6F070    3F5D000    0.0      1.0    1.0
  3.38   ISPSUBS    DC8B0    564B000    0.0     12.0    1.5         0.48   IEEMB887    1C70    4081000    0.0      1.0    1.0
  3.14   IEFJRASP    1830    410C000    0.0      1.0    0.0         0.48   IEWLDR00   1F7D8    436B000    0.0      2.0    0.0
```

If an action flag (shown as ****) is displayed in this report, it may not require action. Sometimes the system automatically assigns smaller modules to whatever space is available in the PLPA page. In such situations, it may not be possible or desirable to make changes.

In the PLPA Modules by Time in Use section, the PAGE FIXED PCT value is calculated as

$$\text{Page Fixed Pct} = \frac{\text{\# of times at least one page was fixed for a module}}{\text{\# of times the module was active}}$$

In this same section, the PERCENT PAGE FAULTS value is calculated as

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$$\text{Percent Page Faults} = \frac{\text{page fault observations for the module in LPA}}{\text{page fault observations for all modules in LPA}}$$

Link Pack Area Report Field Descriptions

Table 3-66 describes each field in Link Pack Area Report.

Table 3-66 Field Descriptions for the Link Pack Area Report

Field	Description
MODULE COUNT	Number of modules in PLPA, FLPA, MLPA, or CSA.
PAGE FIXED PCT	Percentage of times (frequency) this module was observed in fixed pages (see text above for calculation). For OS/390 V2R10 and later, this field is blank.
THRESHOLD RANK	User-supplied value with two functions: to determine the level of activity a module must reach before being included in the substitution section; and to describe the allowable tolerance of differences in the busy ranks of modules in the same page.
ACTION FLAG	Four asterisks (****) are printed whenever a busy rank for a module sharing a page with another module has a difference greater than the user-supplied threshold value.
BUSY RANK	Number of references to a module.
MODULE NAME	Name of the link pack area module.
MODULE LENGTH	Length of the link pack area module in bytes.
PAGE ADDRESS	Hexadecimal address of the page that this module occupies in the link pack area.
% MLPA ACTIVITY	Percentage of MLPA activity caused by this module.
LOAD ADDRESS	Load address of this module.
PAGE FIXED PCT	Percentage of times (frequency) this module was observed in fixed pages.
FRAME USAGE	Number of pages in the module where BUSY RANK was greater than zero.
% MLPA PAGE FAULTS	Percentage of MLPA page faults caused by this module.
% PLPA ACTIVITY	Percentage of PLPA activity caused by this module.
% PLPA PAGE FAULTS	Percentage of PLPA page faults caused by this module.
% FLPA ACTIVITY	Percentage of FLPA activity caused by this module.
% FLPA PAGE FAULTS	Percentage of FLPA page faults caused by this module.

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Logical Partition Report

The Logical Partition Report shows the activity of logical partition (LPAR) management time incurred in a Processor Resource/Systems Manager (PR/SM) or Multiple Logical Processor Facility (MLPF) environment.

This report is produced by using the PRSM Analyzer control statement (see “COMBINE” on page 2-25) or the MDF Analyzer control statement (see “MDF” on page 2-72). The data for this report is obtained by using the CPU Extractor control statement (see “CPU” on page 1-14).

Figure 3-53 is an example of the LPAR Report.

Figure 3-53 Logical Partition Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    LOGICAL PARTITION REPORT                        RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                         XYZ COMPANY                               REPORT DATE: 12 JUN 03 16.36
ACTL 10 JUN 03 09.00.00  10 JUN 03 12.45.00           WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSC     02.09.00

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70-1/15/6,726/3.75
CPU FAMILY: 9672  VERSION: A5  MODEL: Z57
HOME PARTITION = SJSC              NUMBER OF PHYSICAL PROCESSORS =    7       DISPATCH INTERVAL = DYNAMIC
DURATION = DAYS:   0   HOURS:  3   MINUTES: 45   SECONDS:  0

                                                                  ------- LOGICAL PROCESSORS -------     --- PHYSICAL PROCESSORS ----
                                                                        ---- PERCENT DISPATCHED ----     ---- PERCENT DISPATCHED ----
                                     WAIT      WEIGHTING                          PARTITION                          PARTITION
  NAME                  STATUS      COMPLETION    FACTOR       NUM   EFFECTIVE  OVERHEAD   TOTAL      EFFECTIVE  OVERHEAD   TOTAL
--------            --------------  ----------  ----------     ----  ---------  --------- -------     ---------  --------- -------

CF01                ACTIVE          N/A         DED               2      99.92       0.01   99.93         28.55       0.00   28.55

SJSB                ACTIVE          NO                   20       3      19.23       0.55   19.78          8.24       0.24    8.48

SJSC                ACTIVE          NO                   15       4      10.80       0.64   11.43          6.17       0.36    6.53

SJSG                ACTIVE          NO                    3       2       3.98       0.79    4.77          1.14       0.23    1.36

SJSH                ACTIVE          NO                    8       2       4.72       0.68    5.40          1.35       0.20    1.54

SYSO                ACTIVE          NO                   15       3      41.53       0.20   41.73         17.80       0.09   17.89

VM5                 ACTIVE          NO                   10       2      20.54       1.74   22.28          5.87       0.50    6.37

          PARTITION UNATTRIBUTABLE                                                                                      2.01    2.01

          TOTAL                                                                                                    69.11       3.61   72.73
```

Logical Partition Report Field Descriptions

Table 3-67 describes each field in the LPAR Report.

Table 3-67 Field Descriptions for the Logical Partition Report

Field	Description
CPU FAMILY VERSION MODEL	CPU family, version, and model.
HOME PARTITION	Home partition where CMF MONITOR executed and collected the data used as the basis for this report. This home partition is highlighted throughout the report.
NUMBER OF PHYSICAL PROCESSORS	Average number of physical processors available to the complex.

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Table 3-67 Field Descriptions for the Logical Partition Report (continued)

Field	Description
DISPATCH INTERVAL	Average time slice, which is the time that each partition accesses the physical system before another partition is allowed to access it. This may be a value in milliseconds or the word DYNAMIC. If DYNAMIC, it means that the system determines the most effective dispatch interval based on system performance.
DURATION	Total length of all measurement intervals being reported.
NAME	Name of the partition which is displayed on this row. The home partition is highlighted. Note: There is only one row for each partition unless you have specified a criterion for splitting rows based on changes to the PR/SM or MLPF system (see "COMBINE" on page 2-25 for more information) and a change has occurred.
SHARE %	Displayed when you specify a DETAIL= operand in the PRSM control statement that causes new rows to generate based on changes to the PR/SM or MLPF system (see "COMBINE" on page 2-25 for additional information). A value is displayed in this column only if a change has occurred in the area and a split on this value has been specifically requested. The value displayed represents the percent of data record intervals contributing to this row's values and calculations. Note: This value may not be precisely the time interval percentage of the duration of the change, since the smallest time unit available to record the duration of the change is the Extractor record interval. For example, if you change the weighting factor for five minutes and then change it back and the Extractor record interval is one hour, an SMF type 70 record would indicate that a change had occurred to the weighting factor during an hour of data collection. There is no way to determine that the change lasted only five minutes.
STATUS	Two status flags are reported here: – Whether the partition is active (ACTIVE) or deactivated (DEACT). – Whether the partition is CAPPED. Capping limits the maximum share of the system complex to the weighting factor. Even if other partitions are idle, the system does not provide more system access to a partition that has reached its weighting factor.
WAIT COMPLETION	Wait completion attribute of nondedicated logical processors assigned to a partition. Possible values for this field are YES Processor dispatched to a partition remains dispatched until the time slice expires. NO Processor dispatched to a partition is returned to PR/SM and becomes available to other partitions as soon as the partition enters an enabled wait state. MIX Partition has a mixture of nondedicated logical processors with wait comp: letion attributes of YES and NO. N/A Partition has only dedicated processors.

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Table 3-67 Field Descriptions for the Logical Partition Report (continued)

Field	Description
WEIGHTING FACTOR	Dispatching weight assigned to a partition. Possible values for this field are nnn All logical processors are not dedicated and have the same weight of nnn. MIX All logical processors are not dedicated and they do not have the same weights. DED All logical processors are dedicated. DNE Partition has a mixture of dedicated and nondedicated processors; nondedicated processors have equal weights. DNN Partition has a mixture of dedicated and nondedicated processors; nondedicated processors do not have equal weights.
LOGICAL PROCESSORS – NUM	Average number of logical processors assigned to the partition.
LOGICAL PROCESSORS – EFFECTIVE	Percent of time that this partition was processing applications or waiting, if wait assist is enabled. This does not include time spent for partition management. This value is affected by the number of logical processors assigned to the partition.
LOGICAL PROCESSORS – PARTITION OVERHEAD	Percent of time this partition was performing partition management. This value is affected by the number of logical processors assigned to the partition.
LOGICAL PROCESSORS – TOTAL	Sum of effective and partition overhead. This value is affected by the number of logical processors assigned to the partition.
PHYSICAL PROCESSORS – EFFECTIVE	Percent of time that this partition was processing applications or waiting, if wait assist is enabled. This does not include time spent for partition management. This value is affected by the number physical processors available.
PHYSICAL PROCESSORS – PARTITION OVERHEAD	Percent of time this partition was performing partition management. This value is affected by the number of physical processors available.
PHYSICAL PROCESSORS – TOTAL	Sum of effective and partition overhead. This value is affected by the number of physical processors available.
PARTITION UNATTRIBUTABLE	Percent of time spent by the system in partition management that could not be assigned to a specific partition.
TOTAL	Overall sum of effective, partition overhead and effective and partition overhead values for both logical and physical processors running on your system.

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LOTUS DOMINO Server Report

The LOTUS DOMINO Server Report provides information about the activities of LOTUS DOMINO servers. The information may be used to analyze problem servers and to view performance data.

The report consists of two parts:

LOTUS DOMINO Server Summary Report The summary contains one line for each server.

LOTUS DOMINO Server Details Report This part consists of these sections:

- Server data (obtained from SMF type 108-1 and 108-3 records)
- Transaction activity (obtained from SMF type 108-1 and 108-3 records)
- Port activity (obtained from SMF type 108-1 and 108-3 records)

Configuration data is reported together with performance data. Configuration data is not reported if there is not at least one corresponding performance data record.

Note: In this report all rates are per second and all averages are based on counts divided by the number of samples taken during the report period.

Figure 3-54 LOTUS DOMINO Server Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                LOTUS DOMINO SERVER SUMMARY REPORT                    RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                       BMC SOFTWARE, INC.                           REPORT DATE: 12 JUN 03 18.42
ACTL 10 JUN 03 23.45.00  12 JUN 03 23.45.00                 HOUSTON, TX.                              SYSTEM ID: ML96     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  108-1/192/96/24  108-3/192/96/24
-------------------------------------------------------------------------------------------------------------------------------------
                                AVAILABLE  -- AVG. USERS -- -AVG-  TRANSACTION   ASYNC I/O RATE   --- MAIL RATE ---   - SMTP RATE -
SERVER NAME                     HHH.MM.SS  CONNECTED ACTIVE TASKS      RATE       READS   WRITES  DELIVERED     SENT   READS WRITES
------------------------------- ---------  --------- ------ -----  -----------  -------  -------  --------- --------  ------ ------
D01MLC83/01/M/IBM               024.00.00        138      2   258         8.77    26.31    14.71       0.27     0.05  49,710   0.01
D01MLC96/01/M/IBM               024.00.00        608     13   751        38.22   110.68    66.37       1.16     0.23    0.29   0.08
```

LOTUS DOMINO Server Summary Report Field Descriptions

Table 3-68 describes each field in the LOTUS DOMINO Server Summary Report.

Table 3-68 Field Descriptions for the LOTUS DOMINO Server Summary Report (Part 1 of 2)

Field	Description
SERVER NAME	Server name.
AVAILABLE	Total time (hhh.mm.ss) the server was available during the interval.

Table 3-68 Field Descriptions for the LOTUS DOMINO Server Summary Report (Part 2 of 2)

Field	Description
AVG. USERS - CONNECTED	Average number of connected users.
AVG. USERS - ACTIVE	Average number of active users.
AVG TASKS	Average number of tasks in use.
TRANSACTION RATE	Rate (per second) at which transactions were processed for the reporting period.
ASYNC I/O RATE - READS	Rate (per second) of asynchronous reads.
ASYNC I/O RATE - WRITES	Rate (per second) of asynchronous writes.
MAIL RATE - DELIVERED	Rate (per second) of Domino mail messages delivery to local users.
MAIL RATE - SENT	Rate (per second) of Domino mail messages sent to other servers.
SMTP RATE - READS	Rate (per second) of SMTP messages received from other servers.
SMTP RATE - WRITES	Rate (per second) of SMTP messages sent to other servers.

Figure 3-55 LOTUS DOMINO Server Detail Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                LOTUS DOMINO SERVER DETAILS REPORT                    RPTSEQ     7 PAGE     15
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 12 JUN 03  9.43
ACTL 10 JUN 03 23.45.00  12 JUN 03 23.45.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: ML96     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  108-1/192/96/24  108-3/192/96/24
-------------------------------------------------- SERVER ACTIVITY SECTION --------------------------------------------------
NAME: D01MLC83/01/M/IBM

--- USER ACTIVITY ---   ------ TASKS ------   ------------- MESSAGES -------------   --- ACCESS RATES ---   ---- DATABASE CACHE ----
LIMIT               0   HI WATER MARK   474   MAILBOXES                          2   AS I/O READ    26.31   STATUS                OK
CONNECTED         138   AVG IN USE      258                   COUNT  RATE AVG.SIZE   AS I/O WRITE   14.71   MAX ENTRIES          768
ACTIVE              2   MAX UPDATES       0   MAIL DELIVERED 23,055  0.27       57   POP3 READ          0   HIGH WATER MARK      706
 WITHIN  1 MIN     18   MAX REPLICS       0   MAIL SENT       4,091  0.05       75   IMAP READ          0   AVG ENTRIES IN USE   297
 WITHIN  3 MIN     34   COUNT REPLICS 2,184   SMTP RECEIVED  4,295M 49.7K       19   HTTP READ          0   AVG INITIAL OPENS  1,330
 WITHIN  5 MIN     48                         SMTP SENT         843  0.01       13   HTTP WRITE         0   AVG REJECTIONS         0
 WITHIN 15 MIN     94                                                                                         AVG CACHE HITS       599
 WITHIN 30 MIN    136
                        - VIRTUAL THREADS -   - PHYSICAL THREADS -                   --- AVAILABILITY ---   --- NSF BUFFER POOL ----
                        HI WATER MARK   355   HI WATER MARK     19                   THRESHOLD          0   MAX          268,435,456
                        AVG IN USE      139   AVG IN USE         0                   INDEX             86   AVG IN USE   267,665,340
                                              TOTAL             42

------------------------------------------------- TRANSACTION ACTIVITY SECTION -------------------------------------------------

MAXIMUM NUMBER OF CONCURRENT TRANSACTIONS: NO LIMIT

--------------- TOP 10 TRANSACTIONS, BY COUNT ------------------    ---------- TOP 10 TRANSACTIONS, BY TOTAL RESPONSE TIME ---------
                                      % OF   RATE  RESPONSE TIME                                          % OF   RATE  RESPONSE TIME
TYPE   NAME                     COUNT TOTAL  /SEC   AVG     TOTAL    TYPE   NAME                     COUNT TOTAL  /SEC   AVG     TOTAL
---- ---------------------   ------- ----- ----- -----  --------    ---- ---------------------   ------- ----- ----- -----  --------
     TOTAL                   757,565 100.0  8.77 14.02   10,621K         TOTAL                   757,565 100.0  8.77 14.02   10,621K

   1 OPEN_DB_RQST             99,708 13.16  1.15 1.750   174,529     142 START_SERVER_RQST        53,672  7.08  0.62 143.7  7,710.9K
  48 CLOSE_DB_RQST_ALT        91,795 12.12  1.06 0.947  86,910.3       8 UPDATE_NOTE_RQST_ALT     60,230  7.95  0.70 14.56   876,963
   6 OPEN_NOTE_RQST           74,326  9.81  0.86 5.290   393,187      35 WRITE_OBJECT_RQST        20,297  2.68  0.23 22.14   449,281
   8 UPDATE_NOTE_RQST_ALT     60,230  7.95  0.70 14.56   876,963       6 OPEN_NOTE_RQST           74,326  9.81  0.86 5.290   393,187
 142 START_SERVER_RQST        53,672  7.08  0.62 143.7  7,710.9K       1 OPEN_DB_RQST             99,708 13.16  1.15 1.750   174,529
  55 READ_ENTRIES_RQST        40,982  5.41  0.47 2.609   106,934     134 APPLY_FOLDER_REPL_OPS_R   7,685  1.01  0.09 22.67   174,188
 114 GET_REPLICA_MATCHES_RQS  28,791  3.80  0.33 0.002    68.740      34 READ_OBJECT_RQST         23,840  3.15  0.28 4.815   114,786
  23 DB_REPLINFO_GET_RQST     27,034  3.57  0.31 0.001    20.169      55 READ_ENTRIES_RQST        40,982  5.41  0.47 2.609   106,934
  34 READ_OBJECT_RQST         23,840  3.15  0.28 4.815   114,786      53 UPDATE_COLLECTION_RQST    8,296  1.10  0.10 10.50  87,073.0
  35 WRITE_OBJECT_RQST        20,297  2.68  0.23 22.14   449,281      48 CLOSE_DB_RQST_ALT        91,795 12.12  1.06 0.947  86,910.3

------------------------------------------------- PORT ACTIVITY SECTION -------------------------------------------------
MAXIMUM NUMBER OF CONCURRENT SESSIONS:  65,535
SESSION TIMEOUT:                        54,928

NAME     -- SESSIONS IN --  -- SESSIONS OUT --  ----- BYTES ----
            COUNT  RATE         COUNT  RATE       SENT  RECEIVED
TCPIP0    58,634  0.68         5,996  0.07     3,541M    1,144M
```

LOTUS DOMINO Server Detail Report Field Descriptions

Table 3-69 describes each field in the LOTUS DOMINO Server Detail Report.

Table 3-69 Field Descriptions for the LOTUS DOMINO Server Detail Report

Field	Description
NAME	Server name
User Activity	
LIMIT	Maximum number of users that are allowed to access the server. The value 0 means that there is no limit.
CONNECTED	Average number of connected users.
ACTIVE	Average number of active users.
WITHIN n MIN	Average number of connected users that have been active within the last 1, 3, 5, 15, and 30 minutes.
Tasks	
HI WATER MARK	Maximum number of tasks in use.
AVG IN USE	Average number of tasks in use.
MAX UPDATES	Maximum number of concurrent update tasks.
MAX REPLICS	Maximum number of concurrent replicator tasks.
COUNT REPLICS	Average number of replications initiated by server.
Messages	
MAILBOXES	Number of mail boxes.
MAIL DELIVERED	Number, rate per second, and average size of Domino mail messages delivered to local users.
MAIL SENT	Number, rate per second, and average size of Domino mail messages sent to other servers.
SMTP RECEIVED	Number, rate per second, and average size of SMTP mail messages received from other servers.
SMTP SENT	Number, rate per second, and average size of SMTP mail messages sent to other servers.
Access Rates	
AS I/O READ	Rate (per second) of asynchronous I/O reads.
AS I/O WRITE	Rate (per second) of asynchronous I/O writes.
POP3 READ	Rate (per second) of POP3 reads.
IMAP READ	Rate (per second) of IMAP reads.
HTTP READ	Rate (per second) of HTTP reads.
HTTP WRITE	Rate (per second) of HTTP writes.
Database Cache	
STATUS	Status of the database cache: either OK or ? (unknown)

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Table 3-69 Field Descriptions for the LOTUS DOMINO Server Detail Report

Field	Description
MAX ENTRIES	Maximum number of database entries allowed in cache at any one time.
HIGH WATER MARK	High water mark of database entries in cache.
AVG ENTRIES IN USE	Average number of database entries in cache.
AVG INITIAL OPENS	Average number of initial database opens.
AVG REJECTIONS	Average number of overcrowding rejections.
AVG CACHE HITS	Average number of database cache hits.
Virtual Threads	
HI WATER MARK	Maximum number of virtual thread pool threads.
AVG IN USE	Average number of virtual thread pool threads in use.
Physical Threads	
HI WATER MARK	Maximum number of physical thread pool threads.
AVG IN USE	Average number of physical thread pool threads in use.
TOTAL	Total number of physical thread pool threads used.
Availability	
THRESHOLD	Server availability threshold.
INDEX	Server availability index.
NSF Buffer Pool	
MAX	Maximum size (in bytes) of the NSF (Notes Storage Facility) buffer pool.
AVG IN USE	Average number of bytes of the NSF buffer pool in use.
Transaction Activity	
MAXIMUM NUMBER OF CONCURRENT TRANS	Limit for the number of concurrent transactions in a server.
Top-10 List of Transaction Types -- Sorted by COUNT and by R/T TOTAL.	
TYPE	Transaction type.
NAME	Transaction name.
COUNT	Number of transactions processed.
% OF TOTAL	Percentage of all transactions.
RATE/SEC	Rate (per second) of processed transactions.
RESPONSE TIME - AVG	Average response time (in seconds) of all completed transactions.
RESPONSE TIME - TOTAL	Total response time (in seconds) of all completed transactions.
Port Activity	
MAXIMUM NUMBER OF CONCURRENT SESSIONS	Maximum number of sessions that can run concurrently on the server.
SESSION TIMEOUT	Time limit (minutes) after which idle connections are terminated.
NAME	Port name.

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Table 3-69 Field Descriptions for the LOTUS DOMINO Server Detail Report

Field	Description
SESSIONS IN	Count and rate (per second) of incoming sessions established during the interval.
SESSIONS OUT	Count and rate (per second) of outgoing sessions established during the interval.
BYTES - SENT	Number of bytes sent to the network.
BYTES - RECEIVED	Number of bytes received from the network.

LOTUS DOMINO Database Activity Report

The LOTUS DOMINO Database Activity Report displays information, such as the number of documents created/deleted and database operations, for each database of the LOTUS DOMINO application server.

Use the DOMINO (see “DOMINO” on page 2-46) Analyzer control statement (specifying either TYPE=DATABASE or TYPE=ALL) to produce the LOTUS DOMINO Database Activity Report.

The data for this report is obtained from the SMF type 108-6 records that are created by the LOTUS DOMINO server.

Figure 3-56 shows an example of the LOTUS DOMINO Database Activity Report.

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Figure 3-56 LOTUS DOMINO Database Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)          LOTUS DOMINO DATABASE ACTIVITY REPORT          RPTSEQ     7 PAGE     89
BMC SOFTWARE, INC.                                  BMC SOFTWARE, INC.                    REPORT DATE: 16 JAN 03 20.21
ACTL 31 MAY 01 23.45.00  01 JUN 01 23.45.00            HOUSTON, TX.                       SYSTEM ID: ML96     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  108-1/192/96/24  108-2/205/96/24  108-3/192/96/24  108-6/198/96/24
-------------------------------------------------------------------------------------------------------------------------
                                                                    NO. OF       NO. OF       -- DOCUMENTS ---   TOTAL DB
DATABASE NAME                                                     OPERATIONS  REPLICATIONS   CREATED  DELETED   ACTIVITY

/d01mlc96/mail155/hilligra.nsf                                          0            0        121        0        121
/d01mlc96/mail39/richking.nsf                                           0            0        120        0        120
/d01mlc83/mail19/rekowal.nsf                                            0            0        119        0        119
/d01mlc96/mail36/markan.nsf                                             0            0        117        0        117
/d01mlc96/mail83/dnewlan.nsf                                            0            0        114        3        117
/d01mlc83/mail4/tbradley.nsf                                            0           45         71        0        116
/d01mlc83/mail46/mhoffsta.nsf                                           0           47         69        0        116
/d01mlc83/mail65/krtilley.nsf                                           0            0        116        0        116
/d01mlc96/mail81/croushor.nsf                                           0            0        116        0        116
/d01mlc83/mail15/drhoderi.nsf                                           0            0        115        0        115
/d01mlc83/mail56/fraserf.nsf                                            0            0        115        0        115
/d01mlc96/mail106/sadana.nsf                                            0            0        115        0        115
/d01mlc96/mail115/cusimano.nsf                                          0            0        115        0        115
/d01mlc96/mail27/rolfschm.nsf                                           0            0        115        0        115
/d01mlc96/mail72/elainew.nsf                                            0            0        115        0        115
/d01mlc96/mail85/ambrusod.nsf                                           2            0        113        0        115
/d01mlc83/mail60/rayricci.nsf                                           0           41         73        0        114
/d01mlc96/mail6/luannes.nsf                                             0            0        114        0        114
/d01mlc96/mail88/tmacey.nsf                                             0            0        114        0        114
/d01mlc83/mail34/rockyt.nsf                                             0            0        113        0        113
/d01mlc83/mail61/beattie.nsf                                            0           43         70        0        113
/d01mlc96/mail18/voltman.nsf                                            0            0        113        0        113
/d01mlc96/mail20/racfscr.nsf                                            0            0         88       25        113
/d01mlc83/mail22/cutler.nsf                                             0            0        112        0        112
/d01mlc83/mail37/jtison.nsf                                             0            0        112        0        112
/d01mlc96/mail55/efernand.nsf                                           0            0        112        0        112
/d01mlc96/mail67/muriels.nsf                                            0            0        112        0        112
/d01mlc96/mail70/lorettat.nsf                                           0            0        111        1        112
```

LOTUS DOMINO Database Activity Report Field Descriptions

Table 3-72 describes each field in the LOTUS DOMINO Database Activity Report.

Table 3-70 Field Descriptions for the LOTUS DOMINO Database Activity Report

Field	Description
DATABASE NAME	The name of the LOTUS DOMINO server.
NO. OF OPERATIONS	The number of indexing operations performed during the reporting period.
NO. OF REPLICATIONS	The number of database replications performed during the reporting period.
DOCUMENTS CREATED	The number of LOTUS DOMINO documents created in the database.
DOCUMENTS DELETED	The number of LOTUS DOMINO documents deleted from the database.
TOTAL DB ACTIVITY	The sum of the four preceding columns - total activity vs. the database.

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LOTUS DOMINO User Activity Report

LOTUS DOMINO User Activity Report displays information, such as the amount of CPU time and bytes read and written for each user of the LOTUS DOMINO application server.

Use the DOMINO (see “DOMINO” on page 2-46) Analyzer control statement (specifying either TYPE=USER or TYPE=ALL) to produce the LOTUS DOMINO User Activity Report.

The data for this report is obtained from the SMF type 108-2 records that are created by the LOTUS DOMINO server.

Figure 3-57 shows an example of the LOTUS DOMINO Database Activity Report.

Figure 3-57 LOTUS DOMINO User Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                LOTUS DOMINO USER ACTIVITY REPORT                    RPTSEQ     6 PAGE     11
BMC SOFTWARE, INC.                                     BMC SOFTWARE, INC.                             REPORT DATE: 16 JAN 03 20.21
ACTL 31 MAY 01 23.45.00  01 JUN 01 23.45.00               HOUSTON, TX.                               SYSTEM ID: ML96     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  108-1/192/96/24  108-2/205/96/24  108-3/192/96/24  108-6/198/96/24
-------------------------------------------------------------------------------------------------------------------------------------
                                  CONN                                                              - CPU -   -- NO. OF BYTES -
SERVER NAME                       TYPE   -- IP ADDRESS --   --------- DOMINO USER NAME ---------     (MS)       READ   WRITTEN

D01MLC96/01/M/BMC                 NRPC   9.117.165.174      CN=Abba King/OU=Southbury/O=BMC        575,177    1,311K   11,347K
D01MLC96/01/M/BMC                 SMTP   9.99.140.22                                               570,054   41,366K    1,120K
D01MLC83/01/M/BMC                 NRPC   9.242.197.238      CN=Rosemarie Okie/OU=Somers/O=BMC      457,044   454,364    149.1M
D01MLC96/01/M/BMC                 NRPC   9.117.73.244       CN=Lynne Swamp/OU=Houston/O=I          403,418    1,775K   43,927K
D01MLC96/01/M/BMC                 NRPC   9.45.56.141        CN=AUTO TEST1/OU=Houston/O=BMC         267,868   219,600    7,306K
D01MLC96/01/M/BMC                 NRPC   9.117.127.125      CN=D01HUB02/OU=01/OU=H/O=BMC           245,382    172.5M   74,445K
D01MLC83/01/M/BMC                 SMTP   9.37.3.210                                                237,674   15,774K   564,590
D01MLC83/01/M/BMC                 NRPC   9.117.127.108      CN=D01HUB01/OU=01/OU=H/O=BMC           234,339      370M    8,099K
D01MLC83/01/M/BMC                 SMTP   9.99.140.24                                               216,840   11,414K   572,656
D01MLC83/01/M/BMC                 SMTP   9.37.3.208                                                177,556   22,672K   319,250
D01MLC83/01/M/BMC                 SMTP   9.99.140.22                                               136,483   13,366K   244,858
D01MLC96/01/M/BMC                 NRPC   9.117.127.108      CN=D01HUB01/OU=01/OU=H/O=BMC           136,002    424.2M    1,873K
D01MLC83/01/M/BMC                 SMTP   9.117.200.23                                              132,549    7,441K   226,140
D01MLC96/01/M/BMC                 NRPC   9.14.6.41          CN=Michael Williams/OU=Houston/        124,549    6,655K      111M
D01MLC96/01/M/BMC                 NRPC   9.117.182.201      CN=Kristie Krisp/OU=Houston/O=I        113,657   429,098   66,914K
D01MLC96/01/M/BMC                 NRPC   9.14.6.44          CN=Kim Lee/OU=Sterling Forest/O=BMC    108,708    5,970K   85,570K
D01MLC96/01/M/BMC                 NRPC   9.14.6.45          CN=Heather Hendrson/OU=Endicott/O=IB    95,690    5,078K   65,867K
D01MLC96/01/M/BMC                 NRPC   9.117.76.149       CN=Jim Jones/OU=Houston/O=BMC           68,509   623,342   15,363K
D01MLC96/01/M/BMC                 NRPC   9.117.139.181      CN=George Dillman/OU=Houston/O=         62,743   820,998   36,619K
D01MLC83/01/M/BMC                 SMTP   9.117.200.21                                              59,212    1,582K   192,485
D01MLC96/01/M/BMC                 NRPC   9.38.93.53         CN=Marlene Fine/OU=Rochester/OU=Cont    54,308   538,544   23,802K
D01MLC96/01/M/BMC                 NRPC   9.117.109.220      CN=Joseph Jokers/OU=Houston/O=I         53,708   471,056   33,467K
D01MLC96/01/M/BMC                 NRPC   9.14.6.43          CN=John Johnson/OU=Southbury/O=BMC      52,926    5,830K   46,427K
```

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LOTUS DOMINO Database Activity Report Field Descriptions

Table 3-72 describes each field in the LOTUS DOMINO User Activity Report.

Table 3-71 Field Descriptions for the LOTUS DOMINO User Activity Report

Field	Description
SERVER NAME	The name of the LOTUS DOMINO server.
CONN TYPE	The type of connection
IP ADDRESS	The IP address
DOMINO USER NAME	The user name
CPU (MS)	The number of milliseconds or CPU time consumed by the user.
NO. OF BYTES READ	The number of bytes read over the connection by the user.
NO. OF BYTES WRITTEN	The number of bytes written over the connection by the user.

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Multiple Domain Facility (MDF) Report

The MDF Report shows the activity of the Multiple Domain Facility (MDF) running on Amdahl systems. The first header line of the report contains the CPU model and version numbers in the form (mmmm-vv). If the report contains data from multiple CPU configurations, the model and version numbers are replaced with (****-**).

This report is produced by using either the MDF Analyzer control statement (see “MDF” on page 2-72) or the PRSM Analyzer control statement (see “I/O Queuing Activity Report” on page 3-146). The data for this report is obtained by using the CPU Extractor control statement (see “CPU” on page 1-14).

Figure 3-58 is an example of the MDF Report.

Figure 3-58 MDF Report

```
PRODUCED BY CMF MONITOR (5.5.00)                          MDF REPORT                                RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                       XYZ COMPANY                                REPORT DATE: 10 JUN 03 18.56
ACTL 10 JUN 03 13.30.00  10 JUN 03 15.00.00          WORLDWIDE HEADQUARTERS                       SYSTEM ID: SYSB      SP4.3.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  70/4/929/1.42

HOME DOMAIN = :hp2.SYSB:ehp2.            NUMBER OF PHYSICAL PROCESSORS =   5      DISPATCH INTERVAL = DYNAMIC

                                                        ------ LOGICAL PROCESSORS -------      --- PHYSICAL PROCESSORS ----

                                                             ---- PERCENT DISPATCHED ----      ---- PERCENT DISPATCHED ----

                                     WAIT       WEIGHTING                     DOMAIN                          DOMAIN
  NAME                STATUS       COMPLETION     FACTOR       NUM  EFFECTIVE  OVERHEAD   TOTAL       EFFECTIVE  OVERHEAD   TOTAL
--------            --------------  ----------   ----------     ---  ---------  ---------  ------      ---------  ---------  ------
SYSA                ACTIVE          NO          >        60       1      41.56       0.32   41.88          41.56       0.32   41.88

SYSB                ACTIVE          NO                   30       2      28.01       1.02   29.03          28.01       1.02   29.03

SYSC                ACTIVE          NO                   10       1       5.99       0.01    5.98           5.99       0.01    5.98

SYSD                DEACT           NO          >DEDICATED        1      16.32       0.00   16.32          16.32       0.00   16.32

          DOMAIN UNATTRIBUTABLE                                                                                          6.67    6.67

          TOTAL                                                   5      91.86       1.35   93.21          91.86       8.02   99.88
:
:
:
```

MDF Report Field Descriptions

Table 3-72 describes each field in the MDF Report.

Table 3-72 Field Descriptions for the MDF Report

Field	Description
HOME DOMAIN	Home domain is where CMF MONITOR executed and collected the data used as the basis for this report. This home domain is highlighted throughout the report.
NUMBER OF PHYSICAL PROCESSORS	Average number of physical processors available to the complex.
DISPATCH INTERVAL	Average time slice that each domain accesses the physical system before another domain is allowed to access it. This may be a value in milliseconds or the word DYNAMIC. If DYNAMIC, it means that the system determines the most effective dispatch interval based on system performance.
DURATION	Total length of all measurement intervals being reported.
NAME	Name of the domain which is displayed on this row. This home domain is highlighted. Note: There is only one row for each domain unless you have specified a criterion for splitting rows based on changes to the MDF system (see “MDF” on page 2-72 for more information) and a change has occurred.
SHARE %	Column displayed when you specify a DETAIL operand on the MDF Analyzer control statement that generates new rows based on changes to the MDF system (see “MDF” on page 2-72 for additional information). A value is displayed in this column only if a change has occurred in the area and split on this value has been specifically requested. The value displayed represents the percent of data record intervals contributing to this row’s values and calculations. Note: This may not be precisely the time interval percentage of the duration of the change, since the smallest time unit available to record the duration of the change is the Extractor record interval. For example, if you change the weighting factor for five minutes and then change it back and the Extractor record interval is one hour, an SMF type 70 record would indicate that a change had occurred to the weighting factor during an hour of data collection. There is no way to determine that the change lasted only five minutes.
STATUS	Two status flags are reported here: – Whether the domain is active (ACTIVE) or deactivated (DEACT). – Whether the domain is CAPPED. Capping limits the maximum share of the system complex to the weighting factor. Even if the other domains are idle, the system does not provide more system access to a domain that has reached its weighting factor.
WAIT COMPLETION	Flag indicating whether MDF allows other domains to utilize a CPU when the domain currently using the CPU enters a wait state. NO means that MDF allows other domains to utilize the CPU. YES means that the domain currently holding the CPU continues to do so until its reporting period is completed, even if this domain enters a wait state.
WEIGHTING FACTOR	Relative share of the system for this domain. If the domain is dedicated, there is no relative share and this column contains the word DEDICATED.

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Table 3-72 Field Descriptions for the MDF Report (continued)

Field	Description
LOGICAL PROCESSORS – NUM	Average number of logical processors assigned to the domain.
LOGICAL PROCESSORS – EFFECTIVE	Percent of time this domain was processing applications. This does not include time spent for domain management. This value is affected by the number of logical processors assigned to the domain.
LOGICAL PROCESSORS – DOMAIN OVERHEAD	Percent of time this domain was performing domain management. This value is affected by the number of logical processors assigned to the domain.
LOGICAL PROCESSORS – TOTAL	Sum of effective and domain overhead. This value is affected by the number of logical processors assigned to the domain.
PHYSICAL PROCESSORS – EFFECTIVE	Percent of time this domain was processing applications. This does not include time spent for domain management. This value is affected by the number physical processors available.
PHYSICAL PROCESSORS – DOMAIN OVERHEAD	Percent of time this domain was performing domain management. This value is affected by the number of physical processors available. For the row marked DOMAIN UNATTRIBUTABLE, this value represents the percent of time spent by the system in domain management that could not be assigned to a specific domain.
PHYSICAL PROCESSORS – TOTAL	Sum of effective and domain overhead. This value is affected by the number of physical processors available. For the row marked DOMAIN UNATTRIBUTABLE, this value represents the percent of time spent by the system in domain management that could not be assigned to a specific domain.

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OMVS Kernel Activity Report

The OMVS Kernel Activity report displays information about resource consumption by OMVS address spaces.

The OMVS Kernel Activity report is produced by using the OMVS Analyzer control statement (see “OMVS” on page 2-76).

Figure 3-59 is an example of the OMVS Kernel Activity Report.

Figure 3-59 OMVS Kernel Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    OMVS KERNEL ACTIVITY REPORT                      RPTSEQ    23 PAGE    271
BMC SOFTWARE, INC.                                          XYZ COMPANY                             REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-3/28/25.1K/7
-------------------------------------------------  OMVS SYSTEM CALL ACTIVITY  ----------------------------------------------
                                                 SYSCALLS                      CPU TIME (HUNDREDTHS)
                                                PER SECOND                          PER SECOND
                                                ----------                          ----------
                      MINIMUM -                    1.000                               0.000
                      AVERAGE -                    7.273                               0.009
                      MAXIMUM -                  115.000                               1.000
-----------------------------------------------------  OMVS PROCESS ACTIVITY  -----------------------------------------------------
             MAX ALLOWABLE PROCESSES:     200         MAX ALLOWABLE USERS:         200         MAX PROCESSES PER USER:      100
             ---------- PROCESSES -----------         ------------ USERS -------------         ------- PROCESSES / USER -------
              CURRENT #         OVERRUNS/SEC           CURRENT #         OVERRUNS/SEC           CURRENT #         OVERRUNS/SEC
  MINIMUM -          14               0.000                    0               0.000                                       0.000
  AVERAGE -        17.0               0.000                  0.0               0.000                  0.0                  0.000
  MAXIMUM -          19               0.000                    0               0.000                                       0.000
-----------------------------------------------  OMVS INTER-PROCESS COMMUNICATION  ----------------------------------------------
             MAX MESSAGE QUEUE IDS:   500  MAX SEMPHORE IDS:        500  MAX SHRD MEMORY IDS:     500  MAX SHRD MEMORY PAGES:  262K
             ----- MESSAGE QUEUE IDS ----  ------- SEMAPHORE IDS ------  ----- SHARED MEMORY IDS ----  ---- SHARED MEMORY PAGES ---
              CURRENT #     OVERRUNS/SEC    CURRENT #     OVERRUNS/SEC    CURRENT #     OVERRUNS/SEC    CURRENT #     OVERRUNS/SEC
  MINIMUM -         0.0           0.000           0.0           0.000           0.0           0.000           0.0           0.000
  AVERAGE -         0.0           0.000           0.0           0.000           0.0           0.000           0.0           0.000
  MAXIMUM -         0.0           0.000           0.0           0.000           0.0           0.000           0.0           0.000
-----------------------------------------------------  OMVS MEMORY MAP  -----------------------------------------------------
             MAX MEM MAP STORAGE PAGES: 40960         MAX SHARED STORAGE PAGES:    131K
             --- MEMORY MAP STORAGE PAGES ---         ----- SHARED STORAGE PAGES -----
              CURRENT #         OVERRUNS/SEC           CURRENT #         OVERRUNS/SEC
  MINIMUM -         0.0               0.000                  0.0               0.000
  AVERAGE -         0.0               0.000                  0.0               0.000
  MAXIMUM -         0.0               0.000                  0.0               0.000
```

OMVS Kernel Activity Report Field Descriptions

Table 3-73 describes each field in the OMVS Kernel Activity Report.

Table 3-73 Field Descriptions for the OMVS Kernel Activity Report

Field	Description
SYSCALLS PER SECOND – MINIMUM	Minimum number of OMVS system calls invoked per second during any single cycle of the interval.
SYSCALLS PER SECOND – AVERAGE	Average number of OMVS system calls invoked per second during the interval. An asterisk (*) to the right of the value reported indicates that OMVS was not active for the entire duration of the interval.
SYSCALLS PER SECOND – MAXIMUM	Maximum number of OMVS system calls invoked per second during any single cycle of the interval.

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Table 3-73 Field Descriptions for the OMVS Kernel Activity Report (continued)

Field	Description
CPU TIME PER SECOND – MINIMUM	Minimum CPU time per second, reported in hundredths, spent processing system calls or Syscalls in the OMVS kernel address space during any single cycle during the interval.
CPU TIME PER SECOND – AVERAGE	Average CPU time per second, reported in hundredths, spent processing system calls or Syscalls in the OMVS kernel address space during the interval. An asterisk (*) to the right of the value reported indicates that OMVS was not active for the entire duration of the interval.
CPU TIME PER SECOND – MAXIMUM	Maximum CPU time per second, reported in hundredths, spent processing system calls or Syscalls in the OMVS kernel address space during any single cycle during the interval.
MAX ALLOWABLE PROCESSES	Maximum number of OMVS processes allowed, defined as a constant in SYS1.PARMLIB member BPXPRM*xx.*
MAX ALLOWABLE USERS	Maximum number of OMVS users allowed, defined as a constant in SYS1.PARMLIB member BPXPRM*xx.*
MAX PROCESSES PER USER	Maximum number of OMVS processes per user allowed, defined as a constant in SYS1.PARMLIB member BPXPRM*xx.*
PROCESSES: NUMBER OF PROCESSES – MINIMUM	Minimum number of OMVS processes during any single cycle of the interval.
PROCESSES: NUMBER OF PROCESSES – AVERAGE	Average number of OMVS processes during the interval.
PROCESSES: NUMBER OF PROCESSES – MAXIMUM	Maximum number of OMVS processes during any single cycle of the interval.
PROCESSES: OVERRUNS PER SECOND – MINIMUM	Minimum number of times Fork/Dub failed because the maximum number of processes was exceeded during any single cycle of the interval.
PROCESSES: OVERRUNS PER SECOND – AVERAGE	Average number of times Fork/Dub failed because the maximum number of processes was exceeded during any single cycle of the interval. An asterisk (*) to the right of the value reported indicates that OMVS was not active for the entire duration of the interval.
PROCESSES: OVERRUNS PER SECOND – MAXIMUM	Maximum number of times Fork/Dub failed because the maximum number of processes was exceeded during any single cycle of the interval.
USERS: NUMBER OF USERS – MINIMUM	Minimum number of OMVS users during any single cycle of the interval.
USERS: NUMBER OF USERS – AVERAGE	Average number of OMVS users during the interval.
USERS: NUMBER OF USERS – MAXIMUM	Maximum number of OMVS users during any single cycle of the interval.
USERS: OVERRUNS PER SECOND – MINIMUM	Minimum number of times Fork/Dub failed because the maximum number of users was exceeded during any single cycle of the interval.
USERS: OVERRUNS PER SECOND – AVERAGE	Average number of times Fork/Dub failed because the maximum number of users was exceeded during any single cycle of the interval. An asterisk (*) to the right of the value reported indicates that OMVS was not active for the entire duration of the interval.
USERS: OVERRUNS PER SECOND – MAXIMUM	Maximum number of times Fork/Dub failed because the maximum number of users was exceeded during any single cycle of the interval.
PROCESSES/USER: NUMBER OF PROC/USER – MINIMUM	Minimum number of OMVS processes per user during any single cycle of the interval.

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Table 3-73 Field Descriptions for the OMVS Kernel Activity Report (continued)

Field	Description
PROCESSES/USER: NUMBER OF PROC/USER – AVERAGE	Average number of OMVS processes per user during the interval.
PROCESSES/USER: NUMBER OF PROC/USER – MAXIMUM	Maximum number of OMVS processes per user during any single cycle of the interval.
PROCESSES/USER: OVERRUNS PER SECOND – MINIMUM	Minimum number of times Fork/Dub failed because the maximum number of processes per user was exceeded during any single cycle of the interval.
PROCESSES/USER: OVERRUNS PER SECOND – AVERAGE	Average number of times Fork/Dub failed because the maximum number of processes per user was exceeded during the interval. An asterisk (*) to the right of the value reported indicates that OMVS was not active for the entire duration of the interval.
PROCESSES/USER: OVERRUNS PER SECOND – MAXIMUM	Maximum number of times Fork/Dub failed because the maximum number of processes per user was exceeded during any single cycle of the interval.

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Performance Summary Report

The Performance Summary Report summarizes key measures in the system so that potential trouble spots can be located.

The Performance Summary Report is produced by using the PERFSUM (see "PERFSUM" on page 2-81) and PERFORM (see "PERFORM" on page 2-77) Analyzer control statements. The data for this report is obtained by using the following Extractor control statements:

- "ASMDATA" on page 1-6
- "CHANNEL" on page 1-12
- "CPU" on page 1-14
- "DEVICE" on page 1-23
- "ENQUEUE" on page 1-29
- "EXTSUM" on page 1-31
- "IOQ" on page 1-44
- "PAGING" on page 1-52
- "TSODATA" on page 1-74
- "WORKLOAD" on page 1-82

This report (see Figure 3-60 on page 3-177) is divided into the following sections:

Bottleneck Detection Lists and describes bottlenecks detected in key system areas. The types of bottlenecks may be defined by you in the PERFSUM control statement (see "PERFSUM" on page 2-81). If bottleneck types are not defined by you in the PERFSUM control statement, defaults are used.

Three dashes (---) in the DETECTED column indicate that the data necessary to determine if this bottleneck existed is not available. This is most likely due to missing record types on which this determination is based.

Performance Measures Summary Lists busy times and queue depths for key areas of the system.

Job Class Activity Lists active and completed jobs for the extracted time frame.

Policy Activations Lists the service policies that were active during the time frame for this report. The list includes the policy name, its description, and the date and time it was activated.

Workload Activity Lists service classes and report classes, displaying their performance index, response time, transactions, and service units.

Performance Group Activity Lists performance groups, displaying their response time, transactions, and CPU service units.

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Note: The structure of the performance group, summary period, and the workload description is defined according to the following order of precedence:

1. The PERFORM Analyzer control statement (see “PERFORM” on page 2-77).

2. The presence of SMF type *xxx*-07 user records in the Analyzer output. This record is written at CMF MONITOR initialization time when the PERFORM= operand is coded on the EXTSUM Extractor control statement.

3. All performance groups are reported, the summary periods are reported as ALL, and the workload description field is either blank or contains the name of the job class, if applicable.

If the PERFORM information is expected from the //EXTDATA DD statement, but the records written at Extractor start time are not included, the PERFORM data is not available and the default workload description of ALL is used.

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The Performance Summary Report is shown in Figure 3-60.

Figure 3-60 Performance Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    PERFORMANCE SUMMARY REPORT                        RPTSEQ    24 PAGE    272
BMC SOFTWARE, INC.                                          XYZ COMPANY                                REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/28/25.1K/7  240-3/28/420/7  240-5/112/25.1K/7  240-6/28/25.1K/7
240-20/28/25.2K/7  70-1/28/25.1K/7  71-1/28/420/7  72-3/1,176/0/7  73-1/28/111K/7  75-1/112/25.1K/7  77-1/28/0/7
78-2/28/5,012/7  78-3/28/8,390/7  74-1/112/25.1K/7
-----------------------------------------------------  BOTTLENECK DETECTION  ----------------------------------------------------
 DETECTED     BOTTLENECK DESCRIPTION
   NO         ENQUEUE CONFLICT                     --  (CUMULATIVE DELAY GT  10 PERCENTAGE OF TOTAL TIME)
   NO         CHANNEL PATH OVERLOAD                --  (BUSIEST CHANNEL GT  50 PERCENT UTILIZATION)
   YES        CPU OVER/UNDERLOADING                --  (AVERAGE CPU UTILIZATION GT  95 PERCENT OR CPU UTILIZATION LT  20 PERCENT)
   NO         PAGING OVERLOAD                      --  (AVERAGE PAGING RATE GT     50 PAGES PER SECOND)
   NO         TSO RESPONSE PROBLEM                 --  (AVERAGE RESPONSE GT  15 SECONDS)
   YES        SUPERVISOR OVERUTILIZATION           --  (SUPERVISOR STATE MODE GT  50 PERCENT OF CPU BUSY)
   NO         AUXILIARY STORAGE OVERUTILIZATION    --  (SLOTS IN USE GT  90 PERCENT OF SLOTS AVAILABLE)
   ---        SERVICE OVERCONSUMPTION              --  (MOST DEMANDING PERFORMANCE GROUP GT  30 PERCENTAGE OF TOTAL SERVICE)

-----------------------------------------------  PERFORMANCE MEASURES SUMMARY SECTION  ----------------------------------------
 LPAR CPU UTILIZATION PERCENTAGE                     =      6.2   PAGING RATE (PAGES PER SECOND)                          =   23.9
 MVS  CPU UTILIZATION PERCENTAGE                     =      6.6   SWAP RATE (SWAPS PER MINUTE)                           =     .4
 AVERAGE CPU QUEUE DEPTH                             =      1.2   AVERAGE PRIVATE AREA WORKING SET (PAGES)                =  148.4
 TIME CPU QUEUE EXISTED (PERCENT OF SAMPLES)         =    100.0   AVERAGE JES SPOOL SPACE USED                           =   71.1
 BUSIEST CHANNEL PATH (PERCENTAGE OF TOTAL TIME)     =     19.4   3590 MOUNTS     =     5  MAX CONCURRENTLY ALLOCATED    =      2
 TOTAL I/O INTERRUPT RATE FOR ALL CPU'S              =    106.2
 SSCH INSTRUCTIONS PER SECOND                        =     74.5
 AVERAGE TSO TRANSACTION RATE (TRANS PER MINUTE)     =     22.7
 AVERAGE NUMBER OF TSO USERS                         =     25.2

-----------------------------------------------------  JOB CLASS ACTIVITY  ----------------------------------------------------
                                 JOB       JOB CLASS            ACTIVE  JOBS                COMPLETED
                                CLASS     DESCRIPTION        AVG     END    %CPU           JOBS    STEPS
                                E        SMPE_ONLY           .7       0     8.7             4        8
                                F        BATCH_30_SEC        .5       1     5.1            39      100
                                H        CVM_INIT_ONLY      4.0       4     8.4            12       74
                                K        BATCH_05_SEC        .1       0     1.1            15       25
                                X        CICS_BATCH          .0       0     0.0             0        0
                                Y        BATCH_IMS           .0       0     0.4             1       12
                                BATCH    ALL_BATCH          6.0       5    27.4            74      228
                                TSO      ALL_TSO          100.3     119    36.9            25       25
                                STC      ALL_STC          105.7     104    35.7            20       30
                                TOTAL                     212.0     228   100.0           119      283

------------------------------------------------------------ POLICY ACTIVATIONS ------------------------------------------------------
POLICY:BBPOL001 XYZ Company Service Definition   ACTIVATED  10 JUN 2003 AT 10:50
------------------------------------------------------------ WORKLOAD ACTIVITY -------------------------------------------------------
SERVICE                                          PERF   RESPONSE TIME      TRANSACTIONS    EXEC VEL    SERVICE UNITS      SERVICE
 CLASS    DESCRIPTION                   PER    INDX  ACTUAL   GOAL       /SEC  TOTAL    ACTL GOAL  PER SEC    TOTAL      CLASS
POLICY:BBPOL001 XYZ Company Service Definition
BATCH                                    1           49.28 S             0.00      53    58%         4499     113,375K  BATCH
CICS                                     1            2.49 M             0.00      55                                   CICS
STC                                      1           51.20 M             0.00      31    39%          268K  6,758,762K  STC
TSO                                      1            4.48 S             0.40    9737    59%        18004     453,714K  TSO
BATNRM                                   1    0.17   29.58 S             0.00      27    60%  10%     143   3,615,733   BATNRM
                                         2    0.03   68.81 S             0.00      26    58%   1%    4355     109,759K
CICSNRM                                  1   88.50   44.27 S   0.50 S    0.00      46                                   CICSNRM
STCPROD                                  1    0.40                                     100%  40%       4      98,491   STCPROD
SYSSTC                                   1           24.65 M             0.00       9    40%          176K  4,431,041K  SYSSTC
SYSTEM                                   1                                              49%        51911   1,308,178K  SYSTEM
TSONRM                                   1    0.50    0.03 S   0.50 S    0.15    3702    43%         1067      26,889K  TSONRM
                                         2    0.50    0.17 S   2.00 S    0.10    2457    53%         1021      25,735K
                                         3    0.50    2.56 S   5.00 S    0.06    1407    54%         2238      56,410K
                                         4    0.32   18.19 S             0.09    2171    63%  20%   13678     344,680K
```

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Bottleneck Detection Section Field Descriptions

Table 3-74 describes each field in the Bottleneck Detection section of the Performance Summary Report.

Table 3-74 Field Descriptions for the Bottleneck Detection Section

Field	Description
DETECTED	Indication of whether the listed bottleneck existed during the measurement interval.
BOTTLENECK DESCRIPTION	General description of the bottleneck (as defined in the PERFSUM control statement) followed by data on the severity of the bottleneck.
ENQUEUE CONFLICT	Average percent of time an enqueue conflict existed.
CHANNEL PATH OVERLOAD	Average use of the busiest channel path.
CPU OVER/UNDERLOADING	Average CPU busy time.
PAGING OVERLOAD	Average pages per second.
TSO RESPONSE PROBLEM	Average TSO response time. This field measures commands typed at the READY prompt and TSO-in-batch jobs. It ignores command issued within ISPF (except EDIT and TEST).
SUPERVISOR OVERUTILIZATION	Average amount of CPU busy time spent in supervisor state.
AUXILIARY STORAGE OVERUTILIZATION	Average ASM slots in use.
SERVICE OVERCONSUMPTION	Average service rate of the most-used performance group.

The total reporting period is the time during which the bottleneck existed. This period is defined by the DATETIME, CYCLE, and PERIOD statements, or the actual input data.

Performance Measures Summary Field Descriptions

Table 3-75 describes each field in the Performance Measures Summary section of the Performance Summary Report.

Table 3-75 Field Descriptions for the Performance Measures Summary Section

Field	Description
LPAR CPU UTILIZATION PERCENTAGE	LPAR CPU busy percentage during the specified interval. It is the percentage of processor online time used by the home partition (the partition on which records were extracted). The formula is **Wait completion on:** (dispatch time - wait time) / online time **Wait completion off:** dispatch time / online time
MVS CPU UTILIZATION PERCENTAGE	MVS CPU average busy percentage during the specified interval. The formula is (online time - wait time) / online time.

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Table 3-75 Field Descriptions for the Performance Measures Summary Section (continued)

Field	Description
AVERAGE CPU QUEUE DEPTH	Average number of dispatchable address spaces waiting for CPU.
TIME CPU QUEUE EXISTED (PERCENT OF SAMPLES)	Percentage of time that address spaces were found dispatchable and waiting for CPU.
BUSIEST CHANNEL PATH (PERCENTAGE OF TOTAL TIME)	Percentage of time busy for the observed busiest channel.
TOTAL I/O INTERRUPT RATE FOR ALL CPU'S	Rate per second at which I/O interrupts were handled.
SSCH INSTRUCTIONS PER SECOND	Average number of SSCH instructions per second.This value is based on the SMF type 74 device records and is limited by the devices sampled.
AVERAGE TSO TRANSACTION RATE (TRANS PER MINUTE)	Average number of TSO transactions per minute. This field measures commands typed at the READY prompt and TSO-in-batch jobs. It ignores command issued within ISPF (except EDIT and TEST).
AVERAGE NUMBER OF TSO USERS	Average number of TSO users logged on simultaneously.
PAGING RATE (PAGES PER SECOND)	Total paging rate, in pages per second, between auxiliary storage and central storage, including VIO, swap, hiperspace, and block paging.
SWAP RATE (SWAPS PER MINUTE)	Average number of swaps to auxiliary storage per minute.
AVERAGE PRIVATE AREA WORKING SET (PAGES)	Average working set size for storage obtained in private area in pages.
AVERAGE JES SPOOL SPACE USED	Average percentage of JES spool space used. Note: If the Extractor EXTSUM statement does not have the parameter JES=YES specified, --- (dashes) appear in this field.
MOUNTS, MAX CONCURRENTLY ALLOCATED	For each type of tape drives observed (3490, 3590, …), the number of mounts that occurred and the maximum number of tape drives allocated simultaneously.
COUNT OF REEL VOLUMES MOUNTED	Total number of reel mounts that occurred, including all mounts and any remounts of the same tape volume.
COUNT OF CARTRIDGE VOLUMES MOUNTED	Total number of cartridge mounts that occurred, including all mounts and any remounts of the same tape volume.
MAXIMUM 3420 DRIVES CONCURRENTLY ALLOCATED	Maximum number of 3420-type tape drives allocated simultaneously.
MAXIMUM 3480 DRIVES CONCURRENTLY ALLOCATED	Maximum number of 3480-type tape drives allocated simultaneously.
MAXIMUM 3490 DRIVES CONCURRENTLY ALLOCATED	Maximum number of 3490-type tape drives allocated simultaneously.

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Job Class Activity Field Descriptions

Table 3-76 describes each field in the Job Class Activity section of the Performance Summary Report.

Table 3-76 Field Descriptions for the Job Class Activity Section

Field	Description
JOB CLASS	Job class as specified on the Extractor EXTSUM statement.
JOB CLASS DESCRIPTION	Job class description as specified on the Extractor EXTSUM statement.
ACTIVE JOBS	AVG Average number of jobs active in a given class during the Extractor interval. END Number of jobs active in a given job class at the end of the Extractor interval. % CPU Percentage of busy time percent used by a given job class during the Extractor interval.
COMPLETED	JOBS Total number of jobs completed for a given job class during the Extractor interval. STEPS Total number of job steps completed for a given job class during the Extractor interval.

Workload Activity Field Descriptions

Table 3-76 describes each field in the Workload Activity section of the Performance Summary Report.

Table 3-77 Field Descriptions for the Workload Activity Section

Field	Description
POLICY	Service class policy name and description. For more information about service policies, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
SERVICE CLASS	Name of the service class. For more information about service classes, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
DESCRIPTION	Description of the service class.
PER	Period number of the service class.
PERF INDX	Performance index. For more information about the interpretation of a performance index value, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*. This value is not shown if the goal is discretionary or system.
RESPONSE TIME	Applicable only to average response time goal and response time with percentile goal. ACTUAL Actual response time. GOAL Expected response time.
TRANSACTIONS	/SEC Average number of transactions completed per second. TOTAL Total number of transactions completed in the report interval.
EXEC VEL	ACTL Actual execution velocity. GOAL For velocity goal, the expected execution velocity.
SERVICE UNITS	PER SEC Rate at which service units were used per second. TOTAL Number of service units consumed in the report interval.

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Performance Group Activity Field Descriptions

Table 3-78 describes each field in the Performance Group Activity section of the Performance Summary Report.

Table 3-78 Field Descriptions for the Performance Group Activity Section

Field	Description
PERFORMANCE GROUP	Performance group as specified on the Extractor EXTSUM statement (see “EXTSUM” on page 1-31) or the Analyzer PERFORM statement (see “PERFORM” on page 2-77).
SUMMARY PERIOD	Performance periods as specified on the Extractor EXTSUM statement or the Analyzer PERFORM statement.
WORKLOAD DESCRIPTION	The description as specified on the Extractor EXTSUM statement or the Analyzer PERFORM statement. Note: If you specify the keyword PERFORM on the Extractor control card EXTSUM, the workload description is saved in the SMF type 240-7 record. This record is produced only at the time of CMF MONITOR initialization. If the 240-7 record is not found in the input data set to the Anzalyzer, this column is left blank. There is no breakdown of the performance periods for each performance group. The SUMMARY PERIODS column is *All* for all performance groups. If the SMF type 240-7 record is not in the input data set and you want to have this column filled in, specify the PERFORM Analyzer control statement immediately after the PERFSUM statement. You can do this by copying the information from the EXTSUM Extractor control statement.
RESPONSE TIME	Average response time for all transactions that ended in specified period or periods. This includes all jobs in the performance group. For example, if you assign performance group 2 to TSO, this value includes TSO commands plus TSO-in-batch, plus everything else that runs in that performance group.
TRANSACTIONS – PER/SEC	Average number of transactions per second during the Extractor interval for the specified period or periods.
TRANSACTIONS – TOTAL	Total number of transactions during the Extractor interval for specified period or periods; M indicates in units of 1000.
TCB SERVICE – PER/SEC	Average number of CPU (TCB) service units per second used during the Extractor interval for specified period or periods.
TCB SERVICE – SU/1000	Total number of CPU (TCB) service units used during the Extractor interval for specified period or periods; M indicates in units of 1000.
CPU SERVICE – PER/SEC	Average number of TCB plus SRB service units per second used during the Extractor interval for specified period or periods.
CPU SERVICE – SU/1000	Total number of TCB plus SRB service units used during the Extractor interval for specified period or periods. M indicates units of 1000.
EXECUTION VELOCITY	Execution velocity is the rate at which transactions are executing. For more information about execution velocity, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*. Note: This field is not used in reports on systems running MVS 4.3 or earlier.

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Pie Chart

The pie (or multiplot) chart is produced by using the GRAPH TYPE=PIE Analyzer control statement. The measures specified in the GRAPH statement for this chart should be mutually exclusive (for example, CPU busy time and CPU wait time) to show an accurate representation of activity. The pie chart is most useful when measures that add up to 100% are specified (for example, PPB and SUP); however, any measures valid for the GRAPH statement can be charted. Up to 16 measures can be specified.

The Extractor statements required for the pie chart are dependent upon the information to be charted. (See *CMF MONITOR Batch User Guide*, the section titled “Record Types” for information about the record types generated by each Extractor statement and a description of the specific type of data collected by each Extractor statement.)

Each axis on the chart is labeled with a letter. The letter corresponds to a measure specified in the control statement. A key that shows the correspondence of letters to measures is printed at the upper right of the report page, outside the chart. The value listed for each letter represents a percentage of the sum of all items in that lettered category.

The charted value occupies a segment of the circle. The segment is read clockwise from the axis that describes the measure.

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A sample of the pie graph is shown in Figure 3-61 on page 3-183; explanations of the measures follow.

Figure 3-61 Pie Graph

```
PRODUCED BY CMF ANALYZER (5.5.00)                          PIE GRAPH                          RPTSEQ    25 PAGE     60
BMC SOFTWARE, INC.                                       XYZ COMPANY                          REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00          WORLDWIDE HEADQUARTERS                   SYSTEM ID: SYSB     SP4.3.0

                 CPU ENVIRONMENT REQUESTED:  CPU 0
                                             A.L.

                                        *****************                                A.    .00% SWP-AXS
                                   ****        *        ****                             B.  28.99% SWP-DW
                              *****            *            *****                        C.    .03% SWP-ENQ
                         *****                 *                 ****                    D.    .00% SWP-EXC
                      **                       *                     **                  E.   8.59% SWP-LW
                    **                         *                       **                F.    .00% SWP-REQ
                   *                           *                         **              G.    .00% SWP-RSS
                 **                            *                           **            H.    .10% SWP-UNI
               **                              *                             **          I.  37.82% SWP-TOT
              *                                *                               *         J.    .37% SWP-TXS
             *                                 *                                *        K.    .00% SWP-LTT
            *                                  *                                 *       L.  24.12% SWP-TWT
           *                                   *                                  *
          *                                    *                                   *
         *                                     *                                    *
        *                                      *                                     *
       *                                       *                                      *
       *                                       *                                      *
      *                                        *                                       *
      *                                        *                                       *
     *                                         *                                        *
     *                                         *                                        *
     *                                         *                                        *
J.K. *                                         *                                         *
I.  ******************                         *                                         *
    *                 *************************+***                                      *
    *                                          ** ******                                 *
    *                                            **     *******                          *
     *                                             *           *******                   *
     *                                              **                ******              *
     *                                                *                    *******      *
      *                                                **                        ****
      *                                                  **                        *   B.C.D.
       *                                                 *                         *
       *                                                  **                       *
        *                                                  *                        *
         *                                                  **                      *
          *                                                  **                     *
           *                                                   *                    *
            *                                                   **                  *
             *                                                    *                 *
              **                                                   **               *
                **                                                  ** **
                  **                                                 **
                    **                                               *    E.F.G.
                      **                                            **     H.
                        **                                         **
                          ****                                   *****
                              *****                         *****
                                  ****                 ****
                                      *****************
```

Pie Graph Field Descriptions

Table 3-79 describes each field in the Pie Graph.

Table 3-79 Field Descriptions for the Pie Graph

Field	Description
CPU ENVIRONMENT REQUESTED	CPUs for which measures are given, according to the GRAPH statement.
A through L	Breakdown by percentages of the event counts selected in the statement. For information about the measures that are charted, see Appendix A, Measure and Trace Values.

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Processor Concurrency Report

The Processor Concurrency Report graphically displays the number of processors (CPUs) within the configuration and the percentage of time that these CPUs were concurrently busy.

The Processor Concurrency Report is produced by using the CPUCON Analyzer control statement (see “CPUCON” on page 2-34). The data for this report is obtained by using the CPU (see “CPU” on page 1-14) Extractor control statement.

The vertical axis of the graph represents the percentage of time that zero or more CPUs were concurrently busy; the horizontal axis represents the number of CPUs that were concurrently busy. The number of CPUs concurrently busy is represented by columns of asterisks. For example, if two processors in a system were concurrently busy 75% of the time, a column of asterisks would be printed above the number 2 on the horizontal axis and plotted up to the number 75 on the vertical axis.

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A sample of the Processor Concurrency report is shown in Figure 3-62.

Figure 3-62 Processor Concurrency Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                PROCESSOR CONCURRENCY REPORT                    RPTSEQ    11 PAGE     33
BMC SOFTWARE, INC.                                        XYZ COMPANY                            REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00          WORLDWIDE HEADQUARTERS                     SYSTEM ID: SYSB     SP4.3.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/4/709/1.00

-----------------------------------------------------  CPU OPERATION PATTERN  -----------------------------------------------------

                                          NUMBER OF CPU'S IN THE CONFIGURATION ( 3)
                                   ALL CPU'S CONCURRENTLY BUSY ( 57.1 PERCENT OF TOTAL TIME)

    CPU MEASURES   - AVG %  9   18   16   57

                   100 +                                                                                                  +
                       I                                                                                                  I
                       I                                                                                                  I
                       I                                                                                                  I
                       I                                                                                                  I
                       I                                                                                                  I
                       I                                                                                                  I
                       I                                                                                                  I
                   75  +                                                                                                  +
                       I                                                                                                  I
               S       I                                                                                                  I
               A       I                                                                                                  I
               M       I                                                                                                  I
               P       I                                                                                                  I
               L       I                ***                                                                               I
               E       I                * *                                                                               I
                   50  +                * *                                                                               +
               P       I                * *                                                                               I
               E       I                * *                                                                               I
               R       I                * *                                                                               I
               C       I                * *                                                                               I
               E       I                * *                                                                               I
               N       I                * *                                                                               I
               T       I                * *                                                                               I
                   25  +                * *                                                                               +
                       I                * *                                                                               I
                       I                * *                                                                               I
                       I      ***  ***  * *                                                                               I
                       I      * *  * *  * *                                                                               I
                       I      * *  * *  * *                                                                               I
                       I ***  * *  * *  * *                                                                               I
                       I * *  * *  * *  * *                                                                               I
                       ---+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----

                          0    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16

                                                NUMBER OF CPU'S CONCURRENTLY BUSY
```

Processor Concurrency Report Field Descriptions

Table 3-80 describes each field in the Processor Concurrency Report.

Table 3-80 Field Descriptions for the Processor Concurrency Report (Part 1 of 2)

Field	Description
NUMBER OF CPU'S IN THE CONFIGURATION	Total number of CPUs measured.
ALL CPU'S CONCURRENTLY BUSY	Total percentage of time all CPUs measured were concurrently busy.
CPU MEASURES	Average percentages of time that all CPUs were not busy and multiple CPU busy percentages; these figures correspond to columns below.

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Table 3-80 Field Descriptions for the Processor Concurrency Report (Part 2 of 2)

Field	Description
SAMPLE PERCENT	Axis representing percentage of time zero or more CPUs were concurrently busy.
NUMBER OF CPU'S CONCURRENTLY BUSY	Axis representing number of CPUs.

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Profile Bar Graph

The Profile Bar Graph (or histogram) is produced by using the GRAPH TYPE=PROFILE Analyzer control statement. The data in this graph can be used to locate peaks and valleys in the performance of the system over time of day.

The Profile Bar Graph is scaled to the largest LIMIT= value specified in the GRAPH statement. The default limit is 100 (coded LIMIT=10000). Up to 16 measures can be specified; each measure is represented on the graph by a different character. When more than one measure is represented, the one with the smallest value is displayed first on the line.

The Extractor statements required for the Profile Bar Graph are dependent upon the information to be graphed. (See *CMF MONITOR Batch User Guide*, the section titled “Record Types” for information about the record types generated by each Extractor statement and a description of the specific type of data collected by each Extractor statement.)

One line on the graph is produced for each interval specified in the GRAPH command. If the interval default is used, one line is produced for each record interval encountered in the data.

The Profile Bar Graph is read from left to right. The value of each measure on the graph is determined by locating the rightmost character representing that measure; the value shown at that point is the value of the measure. For measures that have exactly the same value on the line, the character O is printed to indicate an overlap.

A sample of the Profile Bar Graph is shown in Figure 3-63. In this figure, one measure, CPU, was selected.

Figure 3-63 Profile Bar Graph

```
PRODUCED BY CMF ANALYZER (5.5.00)                        PROFILE BAR GRAPH                          RPTSEQ    23 PAGE     58
BMC SOFTWARE, INC.                                          XYZ COMPANY                             REPORT DATE: 10 JUN 03  9.33
ACTL 10 JUN 03 06.45.01  10 JUN 03 07.45.00            WORLDWIDE HEADQUARTERS                      SYSTEM ID: SYSB     SP4.3.0


               * REPRESENTS CPU
                 CPU ENVIRONMENT REQUESTED:  ALL CPU'S
  DATE     TIME     TYP70CPU                                GRAPHIC DISPLAY OF INTERVAL TOTAL TIME
                              0        10        20        30        40        50        60        70        80        90       100
                              +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
         07.45.00          56 .*****************************************************   .         .         .         .         .
         08.00.00          60 .*************************************************************         .         .         .         .
         08.15.00          54 .*****************************************************     .         .         .         .         .
         08.30.00          55 .******************************************************    .         .         .         .         .
         08.45.01          54 .*****************************************************     .         .         .         .         .
         09.00.00          52 .***************************************************       .         .         .         .         .
         09.15.00          50 .**************************************************        .         .         .         .         .
                              +---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+
```

The Profile Bar Graph is most effective when used over time to compare one time frame to another.

Profile Bar Graph Field Descriptions

Table 3-81 describes each field in the Profile Bar Graph.

Table 3-81 Field Descriptions for the Profile Bar Graph

Field	Description
n REPRESENTS	Character *n* used to represent each measure selected in GRAPH statement.
DATE	Date when samplings were made.
TIME	Time frames at which samplings were made.
GRAPHIC DISPLAY OF INTERVAL TOTAL TIME	Axis representing values for each measure, according to rightmost character. Values can be percentages, numerical count, and so on, depending on measure being scaled.

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Report Table of Contents

The Report Table of Contents always precedes the CMF MONITOR logs and selected reports. It lists the CMF MONITOR reports by sequence, page number, and report title, and, if specified, by subtitle.

The Report Table of Contents is generated only if the //RPTCONTS DD JCL control statement is defined in the Analyzer JCL (see *CMF MONITOR Batch User Guide*, the section titled “Defining Analyzer JCL Manually”.) The //RPTCONTS DD statement should precede the //SYSPRINT DD statement in the Analyzer JCL.

There are no Analyzer or Extractor control statements required to produce the Report Table of Contents. It is produced automatically as part of the preliminary reporting information that CMF MONITOR supplies with each batch report job (see “Preliminary Reporting Information” on page 3-4 for more information).

An example of the Report Table of Contents is shown in Figure 3-64.

Figure 3-64 Report Table of Contents

```
PRODUCED BY CMF ANALYZER (5.5.00)                    REPORT TABLE OF CONTENTS                                CONTENTS   PAGE        i
BMC SOFTWARE, INC.                                                                                          REPORT DATE:    10 JUN 03
                                                                                                            REPORT TIME:    11.23.55

 RPT SEQ NO   PAGE NO      REPORT TITLE                                          REPORT SUBTITLE

     1           1      CONTROL CARD LOG
     2           2      COLLECTION PHASE LOG
     3           6      AUXILIARY STORAGE REPORT
     4           8      CPU UTILIZATION REPORT
     5          11      VIRTUAL STORAGE ACTIVITY REPORT
     6          17      REPORT PHASE LOG
```

Report Table of Contents Field Descriptions

Descriptions of the fields in the Report Table of Contents are listed in Table 3-82.

Table 3-82 Field Descriptions for the Report Table of Contents

Field	Description
RPT SEQ NO	Sequence number of when the report is displayed in the output.
PAGE NO	Page number within the report output where the report begins.
REPORT TITLE	Report title.
REPORT SUBTITLE	Report subtitle, if SUBTITLE control statement is chosen (see “SUBTITLE” on page 2-111 for more information).

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Shared Device Activity Report

The Shared Device Activity report displays shared DASD and tape activity (see Figure 3-65).

The Shared Device Activity Report is produced by using the SHARDEV Analyzer control statement (see “Shared Device Activity Report”). The data for this report is obtained by using the DEVICE Extractor control statement (see “DEVICE” on page 1-23).

Figure 3-65 Shared Device Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    SHARED DEVICE ACTIVITY REPORT                    RPTSEQ     3 PAGE     69
BMC SOFTWARE, INC.                                            XYZ COMPANY                             REPORT DATE: 10 JUN 03 16.58
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                       SYSTEM ID: **ALL**  COMB-MVS


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  74-1/203/11.6K/11
                                   ------------------- AVERAGE TIME IN MSEC -------------------- *** PERCENT OF TOTAL TIME ***
VOLSER/DEVTYPE /PAV MX                              CU    DIR    DEV                                   DEV                      AVG
DEV  IODF     SYSNAME/  SSCH     TOTAL            BUSY   PORT   BUSY                          DEV   IN     DEV  DEV  MOUNT  DSETS
NUM  SFX  LCU  SYSID   PER SEC  SERVICE   IOSQ   DELAY  DELAY  DELAY   PEND    DISC    CONN   CONN   USE   RESV ALLOC PEND   ALLOC
---- --- ---- -------- -------- ------- -------- ------ ------ ------ ------- ------- ------- ----- ----- ----- ----- ----- -------
TSG305 3380K
8318  25 00B7 SJSC        0.037     8.5      0.0    1.0    0.0    0.0     4.3     0.2     4.0   0.0   0.0   0.0 100.0   0.0   25.4
8318  25 00E8 SJSE        0.015    30.4      0.0    2.9    1.4    0.1    25.9     0.3     4.2   0.0   0.0   0.0 100.0   0.0   13.1
SUMMARY  (  2 ACTIVE)     0.053    18.6      0.0    1.9    0.6    0.1    14.2     0.3     4.1   0.0   0.0   0.0 100.0   0.0   38.4

TSG306 33903
839E  25 00B7 SJSC        0.444    11.1      0.0    0.0    0.0    0.4     1.3     0.2     9.7   0.4   0.4   0.0 100.0   0.0  331.9
839E  25 00E8 SJSE        0.174    12.2      0.0    0.5    0.3    0.5     3.7     0.5     8.0   0.1   0.1   0.0 100.0   0.0  265.5
SUMMARY  (  2 ACTIVE)     0.618    11.6      0.0    0.2    0.1    0.4     2.4     0.4     8.9   0.6   0.6   0.0 100.0   0.0  597.4

TSG307 33903
839F  25 00B7 SJSC        1.551     2.1      0.0    0.0    0.0    0.0     0.7     0.2     1.3   0.2   0.2   0.0 100.0   0.0  195.7
839F  25 00E8 SJSE        0.300     4.9      0.0    0.1    0.2    0.1     2.4     0.2     2.2   0.1   0.1   0.0 100.0   0.0  167.4
SUMMARY  (  2 ACTIVE)     1.852     2.9      0.0    0.0    0.1    0.1     1.2     0.2     1.6   0.3   0.3   0.0 100.0   0.0  363.1

TSG308 33903
83A0  25 00B7 SJSC        0.861     2.2      0.0    0.0    0.0    0.0     1.0     0.2     1.0   0.1   0.1   0.0 100.0   0.0  342.6
83A0  25 00E8 SJSE        0.160     3.6      0.0    0.1    0.2    0.0     2.6     0.2     0.8   0.0   0.0   0.0 100.0   0.0  180.6
SUMMARY  (  2 ACTIVE)     1.021     2.6      0.0    0.0    0.1    0.0     1.5     0.2     1.0   0.1   0.1   0.0 100.0   0.0  523.2

TSG309 33903
83A1  25 00B7 SJSC        0.485     6.1      0.0    0.0    0.0    0.0     1.7     0.3     4.1   0.2   0.2   0.0 100.0   0.0   18.5
83A1  25 00E8 SJSE        0.134     4.9      0.0    0.0    0.2    0.0     2.4     0.5     2.0   0.0   0.1   0.1 100.0   0.0    9.3
SUMMARY  (  2 ACTIVE)     0.619     5.7      0.0    0.0    0.1    0.0     2.0     0.4     3.3   0.2   0.3   0.1 100.0   0.0   27.8

TSG310 33903
83A2  25 00B7 SJSC        2.771     1.8      0.1    0.0    0.0    0.0     0.9     0.1     0.8   0.2   0.2   0.0 100.0   0.0  875.0
83A2  25 00E8 SJSE        0.701     4.8      0.0    0.4    0.4    0.1     3.6     0.2     1.0   0.1   0.1   0.0 100.0   0.0  474.3
SUMMARY  (  2 ACTIVE)     3.472     2.9      0.0    0.1    0.1    0.0     1.8     0.1     0.9   0.3   0.3   0.0 100.0   0.0 1349.3

TSG311 33903
83A3  25 00B7 SJSC        0.728     3.2      0.0    0.0    0.0    0.0     0.8     0.3     2.0   0.1   0.2   0.0 100.0   0.0  380.2
83A3  25 00E8 SJSE        0.324     4.4      0.0    0.1    0.2    0.1     2.4     0.3     1.8   0.1   0.1   0.0 100.0   0.0  316.4
SUMMARY  (  2 ACTIVE)     1.052     3.8      0.0    0.1    0.1    0.0     1.5     0.3     1.9   0.2   0.2   0.0 100.0   0.0  696.6

TSG312 33903
83A4  25 00B7 SJSC        1.584     5.3      0.0    0.0    0.0    0.1     1.0     0.1     4.2   0.7   0.7   0.0 100.0   0.0   75.8
83A4  25 00E8 SJSE        1.016     8.2      0.4    0.1    0.2    0.1     2.5     0.2     5.1   0.5   0.5   0.0 100.0   0.0   41.8
SUMMARY  (  2 ACTIVE)     2.600     6.9      0.2    0.1    0.1    0.1     1.8     0.2     4.7   1.2   1.2   0.0 100.0   0.0  117.6

                                                   SUMMARY

                          580 DASD AND   200 TAPE DEVICES WERE FOUND

                                                # OF DEVICES
                                   SYSTEM      DASD    TAPE
                                   SJSC         580     196
                                   SJSE         574     196
```

Shared Device Activity Report Field Descriptions

Table 3-83 describes each field in the Shared Device Activity Report.

Table 3-83 Field Descriptions for the Shared Device Activity Report

Field	Description
VOLSER	Volser from the UCB of the last volume mounted on this device.
DEV TYPE	Type of the physical I/O device on which the volume is mounted.
PAV MX	Number of exposures (base and aliases) of a Parallel Access Volume (PAV) at the end of the report duration. Applicable only to DASDs. An asterisk (*) following this number indicates that the number of exposures changed during the report duration.
DEV NUM	Four-digit hexadecimal number identifying this device. An asterisk (*) following this number indicates the online/offline status of the device was changed during the report interval.
IODF SFX	IODF suffix in effect for the system.
LCU	Four-digit hexadecimal identifier of the Logical Control Unit.
SYSNAME/SYSID	Name of the system by either SYSNAME or SYSID. See “SYSPLEX” on page 2-112 for more information about SYSNAME and SYSID.
SSCH PER SEC	Rate per second at which SSCH instructions issued for this device completed successfully. OFFLINE is printed under this column if the device was offline during the entire report interval. If the online/offline status of the device was changed during a recording interval, it is considered offline and its data is skipped for that particular interval. The device SUMMARY line contains the sum of SSCH/sec for all systems reported.
TOTAL SERVICE	Average number of milliseconds the device required to service an I/O request (IOSQ + PEND + DISC + CONN). The device SUMMARY line contains the sum of the weighted IOSQ, PEND, DISC, and CONN.
IOSQ	Average number of milliseconds of delay an I/O request encountered because the device was busy performing an I/O from the local system. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
CU BUSY DELAY	Average number of milliseconds of delay an I/O request encountered because control unit was busy. This delay is part of pending time. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
DIR PORT DELAY	Average number of milliseconds of delay an I/O request encountered because the ESCON director port was busy. This delay is part of pending time. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
DEV BUSY DELAY	Average number of milliseconds of delay an I/O request encountered because the device was busy due to I/O from another system. This delay is part of pending time. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.

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Table 3-83 Field Descriptions for the Shared Device Activity Report (continued)

Field	Description
PEND	Average number of milliseconds an I/O request must wait for hardware, such as an available channel path or control unit, as well as time between the SSCH pending at the channel and the device active on the subchannel. This time also includes delays caused by another processor reserving this device in a shared DASD environment. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
DISC	Average number of milliseconds during which the device was processing an SSCH instruction but not transferring data. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
CONN	Average number of milliseconds during which the device was processing an SSCH instruction and transferring data. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
% DEV CONN	Percent of time during the measurement interval the device was connected to a channel path. The device SUMMARY line contains the sum of % DEV CONN for each system.
% DEV IN USE	Percent of time during the measurement interval the device was in use. This includes device connect and disconnect time. The device SUMMARY line contains the sum of % DEV IN USE for each system.
% DEV RESV	Percent of time during the measurement interval this device was reserved by the processor on which the CMF MONITOR Extractor was executing. The device SUMMARY line contains the sum of % DEV RESV for each system.
% DEVICE ALLOC	Percent of time during the measurement interval this device was allocated to one or more data sets. DASD devices always show 100% allocation. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the I/Os by that system over the total I/Os by all reported systems.
% MOUNT PEND	Percent of time during the measurement interval this device had a mount pending request outstanding. The device SUMMARY line contains the sum of % MOUNT PEND for each system.
AVG DSETS ALLOC	Average number of data sets allocated on this DASD. The device SUMMARY line contains the sum of AVG DSETS ALLOC for each system.
NUM OF MOUNTS	Total number of mounts for the tape device during the reporting interval. An asterisk (*) to the left of this value indicates that a mount pending condition existed at the start of the recording interval. An asterisk (*) to the right of the value indicates that a mount pending condition existed at the end of the recording interval. The device SUMMARY lines contains the sum of NUM OF MOUNTS for each system.
AVG MOUNT TIME	Average mount pending time for the tape device. The field is reported as *hh:mm:ss*; the maximum time reported in this field is 99:59:59. The device SUMMARY line contains the weighted average of the values of the reported systems. The weighting factor for a system is the ratio of the number of mounts on that system over the total number of mounts on all reported systems.

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Table 3-83 Field Descriptions for the Shared Device Activity Report (continued)

Field	Description
TIME DEVICE ALLOC	Total time the tape device was allocated during the reporting interval. The field is reported as *hh:mm:ss*; the maximum time reported in this field is 99:59:59. The device SUMMARY line contains the sum of TIME DEVICE ALLOC for each system.
SUMMARY	Total number of DASD and tape devices found on all systems.
# OF DEVICES – DASD	Total number of DASD devices used on the system.
# OF DEVICES – TAPE	Total number of tape devices used on the system.

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Storage Management Report

This report provides detailed information about paging activity, frame counts, and storage movement. The example in Figure 3-66 on page 3-196 illustrates the maximum amount of data available. When data collected on systems which do not make certain values available is used, the display fields associated with those values are not displayed. Notes in the example indicate the affected fields, columns, rows, or report sections.

The Storage Management Report is produced by using the STORAGE Analyzer control statement (see “STORAGE” on page 2-110). The data for this report is obtained by using the PAGING (see “PAGING” on page 1-52) Extractor control statement.

The Storage Management Report consists of these sections:

Detail Paging Activity Displays paging rates and activity percents viewed by page origin.

Expanded Storage Movement Displays special measurements pertaining to expanded storage (Migration age and High UIC) and storage movement between mediums in terms of rate, percent of total, and frame count measures.

Page Frame Counts Displays frame count measures in four categories:

— CENTRAL STORAGE
— FIXED CENTRAL STORAGE
— EXPANDED STORAGE
— SHARED PAGE GROUPS

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A sample of the Storage Management Report is shown in Figure 3-66.

Figure 3-66 Storage Management Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    STORAGE MANAGEMENT REPORT                        RPTSEQ     4 PAGE      7
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03 10.21
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00           WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  71-1/30/450/7.5
MODE = ESAME ------------------------------------- DETAIL PAGING ACTIVITY ----------------------------------------------------
                                                                                                                      PAGE
                           R A T E S   (PAGES PER SECOND)                P E R C E N T   O F   T O T A L            MOVEMENT
                         ------------------------------------          ------------------------------------       ---------------
CENTRAL STORAGE            PAGE-IN      PAGE-OUT      RECLAIMS          PAGE-IN      PAGE-OUT      RECLAIMS       PG/SEC    26.99
  LPA                         0.60                       0.00            100.0                          0.0       TIME %     0.0
  LPA,BLOCK                   0.05                                       100.0
  CSA                         4.93          0.35         0.00             93.4           6.6           0.0
  CSA,BLOCK                   0.02                                       100.0
SYSTEM AREA TOTAL             5.60          0.35         0.00             94.2           5.8           0.0
                                                                                                                   BLOCK PAGING
  NON-VIO, NON-SWAP           0.00         17.88         0.00          *ERROR*       *ERROR*           0.0       ---------------
  NON-VIO, SWAP               2.57          2.56                          50.0          50.0                      PG/BLK     4.48
  NON-VIO,NON-SWAP,BLOCK     11.18                                       100.0
  VIO                         0.00          0.00         0.00            0.0           4.8          95.2
  HIPERSPACE                  0.00          0.00                          0.0           0.0
  SHARED                      0.03          0.02                         64.8          35.2
ADDRESS SPACE TOTAL          13.75         20.46         0.00            40.2          59.8           0.0

TOTAL                        19.36         20.81         0.00            48.2          51.8           0.0

PAGE FAULTS/SECOND            8.08

---------------------------------------------------- EXPANDED STORAGE MOVEMENT ----------------------------------------------

MIGRATION AGE   MIN        0    MAX        0    AVG      0.0            HIGH UIC       MIN      154    MAX    2,540    AVG   2089.5
FREED WITHOUT MIGRATION:   TOTAL        0   PERCENT OF TOTAL      0.0

                  R A T E S   (PAGES PER SECOND)          P E R C E N T   O F   T O T A L         EXPANDED STORAGE FRAME COUNTS
                ------------------------------------      ------------------------------------    ------------------------------------
                   FROM          TO          TO            FROM          TO          TO
                  CENTRAL      CENTRAL    AUXILIARY       CENTRAL      CENTRAL    AUXILIARY      MINIMUM      MAXIMUM      AVERAGE
  VIO                0.00         0.00         0.00           0.0          0.0          0.0            0            0            0
  HIPERSPACE         0.00         0.00         0.00           0.0          0.0          0.0            0            0            0
  SHARED             0.00         0.00                        0.0          0.0                         0            0            0
TOTAL                0.00         0.00         0.00                                                     0            0            0

---------------------------------------------------- PAGE FRAME COUNTS ------------------------------------------------------

CENTRAL STORAGE            MINIMUM       MAXIMUM       AVERAGE   *  EXPANDED STORAGE          MINIMUM       MAXIMUM       AVERAGE
  SQA                        5,886         7,540         7,076   *    SQA                           0             0             0
  LPA                            0         4,187           886   *    LPA                           0             0             0
  CSA                        8,914        17,072        14,445   *    CSA                           0             0             0
  LSQA                      15,440        27,201        23,321   *    LSQA                          0             0             0
  ADDRESS SPACE             64,455       165,791       137,123   *    ADDRESS SPACE                 0             0             0
  AVAILABLE                     22       103,336        20,906   *    AVAILABLE                     0             0             0
TOTAL                      195,063       195,063       195,063   *
                                                                 *    ONLINE                        0
                                                                 *    INSTALLED                     0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  71-1/30/450/7.5
FIXED CENTRAL STORAGE      MINIMUM       MAXIMUM       AVERAGE   *  SHARED PAGE GROUPS        MINIMUM       MAXIMUM       AVERAGE
  NUCLEUS                    1,905                               *    CENTRAL STORAGE              34           438           170
  SQA                        5,375         7,531         6,986   *    EXPANDED STORAGE              0             0             0
  LPA                            0            94            12   *    FIXED TOTAL                   1             2             1
  CSA                          196           570           467   *    FIXED BELOW 16M               0             0             0
  LSQA                       7,413        15,605        12,807   *    AUXILIARY SLOTS               0           389           317
  ADDRESS SPACE              3,258         4,842         3,986
  BELOW 16 MEGABYTES           247           479           416
TOTAL                       19,623        29,697        26,165
```

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Detail Paging Activity Section Field Descriptions

Table 3-84 describes each field in the Detail Paging Activity section of the Storage Management Report.

Note: A value of *ERROR* in any of the fields of this report indicates that invalid data was encountered. One possible cause of invalid data is that expanded storage is offline; however, other causes are possible.

Table 3-84 Field Descriptions for the Detail Paging Activity Section

Field	Description
MODE	Architecture level of the operating system. ESAME indicates 64-bit real support.
RATES – LPA	Paging rate of non swap, non block pages transferred from auxiliary storage to pageable LPA central storage.
RATES – LPA,BLOCK	Paging rate of non swap, block pages transferred from auxiliary storage to pageable LPA central storage.
RATES – CSA	Paging rate of non swap, non block pages transferred between auxiliary storage and pageable CSA central storage.
RATES – CSA,BLOCK	Paging rate of non swap, block pages transferred from auxiliary storage to pageable CSA central storage.
RATES – SYSTEM AREA TOTAL	Paging rate of pages transferred between auxiliary storage and pageable LPA and CSA central storage.
RATES – NON-VIO, NON-SWAP	Paging rate of non VIO, non swap pages transferred between auxiliary and central storage.
RATES – NON-VIO, SWAP	Paging rate of non VIO, swap pages transferred between auxiliary and central storage.
RATES – NON-VIO, NON-SWAP, BLOCK	Paging rate of non VIO, non swap, and block pages transferred between auxiliary to central storage.
RATES – VIO	Paging rate of all VIO pages transferred between auxiliary and central storage.
RATES – HIPERSPACE	Paging rate of hiperspace pages transferred between auxiliary and central storage.
RATES – SHARED	Paging rate of shared pages transferred between auxiliary and central storage. This field is only displayed in MVS 5.2 and later systems.
RATES – ADDRESS SPACE TOTAL	Paging rate of all VIO, non VIO, hiperspace, and shared pages transferred between auxiliary and central storage.
RATES – PAGE-IN	Paging rate of page-ins transferred from auxiliary to central storage.
RATES – PAGE-OUT	Paging rate of page-outs transferred from central storage to auxiliary storage.
RATES – RECLAIMS	Paging rate of pages reused without reading from external storage.
PERCENT OF TOTAL – PAGE-IN	Percentage of the total of the three rates (page-ins, page-outs, and reclaims) for this row that was the page-in rate.
PERCENT OF TOTAL – PAGE-OUT	Percentage of the total of the three rates (page-ins, page-outs, and reclaims) for this row that was the page-out rate.
PERCENT OF TOTAL – RECLAIMS	Percentage of the total of the three rates (page-ins, page-outs, and reclaims) for this row that was the reclaim rate.

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Table 3-84 Field Descriptions for the Detail Paging Activity Section (continued)

Field	Description
PAGE MOVEMENT PG/SEC	Rate of page movement between below the 16MB line and above the 16MB line in central storage.
PAGE MOVEMENT TIME %	Percentage of time spent in PREF STEAL during the reporting interval. This field is reported as a system area total value.
BLOCK PAGING PG/BLK	Average number of pages per block.
TOTAL	Paging rate of all pages transferred.
PAGE FAULTS/SEC	Rate of page faults per second. This is the rate of pages read from DASD only.

Expanded Storage Movement Section Field Descriptions

Table 3-85 describes each field in the Expanded Storage Movement section of the Storage Management Report.

Table 3-85 Field Descriptions for the Expanded Storage Movement Section

Field	Description
MIGRATION AGE – MIN	Minimum age in seconds of a page before it was migrated from expanded storage.
MIGRATION AGE – MAX	Maximum age in seconds of a page before it was migrated from expanded storage.
MIGRATION AGE – AVG	Average age in seconds of a page before it was migrated from expanded storage.
HIGH UIC – MIN	Minimum high unreferenced interval count in seconds (time that the page has not been referenced) of central storage frames.
HIGH UIC – MAX	Maximum high unreferenced interval count in seconds (time that the page has not been referenced) of central storage frames.
HIGH UIC – AVG	Average high unreferenced interval count in seconds (time that the page has not been referenced) of central storage frames.
RATES – FROM CENTRAL	Pages moved from central storage to expanded storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
RATES – TO CENTRAL	Pages moved from expanded storage to central storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
RATES – TO AUXILIARY	Pages moved from expanded storage to auxiliary storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
PERCENT OF TOTAL – FROM CENTRAL	Percentage of the total page movements for this row's area that were movements from central storage to expanded storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.

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Table 3-85 Field Descriptions for the Expanded Storage Movement Section (continued)

Field	Description
PERCENT OF TOTAL – TO CENTRAL	Percentage of the total page movements for this row's area that were movements from expanded storage to central storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
PERCENT OF TOTAL – TO AUXILIARY	Percentage of the total page movements for this row's area that were movements from expanded storage to auxiliary storage. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
EXPANDED STORAGE FRAME COUNTS – MINIMUM	Minimum number of VIO, HIPERSPACE, or SHARED page frames in use in expanded storage. A VIO page frame is allocated to a VIO address space, a HIPERSPACE frame is allocated to a HIPERSPACE, and a SHARED page frame is allocated to a shared address space. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
EXPANDED STORAGE FRAME COUNTS – MAXIMUM	Maximum number of VIO, HIPERSPACE, or SHARED page frames in use in expanded storage. A VIO page frame is allocated to a VIO address space, a HIPERSPACE frame is allocated to a HIPERSPACE, and a SHARED page is allocated to a shared address space. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
EXPANDED STORAGE FRAME COUNTS – AVERAGE	Average number of VIO, HIPERSPACE, or SHARED page frames in use in expanded storage. A VIO page frame is allocated to a VIO address space, a HIPERSPACE frame is allocated to a HIPERSPACE, and a SHARED page is allocated to a shared address space. Note: The VIO, HIPERSPACE, and SHARED values are subsets of the TOTAL values.
EXPANDED STORAGE FRAME COUNTS – ONLINE	Number of expanded storage page frames online.
EXPANDED STORAGE FRAME COUNTS – INSTALLED	Number of expanded storage page frames installed.

Page Frame Counts Section Field Descriptions

Table 3-86 describes each field in the Page Frame Counts section of the Storage Management Report.

Table 3-86 Field Descriptions for the Page Frame Counts Section

Field	Description
CENTRAL STORAGE – MINIMUM	Minimum number of page frame counts in SQA, LPA, CSA, LSQA, address space, available, or total.
CENTRAL STORAGE – MAXIMUM	Maximum number of page frame counts in SQA, LPA, CSA, LSQA, address space, available, or total.

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Table 3-86 Field Descriptions for the Page Frame Counts Section (continued)

Field	Description
CENTRAL STORAGE – AVERAGE	Average number of page frame counts in SQA, LPA, CSA, LSQA, address space, available, or total.
EXPANDED STORAGE – MINIMUM	Minimum number of page frames backing SQA, LPA, CSA, LSQA, address space, available, or total page frames in expanded storage.
EXPANDED STORAGE – MAXIMUM	Maximum number of page frames backing SQA, LPA, CSA, LSQA, address space, available, or total page frames in expanded storage.
EXPANDED STORAGE – AVERAGE	Average number of page frames backing SQA, LPA, CSA, LSQA, address space, available, or total page frames in expanded storage.
EXPANDED STORAGE – ONLINE	Number of expanded storage page frames online.
EXPANDED STORAGE – INSTALLED	Number of expanded storage page frames installed.
FIXED CENTRAL STORAGE – MINIMUM	Minimum fixed central storage page frame count.
FIXED CENTRAL STORAGE – MAXIMUM	Maximum fixed central storage page frame count.
FIXED CENTRAL STORAGE – AVERAGE	Average fixed central storage page frame count.
SHARED PAGE GROUPS – MINIMUM	Minimum number of shared page group page-ins and page-outs in central storage.
SHARED PAGE GROUPS – MAXIMUM	Maximum number of shared page group page-ins and page-outs in central storage.
SHARED PAGE GROUPS – AVERAGE	Average number of shared page group page-ins and page-outs in central storage.

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System Resources Manager Report

The System Resources Manager Report provides general information about the System Resource Manager (SRM) in five sections.

The System Resources Manager Report is produced by using the SRM Analyzer control statement (see “SRM” on page 2-109). The data for this report is obtained by using the CPU (see “CPU” on page 1-14) and PAGING (see “PAGING” on page 1-52) Extractor control statements.

Queue Measures Shows queuing and swapping data for address spaces. This section is divided into two parts, physical queues and logical queues.

Paging Activity Viewed by average pages per second and average percentage. These measures are further divided into system area and private area measures.

Reclaims are shown under Paging Activity. A reclaim occurs when a page frame is stolen from a private or system pageable area but is retrieved for reuse before being reallocated. The request for a page is satisfied without starting a page-in.

Expanded Storage Measures Shows paging activity to the expanded storage and statistical data on available frames and migration age.

SRM Data Contains counts of SRM related events, such as SQA and available frame queue shortages. It also displays percentages of threshold imbalance as defined in the following control blocks:

CPU management control table (CCT)
I/O management control table (ICT)
Storage management control table (MCT)

Swapping Measures A count of reasons for swapping by destination of the swap, rate per minute, and percentage value. This section of the report prints on two pages, separate from the other four report sections. (Two pages are required for the Swapping Measures section because of the volume of information presented.)

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A sample of the System Resource Manager Report is shown in Figure 3-67, except for the Swapping Measures section. The Swapping Measures section, which prints on two pages, is shown in Figure 3-68 on page 3-207.

Figure 3-67 SRM Report (except Swapping Measures Section)

```
PRODUCED BY CMF ANALYZER (5.5.00)                  SYSTEM RESOURCES MANAGER REPORT                    RPTSEQ     4 PAGE      9
BMC SOFTWARE, INC.                                            XYZ COMPANY                             REPORT DATE: 10 JUN 03 11.55
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/30/5,393/7.5  240-3/30/450/7.5  70-1/30/5,393/7.5  71-1/30/450/7.5
-------------------------------------------------------  QUEUE MEASURES  ------------------------------
                         PHYSICAL QUEUES                                          LOGICAL QUEUES                  ADDRESS SPACES
    MEASURE      IN & READY      IN QUEUE  OUT & READY  WAIT QUEUE            OUT & READY    WAIT QUEUE             IN AND NONSWAP
    PCT QUEUED      100.0           100.0        .3          57.7                   .4         100.0                       N/A
    AVERAGE           1.8            97.8        .0          34.5                   .0          73.4                      95.2
    MINIMUM           1.0            67.0        .0            .0                   .0           5.0                      66.0
    MAXIMUM          81.0           158.0       1.0         117.0                  2.0         118.0                     132.0
    STD DEV           0.5            10.3       0.5          21.7                  0.5          19.5                      10.2
-----------------------------------------------------  PAGING ACTIVITY  -------------------------------------------------------
ACTIVITY TYPE                 SYSTEM AREA      PRIVATE AREA       *      ACTIVITY TYPE                        RCL/MIN      PCT
                            PG/SEC     PCT    PG/SEC     PCT      *
DEMAND PAGING PAGE IN         5.60    94.18    11.16    32.66     *
DEMAND PAGING PAGE OUT         .35     5.82    17.88    52.33     *      COMMON AREA RECLAIMS                     .00       .00
VIO PAGE IN                                      .00      .00     *      PRIVATE AREA RECLAIMS (NON-VIO)          .00       .00
VIO PAGE OUT                                     .00      .00     *      VIO RECLAIMS                             .04    100.00
SWAP PAGE IN                                    2.57     7.51     *
SWAP PAGE OUT                                   2.56     7.50     *      TOTAL RECLAIMS                           .04    100.00
TOTAL PAGING                  5.95   100.00    34.17   100.00     *      ACTIVITY TYPE                     PAGES MOVED    PG/SEC
                                                                  *      PAGE MOVEMENT                        728729     26.99
-----------------------------------------------  EXPANDED STORAGE MEASURES  ---------------------------------------------------
                    EXPANDED STORAGE ACTIVITY                     *                 EXPANDED STORAGE CONFIGURATION
PAGES TO EXPANDED STORAGE                        .00              *      INSTALL PAGE FRAMES                        0
MIGRATION RATE TO AUX. STORAGE                   .00              *      ONLINE PAGE FRAMES                         0
                  AVAILABLE          SYSTEM            MIGRATION  *
MEASURE           ES FRAMES         HIGH UIC              AGE     *
AVERAGE               0.0            2089.5               0.0     *
MINIMUM                 0               154                 0     *
MAXIMUM                 0              2540                 0     *
-------------------------------------------------------     SRM DATA    ---------------------------------------------------
KEY SRM MEASURES                                        VALUE     *      KEY SRM MEASURES                                    PCT
SQA LOW EVENT COUNT                                         0     *      CPU OVERLOAD PERCENTAGE                             .00
AVAILABLE QUEUE LOW EVENT COUNT                          6334     *      I/O OVERLOAD PERCENTAGE                             .00
ENQUEUE HOLD SWAPOUT EVENT COUNT                            0     *      I/O UNDERLOAD PERCENTAGE                            .00
MAX PAGE-INS/SEC                                         392.2    *      CPU IMBALANCE PERCENTAGE                            .00
MAX SWAPS/MIN                                              230    *      STORAGE IMBALANCE PERCENTAGE                        .00
AVG PAGES/SWAP OUT                                         268    *      TERMINAL I/O SWAPS PERCENTAGE DUE TO OUTPUT        4.92
AVG PAGES/SWAP IN                                          268    *
SRM OPTIONS MEMBER FROM PARMLIB                       IEAOPTE1    *
```

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Queue Measures Section Field Descriptions

Table 3-87 describes each field in the Queue Measures section of the System Resources Manager Report.

Table 3-87 Field Descriptions for the Queue Measures Section

Field	Description
MEASURE	Measure being reported, which can be PCT QUEUEDPercentage of time the queue existed. AVERAGE Average number of address spaces queued over time. MINIMUM Minimum number of address spaces queued over time. MAXIMUM Maximum number of address spaces queued over time. STD DEV Standard deviation of the average.
PHYSICAL QUEUES	IN & READY Number of address spaces swapped in with dispatchable work to do. IN QUEUE Number of address spaces swapped in, but were nondispatchable. OUT & READY Number of address spaces swapped out, but were ready to be swapped in. WAIT QUEUE Number of address spaces swapped out and waiting for an event to finish (such as a WTOR or mount).
LOGICAL QUEUES	OUT & READY Address spaces on the SRM out queue that are physically in central storage but are logically swapped out of central storage and ready to execute. WAIT QUEUE Address spaces on the SRM wait queue that are physically in central storage but are logically swapped out to central storage and not ready to execute.
ADDRESS SPACES IN AND NONSWAP	Number of swapped in address spaces marked not swappable.

Paging Activity Section Field Descriptions

Table 3-88 describes each column field in the Paging Activity section of the System Resources Manager Report.

Table 3-88 Field Descriptions for the Paging Activity Section (Part 1 of 2)

Field	Description	
SYSTEM AREA	PG/SEC	Rate per second at which pages were moved in the system area for the ACTIVITY TYPE.
	PCT	Percentage of total pages moved in the system area for the ACTIVITY TYPE.
PRIVATE AREA	PG/SEC	Rate per second at which pages were moved in the private for the ACTIVITY TYPE.
	PCT	Percentage of total pages moved in the private for the ACTIVITY TYPE.

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Table 3-88 Field Descriptions for the Paging Activity Section (Part 2 of 2)

Field	Description
ACTIVITY TYPE	DEMAND PAGING PAGE IN Page-ins triggered to satisfy address space requests for pages that were not in central storage. DEMAND PAGING PAGE OUT Central storage page in an address space was paged out so that a page-in request could be satisfied. VIO PAGE IN VIO pages brought into central storage. VIO PAGE OUT VIO pages paged out of central storage. SWAP PAGE IN Page-ins into central storage because an address space was swapped in. SWAP PAGE OUT Page-outs that occurred because an address space was swapped out. TOTAL PAGING Total paging activity. COMMON AREA RECLAIMS RCL/MIN Pages reclaimed per minute in CSA and PLPA. PCT Percentage of total reclaims that were common area reclaims. PRIVATE AREA RECLAIMS (NON-VIO) RCL/MIN Pages reclaimed per minute in the private area. PCT Percentage of total reclaims that handled in the address space. VIO RECLAIMS RCL/MIN Pages reclaimed per minute due to a VIO page request that was satisfied without a page I/O (handled by an explicit VIO reclaim interface). PCT Percentage of total reclaims that were VIO reclaims. TOTAL RECLAIMS RCL/MIN Total reclaims per minutes. PCT Total percentage of all reclaims (by definition, 100%).
PAGE MOVEMENT	PAGES MOVED Total number of pages that were moved between below the 16MB line and above the 16MB line in central storage. PG/SEC Rate per second at which pages were moved between below the 16MB line and above the 16MB line in central storage.

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Expanded Storage Measures Section Field Descriptions

Each field in the Expanded Storage Measures section of the System Resources Manager Report is described in Table 3-89.

Table 3-89 Field Descriptions for the Expanded Storage Measures Section

Field	Description
EXPANDED STORAGE ACTIVITY	PAGES TO EXPANDED STORAGE Total rate per minute of pages sent to expanded storage for paging and swapping requests. MIGRATION RATE TO AUX. STORAGE Total rate per minute of pages migrated from expanded storage to auxiliary storage. AVAILABLE ES FRAMES AVERAGE Average number of page frames actually available in expanded storage for the reporting interval. MINIMUM Minimum number of page frames actually available in extended storage for the reporting interval. MAXIMUM Maximum number of page frames actually available in expanded storage for the reporting interval. SYSTEM HIGH UIC AVERAGE Average system high unreferenced interval count for the reporting interval. MINIMUM Minimum system high unreferenced interval count for the reporting interval. MAXIMUM Maximum system high unreferenced interval count for the reporting interval. MIGRATION AGE AVERAGE Average length of time a page remains unreferenced in expanded storage before being migrated to auxiliary storage for the reporting interval, in seconds. MINIMUM Minimum length of time a page remains unreferenced in expanded storage before being migrated to auxiliary storage for the reporting interval, in seconds. MAXIMUM Maximum length of time a page remains unreferenced in expanded storage before being migrated to auxiliary storage for the reporting interval, in seconds.
EXPANDED STORAGE CONFIGURATION	IINSTALLED PAGE FRAMES Total number of page frames installed in expanded storage. ONLINE PAGE FRAMES Total number of page frames in expanded storage that are online to the system.

Table 3-90 describes each field in the SRM Data section of the System Resources Manager Report.

Table 3-90 Field Descriptions for the SRM Data Section (Part 1 of 2)

Field	Description
SQA LOW EVENT COUNT	Number of times SQA low threshold was reached; an SQALOW SYSEVENT was issued.
AVAILABLE QUEUE LOW EVENT COUNT	Number of times available frame queue dropped below the low threshold; an AVQLOW SYSEVENT was issued.

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Table 3-90 Field Descriptions for the SRM Data Section (Part 2 of 2)

Field	Description
ENQUEUE HOLD SWAPOUT EVENT COUNT	Number of times an owner of a resource in contention was swapped out of storage.
MAX PAGE-INS/SEC	Maximum number of page-ins per second; this includes demand page-ins, swap page-ins, and VIO page-ins.
MAX SWAPS/MIN	Maximum number of swaps per minute.
AVG PAGES/SWAP OUT	Average number of pages swapped out for each swap-out.
AVG PAGES/SWAP IN	Average number of pages swapped in for each swap-in.
SRM OPTIONS MEMBER FROM PARMLIB	Name of the member in SYS1.PARMLIB that was used for the SRM options.
CPU OVERLOAD PERCENTAGE	Percentage of time the CPU was observed to be overloaded. This is determined by measuring whether the CCVUTILP field of the CCT contains a value greater than 100.
I/O OVERLOAD PERCENTAGE	If I/O load balancing is active, percent of time any logical path block was over utilized. The LPB thresholds are user-specifiable in the IEAOPT member of SYS1.PARMLIB.
I/O UNDERLOAD PERCENTAGE	If I/O load balancing is active, percent of time any logical path block was under-utilized. The LPB thresholds are user-specifiable in the IEAOPT member of SYS1.PARMLIB.
CPU IMBALANCE PERCENTAGE	If CPU load balancing is active, percent of time the CPUs were out of balance.
STORAGE IMBALANCE PERCENTAGE	If storage balancing is active, percent of time that storage utilization was out of balance.
TERMINAL I/O SWAPS PERCENTAGE DUE TO OUTPUT	Percentage of terminal swaps out of the total TERMINAL I/O WAITS.

Swapping Measures Section

In interpreting the Swapping Measures section of Figure 3-68 on page 3-207, columns represent swap reasons and rows represent swap types. While swap reasons are mutually exclusive, swap types may overlap or otherwise interact:

- Row labeled LOG SWAP EFFECTIVE is a subset of LOG SWAP TOTAL.
- AUX STOR DIRECT and AUX STOR VIA TRANSITION are added together to produce AUX STOR TOTAL.
- LOG SWAP EFFECTIVE and EXPANDED STORAGE EFFECTIVE are added together to produce LOG SWAP +EXT STOR EFFECTIVE.
- TOTAL row shows the sum of LOG SWAP EFFECTIVE, AUX STOR TOTAL, and EXTENDED STORAGE TOTAL .

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The TOTAL values shown under each column heading represent each swap type's percentage of that column's reason. The totals for each row in the TOTAL column represent that swap type's percentage of all swaps.

Figure 3-68 on page 3-207 shows the two pages that contain the Swapping Measures section of the SRM Report.

Figure 3-68 SRM Report, Swapping Measures Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                    SYSTEM RESOURCES MANAGER REPORT                    RPTSEQ     4 PAGE     10
 BMC SOFTWARE, INC.                                            XYZ COMPANY                              REPORT DATE: 10 JUN 03 11.55
 ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0

 BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/30/5,393/7.5  240-3/30/450/7.5  70-1/30/5,393/7.5  71-1/30/450/7.5
 ------------------------------------------------------  SWAPPING MEASURES  ------------------------------------------------------
                                                   CENTRAL
                          TERMINAL    LONG    AUX STOR  STORAGE   DETECTED                                        UNI-     TRANS
 SWAP TYPE   MEASURE      I/O WAIT    WAIT    SHORTAGE  SHORTAGE    WAIT    REQUEST   ENQUEUE   EXCHANGE  LATERAL   NONSWAP
 ---------- ----------    --------  --------  --------  --------  --------  --------  --------  --------  --------  --------
 LOG SWAP   COUNT            15351     11402         0         0      3575         0         0         2        50         0
 EFFECTIVE  RATE/MIN         34.11     25.34       .00       .00      7.94       .00       .00       .00       .11       .00
            % TOTAL          99.29     99.63       .00       .00     99.69       .00       .00    100.00    100.00       .00
 LOG SWAP   COUNT            15461     11444         0         0      3586         0         0         2        50         1
 TOTAL      RATE/MIN         34.36     25.43       .00       .00      7.97       .00       .00       .00       .11       .00
            % TOTAL         100.00    100.00       .00       .00    100.00       .00       .00    100.00    100.00      1.05
 AUX STOR   COUNT                0         0         0         0         0         0         0         0         0        94
 DIRECT     RATE/MIN           .00       .00       .00       .00       .00       .00       .00       .00       .00       .21
            % TOTAL            .00       .00       .00       .00       .00       .00       .00       .00       .00     98.95
 AUX STOR   COUNT             110        42         0         0        11         0         0         0         0         1
 VIA        RATE/MIN           .24       .09       .00       .00       .02       .00       .00       .00       .00       .00
 TRANSITION % TOTAL            .71       .37       .00       .00       .31       .00       .00       .00       .00      1.05
 AUX STOR   COUNT             110        42         0         0        11         0         0         0         0        95
 TOTAL      RATE/MIN           .24       .09       .00       .00       .02       .00       .00       .00       .00       .21
            % TOTAL            .71       .37       .00       .00       .31       .00       .00       .00       .00    100.00
 EXPANDED   COUNT                0         0         0         0         0         0         0         0         0         0
 STORAGE    RATE/MIN           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 DIRECT     % TOTAL            .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 EXPANDED   COUNT                0         0         0         0         0         0         0         0         0         0
 STORAGE    RATE/MIN           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 EFFECTIVE  % TOTAL            .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 EXPANDED   COUNT                0         0         0         0         0         0         0         0         0         0
 STORAGE    RATE/MIN           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 TOTAL      % TOTAL            .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 MIGRATED   COUNT                0         0         0         0         0         0         0         0         0         0
 FROM       RATE/MIN           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 EXP STOR   % TOTAL            .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
 LOG SWAP   COUNT            15351     11402         0         0      3575         0         0         2        50         0
 +EXP STOR  RATE/MIN         34.11     25.34       .00       .00      7.94       .00       .00       .00       .11       .00
 EFFECTIVE  % TOTAL          99.29     99.63       .00       .00     99.69       .00       .00    100.00    100.00       .00
 TOTAL      COUNT            15461     11444         0         0      3586         0         0         2        50        95
            RATE/MIN         34.36     25.43       .00       .00      7.97       .00       .00       .00       .11       .21
            % GRND TOT       50.46     37.35       .00       .00     11.70       .00       .00       .01       .16       .31
```

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PRODUCED BY CMF ANALYZER (5.5.00)                  SYSTEM RESOURCES MANAGER REPORT                    RPTSEQ     4 PAGE     11
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03 11.55
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/30/5,393/7.5  240-3/30/450/7.5  70-1/30/5,393/7.5  71-1/30/450/7.5
-------------------------------------------------------  SWAPPING MEASURES  -------------------------------------------------------
                                                                          OMVS      OMVS
                        IMPROVE   IMPROVE   USER OUT    APPC      INPUT    OUTPUT
SWAP TYPE   MEASURE     CS USAGE  PAGE RT   TOO LONG    WAIT      WAIT      WAIT     TOTAL
---------- ----------   --------  --------  --------  --------  --------  --------  --------
LOG SWAP   COUNT              0         0         0         0         0         0     30380
EFFECTIVE  RATE/MIN         .00       .00       .00       .00       .00       .00     67.51
           % TOTAL          .00       .00       .00       .00       .00       .00     99.46
LOG SWAP   COUNT              0         0         0         0         0         0     30544
TOTAL      RATE/MIN         .00       .00       .00       .00       .00       .00     67.88
           % TOTAL          .00       .00       .00       .00       .00       .00     99.69
AUX STOR   COUNT              0         0         0         0         0         0        94
DIRECT     RATE/MIN         .00       .00       .00       .00       .00       .00       .21
           % TOTAL          .00       .00       .00       .00       .00       .00       .31
AUX STOR   COUNT              0         0         0         0         0         0       164
VIA        RATE/MIN         .00       .00       .00       .00       .00       .00       .36
TRANSITION % TOTAL          .00       .00       .00       .00       .00       .00       .54
AUX STOR   COUNT              0         0         0         0         0         0       258
TOTAL      RATE/MIN         .00       .00       .00       .00       .00       .00       .57
           % TOTAL          .00       .00       .00       .00       .00       .00       .84
EXPANDED   COUNT              0         0         0         0         0         0         0
STORAGE    RATE/MIN         .00       .00       .00       .00       .00       .00       .00
DIRECT     % TOTAL          .00       .00       .00       .00       .00       .00       .00
EXPANDED   COUNT              0         0         0         0         0         0         0
STORAGE    RATE/MIN         .00       .00       .00       .00       .00       .00       .00
EFFECTIVE  % TOTAL          .00       .00       .00       .00       .00       .00       .00
EXPANDED   COUNT              0         0         0         0         0         0         0
STORAGE    RATE/MIN         .00       .00       .00       .00       .00       .00       .00
TOTAL      % TOTAL          .00       .00       .00       .00       .00       .00       .00
MIGRATED   COUNT              0         0         0         0         0         0         0
FROM       RATE/MIN         .00       .00       .00       .00       .00       .00       .00
EXP STOR   % TOTAL          .00       .00       .00       .00       .00       .00       .00
LOG SWAP   COUNT              0         0         0         0         0         0     30380
+EXP STOR  RATE/MIN         .00       .00       .00       .00       .00       .00     67.51
EFFECTIVE  % TOTAL          .00       .00       .00       .00       .00       .00     99.16
TOTAL      COUNT              0         0         0         0         0         0     30638
           RATE/MIN         .00       .00       .00       .00       .00       .00     68.08
           % GRND TOT       .00       .00       .00       .00       .00       .00    100.00
```

Swapping Measures Section Column Field Descriptions

Table 3-91 describes each column field in the Swapping Measures section of the System Resources Manager Report.

Table 3-91 Column Field Descriptions for the Swapping Measures Section (Part 1 of 2)

Field	Description
TERMINAL I/O WAIT	Number of swap-outs that occurred because a terminal was waiting for input or output buffers, but was not a candidate for logical swapping.
LONG WAIT	Number of swap-outs that occurred because the user address space was issued a WAIT,LONG=YES.
AUX STOR SHORTAGE	Number of swap-outs that occurred because 70% of all local page slots are allocated.
CENTRAL STORAGE SHORTAGE	Number of swap-outs that occurred due to a shortage of central storage page frames.
DETECTED WAIT	Number of swap-outs that occurred because the user address space has been in a wait greater than the SRM specified threshold of 2 seconds.
REQUEST	Number of swap-outs that occurred due to the user address space being set nonswappable by PPT or by the CONFIG STOR,OFFLINE command.
ENQUEUE	Number of swap-outs that occurred because a user address space was enqueued on a required system resource.

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Table 3-91 Column Field Descriptions for the Swapping Measures Section (Part 2 of 2)

Field	Description
EXCHANGE	Number of swap-outs that occurred to allow a user with a greater workload level to be swapped in.
UNILATERAL	Number of swap-outs that occurred because the target multiprogramming level for the domain has been exceeded.
TRANS NOSWAP	Number of swap-outs that occurred due to a user issuing the TRANSWAP SYSEVENT.
IMPROVE CS USAGE	Number of swaps that occurred because the SRM is attempting to improve Central Storage (CS) usage.
IMPROVE PAGE RT	Number of swaps that occurred because the SRM is attempting to improve the paging rate of the entire system.
USER OUT TOO LONG	Number of swaps that occurred because a user is swapped-out too long.
APPC WAIT	Number of swaps that occurred because the SRM is attempting to improve Advanced Program-to-Program Communication (APPC/MVS).
OMVS INPUT WAIT	Number of swap-outs that occurred because the OMVS address space was waiting for terminal input.
OMVS OUTPUT WAIT	Number of swap-outs that occurred because the OMVS address space was waiting for terminal output.
IN-REAL	Number of swap-outs that occurred due to recovery of real storage frames from a swappable address space. Note: This swap measure is applicable at z/OS 1.2 or later
TOTAL	Number of swap-outs for a specific placement.

Swapping Measures Section Row Field Descriptions

Table 3-92 describes each row field in the Swapping Measures section of the System Resources Manager Report.

Table 3-92 Row Field Descriptions for the Swapping Measures Section

Field	Description
LOGICAL SWAP EFFECTIVE	Logical swap candidates that were logically swapped but not physically swapped.
LOGICAL SWAP TOTAL	Logical swap candidates that were logically swapped.
AUX STORAGE DIRECT	Swap requests that were directed to auxiliary storage that went directly to auxiliary storage.
AUX STORAGE VIA TRANSITION	Swap requests that were directed to auxiliary storage but either were logically swapped or were swapped to expanded storage before being placed on auxiliary storage.
AUX STORAGE TOTAL	Swap requests that were either directly or indirectly placed on auxiliary storage.
EXPANDED STORAGE DIRECT	Physical swaps directed to expanded storage.
EXPANDED STORAGE EFFECTIVE	Physical and logical swaps directed to expanded storage that were not migrated to auxiliary storage.

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Table 3-92 Row Field Descriptions for the Swapping Measures Section

Field	Description
EXPANDED STORAGE TOTAL	Logical swap candidates that were directly or indirectly placed on the expanded storage.
MIGRATED FROM EXP STORAGE	Swap requests migrated from the expanded storage to auxiliary storage.
LOGICAL SWAP + EXP STORAGE EFFECTIVE	Swap requests that remained logically swapped or were swapped to expanded storage. Sum of Logical Swap Effective and Expanded Storage Effective.
TOTAL	Total swap requests.

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System Workload Activity Report

The System Workload Activity Report provides information about the use of each performance group period. The information in the report can be used to determine if your SRM parameters are giving the desired results. The report will include either all performance groups by default or only those specified by the PERFORM Analyzer Control Statements.

The System Workload Activity Report is produced by using the WORKLOAD Analyzer control statement (see “WORKLOAD” on page 2-126). The data is obtained using the WORKLOAD Extractor control statement (see “WORKLOAD” on page 1-82).

The System Workload Activity Report shown in Figure 3-69.

Figure 3-69 System Workload Activity Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                SYSTEM WORKLOAD ACTIVITY REPORT                RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                         XYZ COMPANY                          REPORT DATE: 10 JUN 03 11.32
ACTL 10 JUN 03 16.27.40  10 JUN 03 17.00.00          WORLDWIDE HEADQUARTERS                   SYSTEM ID: SJSF     02.10.00


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-1/57/0/0.54
                                        SERVICE USAGE BREAKDOWN BY PERFORMANCE GROUP
-----------------------------------------------------  PERFORMANCE GROUP     2  -----------------------------------------------------
SUBSYS = TSO     TRXCLASS =               ACCTINFO =        USERID =               TRXNAME  =               SRVCLASS =
-----------------------------------------------------------------------------------------------------------------------------------
SU COUNTS -->      TCB SERV      SRB SERV      MEM SERV      I/O SERV      TOT SERV      SRV RATE      ABS RATE
SU PERCENT ->      TCB SU %      SRB SU %      MEM SU %      I/O SU %      TOT SU %      SU/SECOND     EX VEL %
PAGE-INS --->      TOTAL PI      BLOCK PI      SHRD PI       ES SINGLE     ES BLOCK      ES SHR        HS PI         HS MISS
TRANSACTION >      AVERAGE       AVG MPL       # ENDED       # SWAPS       END/SEC       I/O INT       HS SERV       RCT TIME
STORAGE ---->      AVERAGE       TOTAL         CENTRAL       EXPANDED      SHARED        TCB SEC       SRB SEC       SRB+TCB%
TIMES ------>        AVERAGE XACT TIME          STANDARD DEVIATION          AVERAGE QUEUE TIME            TOTAL XACT TIME
 PGN  PGP TS   -----------------------------------------------------------------------------------------------------------------------
   2   1  **         8,295          514           451           110         9,370        8456.9       15482.8
                     0.08          0.03          0.07          0.02          0.07          4.83          0.00
                      9.9           0.0           0.0           0.0           0.0           0.0           0.0           0.0
                     0.00          0.00            41            32          0.02         0.001         0.000         0.012
                 2,272.21          0.71          0.71          0.00          0.00          0.08          0.01          0.00
                     0.00.00.019                 0.00.00.037                 0.00.00.000                 0.00.00.020
   2   2  **         4,345          115           195           145         4,800       31250.0       31250.0
                     0.04          0.01          0.03          0.03          0.04          2.48          0.00
                      6.5           0.0           0.0           0.0           0.0           0.0           0.0           0.0
                     0.00          0.00             1             1          0.00         0.001         0.000         0.000
                 2,037.23          0.16          0.16          0.00          0.00          0.04          0.00          0.00
                     0.00.00.312                 0.00.00.000                 0.00.00.000                 0.00.00.312
   2   3  **        17,237           839           718         1,420        20,214       12776.8       12776.8
                     0.17          0.05          0.11          0.30          0.16         10.42        100.00
                      3.2           0.0           0.0           0.0           0.0           0.0           0.0           0.0
                     0.00          0.00             0             0          0.00         0.010         0.000         0.000
                 1,783.24          1.45          1.45          0.00          0.00          0.17          0.01          0.01
                     0.00.00.000                 0.00.00.000                 0.00.00.000                 0.00.00.000
   2   4  **        41,677         1,923         1,847         2,880        48,327       14467.9       14467.9
                     0.41          0.12          0.29          0.60          0.37         24.92        100.00
                      2.4           0.0           0.0           0.0           0.0           0.0           0.0           0.0
                     0.00          0.00             1             1          0.00         0.020         0.000         0.000
                 1,830.54          3.15          3.15          0.00          0.00          0.41          0.02          0.02
                     0.00.05.049                 0.00.00.000                 0.00.00.000                 0.00.05.049

 SUMMARY            71,554         3,391         3,211         4,555        82,711       13375.1       14558.8
                     0.70          0.21          0.50          0.95          0.64         42.65          0.00
                      3.5           0.0           0.0           0.0           0.0           0.0           0.0           0.0
                     0.00          0.00            43            34          0.02         0.032         0.000         0.012
                 1,870.01          5.48          5.48          0.00          0.00          0.70          0.03          0.04
                     0.00.00.143                 0.00.00.758                 0.00.00.000                 0.00.00.143
```

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System Workload Activity Report Field Descriptions

Table 3-93 describes each field in the System Workload Activity Report.

Table 3-93 Field Descriptions - System Workload Activity Report

Field	Description
SUBSYS	Subsystem name when the performance group is associated with a single subsystem, as specified in IEAICSxx. This field contains a value only if you specify TYPE=PERFGRP on the WORKLOAD Analyzer control statement.
TRXCLASS	Transaction class when all transactions of this performance group belong to this transaction class. This field contains a value only if you specify TYPE=PERFGRP on the WORKLOAD Analyzer control statement.
ACCTINFO	Account information when all transactions of this performance group use this account information.
USERID	User id when all transactions of this performance group belong to this user. This field contains a value only if you specify TYPE=PERFGRP on the WORKLOAD Analyzer control statement.
TRXNAME	Transaction name when all transactions of this performance group have this transaction name. This field contains a value only if you specify TYPE=PERFGRP on the WORKLOAD Analyzer control statement.
SRVCLASS	Specifies a service class name. This field contains a value only if a service class name is specified in the ICS.
SU COUNTS	Service unit counts.
TCB SERV	Total Task Control Block (TCB) service units received for this performance group period.
SRB SERV	Total System Request Block (SRB) service units received for this performance group period.
MEM SERV	Number of memory service units received for this performance group period.
I/O SERV	Number of I/O service units received for this performance group period.
TOT SERV	Total number of service units received for this performance group period.
SRV RATE	Rate that service units were consumed while transactions were active.
ABS RATE	Rate that service units were consumed while transactions were resident in central storage.
SU PERCENT	Service unit percentages.
TCB SU %	Percentage of TCB service units received for this performance group period.
SRB SU %	Percentage of SRB service units received for this performance group period.
MEM SU %	Percentage of memory service units received for this performance group period.
I/O SU %	Percentage of I/O service units received for this performance group period.
TOT SU %	Percentage of service units received for this performance group period.
SU/SECOND	Average number of service units used per second.
EX VEL %	Execution velocity percent. For more information about execution velocity, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
PAGE-INS	Page-in information.

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Table 3-93 Field Descriptions - System Workload Activity Report (continued)

Field	Description
TOTAL PI	Rate per second of pages that were transferred (paged-in) from auxiliary storage to central storage while transactions were active. Page-ins resulting from block paging are not included in this field.
BLOCK PI	Rate per second of blocked pages that were transferred (paged-in) from auxiliary storage to central storage while transactions were active. These pages are transferred because they belong to a block in which only one page is demanded. This rate refers to blocked pages, not blocks.
SHRD PI	Total number of shared pages transferred (paged-in) from auxiliary storage to central storage.
ES SINGLE	Total number of unblocked pages transferred (paged-in) from expanded storage to central storage.
ES BLOCK	Total number of blocked pages transferred (paged-in) from expanded storage to central storage.
ES SHR	Total number of shared pages transferred (paged-in) from expanded storage to central storage.
HS PI	Rate per second of Hiperspace pages transferred (paged-in) from auxiliary storage to central storage while transactions were active.
HS MISS	Rate of expanded storage only (ESO) Hiperspace read misses. A miss occurs when a read to expanded storage is issued and the requested page resides in auxiliary storage.
TRANSACTION	Information about transactions.
AVERAGE	Average central and expanded storage, in frames, allocated to an address space while resident in storage; it is page residency time divided by address space residency time.
AVG MPL	Average number of transactions resident in central storage during the interval.
# ENDED	Number of transactions that terminated during the interval.
# SWAPS	Number of swap sequences during the interval.
END/SEC	Average number of transactions that ended per second during the interval.
I/O INT	I/O interrupt processing time in seconds for the interval.
HS SERV	Hiperspace service time in seconds for the interval.
RCT TIME	Region Control Task (RCT) time in seconds for the interval.
STORAGE	Information about system storage.
AVERAGE	Average central and expanded storage, in frames, used for transactions during the interval.
TOTAL	Total central and expanded storage, in frames, allocated to all address spaces during the report interval; it is page residency time divided by report interval.
CENTRAL	Amount of central storage, in frames, allocated to all address spaces during the report interval.
EXPANDED	Amount of expanded storage, in frames, allocated to all address spaces during the report interval.
SHARED (storage)	Amount of shared storage, in frames, allocated to all address spaces during the report interval.

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Table 3-93 Field Descriptions - System Workload Activity Report (continued)

Field	Description
TCB SEC	Number of CPU seconds used by the performance group period running in TCB mode during the interval.
SRB SEC	Number of CPU seconds used by the performance group period running in SRB mode during the interval.
SRB+TCB%	Percentage of the interval time that the performance group period spent in either SRB or TCB mode. The total can exceed 100% if the system has more than one processor.
TIMES	Information about transaction times.
AVERAGE XACT TIME	Average elapsed time of ended transactions. The elapsed time is calculated for all transactions that ended during the performance group period; the time is expressed in hours, minutes, seconds, and thousandths of seconds. Note: This field is not comparable to the AVERAGE RESPONSE field in the TSO Interval Summary Report because this field shows the average response time for TSO as a whole and the other field shows the average response time for all commands issued. For example, for a particular CLIST, this field shows the average response time for the execution of the entire CLIST, while the other field shows the average response time for just the commands issued within that CLIST. For TSO performance groups, this time can include batch TMP.
STANDARD DEVIATION	Standard deviation of elapsed times for ended transactions.
AVERAGE QUEUE TIME	Average queue time in seconds for all transactions that ended during the interval.
TOTAL XACT TIME	Sum of average transaction time and average queue time.
PGN	Performance group number.
PGP	Performance group period.
TS	Time slice group.

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Tabular Subreport

The Tabular Subreport is produced by using the Analyzer GRAPH TYPE=TAB control statement. Up to 12 measures can be specified in the GRAPH statement (see “GRAPH” on page 2-56); if more than 12 are specified, only the first 12 measures are used.

Each measure selected is represented by a column on the report. The measures are printed in the same sequence as they appear in the GRAPH command, allowing you to group corresponding measures together.

The Extractor statements required for the Tabular Subreport are dependent upon the information to be graphed. (See *CMF MONITOR Batch User Guide*, the section titled “Record Types” for information about the record types generated by each Extractor statement and a description of the specific type of data collected by each Extractor statement.)

One line of values is produced for each date and time interval specified on the GRAPH command. If the default is used, one line is produced for each record interval encountered in the data.

A sample of the Tabular Subreport is shown in Figure 3-70.

Figure 3-70 Tabular Subreport

```
PRODUCED BY CMF ANALYZER (5.5.00)                        TABULAR   SUBREPORT                        RPTSEQ     5 PAGE      8
BMC SOFTWARE, INC.                                           XYZ COMPANY                          REPORT DATE: 10 JUN 03 17.14
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00             WORLDWIDE HEADQUARTERS                   SYSTEM ID: SJSE     Z 1.01.0

  CPU ENVIRONMENT REQUESTED:  ALL CPU'S
  DATE     TIME    BTCH-MAX BTCH-MIN  NTU-MAX  NTU-MIN  STC-MAX  STC-MIN TSO-COMM

10JUN 03 09.00.00      1.00     0.00    36.00    34.00   110.00   107.00    61.00
         09.15.00      3.00     0.00    53.00    35.00   109.00   105.00   800.00
         09.30.00      2.00     2.00    67.00    53.00   114.00   108.00   804.00
         09.45.00      3.00     2.00    80.00    66.00   116.00   114.00   790.00
         10.00.00      7.00     2.00    91.00    80.00   120.00   111.00   370.00
         10.15.00      4.00     3.00    93.00    90.00   121.00   119.00   205.00
         10.30.00      8.00     3.00    97.00    92.00   122.00   117.00   148.00
         10.45.00      7.00     5.00    97.00    97.00   128.00   119.00    18.00
         11.00.00      7.00     6.00    98.00    97.00   126.00   123.00    20.00
         11.15.00      8.00     6.00    98.00    96.00   126.00   124.00    18.00
         11.30.00      9.00     6.00    99.00    97.00   128.00   122.00    46.00
         11.45.00     12.00     7.00    99.00    98.00   130.00   123.00     9.00
         12.00.00     11.00     7.00    98.00    47.00   129.00   125.00     0.00
         12.15.00      8.00     7.00    47.00    46.00   129.00   128.00     0.00
         12.30.00      8.00     7.00    47.00    46.00   129.00   128.00     0.00
         12.45.00     10.00     7.00    48.00    46.00   129.00   126.00     0.00
         13.00.00     10.00     8.00    49.00    47.00   127.00   124.00     0.00
         13.15.00     10.00     9.00    48.00    46.00   125.00   124.00     0.00
         13.30.00     10.00     9.00    48.00    45.00   126.00   124.00     0.00
         13.45.00     10.00     8.00    47.00    45.00   127.00   124.00     0.00
         14.00.00      9.00     8.00    47.00    46.00   127.00   126.00     0.00
         14.15.00     13.00     8.00    47.00    47.00   127.00   121.00     0.00
         14.30.00     13.00    10.00    47.00    44.00   125.00   122.00     0.00
         14.45.00     10.00     8.00    44.00    41.00   127.00   125.00     0.00
         15.00.00      8.00     7.00    41.00    33.00   128.00   127.00     0.00
         15.15.00      7.00     7.00    33.00    32.00   127.00   127.00     0.00
         15.30.00      7.00     7.00    32.00    32.00   127.00   127.00     0.00
         15.45.00      7.00     7.00    33.00    32.00   128.00   126.00     0.00
```

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Tabular Subreport Field Descriptions

Table 3-94 describes each field in the Tabular Subreport.

Table 3-94 Field Descriptions for the Tabular Subreport

Field	Description
CPU ENVIRONMENT REQUESTED	CPU number or ALL selected in GRAPH control statement.
DATE TIME	Date and time intervals selected.
nnn-nnn	Remaining columns show values for specific measures. See Appendix A, “Measure and Trace Values” for information about specific measures.

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Trace Report

The Trace Report lists the data in the trace records generated by the Extractor. The data for this report is obtained from CMF type 240-18 user records that are generated by using the Extractor TRACE control statement (see “TRACE” on page 1-65). The report is produced by using the Analyzer TRACE control statement (see “TRACE” on page 2-114).

The Analyzer TRACE control statement causes the data in the Extractor trace records to be formatted. Unlike other Analyzer reporters, the trace formatter has no data collection phase. The trace records are formatted and written out as they are read. For this reason, a separate CMXTRACE sysout data set is dynamically allocated by the Analyzer. However, the ddname //CMXTRACE can be used to direct the output from the Trace Report.

The TITLE and LOCATION parameter values from the Analyzer HEADERS control statement do not appear on the Trace Report. The Analyzer SUBTITLE control statement parameter values are used.

The Trace Report terminates with one of the following messages:

total trace entries processed ===> x,xxx,xxx

Shows how many trace entries were formatted.

no trace entries selected for formatting

Although trace records were present, none of those found matched the criteria specified on the Analyzer TRACE control statement.

no trace records encountered

No CMF type 240-18 user records were encountered in the EXTDATA data set. If this message is issued unexpectedly, make sure the record type and monitor ID specified for this Analyzer run match the corresponding parameters in the extraction run.

Note: The default value for CMF MONITOR user type records is 240; a different value could have been specified at the SMFRECID parameter of the Extractor report control statement.

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A sample of the Trace Report is shown in Figure 3-71.

Figure 3-71 Trace Report

```
PRODUCED BY CMF ANALYZER (5.5.00)              C M F  T R A C E  R E P O R T                        MODE = ALL   PAGE     1
BMC SOFTWARE, INC.                                                                                   REPORT DATE: 10 JUN 03 16.29

      DATE         TIME       ID  MODE   ADDR                DATA
   10 JUN 03     12:01:02     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:02     20  SRM   0E90FD               C3D4C4E2 C1E4D7F9 07DC0014 7FFD8800    *CMDSAUP9........*
                 12:01:02     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:02     21  SRM   0E90FD               C3D4C4E2 C1E4D7F9 07DC0015 7FFD8800    *CMDSAUP9........*
                 12:01:02     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:02     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:02     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:02     20  SRM   0E90FD               D4C9D4C3 D6D54040 001A0014 7FFD8800    *MIMCON  ........*
                 12:01:02     21  SRM   0E90FD               D4C9D4C3 D6D54040 001A0015 7FFD8800    *MIMCON  ........*
                 12:01:03     20  SRM   0E90FD               E2D3E2F0 40404040 003C0014 7FFD8800    *SLS0    ........*
                 12:01:03     21  SRM   0E90FD               E2D3E2F0 40404040 003C0015 7FFD8800    *SLS0    ........*
                 12:01:03     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:03     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:03     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:03     20  SRM   0E90FD               D4C9D4C3 D6D54040 001A0014 7FFD8800    *MIMCON  ........*
                 12:01:03     21  SRM   0E90FD               D4C9D4C3 D6D54040 001A0015 7FFD8800    *MIMCON  ........*
                 12:01:03     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               C3C1E3C1 D3D6C740 00230014 7FFD8800    *CATALOG ........*
                 12:01:04     21  SRM   0E90FD               C3C1E3C1 D3D6C740 00230015 7FFD8800    *CATALOG ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*
                 12:01:04     20  SRM   0E90FD               D4C9D4C7 D9404040 00190014 7FFD8800    *MIMGR   ........*
                 12:01:04     21  SRM   0E90FD               D4C9D4C7 D9404040 00190015 7FFD8800    *MIMGR   ........*

                 TOTAL TRACE ENTRIES PROCESSED ===>        50
```

Trace Report Field Descriptions

Table 3-95 describes each field in the Trace Report.

Table 3-95 Field Descriptions for the Trace Report (Part 1 of 2)

Field	Description
DATE	Date entries being formatted were written by the Extractor. Date is repeated if it changes or if a page eject occurs. This date is affected by the START and STOP parameters in the Analyzer TRACE control statement.
TIME	Time the entry being formatted was traced by the Extractor; repeated for each entry. This time is affected by the START and STOP parameters in the TRACE control statement, but is taken from the time stamp on the record, indicating when it was written.

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Table 3-95 Field Descriptions for the Trace Report (Part 2 of 2)

Field	Description
ID	ID of the entry as specified in the Extractor TRACE control statement or on the CMFTRACE macro in the user-written SRB routine.
MODE	Mode in which this entry was traced. SRB Trace was made from the user-written SRB routine. SRM Trace resulted from a SYSEVENT ID specified in the Extractor TRACE control statement.
ADDR	Virtual address storage location from which the data was traced.
DATA	Actual data traced; can be from 1 to 112 characters long. Each line for a trace entry formats up to 16 characters. Data is displayed in hexadecimal format, followed by an EBCDIC translation.

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TSO Command Summary Report

The TSO Command Summary Report graphically summarizes TSO command usage. The frequency and average response time of each command are listed and plotted individually in this report. The data is obtained from type 240-20 user records, which are generated by the Extractor TSODATA control statement (see “TSODATA” on page 1-74). The TSO Command Summary Report is produced by using the Analyzer TSOPERF control statement (see “TSOPERF” on page 2-116).

A sample of the TSO Command Summary Report is shown in Figure 3-72 on page 3-221. In the TSODATA Extractor control statement at the CMDS parameter, either proper command names or TSO aliases (command short form) can be defined for sampling. For example, either EDIT or E can be listed for the EDIT command.

The number of commands reported on is controlled by the LIMIT parameter of the TSOPERF control statement. When the number of commands is limited, the commands displayed are those most frequently used during the measurement interval. When the number of commands is not limited, all commands sampled are listed.

When a TSO user enters a command for which a response is never received, the Extractor stops response timing at 5 minutes. In this way, infinite response times are not collected.

TSO commands executed under SPF do not issue SYSEVENT ZERO; therefore, these commands are not timed under SPF. However, the EDIT and TEST subcommands under EDIT and TEST modes are counted and monitored. If FSE is being used and the subcommands are stacked, FSE replaces the last character of the subcommand with the character Z.

When executing programs in foreground, response times tend to be high. For this reason, use a value between 5 and 15 for the scale on this report so that the graphed data is more meaningful.

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Figure 3-72 is an example of the TSO Command Summary Report.

Figure 3-72 TSO Command Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    TSO COMMAND SUMMARY REPORT                        RPTSEQ     9 PAGE     12
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03 11.55
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/30/5,393/7.5  240-20/12/2,171/3
                                                     C O M M A N D  S U M M A R Y
          TSO          COMMAND        RESPONSE         0             USAGE          2,054      0.0          RESPONSE         11.22
        COMMAND         USAGE           TIME          +--+--+--+--+--+--+--+--+--+--+--+--+      +--+--+--+--+--+--+--+--+--+--+--+--+
        ALLOCATE       2,054            0.78          .********************************       .*I                                .
        ATTRIB           100            0.12          .**                                .       . I                                .
        CONSOLE            3            0.23          .                                  .       .*I                                .
        DEFINE             1           11.22          .                                  .       .*I*******************************
        DSN               23            4.01          .                                  .       .*I**********                     .
        DYNASTEP           1            0.11          .                                  .       . I                                .
        END               13            4.18          .                                  .       .*I**********                     .
        EXEC             385            0.49          .******                            .       .*I                                .
        EXECUTIL          11            0.12          .                                  .       . I                                .
        FREE             337            0.11          .*****                             .       . I                                .
        IKJEFF76          64            0.31          .*                                 .       .*I                                .
        IPCS               1            5.15          .                                  .       .*I*************                   .
        ISPEXEC            1            0.20          .                                  .       .*I                                .
        ISPF               8            0.70          .                                  .       .*I                                .
        LISTALC            5            0.88          .                                  .       .*I*                               .
        LOCATE             1            0.20          .                                  .       .*I                                .
        PDF               73            2.12          .*                                 .       .*I****                            .
        PMGLAUTH          12            1.80          .                                  .       .*I***                             .
        PROFILE          172            0.10          .***                               .       . I                                .
        SYSPROG            1            0.44          .                                  .       .*I                                .
        TAOINQ             1            0.52          .                                  .       .*I                                .
        TEST              20 (1,862)    0.70          .                                  .       .*I                                .
        TESTXA             2            0.08          .                                  .       . I                                .
                                                      +--+--+--+--+--+--+--+--+--+--+--+--+      +--+--+--+--+--+--+--+--+--+--+--+--+
        TOTAL/AVG      3,289            0.68          0             USAGE          2,054      0.0          RESPONSE         11.22
```

TSO Command Summary Report Field Descriptions

Table 3-96 describes each field in the TSO Command Summary Report.

Table 3-96 Field Descriptions for the TSO Command Summary Report

Field	Description
TSO COMMAND	All major TSO commands issued, or commands most frequently used during the measurement interval.
COMMAND USAGE	Total number of times command was used. For EDIT and TEST, number of times a subcommand was issued is shown in parentheses.
RESPONSE TIME	Average command response time. Defined internally as SYSEVENT ZERO (enter) to TPUT (screen), line speed and other external activities are not included. Reported in seconds per command.
USAGE	Usage count for each command plotted on a self-scaling bar graph.
RESPONSE	Response time for each command plotted on a bar graph. The graph scales to the value specified, to the highest value encountered (if SCALE=999 is specified), or to the default of the TSOPERF statement.
TOTAL/AVG	Total count of all commands reported. Average response time for all commands are reported.

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TSO Interval Summary Report

The TSO Interval Summary Report graphically summarizes TSO workload on an interval basis. The average number of TSO users and either the average response time or the average TSO overhead for the interval are plotted.

The data for this report is obtained from type 20 user records and type 1 CPU records. Type 20 records are generated by the Extractor TSODATA control statement (see “TSODATA” on page 1-74). Type 1 CPU records are generated by the Extractor CPU control statement (see “CPU” on page 1-14). If no type 20 records are encountered, this report is not produced. This report is produced by using the Analyzer TSOPERF control statement (see “TSOPERF” on page 2-116).

Examples of the TSO Interval Summary report are shown in Figure 3-73.

Figure 3-73 TSO Interval Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    TSO INTERVAL SUMMARY REPORT                        RPTSEQ    31 PAGE    340
BMC SOFTWARE, INC.                                          XYZ COMPANY                                 REPORT DATE: 12 JUN 03 13.40
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00            WORLDWIDE HEADQUARTERS                          SYSTEM ID: SJSE     Z 1.01.0

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-1/28/25.1K/7  240-20/28/25.2K/7
                                                I N T E R V A L  S U M M A R Y
 INTERVAL   INTERVAL    AVERAGE   AVERAGE   % CPU     0.0       AVERAGE USERS        30.6      0.0          RESPONSE          2.07
   DATE       TIME       USERS    RESPONSE   TSO       +--+--+--+--+--+--+--+--+--+--+--+       +--+--+--+--+--+--+--+--+--+--+--+
10 JUN 03   09:00:00      16.1      1.11      0.6      .*****************         I     .       .*****I************               .
            09:15:00      19.1      0.57      0.6      .*********************     I     .       .*****I***                        .
            09:30:00      20.7      0.25      0.4      .**********************    I     .       .**** I                           .
            09:45:00      18.8      0.14      0.3      .********************      I     .       .**   I                           .
            10:00:00      17.8      0.07      0.2      .*******************       I     .       .*    I                           .
            10:15:00      20.6      0.25      0.5      .**********************    I     .       .**** I                           .
            10:30:00      25.9      0.20      0.8      .***************************I*    .       .***  I                           .
            10:45:00      27.8      0.48      1.0      .***************************I***  .       .*****I**                         .
            11:00:00      28.6      0.77      0.4      .***************************I**** .       .*****I******                    .
            11:15:00      29.2      0.32      0.2      .***************************I**** .       .*****I                          .
            11:30:00      30.6      0.75      1.0      .***************************I******       .*****I******                    .
            11:45:00      30.0       ---      0.3      .***************************I*****.       .     I                          .
            12:00:00      30.0      0.28      0.7      .***************************I*****.       .**** I                          .
            12:15:00      30.0      0.22      0.6      .***************************I*****.       .**** I                          .
            12:30:00      29.0      0.75      1.1      .***************************I**** .       .*****I******                    .
            12:45:00      28.8      1.07      0.5      .***************************I**** .       .*****I***********               .
            13:00:00      29.0       ---      0.4      .***************************I**** .       .     I                          .
            13:15:00      28.6      0.76      1.0      .***************************I**** .       .*****I******                    .
            13:30:00      27.8      1.66      1.6      .***************************I***  .       .*****I********************      .
            13:45:00      27.7      0.63      1.6      .***************************I***  .       .*****I****                       .
            14:00:00      26.0      0.57      1.3      .***************************I*    .       .*****I***                        .
            14:15:00      25.1      0.31      0.7      .***************************I     .       .*****I                          .
            14:30:00      26.3      0.86      1.4      .***************************I*    .       .*****I********                  .
            14:45:00      25.2      0.18      0.8      .***************************I     .       .***  I                          .
            15:00:00      24.1      0.11      0.3      .***************************I     .       .**   I                          .
            15:15:00      21.7      2.07      0.3      .**********************   I     .       .*****I****************************
            15:30:00      20.6      0.09      0.1      .**********************    I     .       .*    I                          .
            15:45:00      21.2      0.19      0.5      .***********************   I     .       .***  I                          .
                                                        +--+--+--+--+--+--+--+--+--+--+--+       +--+--+--+--+--+--+--+--+--+--+--+
            AVERAGES      25.2      0.40      0.7     0.0       AVERAGE USERS        30.6      0.0          RESPONSE          2.07
```

Fields and data columns are described in the legend of the figure. Dashes (---) are printed in the report to indicate values that were not calculated because of missing record types or zero samples for an interval.

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In Figure 3-73, the two graphs at the right show that at the sample interval beginning at 0730 hours, the number of users was 113.7, which was above the average number of users of 101.0. The average response time was 1.13, which was below the average of 1.24 seconds.

Note: When recording at relatively short intervals, the average response time for an interval could be skewed because of a few large response times. For example, a foreground compilation run during a five-minute recording interval could cause an unusually high average response time to be reported.

TSO Interval Summary Report Field Descriptions

Table 3-97 describes each field in the TSO Interval Summary Report.

Table 3-97 Field Descriptions for the TSO Interval Summary Report

Field	Description
INTERVAL DATE	Start date of measurement interval.
INTERVAL TIME	Start time of measurement interval.
AVERAGE RESPONSE	Average response time for all commands issued during measurement interval. Note: This field is not comparable to the AVERAGE XACT TIME field in the System Workload Activity Report because this field shows the average response time for all commands issued and the other field shows the average response time for TSO as a whole. For example, for a particular CLIST, this field shows the average response time for just the commands issued within that CLIST, while the other field shows the average response time for the execution of the entire CLIST.
% CPU TSO	Percent of time during measurement interval that the CPU was busy for a TSO user. (You may plot this value on a self scaling bar graph by specifying PLOT=TSO in the Analyzer TSOPERF control statement. The graph scales to highest value encountered. A column of I's marks the average TSO/CPU line.)
AVERAGE USERS	Average number of active TSO users during measurement interval. This number of active TSO users is plotted on a self scaling bar graph, which is scaled to highest value encountered. A column of I's marks average number of active TSO users.
RESPONSE	Average response time for all commands issued plotted on a self scaling bar graph; PLOT=RESPONSE must be specified in the Analyzer TSOPERF control statement. Graph is scaled to highest value encountered. A column of I's marks average response time.

TSO User Summary Reports

The TSO User Summary Report provides information about TSO usage by TSO logon ID, displaying it in these categories:

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- swapping
- paging
- SRM usage

The TSO User Summary Report is produced by using the TSOUSER Analyzer control statement (see “TSOUSER” on page 2-118). The data for this report is obtained using the TSODATA Extractor control statement with the parameter USERS=YES (the default) specified (see “TSODATA” on page 1-74). Report data is obtained from type 21 user records. These are generated only if USERS=YES is defined in the Extractor TSODATA control statement.

Note: This report reflects TSO activities of users logging off during the report interval. Transactions executed prior to this report period are recorded during the interval in which the user logs off. Information about swapping, paging, and SRM service consumption is also recorded in that interval.

If PCF is installed and the command accounting option is used, PCF resets certain system data fields used in the CMF type 21 record, so that the type 21 record is invalid.

A sample of the TSO User Summary report is shown in Figure 3-74.

Figure 3-74 TSO User Summary Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                    TSO USER SUMMARY REPORT                        RPTSEQ    11 PAGE     14
BMC SOFTWARE, INC.                                         XYZ COMPANY                              REPORT DATE: 10 JUN 03 11.55
ACTL 10 JUN 03 09.00.00  10 JUN 03 16.00.00          WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-21/12/0/3
                                   **** S W A P P I N G ****     ******** P A G I N G ********    ********** S R M ***********
  TSO USER    TOTAL   AVERAGE   TOTAL   AVERAGE  PAGES/   PAGES/      PAGES  PAGE-INS/  PAGE-OUTS/  SERVICE  ABSORBTION  AVERAGE
            SESSIONS  SESSION   TRANS    SWAPS  SWAP-IN  SWAP-OUT     STOLEN    TRANS       TRANS       RATE      RATE      TRANS
  BAOBKS4       1      02:44       116    1.0   392.0    392.0       111.0      0.1         0.3      8292.6    8338.3     116.0
  BCVKSR3       1      06:10       342    2.0   437.0    437.0      1269.0      0.6         0.7      8860.9     123.0     342.0
  BMCGPA3       1      03:07       465    0.0     0.0      0.0         0.0      0.0         0.0      1209.3    1556.5     465.0
  BMCHVM1       1      00:01         5    0.0     0.0      0.0         0.0      0.0         0.0      1607.9    1607.9       5.0
  BMCHVM2       1      00:07         5    0.0     0.0      0.0         0.0      0.0         0.0      4143.1    4143.1       5.0
  BMCPXK2       1      03:50       404    7.0   435.0    435.0       684.0      0.4         0.3        46.4     946.8     404.0
  BMCQC01       1      00:57         9    1.0   505.0    505.0       593.0      2.7         0.2      9565.2    9866.1       9.0
  BMVBHM6       1      00:18        27    0.0     0.0      0.0         0.0      0.0         0.0      5115.3    5115.3      27.0
  BMVDLL3       1      02:02        33    0.0     0.0      0.0         0.0      0.0         0.0      4883.1    4883.1      33.0
  BMVGKC2       2      01:27       684    0.5   282.0    282.0       101.5      0.1         0.1      4239.0    4285.3     342.0
  BMVJES1       1      04:12       173    0.0     0.0      0.0       815.0      0.3         0.6      9354.1     243.3     173.0
  BMVSAU2       1      00:15       144    0.0     0.0      0.0         0.0      0.0         0.0       902.8     928.5     144.0
  BOLGBG3       2      00:26        64    1.0   509.0    509.0      4539.5     10.5         7.3      6692.2    6698.3      32.0
  BOLKGB1       1      01:31        74    0.0     0.0      0.0         0.0      0.0         0.0       213.2     328.5      74.0
  BOLRSD5       1      02:54        13    1.0    73.0     73.0       912.0      5.6         2.5      9867.3    9867.3      13.0
  BOLSMR2       2      00:33        66    1.0   494.5    494.5       264.5      1.9         0.1      6979.4    6981.9      33.0
  BOLSMR3       2      00:31        94    0.0     0.0      0.0       308.0      1.6         0.3      5845.0    6259.1      47.0
  BSDMXM1       1      00:01         3    0.0     0.0      0.0         0.0      0.0         0.0      9347.5    9347.5       3.0
  BSDMXM2       1      00:00         3    0.0     0.0      0.0         0.0      0.0         0.0      4736.7    4736.7       3.0
  PPE2          1      04:10       141    0.0     0.0      0.0       986.0      0.3         1.1      8957.6    9045.9     141.0
  ROCPXA1       1      01:48        66    1.0   149.0    149.0      1891.0      7.4         3.7      9233.0    9233.0      66.0
    TOTAL      25                 2,931
  AVERAGE/SESSION                         0.7   407.1    407.1       707.5      0.7         0.5      5529.9    5547.8     117.2
```

The number of users reported on is controlled by the LIMIT parameter in the Analyzer TSOUSER control statement. If the number of users is limited, the data displayed is for those users with the most SRM service consumption.

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TSO User Summary Report Field Descriptions

Table 3-98 describes each field in the TSO User Summary Report.

Table 3-98 Field Descriptions for the TSO User Summary Report

Field	Description
TSO USER	Logon ID of any TSO user who logged off during the measurement interval, displayed in ascending alphanumeric order.
TOTAL SESSIONS	Total number of TSO sessions for user during the measurement interval.
AVERAGE SESSIONS	Average length of user's TSO session displayed in hours:minutes. This value is 00:00 if user is logged on for under one minute.
TOTAL TRANS	Total number of TSO transactions for all this user's TSO sessions.
AVERAGE SWAPS	User's average number of address space swap sequences per session. A swap sequence is one address space swap-out and swap-in.
PAGES/SWAP-IN	User's average number of pages per swap-in.
PAGES/SWAP-OUT	User's average number of pages per swap-out.
PAGES STOLEN	User's average number of pages stolen per session.
PAGE-INS/TRANS	User's average number of page in operations per transaction.
PAGE-OUTS/TRANS	User's average number of page out operations per transaction.
SERVICE RATE	Rate at which user consumed service while transactions were active but not necessarily in storage.
ABSORPTION RATE	Rate at which user consumed service while transactions were resident in central storage.
AVERAGE TRANS	User's average number of transactions per TSO session.

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Virtual Storage Activity Report

The Virtual Storage Activity Report is produced by using the VIRTSTOR Analyzer control statement (see “VIRTSTOR” on page 2-119). The data is obtained using the VSMDATA Extractor control statement (see “VSMDATA” on page 1-79).

The Virtual Storage Activity Report is divided into five sections, which can be produced independently or concurrently. The report sections are as follows:

Virtual Storage Map

Describes the static boundaries of system areas and the private region both above and below 16MB. The map also includes values regarding space usage in the PLPA. (See Figure 3-75 on page 3-227 for an example of this report.) This map can be suppressed by including the MAP=NO parameter.

Because some values are reset at IPL time, the virtual storage map is printed once for each IPL that occurred within the DATETIME range.

Common Area Storage Summary

Reports on storage usage by CSA and SQA, both above and below 16 megabytes. The Summary Report also includes information about allocated storage, free storage, and allocated area size. CSA allocated storage information is detailed by storage key. (See Figure 3-76 on page 3-229 for an example of this report.)

Common Area Storage Detail

Details CSA and SQA allocated storage information by subpool and, for CSA, by storage key. The Detail Report includes information only about storage below 16MB. (See Figure 3-77 on page 3-230 for an example of this report.) This report is generated by the DETAIL=YES parameter.

Private Area Storage Summary

Reports on storage usage within the private area, both above and below 16 megabytes. Includes a storage map of the private area, indicating allocated area boundaries and GETMAIN limits. Storage usage data is reported for the authorized region (LSQA, SWA, and subpools 229 and 230) and the user region (subpools 0 through 128, 251 and 252). Information about free storage, allocated storage, and allocated area size is reported for both regions in minimum, maximum, and average values. (See Figure 3-78 on page 3-232 for an example of this report.)

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Private Area Storage Detail

Reports private area storage usage by subpool. Minimum, maximum, and average values are reported for both user and authorized subpools. (See Figure 3-79 on page 3-233 for an example of this report.)

Storage addresses are reported as hexadecimal byte addresses. Storage area lengths are given in decimal K bytes (for values up to 9999K) and in decimal megabytes (for values greater than 9999K).

Date/time stamps, included for all minimum and maximum values, are in the format (*ddmmm/hh.mm*) in the summary reports and in the format (*dd mmm yy / hh.mm.ss*) in the detail reports. Because virtual storage data is obtained by sampling, the minimum and maximum values reported might not represent the actual usage limits experienced during the reporting interval.

Virtual Storage Map Section

An example of the Virtual Storage Map section is shown in Figure 3-75.

Figure 3-75 Virtual Storage Map

```
PRODUCED BY CMF ANALYZER (5.5.00)                  VIRTUAL STORAGE ACTIVITY REPORT                    RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                            XYZ COMPANY                             REPORT DATE: 10 JUN 03 16.53
ACTL 10 JUN 03 16.33.43  10 JUN 03 16.49.53            WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-2/4/119/0.27
-------------------------------------------------------  VIRTUAL STORAGE MAP   ---------------------------------------------------
            -------- BELOW 16M --------                                        -------- ABOVE 16M --------
   DESCRIPTION          START ADDRESS        LENGTH                 DESCRIPTION           START ADDRESS           LENGTH
  ---------------       ---------------     --------             ---------------        ---------------         --------
   NUCLEUS                   00FC8000           221K           EXTENDED NUCLEUS                01000000           7,377K
   SQA                       00E08000         1,792K           EXTENDED SQA                    01735000            17.6M
   PLPA                      00BBB000         2,356K           EXTENDED PLPA                   028C8000            51.1M
   FLPA                        N/A                0K           EXTENDED FLPA                   05BE0000              12K
   MLPA                      00BA9000            72K           EXTENDED MLPA                   05BE3000             636K
   CSA                       00800000         3,748K           EXTENDED CSA                    05C82000             200M
   PRIVATE AREA              00001000         8,188K           EXTENDED PRIVATE AREA           12500000            1755M
   PSA                       00000000             4K
                                                  BELOW 16M         ABOVE 16M            TOTAL
                                                 -----------       -----------          -------
                PLPA INTERMODULE SPACE    -              7K               88K               95K
   PLPA SPACE REDUNDANT WITH MLPA/FLPA    -              3K               10K               12K
          MAXIMUM POSSIBLE USER REGION    -          7,992K            1745M            1,753M
```

Virtual Storage Map Section Field Descriptions

Table 3-99 describes each field in the Virtual Storage Map section of the Virtual Storage Activity Report.

Table 3-99 Field Descriptions for the Virtual Storage Map Section

Field	Description
BELOW 16M – DESCRIPTION	Named area.
BELOW 16M – START ADDRESS	Address of beginning of the named area. This address is reported in hexadecimal format. If an N/A is displayed in this column, the named area was not allocated space. This is space that was not occupied by either the load modules or the link pack directory.
BELOW 16M – LENGTH	Length of the named area, in decimal K bytes.
ABOVE 16M – DESCRIPTION	Named area.
ABOVE 16M – START ADDRESS	Address of the beginning of the named area. This address is reported in hexadecimal format. If an N/A is displayed in this column, the named area was not allocated space. This is space that was not occupied by either the load modules or the link pack directory.
ABOVE 16M – LENGTH	Length of the named area, in decimal K bytes.
PLPA INTERMODULE SPACE	PLPA space not occupied by modules or the LPA directory. The value for this field is determined by subtracting the link pack directory size and the sum of sizes of all PLPA modules from the total PLPA size.
PLPA SPACE REDUNDANT WITH MLPA/FLPA	Space occupied by modules in PLPA that are never accessed because a module with the same name exists in MLPA or FLPA.
MAXIMUM POSSIBLE USER REGION	Maximum amount of space available in the user region. This amount is below the size of the user region and is obtained at start time for the CMF MONITOR Extractor, by subtracting the address of the lowest available block in the user region from the end address of the region.

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Common Area Storage Summary Section

An example of the Common Area Storage Summary section is shown in Figure 3-76.

Figure 3-76 Common Area Storage Summary

```
PRODUCED BY CMF ANALYZER (5.5.00)                  VIRTUAL STORAGE ACTIVITY REPORT                    RPTSEQ     3 PAGE      6
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03 16.53
ACTL 10 JUN 03 16.33.43  10 JUN 03 16.49.53             WORLDWIDE HEADQUARTERS                       SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-2/4/119/0.27
-------------------------------------------------  COMMON AREA REPORT - SUMMARY  ----------------------------------------------
                                                      ALLOCATED CSA / SQA
                                                    ---------------------
                    -------- BELOW 16M --------                        |          -------- ABOVE 16M --------
   AREA          MINIMUM               MAXIMUM              AVG       |       MINIMUM               MAXIMUM              AVG
  ------        ---------            ---------            -----      |      ---------            ---------            -----
   CSA        1,008K (10 JUN/16.34)  1,056K (10 JUN/16.47)  1,020K      |     58.7M (10 JUN/16.37)   62.5M (10 JUN/16.46)   59.9M
   SQA        1,128K (10 JUN/16.34)  1,132K (10 JUN/16.43)  1,129K      |     11.4M (10 JUN/16.43)   11.9M (10 JUN/16.45)   11.6M
  ALLOCATED CSA BY STORAGE KEY                                         |
                    -------- BELOW 16M --------                        |          -------- ABOVE 16M --------
   KEY           MINIMUM               MAXIMUM              AVG       |       MINIMUM               MAXIMUM              AVG
  -----         ---------            ---------            -----      |      ---------            ---------            -----
    0           584K (10 JUN/16.34)    620K (10 JUN/16.46)    593K      |     19.0M (10 JUN/16.35)   20.4M (10 JUN/16.47)   19.3M
    1            52K (10 JUN/16.34)     56K (10 JUN/16.47)     52K      |      924K (10 JUN/16.34)    928K (10 JUN/16.46)    925K
    2            36K (10 JUN/16.34)     36K (10 JUN/16.34)     36K      |    1,584K (10 JUN/16.34)  1,584K (10 JUN/16.34)  1,584K
    3             4K (10 JUN/16.34)      4K (10 JUN/16.34)      4K      |       40K (10 JUN/16.34)     40K (10 JUN/16.34)     40K
    4            52K (10 JUN/16.34)     52K (10 JUN/16.34)     52K      |     20.8M (10 JUN/16.35)   21.0M (10 JUN/16.44)   20.9M
    5             4K (10 JUN/16.34)      4K (10 JUN/16.34)      4K      |    2,736K (10 JUN/16.34)  2,736K (10 JUN/16.34)  2,736K
    6            76K (10 JUN/16.34)     76K (10 JUN/16.34)     76K      |    7,320K (10 JUN/16.38)  7,352K (10 JUN/16.46)  7,333K
    7            24K (10 JUN/16.34)     32K (10 JUN/16.46)     26K      |    5,780K (10 JUN/16.37)  8,172K (10 JUN/16.46)  6,549K
   8-F          176K (10 JUN/16.34)    176K (10 JUN/16.34)    176K      |      952K (10 JUN/16.34)    956K (10 JUN/16.46)    952K
  SQA EXPANSION INTO CSA                                               |
                 0K                     0K                     0K      |       0K                     0K                     0K
                                                      UNALLOCATED CSA / SQA
                                                    ------------------------
                                 -------- BELOW 16M --------                          -------- ABOVE 16M --------
        DESCRIPTION          MINIMUM               MAXIMUM              AVG         MINIMUM               MAXIMUM              AVG
      -------------        ---------             ---------            -----       ---------             ---------            -----
   CSA
     FREE PAGES (BYTES)   2,692K (10 JUN/16.47)  2,740K (10 JUN/16.34)  2,728K       138M (10 JUN/16.46)    142M (10 JUN/16.37)
141M
     LARGEST FREE BLOCK   2,692K (10 JUN/16.47)  2,740K (10 JUN/16.34)  2,728K       138M (10 JUN/16.46)    141M (10 JUN/16.34)
140M
     ALLOCATED AREA SIZE  1,008K (10 JUN/16.34)  1,056K (10 JUN/16.47)  1,020K      59.1M (10 JUN/16.34)   62.5M (10 JUN/16.46)
60.0M
   SQA
     FREE PAGES (BYTES)     660K (10 JUN/16.43)    664K (10 JUN/16.34)    663K     5,776K (10 JUN/16.45)  6,308K (10 JUN/16.43)
6,119K
     LARGEST FREE BLOCK     512K (10 JUN/16.34)    512K (10 JUN/16.34)    512K     5,636K (10 JUN/16.46)  5,872K (10 JUN/16.34)
5,813K
     ALLOCATED AREA SIZE  1,280K (10 JUN/16.34)  1,280K (10 JUN/16.34)  1,280K      11.8M (10 JUN/16.34)   12.1M (10 JUN/16.46)
11.9M
```

Common Area Storage Summary Section Field Descriptions

Table 3-100 describes each field in the Common Area Storage Summary section of the Virtual Storage Activity Report.

Table 3-100 Field Descriptions for the Common Area Storage Summary Section (Part 1 of 2)

Field	Description
ALLOCATED CSA/SQA	Amount of storage acquired through GETMAIN service from CSA and SQA. A 4K block is considered allocated if any portion of it is allocated.
MINIMUM	Smallest amount of CSA/SQA allocated during the report interval.
MAXIMUM	Largest amount of CSA/SQA allocated during the report interval.
AVG	Average amount of CSA/SQA allocated during the report interval.
KEY	Storage key.

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Table 3-100 Field Descriptions for the Common Area Storage Summary Section (Part 2 of 2)

Field	Description
SQA EXPANSION INTO CSA	Amount of storage allocated within CSA for use by SQA.
FREE PAGES	Amount of storage not allocated. Only blocks equal to or greater than 4K in length are included in this total. Consequently free storage blocks less than a page in length are not represented here.
LARGEST FREE BLOCK	Largest contiguous block of free storage available.
CSA ALLOCATED AREA SIZE	Size of the area bounded by all the allocated blocks within CSA. The difference between this figure and the amount of storage used within CSA gives an indication of fragmentation within CSA. This figure is computed as (high address of CSA) (address of lowest allocated block in CSA)
SQA ALLOCATED AREA SIZE	Size of the area bounded by all the allocated blocks within SQA. The difference between this figure and the amount of storage used within SQA gives an indication of fragmentation within SQA. This figure is computed as (size of SQA) (size of lowest free block within SQA)

Common Area Storage Detail Section

An example of the Common Area Storage Detail section is shown in Figure 3-77.

Figure 3-77 Common Area Storage Detail Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                VIRTUAL STORAGE ACTIVITY REPORT                RPTSEQ     3 PAGE      7
BMC SOFTWARE, INC.                                          XYZ COMPANY                         REPORT DATE: 10 JUN 03 16.53
ACTL 10 JUN 03 16.33.43  10 JUN 03 16.49.53          WORLDWIDE HEADQUARTERS                    SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-2/4/119/0.27
-------------------------------------------------  COMMON AREA REPORT - DETAIL  ------------------------------------------------
                              ALLOCATED CSA (BELOW 16M) BY SUBPOOL AND STORAGE KEY
                             -----------------------------------------------------
  CSA - SUBPOOL 227
   KEY          MINIMUM                          MAXIMUM                          AVG
  -----        ---------                        ---------                        -----
    0           28K (10 JUN 03 / 16.34.14)       28K (10 JUN 03 / 16.34.14)       28K
    1            0K (10 JUN 03 / 16.34.14)        4K (10 JUN 03 / 16.47.56)        0K
    2            0K                               0K                               0K
    3            0K                               0K                               0K
    4            0K                               0K                               0K
    5            0K                               0K                               0K
    6           12K (10 JUN 03 / 16.34.14)       12K (10 JUN 03 / 16.34.14)       12K
    7            0K                               0K                               0K
   8-F           0K                               0K                               0K
   ALL          40K (10 JUN 03 / 16.34.14)       44K (10 JUN 03 / 16.47.56)       40K
  CSA - SUBPOOL 228
   KEY          MINIMUM                          MAXIMUM                          AVG
  -----        ---------                        ---------                        -----
    0           32K (10 JUN 03 / 16.34.14)       40K (10 JUN 03 / 16.45.31)       32K
    1            4K (10 JUN 03 / 16.34.14)        4K (10 JUN 03 / 16.34.14)        4K
    2            0K                               0K                               0K
    3            0K                               0K                               0K
    4           52K (10 JUN 03 / 16.34.14)       52K (10 JUN 03 / 16.34.14)       52K
    5            0K                               0K                               0K
    6           12K (10 JUN 03 / 16.34.14)       12K (10 JUN 03 / 16.34.14)       12K
    7           12K (10 JUN 03 / 16.34.14)       16K (10 JUN 03 / 16.46.19)       13K
   8-F          32K (10 JUN 03 / 16.34.14)       32K (10 JUN 03 / 16.34.14)       32K
   ALL         144K (10 JUN 03 / 16.34.14)      152K (10 JUN 03 / 16.45.31)      145K

                              ALLOCATED SQA (BELOW 16M) BY SUBPOOL
                             --------------------------------------
   SUBPOOL      MINIMUM                          MAXIMUM                          AVG
  ---------    ---------                        ---------                        -----
   226          56K (10 JUN 03 / 16.34.14)       56K (10 JUN 03 / 16.34.14)       56K
   239         100K (10 JUN 03 / 16.34.14)      100K (10 JUN 03 / 16.34.14)      100K
   245         972K (10 JUN 03 / 16.34.14)      976K (10 JUN 03 / 16.43.59)      973K
```

Common Area Storage Detail Section Field Descriptions

Table 3-101 describes each field in the Common Area Storage Detail section of the Virtual Storage Activity Report.

Table 3-101 Field Descriptions for the Common Area Storage Detail Section

Field	Description
ALLOCATED CSA (BELOW 16M)	Amount of storage acquired through GETMAIN service from CSA, viewed by subpool and storage key. This data is available only for the lower CSA (below 16MB).
KEY	Storage key.
MINIMUM	Smallest amount of CSA allocated during the report interval.
MAXIMUM	Largest amount of CSA allocated during the report interval.
AVG	Average amount of CSA allocated during the report interval.
ALLOCATE SQA (BELOW 16M)	Amount of storage acquired through GETMAIN service from SQA, viewed by subpool. All SQA is acquired in storage key 0. This data is available only for the lower SQA (below 16MB).

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Private Area Storage Summary Section

A sample of the Private Area Storage Summary section is shown in Figure 3-78.

Figure 3-78 Private Area Storage Summary Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                  VIRTUAL STORAGE ACTIVITY REPORT                    RPTSEQ     3 PAGE      9
BMC SOFTWARE, INC.                                          XYZ COMPANY                               REPORT DATE: 10 JUN 03 16.53
ACTL 10 JUN 03 16.33.43  10 JUN 03 16.49.53            WORLDWIDE HEADQUARTERS                         SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-2/4/119/0.27
-------------------------------------------------  PRIVATE AREA REPORT - SUMMARY  ---------------------------------------------
                     JOB NAME     - XTSTKPAS                                REGION REQUESTED (IN JCL)   -     32.0M
                     STEP NAME    - XTSTKPAS                                REGION ASSIGNED (BELOW 16M) -    8,104K
                     PROGRAM NAME - BBM9DA00                                REGION ASSIGNED (ABOVE 16M) -     32.0M
                     SAMPLE COUNT -    119
                                                     PRIVATE AREA MAP
            -------- BELOW 16M --------                                    -------- ABOVE 16M --------
    DESCRIPTION          START ADDRESS        LENGTH                 DESCRIPTION           START ADDRESS           LENGTH
  ---------------        ---------------     --------              ---------------        ---------------         --------
    AUTH REGION ALLOC AREA    007AE000           328K           EXT AUTH REGION ALLOC AREA       7E28A000            29.5M
    AUTH REGION UNUSED AREA   00800000             0K           EXT AUTH REGION UNUSED AREA      14500000            1694M
    AUTHORIZED REGION         00800000             0K           EXT AUTHORIZED REGION            14500000            1723M
  ----------  GETMAIN LIMIT : 00800000  -------------          ---------------  GETMAIN LIMIT :  14500000  ---------------
    USER REGION UNUSED AREA   001D7000         6,308K           EXT USER REGION UNUSED AREA      13008000            21.0M
    USER REGION ALLOC AREA    00006000         1,532K           EXT USER REGION ALLOC AREA       12500000            11.0M
    USER REGION               00006000         8,168K           EXT USER REGION                  12500000            32.0M
    SYSTEM REGION             00001000            20K
                                                  PRIVATE AREA STORAGE SUMMARY
                                  -------- BELOW 16M --------                            -------- ABOVE 16M --------
        DESCRIPTION          MINIMUM               MAXIMUM             AVG         MINIMUM               MAXIMUM               AVG
       -------------        ---------             ---------           -----       ---------             ---------             -----
  AUTHORIZED REGION (LSQA/SWA/229/230)
    FREE PAGES (BYTES)       0K                    0K                    0K      1694M (10 JUN/16.47)   1694M (10 JUN/16.44)
1,694M
    LARGEST FREE BLOCK       0K                    0K                    0K      1694M (10 JUN/16.45)   1694M (10 JUN/16.34)
1,694M
    PAGES ALLOCATED
       (IN BYTES)          304K (10 JUN/16.34)    324K (10 JUN/16.45)    304K      29.2M (10 JUN/16.44)   29.4M (10 JUN/16.47)
29.3M
    ALLOCATED AREA SIZE    308K (10 JUN/16.34)    328K (10 JUN/16.45)    308K      29.3M (10 JUN/16.34)   29.5M (10 JUN/16.45)
29.4M
  USER REGION
    FREE PAGES (BYTES)   7,108K (10 JUN/16.45)  7,136K (10 JUN/16.34)  7,136K      21.0M (10 JUN/16.49)   21.7M (10 JUN/16.34)
21.5M
    LARGEST FREE BLOCK   6,308K (10 JUN/16.45)  6,328K (10 JUN/16.34)  6,328K      21.0M (10 JUN/16.47)   21.6M (10 JUN/16.34)
21.4M
    PAGES ALLOCATED
       (IN BYTES)          744K (10 JUN/16.34)    752K (10 JUN/16.45)    744K      10.3M (10 JUN/16.34)   11.0M (10 JUN/16.49)
10.5M
    ALLOCATED AREA SIZE  1,532K (10 JUN/16.34)  1,532K (10 JUN/16.34)  1,532K      10.4M (10 JUN/16.34)   11.0M (10 JUN/16.47)
10.6M
```

Private Area Storage Summary Section Field Descriptions

Table 3-102 describes each field in the Private Area Storage Summary section of the Virtual Storage Activity Report.

Table 3-102 Field Descriptions for the Private Area Storage Summary Section (Part 1 of 2)

Field	Description
AUTH REGION ALLOC AREA	Size of area bounded by allocated blocks in the region.
AUTH REGION UNUSED AREA	Area in the region from which no storage has been obtained. Size of the UNUSED AREA is usually equal to the LARGEST FREE BLOCK.
AUTHORIZED REGION	Size of the entire region in decimal K bytes.
GETMAIN LIMIT	Highest address at which storage can be obtained using the GETMAIN service. Equivalent to the top of the USER REGION.

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Table 3-102 Field Descriptions for the Private Area Storage Summary Section (Part 2 of 2)

Field	Description
MINIMUM	Minimum value for a field during the reporting interval. Date and time of minimum value.
MAXIMUM	Maximum value for a field during the reporting interval. Date and time of maximum value.
AVG	Average amount of storage allocated during the report interval.
FREE PAGES	Amount of storage (in bytes) available as free 4K blocks.
LARGEST FREE BLOCK	Largest contiguous block of free storage available.
PAGES ALLOCATED	Amount of storage (in bytes) in partially or wholly allocated 4K blocks.
ALLOCATED AREA SIZE	Size of area bounded by all allocated blocks in private area storage.

Private Area Storage Detail Section

A sample of the Private Area Storage Detail section is shown in Figure 3-79.

Figure 3-79 Private Area Storage Detail Section

```
PRODUCED BY CMF ANALYZER (5.5.00)                  VIRTUAL STORAGE ACTIVITY REPORT                    RPTSEQ     3 PAGE     10
BMC SOFTWARE, INC.                                           XYZ COMPANY                              REPORT DATE: 10 JUN 03 16.53
ACTL 10 JUN 03 16.33.43  10 JUN 03 16.49.53             WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSE     Z 1.01.0


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  78-2/4/119/0.27
-------------------------------------------------  PRIVATE AREA REPORT - DETAIL  ------------------------------------------------
    JOB NAME - XTSTKPAS
                            ALLOCATED PRIVATE AREA STORAGE (BELOW 16M) BY SUBPOOL
                           -------------------------------------------------------
                        SUBPOOL              MINIMUM                          MAXIMUM                          AVG
                       ---------            ---------                        ---------                        -----
 AUTHORIZED REGION
                        229                    4K (10 JUN 03 / 16.34.14)        8K (10 JUN 03 / 16.46.44)        4K
                        230                  136K (10 JUN 03 / 16.34.14)      136K (10 JUN 03 / 16.34.14)      136K
                        236 (SWA)             60K (10 JUN 03 / 16.34.14)       60K (10 JUN 03 / 16.34.14)       60K
                        237 (SWA)             16K (10 JUN 03 / 16.34.14)       16K (10 JUN 03 / 16.34.14)       16K
                        255 (LSQA)            88K (10 JUN 03 / 16.34.14)      108K (10 JUN 03 / 16.45.19)       88K
 USER REGION
                          0                  288K (10 JUN 03 / 16.34.14)      292K (10 JUN 03 / 16.38.26)      288K
                          8                    4K (10 JUN 03 / 16.34.14)        4K (10 JUN 03 / 16.34.14)        4K
                         10                   20K (10 JUN 03 / 16.34.14)       20K (10 JUN 03 / 16.34.14)       20K
                         13                    4K (10 JUN 03 / 16.34.14)        4K (10 JUN 03 / 16.34.14)        4K
                         21                  144K (10 JUN 03 / 16.34.14)      144K (10 JUN 03 / 16.34.14)      144K
                         78                    8K (10 JUN 03 / 16.34.14)       12K (10 JUN 03 / 16.45.19)        8K
                        251 (MODULES)        124K (10 JUN 03 / 16.34.14)      124K (10 JUN 03 / 16.34.14)      124K
                        252 (REENTRANT)      152K (10 JUN 03 / 16.34.14)      152K (10 JUN 03 / 16.34.14)      152K
```

Private Area Storage Detail Section Field Descriptions

Table 3-103 describes each field in the Private Area Storage Detail section of the Virtual Storage Activity Report.

Table 3-103 Field Descriptions for the Private Area Storage Detail Section (Part 1 of 2)

Field	Description
ALLOCATED PRIVATE AREA	Amount of storage acquired by the job through GETMAIN service for the subpool. This data is available only for below 16 megabytes.
SUBPOOL	Subpool ID; may be accompanied by a description of the area.

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Table 3-103 Field Descriptions for the Private Area Storage Detail Section (Part 2 of 2)

MINIMUM	Smallest amount of storage allocated during the report interval.
MAXIMUM	Largest amount of storage allocated during the report interval.
AVG	Average amount of storage allocated during the report interval.

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Workload Characterization Report

The Workload Characterization Report shows the MACS (MVS Automatic Characterization) —projected values and the actual values for I/O by device for all workloads and workloads by performance groups and performance periods. The Workload Characterization Report shows

- percentage of time that MACS projected each device would be busy for each workload
- percentage of time that MACS projected each device would be busy for all workloads (TOTAL %)
- percentage of time that each device was actually busy with all workloads (ACTUAL %)

The Workload Characterization Report is produced by using the WKLDCHAR Analyzer control statement (see “WKLDCHAR” on page 2-122).

This report has the following sections:

Workload Matrix

This section assigns a numeric value to each workload and shows the performance group, performance period, performance group name, the MACS-projected CPU busy percentages based on CPU and SRB service units for all workloads, the MACS-projected CPU busy percentages based on CPU and SRB service unit time and I/O service unit percentage for each workload, the MACS-projected memory service unit percentage, the MACS-projected I/O service unit percentage, and the MACS-projected workload I/O percentage for each workload.

Note: Average Processor Busy may be overstated in this report since only the first processor is taken as the current average; but, in reality, the first processor in line is usually the busiest.

Device Matrix

This section uses the numeric value assigned to each workload in the Workload Matrix section to show the MACS-projected and actual busy percentages for each device by unit and volume serial.

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Tapes Matrix

This section shows the same information as the Device Matrix section, but is produced only if there is tape device information in the report data.

Total Values

This section shows overall MACSCHAR Extractor control statement sampling statistics.

A sample Workload Characterization Report is shown in Figure 3-80.

Figure 3-80 Workload Characterization Report

```
PRODUCED BY CMF ANALYZER (5.5.00)                 WORKLOAD CHARACTERIZATION REPORT                    RPTSEQ     3 PAGE      5
BMC SOFTWARE, INC.                                          XYZ COMPANY                              REPORT DATE: 12 JUN 03 17.26
ACTL 10 JUN 03 17.06.01  10 JUN 03 17.13.29            WORLDWIDE HEADQUARTERS                        SYSTEM ID: SJSF     02.10.00


BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  240-0/2/2/.12   240-19/13/111/.12   72/38/0/.12
                                          AUTOMATIC CHARACTERIZATION MATRIX SUBREPORT

------------------------------------------------------ WORKLOAD MATRIX ------------------------------------------------------
WORKLOAD            1      2      3      4      5      6      7      8      9     10     11     12     13     14   TOTAL % ACTUAL %
PERFGRP #           0      1      2      2      4      5      6     10     30
PERFPER #           1      1      1      2      1      1      1      1      1
PERFGRP NAMES              S      T      M      D      S      S      S      S
                           T      S      S      I      U      T      T      T
                           C      O      O      M      M      C      C      C
                                                (1)    P
                                                       S
                                                       R
                                                       V

PRIORITY          255    255     20    254    255    255    255    255    255
CPU % (SU)        1.0    0.2    0.1    0.0    0.7    0.0    1.4    3.7    0.8                                        7.9   7.89
MEM SU %          0.9    2.1    0.5    0.0    4.0    0.0   14.3   62.7   15.5                                      100.0
I/O SU %          0.3    4.2    1.6    0.0   77.5    0.0    3.0    8.2    5.1                                      100.0
WK IO %           0.0    0.0    0.0    0.0   89.9    0.0    2.8    1.1    6.2                                      100.0
------------------------------------------------------ DEVICE MATRIX ------------------------------------------------------
WORKLOAD            1      2      3      4      5      6      7      8      9     10     11     12     13     14   TOTAL % ACTUAL %
   DEVICE % BY
 # UNIT-VOLSER
--------------
001 8305-TSG331                                                                                                        0.0    0.02
002 8306-SYSP14                                                                                                        0.0    0.00
003 830A-SPLF3D                                                   0.0    0.0                                           0.0    0.03
004 830C-SMFF37                                                                                                        0.0    0.01
005 8310-SYM028                                                          0.0                                           0.0    0.00
006 833E-SVC001                                                                                                        0.0    0.00
007 8356-SMS003                                                     0.0                                                0.0    0.00
008 8369-BAB320                                                                                                        0.0    0.01
009 836E-BAB325                                                          0.0                                           0.0    0.00
010 837D-SYSH23                                                                                                        0.0    0.00
011 8387-HFS000                                                     0.0                                                0.0    0.00
012 8388-HFS005                                                     0.0                                                0.0    0.00
013 83A8-TSG316                                                                                                        0.0    0.00
014 83AC-TSG320                                                   0.1          0.2                                     0.3    0.27
015 83BD-SMS002                                                                                                        0.0    0.00
020 8522-HFS004                                                     0.0                                                0.0    0.01
021 8548-BAB338                                                                                                        0.0    0.00
022 8566-SVC003                                                                                                        0.0    0.00
023 856B-BAB406                                                                                                        0.0    0.03
024 85A2-SMSA00                                                                                                        0.0    0.00
025 85A3-SMS011                                                          0.0                                           0.0    0.00
026 870A-TSG333                                  2.0                                                                   2.0    2.03
027 870B-TSG334                                  0.0                                                                   0.0    0.00
028 870D-TSG336                                                                                                        0.0    0.17
------------------------------------------------------ TOTAL VALUES -------------------------------------------------------
              PERCENT OF TOTAL SIO'S   77.50
              IO WORKLOAD INFORMATION DUPLICATION FACTOR   0.3163487
              IO WORKLOAD SERVICE TIME CAPTURE PERCENT    2.17
              IO WORKLOAD SIO CAPTURE PERCENT   62.47
              MAXIMUM SIO COUNT PROJECTED WITH DEVICE BASED SERVICE TIME          116
```

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Workload Matrix Section Field Descriptions

Table 3-104 describes each field in the Workload Matrix section of the Workload Characterization Report.

Table 3-104 Field Descriptions for the Workload Matrix Section (Part 1 of 2)

Field	Description
WORKLOAD	Identifying number assigned to each workload up to maximum number of workloads allowed; maximum allowed is 100.
PERFGRP #	Number of the performance group associated with the workload. More than one workload may come from a particular performance group, if it has more than one period. For example, workloads 5 through 8 may come from the performance group 2.
PERFPER #	Number of the performance period associated with the workload.
PERFGRP NAMES	If the performance group and period is given a name in a user established ICS, that name is displayed here. Selection is made in this order: • Transaction name • User ID • Subsystem name
CPU % (SU)	MACS projected workload CPU busy percentages directly proportional to the workload's TCB and SRB service units. This field is displayed if no parameters are defined or if both the CPUBASE and IOBASE parameters are defined to the WKLDCHAR Analyzer control statement.
CPU % (IO)	MACS projected workload CPU busy percentages relating to I/O service units. This value is calculated on a formula based on the CPU Service Unit Adjustment factor. This field is displayed only if the IOBASE parameter is defined to the WKLDCHAR Analyzer control statement.
MEM SU %	MACS projected percentage of memory service units for each workload.
I/O SU %	MACS projected percentage of I/O service units for each workload.
WK IO %	MACS projected percentage of I/O service projected from the IOWKLD sampling, if it is available.
CAP % (SU)	MACS projected workload CPU busy percentages directly proportional to the workload's TCB and SRB service units adjusted by the LPAR's cap (weighting factor). This field is displayed only if the CPUCAP parameter is defined to the WKLDCHAR Analyzer control statement. Note: Percentages over 100% may occur if the partition is using more than its weighting factor designates (CAPing is not required to request this line). If the partition has a dedicated processor, this line is marked D E D I C A T E D.
CAP % (IO)	MACS projected workload CPU busy percentages relating to I/O service units adjusted by the LPAR's cap (weighting factor). This value is based on the CPU Service Unit Adjustment factor and the LPAR's cap percentage. This field is displayed only if the IOCAP parameter is defined to the WKLDCHAR Analyzer control statement. Note: Percentages over 100% may occur if the partition is using more than its weighting factor designates (CAPing is not required to request this line). If the partition has a dedicated processor, this line is marked D E D I C A T E D.

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Table 3-104 Field Descriptions for the Workload Matrix Section (Part 2 of 2)

Field	Description
TOTAL %	Sum of MACS projected percentages for all workloads. For the MEM SU %, I/O SU %, and WK IO % fields, there is no projected value reflected in the TOTAL % field; it is 100% by definition. The CPU % (SU) and CPU % (IO) fields show actual MACS projected TOTAL % values. A TOTAL % value is not reported for the other fields in the Workload Matrix section because they contain fixed, not percentage, values.
ACTUAL %	Actual measured busy percentage for each workload. These values are calculated only for the CPU % (SU), SCP % (IO), CAP % (SU), and CAP % (IO) fields. Note: The actual value will always be the measured CPU busy percentage (that is, not relative to the CAP).

Device Matrix Section Field Descriptions

Table 3-105 describes each field in the Device Matrix section of the Workload Characterization Report.

Table 3-105 Field Descriptions for the Device Matrix Section

Field	Description
DEVICE % BY # UNIT-VOLSER	MACS projected percentage each device was to be used by each workload. Devices with the highest SIO counts are selected for workload characterization, up to a maximum of 400 devices per workload. Large differences between TOTAL % and ACTUAL % values can be caused by a low sampling rate, or by the MACSCHAR sampler being inactive during data collection. Only two types of devices are accounted for under this section: disks and tapes. Tapes are listed in a separate Tapes Matrix section that is displayed after this section.
TOTAL %	Sum of integer percentages for a device across all workloads.
ACTUAL %	Measured device busy percentage across all workloads.

Tapes Matrix Section Field Descriptions

The same fields that appear in Table 3-105 also appear in the Tape Matrix section of the Workload Characterization Report, only the information reflects tape devices rather than disk devices.

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Total Values Section Field Descriptions

Table 3-106 describes each field in the Total Values section of the Workload Characterization Report.

Table 3-106 Field Descriptions for the Total Values Section

Field	Description
PERCENT OF TOTAL SIOs	Percentage of all actual measured SIOs to disks or tapes for the workloads characterized. This value should be over 99%; if not, decrease the IOWSAMP parameter on the MACSCHAR Extractor control statement. The higher the value, the closer the MACS projected percentages are to the actual percentages. However, as this value approaches 100%, there is a greater likelihood that the CPU overhead for the MACSCHAR sampler will noticeably increase. (See the discussion of tuning overhead in the description of the IO WORKLOAD INFORMATION DUPLICATION FACTOR.)
IO WORKLOAD INFORMATION DUPLICATION FACTOR	Number representing the impact of duplicating MACSCHAR extraction information. If this value is over 0.0001, the MACSCHAR extraction sampling interval (IOWSAMP= parameter) should be increased for the next extraction. A value is displayed in this field only if MACSCHAR sampling is used.
IO WORKLOAD SERVICE TIME CAPTURE PERCENT	Percentage of total measured service time captured by the IOWKLD sampler. This value is displayed only if the IOWKLD sampler is used.
IO WORKLOAD SIO CAPTURE PERCENT	Percentage of total measured SIOs captured by the MACSCHAR sampler. This value is displayed only if the MACSCHAR sampler is used. A value of approximately 5% has been found to be adequate and representative.
PAGE IN WORKLOAD CAPTURE PERCENT	Percentage of total measured page faults captured by the MACSCHAR sampler. This value is displayed only if the MACSCHAR sampler is used. A value of approximately 5% has been found to be adequate and representative.
MAXIMUM SIO COUNT PROJECTED WITH DEVICE BASED SERVICE TIME	Highest workload device SIO count with service time based on the overall average. This value bases workload device service time on MACSCHAR service time sampling, if available. If sampling is not available, the overall average service time is used.

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Workload Manager Goal Mode Report

The Workload Manager Goal Mode Report provides information about the workloads in your service definition. Four subsections of the Workload Manager Goal Mode Report are available:

Detail Section

This section contains detailed information about all aspects of each workload. To request this section of the report, specify TYPE=DETAIL on the WLMGL Analyzer control statement.

The information in this section also contains the service classes specified by the PERFORM INCLUDE and PERFORM SCTYPE Analyzer control statements. By default, the report will include all service classes.

Goal Mode Delay Map Section

This section shows the most common delay reason for a particular workload for each service class period. To request this section of the report, specify TYPE=DELAY on the WLMGL Analyzer control statement.

Goal Activity Map Section

This section provides an overview of how well each workload met its predefined goals for each service class period.

To request this section of the report, specify TYPE=ACTIVITY on the WLMGL Analyzer control statement.

The data for this report is obtained using the WORKLOAD Extractor control statement (see “WORKLOAD” on page 1-82).

Figure 3-81 shows the Workload Manager Goal Mode Report, emphasizing the Activity Map and Delay Map sections.

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Figure 3-81 WLM Goal Mode Report - Detail Section

```
PRODUCED BY CMF ANALYZER (5.5.00)             WORKLOAD MANAGER GOAL MODE REPORT (DETAIL)                RPTSEQ     3 PAGE      16
BMC SOFTWARE, INC.                                      BMC SOFTWARE, INC.                              REPORT DATE: 10 JUN 03 13.45
REQD 10 JUN 03 11.45.00  10 JUN 03 23.59.59                HOUSTON, TX.                                 SYSTEM ID: **ALL**  COMB-MVS
ACTL 10 JUN 03 11.45.00  10 JUN 03 13.45.00                                                             REPORT CYCLE: CYCLE099

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-3/720/57.6K/4
------------------------------------------------------------ DETAIL SECTION ------------------------------------------------------------
- POLICY: BBPLEX01 - BMC Software Service Policy -----ACTIVATED: 10JUN2003  10:14:36 - INSTALLED: 10JUN2003  10:13:42 ID: CSTTXC   -
----- WORKLOAD: BATCH ------ Batch Workload -------------------- SERVICE CLASS: BATNRM ----- Batch Normal Jobs --------------------
PERIOD: 1   IMPORTANCE: 4   RESOURCE GROUP: ---
-TRANSACTIONS-  TRANS. TIME  HHH.MM.SS.TTT  --DASD I/O--  ---SERVICE UNITS---  --SERVICE RATES--  -PAGE-IN RATES-  -----STORAGE-----
AVG       0.52  ACTUAL              22.518  RATE    10.1  I/O         423,529  ABSRPTN   13980.6  SINGLE      0.1  AVG       1,854.0
MPL       0.52  EXECUTION           17.118  RESP     5.1  TCB       5,228,878  TRX SRV   13980.5  BLOCK       0.0  TOTAL       955.2
ENDED       48  QUEUED               5.400  CONN     1.5  SRB       1,420,295  TCB SEC      39.1  SHARED      0.0  CENTRAL     955.2
END/SEC   0.01  R/S AFFINITY         0.000  DISC     0.2  MEM      44,789,025  SRB SEC      10.6  HSP         0.0  EXPAND        0.0
#SWAPS       6  INELIGIBLE           0.000  PEND     2.2  TOTAL    51,861,727  RCT TIME      0.1  HSP MISS    0.0  SHARED        0.0
EXECUTD      0  CONVERSION           0.197  IOSQ     1.3  SU/SEC        7,203  I/O INT       1.5  EXP SNGL    0.0
AVG ENC      0  STD DEV           1.34.115                                      HS SERV       0.0  EXP BLK     0.0
REM ENC      0                                                                  APPL %        0.7  EXP SHRD    0.0
MS ENC       0

EXECUTION VELOCITY MIGRATION:   I/O MGMT  17.8   INIT MGMT   9.6

        -- RESPONSE TIME --   EX    PERF    AVG   -USING %-  ------------ EXECUTION DELAYS % ------------- %DLY %    %    %CRY %CRY
        HH.MM.SS.TTT          VEL   INDX    # AS   CPU  I/O  TOTAL  CPU DASD                               UNKN IDLE QUIE  USG  DLY
GOAL                         10.0
*ALL                         17.8    0.6     0.6   0.8  2.5   15.4  9.6  5.7                               5.3 75.9  0.0  0.0  0.0
  SJSD                        9.7    1.0     0.0   0.0  0.8    7.4  6.2  1.1                              16.6 75.2  0.0  0.0  0.0
  SJSE                       18.0    0.6     0.5   0.9  2.6   15.9  9.8  6.0                               4.8 75.9  0.0  0.0  0.0

PRODUCED BY CMF ANALYZER (5.5.00)             WORKLOAD MANAGER GOAL MODE REPORT (DETAIL)                RPTSEQ     3 PAGE      24
BMC SOFTWARE, INC.                                      BMC SOFTWARE, INC.                              REPORT DATE: 10 JUN 03 13.45
REQD 10 JUN 03 11.45.00  10 JUN 03 23.59.59                HOUSTON, TX.                                 SYSTEM ID: **ALL**  COMB-MVS
ACTL 10 JUN 03 11.45.00  10 JUN 03 13.45.00                                                             REPORT CYCLE: CYCLE099
BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-3/720/57.6K/4
------------------------------------------------------------ DETAIL SECTION ------------------------------------------------------------
- POLICY: BBPLEX01 - BMC Software Service Policy -----ACTIVATED: 10JUN2003  10:14:36 - INSTALLED: 10JUN2003  10:13:42 ID: CSTTXC   -
----- WORKLOAD: IMS -------- IMS Workload ----------------------- SERVICE CLASS: IMSNRM ----- IMS Normal Transactions --------------
PERIOD: 1   IMPORTANCE: 3   RESOURCE GROUP: ---
-TRANSACTIONS-  TRANS. TIME  HHH.MM.SS.TTT
AVG       0.00  ACTUAL              0.096
MPL       0.00  QUEUED              0.000
ENDED   29,643  EXECUTION           0.010
END/SEC   4.12  STD DEV             0.174
#SWAPS       0
EXECUTD 29,646
        -- RESPONSE TIME --  PERF  SUB    P    RESP   ------------------------- RESOURCE MANAGER STATES % --------------------------
        HH.MM.SS.TTT         INDX  TYPE       TIME %  --ACTIVE-- READY IDLE ---------------- DELAYS ---------------- -CONTINUATION-
GOAL    00.00.01.000   AVG         IMS   BTE           SUB  APPL            TOTAL LOCK                                 LOC  REM SPLX
*ALL    00.00.00.096          0.1                 7.9  85.5   0.0   0.0  0.0  14.5 14.5                                0.0  0.0  0.0
  SJSE  00.00.00.096          0.1                 7.9  85.5   0.0   0.0  0.0  14.5 14.5                                0.0  0.0  0.0

TRANSACTION RESPONSE TIME DISTRIBUTION
  RESP TIME ( MS.)  -----500-----600-----700-----800-----900--*1,000*--1,100---1,200---1,300---1,400---1,500---2,000---4,000------>>
  % IN BUCKET           99.5     0.1     0.1     0.1     0.0     0.1     0.0     0.0     0.0     0.0     0.0     0.0     0.1     0.0
  % CUMULATIVE          99.5    99.6    99.7    99.8    99.8    99.8    99.9    99.9    99.9    99.9    99.9    99.9     100     100
  # IN BUCKET         29,494      39      24      19       7      15       2       9       2       0       1      10      16       5
  # CUMULATIVE        29,494  29,533  29,557  29,576  29,583  29,598  29,600  29,609  29,611  29,611  29,612  29,622  29,638  29,643

PRODUCED BY CMF ANALYZER (5.5.00)             WORKLOAD MANAGER GOAL MODE REPORT (DETAIL)                RPTSEQ     3 PAGE      38
BMC SOFTWARE, INC.                                      BMC SOFTWARE, INC.                              REPORT DATE: 10 JUN 03 13.45
REQD 10 JUN 03 11.45.00  10 JUN 03 23.59.59                HOUSTON, TX.                                 SYSTEM ID: **ALL**  COMB-MVS
ACTL 10 JUN 03 11.45.00  10 JUN 03 13.45.00                                                             REPORT CYCLE: CYCLE099
BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-3/720/57.6K/4
------------------------------------------------------------ DETAIL SECTION ------------------------------------------------------------
- POLICY: BBPLEX01 - BMC Software Service Policy -----ACTIVATED: 10JUN2003  10:14:36 - INSTALLED: 10JUN2003  10:13:42 ID: CSTTXC   -
--------------------------------------------------------------------------------------------------------------------------------------
*TOTAL      SERVICE UNIT COEFFICIENTS: IOC  5.0  TCB 10.0  SRB 10.0  MSO  3.0000   I/O MGMT: YES
-TRANSACTIONS-  TRANS. TIME  HHH.MM.SS.TTT  --DASD I/O--  ---SERVICE UNITS---  --SERVICE RATES--  -PAGE-IN RATES-  -----STORAGE-----
AVG     215.05  ACTUAL              9.900  RATE   514.6  I/O      18,767,793  ABSRPTN   11394.1  SINGLE      0.0  AVG       1,076.7
MPL     215.04  EXECUTION           4.667  RESP     4.2  TCB      1.1482E+09  TRX SRV   11393.6  BLOCK       0.1  TOTAL   231,531.0
ENDED   63,526  QUEUED              0.050  CONN     0.9  SRB      59,413,960  TCB SEC    8,582.8  SHARED      0.0  CENTRAL 231,531.0
END/SEC   8.82  R/S AFFINITY        0.000  DISC     0.4  MEM      1.6415E+10  SRB SEC     444.1  HSP         0.0  EXPAND        0.0
#SWAPS  41,191  INELIGIBLE          0.001  PEND     2.2  TOTAL    1.7641E+10  RCT TIME     19.3  HSP MISS    0.0  SHARED      541.8
EXECUTD 29,646  CONVERSION          0.000  IOSQ     0.6  SU/SEC    2,450,174  I/O INT      93.5  EXP SNGL    0.0
AVG ENC      0  STD DEV           5.57.097                                      HS SERV       0.0  EXP BLK     0.0
REM ENC      0                                                                  APPL %      126.9  EXP SHRD    0.0
MS ENC       0

EXECUTION VELOCITY MIGRATION:   I/O MGMT  25.8   INIT MGMT  25.4
        -- RESPONSE TIME --   EX    PERF    AVG   -USING %-  ------------ EXECUTION DELAYS % ------------- %DLY %    %    %CRY %CRY
        HH.MM.SS.TTT          VEL   INDX    # AS   CPU  I/O  TOTAL  CPU DASD                               UNKN IDLE QUIE  USG  DLY
GOAL
*ALL                         25.8    ---   373.7   0.4  0.1    1.4  1.0  0.4                              11.4 85.9  0.0  0.0  0.0

SYSTEMS
  SYSID  -- START TIME --  --- END TIME ---  - DURATION -  - MVS --  OPT  -SU/SEC-
  SJSD   10JUN03 11.45.00  10JUN03 13.45.00      02.00.00  ZV010100  D1   13377.93
  SJSE   10JUN03 11.45.00  10JUN03 13.45.00      02.00.00  ZV010300  E1   13377.93
```

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Figure 3-82 shows the Workload Manager Goal Mode Report, emphasizing the Activity Map and Delay Map sections.

Figure 3-82 WLM Goal Mode Report - Activity and Delay Map Sections

```
PRODUCED BY CMF ANALYZER (5.5.00)                    WORKLOAD MANAGER MAP REPORT                      RPTSEQ     7 PAGE    180
BMC SOFTWARE, INC.                                           XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.26
ACTL 10 JUN 03 17.00.00  11 JUN 03 17.00.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: **ALL**  COMB-MVS

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-3/7,896/0/46.64
---------------------------------------------  GOAL ACTIVITY MAP SECTION (DAILY)  ---------------------------------------------
       POLICY INSTALLATION DATE-TIME / NAME / DESCRIPTION:  10JUN2003 10:50:03 / BBPOL002 / XYZ COMPANY Service Policy
'+' = EXCEEDED GOAL, '.' = MET GOAL, '123...' = BELOW GOAL BY 10%, 20%, 30%...  ' ' = ZERO OR NO DATA
                  0   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   2   2   2   2
             TIME: 0   1   2   3   4   5   6   7   8   9   0   1   2   3   4   5   6   7   8   9   0   1   2   3
WORKLOAD ----- BATCH ------- Batch Workload ---------------------------------------------------------------------------
  BATNRM   P1                  +    + + +++ ++++++++++++++++++++++++++++++++++++++++++++++++++++++++  +     +     +
           P2                  +          + ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
  BATPROD  P1             +                                      ++  ++ +                          +
WORKLOAD ----- CICS -------- CICS Workload ----------------------------------------------------------------------------
  CICSHOT  P1                       007++072027424717.+0 058+29467027330 907+ ++4  ++  1+. +6+ 5             1 +
  CICSNRM  P1                       ++3+++0++76+95++++++1+6+++++++++++3++++++++4+++++   +09032
WORKLOAD ----- IMS --------- IMS Workload ------------------------------------------------------------------------------
  IMSNRM   P1                                   5 9     0        +   ++++++2++.2+995 +
WORKLOAD ----- OMVS -------- Open MVS Workload -------------------------------------------------------------------------
  OMVSNRM  P1                            90 7 88 9 94 726    70 1 535591577585 02 3  ++ 456977
WORKLOAD ----- STC --------- STC Workload ------------------------------------------------------------------------------
  GRS      P1      99 299  93194 7 99124942154 8719805086360579921632746931472950055 80 92815036511496959789 0 2890
  STCNRM   P1      ++++++++++++++++++++++++++++++++++++++++4++++++++++++1+++++++++++++++++++++++++++++++++++++++++
  STCPAS   P1                              +++++++++1+++...++++++++++++++++++++++++...5300+2142.26834.++++++++
  STCPROD  P1                      +   +     ++    6 + +++  2 +++  ++++   +++    +     + +        +
  STCSYS   P1      7 9              4       9                        4            + 9  5483635453335453523333224333
WORKLOAD ----- TSO --------- TSO Workload ------------------------------------------------------------------------------
  TSONRM   P1            9 9++++++1.1231..31..2213133123112.1133212222121.1112.1..11+.+.1131.+.22231+.+++++++++++++
           P2             +333231.12131..1..112113111..1..+..12...11111.21....+111+++..+++.+++++.11++++     6 8+834
           P3             7 ++++.+3++.1++.+++++++++++++++++.++.+++++++++.+++++++++++++++++++++++++++++ +++ +  .+++
           P4            +  ++++ ++ +++++++++++++++++++++++++++++++++51++2+2+++++++++++++++++++++++++++++++++++++++

PRODUCED BY CMF ANALYZER (5.5.00)                    WORKLOAD MANAGER MAP REPORT                      RPTSEQ     7 PAGE    181
BMC SOFTWARE, INC.                                           XYZ COMPANY                              REPORT DATE: 12 JUN 03 13.26
ACTL 10 JUN 03 17.00.00  11 JUN 03 17.00.00            WORLDWIDE HEADQUARTERS                         SYSTEM ID: **ALL**  COMB-MVS

BASED ON REC TYPE/# RECS/# SAMPLES/REC HOURS:  72-3/7,896/0/46.64
---------------------------------------------  GOAL MODE DELAY MAP SECTION (DAILY)  ---------------------------------------------
       POLICY INSTALLATION DATE-TIME / NAME / DESCRIPTION:  10JUN2003 10:50:03 / BBPOL002 / XYZ COMPANY Service Policy
  C = CPU, A = CAPP, S = STOR, M = MPL, I = I/O, P = PAGE, O = OTHER, V = SERV, _ = IDLE, R = RSCE GRP, Z = QUIESCE,   = NO DATA
                  0   0   0   0   0   0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   2   2   2   2
             TIME: 0   1   2   3   4   5   6   7   8   9   0   1   2   3   4   5   6   7   8   9   0   1   2   3
WORKLOAD ----- BATCH ------- Batch Workload ---------------------------------------------------------------------------
  BATNRM   P1                  OO     O OO_OOO____OOOOO__ OOOOOOOOOOOOOOOOOOOOOOOOOO_OOOOOOOOOOO  O     O     O
           P2                  OO     O OO_OOO____OOOOO__ OOOOOOOOOOOOOOOOOOOOOOOOOO_OOOOOOOOOOO  O     O     O
  BATPROD  P1             O                                      OO  OO O      O                 O
WORKLOAD ----- OMVS -------- Open MVS Workload -------------------------------------------------------------------------
  OMVSNRM  P1      ______________________________________________________________________________________________
WORKLOAD ----- SLOW -------- Low Service ------------------------------------------------------------------------------
  SLOW     P1                                                   CC__________
WORKLOAD ----- STC --------- STC Workload ------------------------------------------------------------------------------
  GRS      P1      OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
  STCLOW   P1      OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
  STCNRM   P1      ______________________________________________________________________________________________
  STCPAS   P1                                _____________________OO_____________________________________________
  STCPROD  P1      ______________________________________________________________________________________________
  STCSYS   P1      ______________________________________________________________________________________________
WORKLOAD ----- SYSTEM ------ THE SYSTEM WORKLOAD ----------------------------------------------------------------------
  SYSSTC   P1      ______________________________________________________________________________________________
  SYSTEM   P1      ______________________________________________________________________________________________
WORKLOAD ----- TSO --------- TSO Workload ------------------------------------------------------------------------------
  TSONRM   P1            _OO____________________________________________________________________________________
           P2            _OO____________________________________________________________________________________
           P3            _OO____________________________________________________________________________________
           P4            _OO____________________________________________________________________________________
  TSOSUPP  P1                                                O
           P2                                                O
           P3                                                O
           P4                                                O
           P5                                                O
```

Workload Manager Goal Mode Report Field Descriptions

Table 3-107 describes each field in the Detail section of the Workload Manager Goal Mode Report.

Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 1 of 6)

Field	Description
POLICY	Name of policy used by the service definition. For more information about service definition policies, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
ACTIVATED	Date and time service policy was activated.
INSTALLED	Date and time this policy was installed.
ID	User ID of person who installed the policy.
WORKLOAD	Name and description of the workload in the service class definition in the workload manager. For more information about goal mode workloads, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
SERVICE CLASS, REPORT CLASS	Name and description of the service class or report class in the service definition. For more information about service classes, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
PERIOD	Period number of the service or report class. For more information about service or report class periods, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
IMPORTANCE	Importance level of the performance goal, ranging from 1 (highest) to 5 (lowest) This field is not present for report classes and not applicable to service classes having system or discretionary goal.
RESOURCE GROUP	Name of the resource group that the service class is assigned to. Resource groups are used to set a minimum or limit the amount of CPU capacity available to one or more service classes. This field is not present for report classes.
HOMOGENOUS REPORT PERIOD	A report class period is called homogeneous if all its transactions are being assigned to the same service class period. If the report class period is homogeneous, the report shows the service class the goal is derived from.
HETEROGENOUS REPORT PERIOD	A report class period is called heterogeneous if the transactions are being assigned to different service class periods.
SERVICE UNIT COEFFICIENTS	Numbers by which I/O, TCB, SRB, and storage service units are multiplied.
I/O MGMT	Whether WLM dynamically adjusts the priority of non paging DASD I/O requests to meet goals.
TRANSACTIONS	Counts of transactions.
AVG	Average number of active transactions (not necessarily in central storage)
MPL	Average number of transactions resident in storage.
ENDED	Total number of transactions completed in the report interval.
END/SEC	Average number of transactions completed per second.
# SWAPS	Number of swap sequences during the interval.
EXECUTD	Number of execution phases completed as reported by subsystem work managers.

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Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 2 of 6)

Field	Description
AVG ENC	Average number of independent enclaves.
REM ENC	Average number of foreign enclaves imported from a remote system.
MS ENC	Average number of multisystem enclaves exported to and executing on a remote system.
TRANS. TIME HHH.MM.SS.TTT	Average times for transactions.
ACTUAL	Average transaction response time.
EXECUTION	Average transaction execution time.
QUEUED	Average queue delay time. For batch jobs, it is the time jobs spent waiting for an initiator. For TSO users, it is a portion of the LOGON process. For APPC, it is the time an APPC request spent on an APPC queue.
R/S AFFINITY	Average time batch jobs were ineligible to run because the resources the job had affinity to was unavailable.
INELIGIBLE	Average time batch jobs spent on job queues (after JCL conversion) while ineligible to run for reasons other than resource affinity, including operator hold, delays due to duplicate job names, delays due to job class limits.
CONVERSION	Average time batch jobs spent on JCL conversion.
STD DEV	Measure of how widely transaction response times varied from the average value.
DASD I/O	Non paging DASD I/O requests.
RATE	Average number of non paging DASD I/O requests completed per second.
RESP	Average response time of non paging DASD I/O requests in milliseconds.
CONN	Average connect time in milliseconds, including data transfer and search time.
DISC	Average disconnect time in milliseconds.
PEND	Average pending time in milliseconds, including channel & control unit contention, device busy on another system.
IOSQ	Average IOS queue time in milliseconds, i.e. time waiting for a device while it is busy performing I/O.
SERVICE UNIT	Number of service units of each type consumed in the interval.
I/O	Number of I/O service units used.
TCB	Number of Task Control Block (TCB) service units used.
SRB	Number of System Request Block (SRB) service units used.
MEM	Number of memory service units used.
TOTAL	Total number of I/O, TCB, MEM, and SRB service units used.
SU/SEC	Rate at which service units were used per second.
SERVICE RATES	Rate at which service units were used.
ABSRPTN	Service units used per second while transactions were resident in central storage.
TRX SRV	Service units used per second while transactions were active (not necessarily in central storage).
TCB SEC	Number of CPU seconds used by transactions while executing in TCB mode.

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Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 3 of 6)

Field	Description
SRB SEC	Number of CPU seconds used by transactions while executing in SRB mode.
RCT TIME	Region control task time in seconds.
I/O INT	I/O interrupt processing time in seconds.
HS SERV	Hiperspace service time in seconds.
APPL %	Percentage of report interval that transactions used CPU. It is the sum of TCB SEC, SRB SEC, RCT TIME, I/O INT, and HS SERV time divided by the report interval. It is possible for this value to exceed 100% when an LPAR has more than one logical processor or input contains data from more than one system.
PAGE-IN RATES	Paging, in pages per second.
SINGLE	Rate at which individual pages were transferred due to demand paging.
BLOCK	Rate of pages transferred (paged in) from auxiliary storage to central storage in blocks, as part of swap-in or directed page ins.
SHARED (page-ins)	Rate of shared pages transferred (paged in) from auxiliary storage to central storage.
HSP	Rate per second of hiperspace pages transferred (paged in) from auxiliary storage to central storage while transactions were active.
HSP MISS	Rate of expanded storage only (ESO) hiperspace read misses. A miss occurs when a read to expanded storage is issued and the requested page resides in auxiliary storage.
EXP SNGL	Rate of unblocked pages transferred (paged in) from expanded storage to central storage.
EXP BLK	Rate of blocked pages transferred (paged in) from expanded storage to central storage.
EXP SHRD	Rate of shared pages transferred (paged in) from expanded storage to central storage.
STORAGE	Storage frames allocated to address spaces.
AVG	Average central and expanded storage, in frames, allocated to an address space while resident in storage; it is page residency time divided by address space residency time.
TOTAL	Average central and expanded storage, in frames, allocated to all address spaces during the report interval; it is page residency time divided by report interval.
CENTRAL	Average central storage, in frames, allocated to all address spaces during the report interval.
EXPAND	Average expanded storage, in frames, allocated to all address spaces during the report interval.
SHARED (storage)	Average shared storage, in frames, allocated to all address spaces during the report interval.
RESPONSE TIME	For average response time goal, the expected response time is formatted on the GOAL line and the actual response time is on the subsequent lines for sysplex and individual systems. For response time with percentile goal, the expected percentage of transactions to be completed within the specified response time is formatted on the GOAL line and the actual percentage is on the subsequent lines for sysplex and individual systems. For system or discretionary goal, SYSTEM or DISCRETIONARY is printed. This column is not applicable to report classes.

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Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 4 of 6)

Field	Description
EX VEL	For velocity goal, the expected execution velocity is formatted on the GOAL line. The actual execution velocity is formatted on the subsequent lines for sysplex and individual systems, regardless of goal type. For more information about execution velocity, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*.
PERF INDX	Performance index. For more information about the interpretation of a performance index value, see Workload Measurement in Goal Mode in *CMF MONITOR Batch User Guide*. Note: This column is not applicable to report classes and service classes of system or discretionary goal.
AVG # AS	Average number of address spaces and enclaves that contributed delay and using samples.
USING %	CPU Ratio of CPU using samples compared with all using and delay samples. I/O Ratio of non paging DASD I/O using samples compared with all using and delay samples.
EXECUTION DELAYS %	TOTAL Percentage of all delay samples used in the calculation of execution velocity. This field does not necessarily equal the sum of delay reason percentages listed (for example, if I/O priority management option is inactive, I/O delay reason is not included.) At most, seven delay reasons are listed in descending order at the sysplex level: CPU CPU delay. Work is either waiting to be dispatched or for the local lock. CPU CAPP CPU capping delay. Work is non dispatchable because a resource group maximum is being enforced. DASD Non paging DASD I/O. This delay is not included in TOTAL if WLM does not manage I/O priority. MPL MPL delay. Work is delayed for storage due to multiprogramming level constraint. PGIN COMM Page in for common storage PGIN EHSP Page in for ESO hiperspaces PGIN HSP Page in for standard hiperspaces PGIN PRIV Page in for private storage PGIN VIO Page in for VIO storage PGIN XMEM Cross memory page in SERV HSP Server hiperspace page in SERV MPL Server MPL delay SERV PRIV Server private area page in SERV QUE Server queue delay. Work is waiting for a server. SERV SWIN Server swap-in SERV VIO Server VIO page in SWAP IN Swap-in delay
%DLY UNKN	Work is delayed but none of the reasons listed under EXECUTION DELAYS % above apply.
% IDLE	Work is in STIMER wait, TSO terminal wait, APPC wait, or is an initiator waiting for work.
% QUIE	Work in this service class has been reset by the RESET jobname,QUIESCE command, which swaps out a swappable address space or gives the lowest possible performance characteristics to a non swappable address space.

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Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 5 of 6)

Field	Description
CRYPTO% USG	Crypto using state -- a TCB or SRB was found to be using a cryptographic asynchronous message processor (CAP), an adjunct processor (AP).
CRYPTO% DLY	Crypto delay state -- a TCB or SRB was found to be waiting for a cryptographic asynchronous message processor (CAP), an adjunct processor (AP) or a processor feature queue.
SUB TYPE	Subsystem type, as specified in the classification rules.
P	States sampled in the begin-to-end phase of a transaction (BTE) or in the execution phase (EXE).
RESP TIME %	Percentage of the response time that a transaction spends in the begin-to-end or execution phase. Note: Long-running and never-ending transactions that did not complete during the report interval contributed state samples but not response time, causing this transaction to appear inflated, perhaps even registering above 100%.
RESOURCE MANAGER STATES %	Ratio of the specified state samples compared with total state samples.
ACTIVE	A program was executing on behalf of the work request, from the perspective of the work manager. This does not mean that the program is active from the MVS perspective. SUB The program was the subsystem itself APPL The program was an application invoked by the subsystem (z/OS 1.2.0 or later only)
READY	A program was ready to execute on behalf of the work request, but the work manager has given priority to another work request.
IDLE	Work manager saw a transaction as idle.
DELAYS	TOTAL Percentage of all delay state samples. At most six delay reasons are listed in descending order at the sysplex level: CONV Waiting for conversation DIST Waiting for distributed request. Some function or data had to be routed prior to resumption of the work request. I/O Waiting for I/O LTCH Waiting for new latch LOCK Waiting for lock LSES Waiting for a session to be established locally on the current MVS image NSES Waiting for a session to be established somewhere in the network PROD Waiting for another product SSES Waiting for a session to be established somewhere in the sysplex TIMR Waiting for a timer UNKN Waiting for an unidentified resource SSLT Waiting for an SSL thread (z/OS 1.2.0 or later only) REGT Waiting for a regular thread (z/OS 1.2.0 or later only) WORK Waiting for a registration worktable (z/OS 1.2.0 or later only)

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Table 3-107 Field Descriptions for the Workload Manager Goal Mode Report (Part 6 of 6)

Field	Description
CONTINUATION	Percentage of logical continuation state samples. LOC Logical continuation on the local system. Subsystem work managers function shipped a transaction to another component within the same system. REM Logical continuation on a remote system in the sysplex. Subsystem work managers function shipped a transaction to another component on another system. SPLX Logical continuation somewhere within the network. Subsystem work managers function shipped a transaction to another component within the network.
TRANSACTION RESPONSE TIME	For response time with percentile goal, this table shows the distribution of completed transactions.
RESP TIME (unit)	Response times of response time buckets. The unit may be millisecond (MS.), second (SEC.), minute (MIN.), or hour (HRS.)
% IN BUCKET	Percentage of transactions completed in the reporting period represented by a response time bucket
% CUMULATIVE	Percentage of transactions completed with a response time less than or equal to the value displayed in the RESP TIME line.
# IN BUCKET	Number of transactions completed in the reporting period represented by a response time bucket.
# CUMULATIVE	Number of transactions completed with a response time less than or equal to the value displayed in the RESP TIME line.

Workload Manager Goal Mode Report - Activity Map and Delay Map Sections

These sections provide an overview of workload performance over the course of a day, week, or month. Using the Activity map section, you can see the times during which workloads were running smoothly as well as the times they were subject to delays. Using the Delay Map section, you can see the main cause of delays during a particular time frame for each workload.

Either map may be specified as providing information on a daily, weekly, or monthly basis. If you request PERIOD=DAY on the WLMGL report control statement, each column of the map represents 15 minutes. If you request PERIOD=WEEK in the WLMGL report control statement, each column represents 2 hours. If you specify PERIOD=MONTH in the WLMGL report control statement, each column represents 8 hours.

After the report header, the first line of a map section indicates the type of map being shown (Activity or Delay) and the period it covers (Daily, Weekly, or Monthly).

The next line contains information about the service policy.

Following the policy information is the report legend.

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- For the Activity Map, the values for the legend are as follows:

  + Indicates the goal was exceeded for the interval.

  . Indicates the goal was met for the interval.

  (blank) Indicates no data was found for the interval.

  1 2 3...9 Indicates the goal was not met; the number shows the approximate percentage by which the workload did not achieve its goal; a value of 1 indicates the workload missed its goal by 10%, a value of 2 indicates the workload missed its goal by 20%, and so on.

- For the Delay Map, the values for the legend are the following delay reasons:

  A Capping
  C CPU
  I I/O
  M MPL
  O Other delay reason
  P Paging
  Q Queueing
  R Resource Group Capp
  S Swapping
  V Server
  _ Idle
  z Quiesce
  (blank) Zero or no data available

The next two lines are the column headers for DAY, WEEK, or MONTH reporting. The map is laid out as follows for each of the time frames:

DAY: Twenty-four hours are displayed, from midnight to midnight. Each hour is broken into four 15-minute intervals starting at midnight, for a total of 96 intervals.

WEEK: Seven days are displayed, from Sunday through Saturday. Each day is broken into twelve 2-hour intervals starting 00:00 hours Sunday morning, for a total of 84 intervals.

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MONTH: Up to 31 days are displayed. Each day is divided into three 8-hour intervals starting at 00:00 hours on the first day of the month for a maximum of 93 intervals depending on the number of days in the month.

Note: Exercise caution in choosing data for this report to avoid the unexpected combining of data. For example, if PERIOD=DAY is used with data from more than one day, the report combines the data by each 15-minute interval. This generates a single report that contains the combined data from multiple days, rather than separate reports for each day.
To limit the data used for this report, use the Analyzer DATETIME parameter, as described in “DATETIME” on page 2-40.
A new report header is generated whenever a Workload Policy change is detected.

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Appendix A Measure and Trace Values

The information presented in “Values for EXCEPTS and GRAPH Statements” defines the acceptable values for the MEASURE parameter of the Analyzer EXCEPTS (see “EXCEPTS” on page 2-50) and GRAPH (see “GRAPH” on page 2-56) control statements.

The information presented in “Traceable Data Fields” on page A-12 defines the acceptable values for the MEASURE parameter of the Analyzer EXCEPTS, GRAPH control statements and the FIELD parameter of the Extractor TRACE76 (see “TRACE” on page 2-114) control statement.

Values for EXCEPTS and GRAPH Statements

Table A-1 lists the allowable values that can be defined to the MEASURE parameter of the Analyzer EXCEPTS and GRAPH control statements.

Note: VSDB and VSDA labels used in the calculations in Table A-1 are DSECT fields in VSDATA. They define areas within major SMF78RCD triplet areas associated with CSA and SQA data.

Table A-1 Values for EXCEPTS and GRAPH Statements (Part 1 of 12)

Measure	Description	Record Type
APPC-MAX	Maximum number of APPC address spaces.	SMF70
APPC-MIN	Minimum number of APPC address spaces.	SMF70
APQ	Average amount of available page frames in K-bytes.	SMF70
AVTSK	Average number of address spaces in storage and ready to execute.	SMF70
APPC-AVG	Average number of APPC address spaces.	SMF70

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 2 of 12)

Measure	Description	Record Type
BTCH-AVG	Average number of batch jobs.	SMF70
BTCH-CPU	Percent of time during the measurement interval that the CPU was executing on behalf of a batch job.	CMF-01
BTCH-MAX	Maximum number of batch jobs.	SMF70
BTCH-MIN	Minimum number of batch jobs.	SMF70
CHA-*nn*	Average rate of SSCH per second for the specified LCU; *nn* is the two-character logical control unit number in hexadecimal.	SMF78
CHC-*nnnn*	Percentage of requests that were satisfied from cache for control unit *nnnn* (number of hits/number of requests).	CMF-27
CHD-*nnnn*	Percentage of requests that were satisfied from cache for device *nnnn* (number of hits/number of requests).	CMF-27
CHN-*nn*	Percent of time during the measurement interval that the specified channel path was observed to be busy; *nn* is the two-character channel path in hexadecimal.	SMF73
CHS-*nn*	Service time in milliseconds for the specified LCU; *nn* is the two-character logical control unit number in hexadecimal.	SMF74
CMB-*nn*	*nn* is a two-digit number specifying which logical combination is to be taken from the Combinations of Configuration.	varies
CMC-*nnnn*	Percentage of requests that were not satisfied from cache for control unit *nnnn* (number of misses/number of requests).	CMF-27
CMD-*nnnn*	Percentage of requests that were not satisfied from cache for device *nnnn* (number of misses/number of requests).	CMF-27
CNN-*nnn*	Average number of milliseconds the device was processing an SSCH instruction and transferring data; *nnn* is the 3- or 4-character device address.	SMF74
COEFCPU	IPS CPU service definition coefficient.	SMF72
COEFIO	IPS I/O service definition coefficient.	SMF72
COEFMEM	IPS memory service definition coefficient.	SMF72
COEFSRB	IPS SRB service definition coefficient.	SMF72
COMRECL	Common system area page reclaim rate per minute.	SMF71
CPK-*n*	Percent of time during the measurement interval that the processor was observed to be executing in the specified key. *n* is a one-character hexadecimal number from 0 to F.	CMF-01
CPU	PR/SM, MDF, or MLPF environment: The LPAR CPU busy percentage during the specified interval. It is the percentage of processor dispatch capacity used by the home partition (the partition on which the records were extracted). The processor dispatch capacity is equal to the interval length multiplied by the number of logical processors assigned to the partition. The formula is **Wait completion on:**(dispatch time - wait time) / interval **Wait completion off:**dispatch time / interval Native mode: Average CPU busy percentage during the specified interval. The formula is (interval - wait time) / interval. In this environment, this measure has the same meaning as CPUBZMVS below.	SMF70

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 3 of 12)

Measure	Description	Record Type
CPUBZMVS	In a PR/SM, MDF, or MLPF environment, this value is the average percent of time during the specified interval the CPU either was not dispatched or was dispatched and busy. This value is calculated as (interval length - wait time) / interval length. This measure is not available if the SMF type 70 records were extracted from a partition running a version of MVS prior to 4.3 and at least one nondedicated processor has wait completion off. In a non-PR/SM, non-MDF, non-MLPF environment, this value is the average percent of time during the specified interval the CPU was busy.	SMF70
CPUCAP	Percent of the partition or domain weight used by the home partition or domain. This is equal to the CPU busy for MDF, MLPF, or PR/SM environments multiplied by the portion of the environment allotted to the home partition or domain (weight factor). For non-MDF, non-MLPF, or non-PR/SM environments, this value is always 100%.	SMF78
CRC-*nnnn*	Percentage of read requests that were satisfied from cache for control unit *nnnn* (read hits/read requests).	CMF-27
CRD-*nnnn*	Percentage of read requests that were satisfied from cache for device *nnnn* (read hits/read requests).	CMF-27
CSA-AVG	Average CSA allocated area size as a percentage of total CSA available above and below the 16-megabyte line. This area contains both used and free CSA storage.	SMF78
CSA-MAX	Maximum CSA allocated area size as a percentage of total CSA available above and below the 16-megabyte line. (Area contains both used and free CSA storage.)	SMF78
CSA-MIN	Minimum CSA allocated area size as a percentage of total CSA available above and below the 16-megabyte line. (Area contains used and free CSA storage.)	SMF78
CSAUSE-*x*	Average amount of CSA used: Above 16MB, when *x* = **A** Below 16MB, when *x* = **B** The CSA in use includes fragmentation caused by allocation of 4K storage blocks.	SMF78
CSC-*nnnn*	Percentage of read requests that were not satisfied from cache for control unit *nnnn* (read misses/read requests).	CMF-27
CSD-*nnnn*	Percentage of read requests that were not satisfied from cache for device *nnnn* (read misses/read requests).	CMF-27
CSF-AVG	Average free CSA (within CSA allocated area size) as a percentage of total CSA available above and below the 16-megabyte line.	SMF78
CSF-MAX	Maximum free CSA (within the size of CSA allocated area) as a percentage of total CSA available above and below the 16-megabyte line.	SMF78
CSF-MIN	Minimum free CSA (within size of CSA allocated area) as a percentage of total CSA available above and below the 16-megabyte line.	SMF78
CSU-AVG	Average CSA used (within CSA allocated area size) as a percentage of the total CSA available above and below the 16-megabyte line.	SMF78
CSU-MAX	Maximum CSA used (within CSA allocated area size) as a percentage of total CSA available above and below the 16-megabyte line.	SMF78
CSU-MIN	Minimum CSA used (within CSA allocated area size) as a percentage of total CSA available above and below the 16-megabyte line.	SMF78

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 4 of 12)

Measure	Description	Record Type
CUB-*nnn*	Average control unit busy delay time: the average number of milliseconds of delay for an I/O request because the control unit was busy. If the device is shared at the control unit level, the contention can be caused by the sharing system. If the device is not shared at the control unit level, the contention is because of other device activity using the same or an alternate path serviced by the control unit. *nnn* is the 3- or 4-character device address.	SMF74
CWC-*nnnn*	Percentage of write requests that were satisfied from cache for control unit *nnnn* (write hits/write requests).	CMF-27
CWD-*nnnn*	Percentage of write requests that were satisfied from cache for device *nnnn* (write hits/write requests).	CMF-27
CXC-*nnnn*	Percentage of write requests that were not satisfied from cache for control unit *nnnn* (write misses/write requests).	CMF-27
CXD-*nnnn*	Percentage of write requests that were not satisfied from cache for device *nnnn* (write misses/write requests).	CMF-27
DEV-*nnn*	Percent of time during the measurement interval that the specified device was busy. *nnn* is the 3- or 4-character device address.	SMF74
DIS-*nnn*	Average number of milliseconds during which the device was processing an SSCH instruction, but was not transferring data; *nnn* is the 3- or 4-character device address.	SMF74
DSO-*nnn*	Average number of data sets opened on the specified device. This excludes measurement intervals during which the designated device was varied online or offline. This excludes multiple exposure devices. *nnn* is the 3- or 4-character device address.	SMF74
DSL-GSRB	Percent of CPU busy time that the processor was executing as a global SRB in the disabled state.	CMF-01
DSL-LSRB	Percent of CPU busy time that the processor was executing as a local SRB in the disabled state.	CMF-01
DSL-TCB	Percent of CPU busy time that the processor was executing in TCB mode in the disabled state.	CMF-01
DSL-TOT	Percent of CPU busy time that the processor was executing in the disabled state.	CMF-01
DVA-*nnn*	Average rate of SSCH per second for the specified device.	SMF74
DVB-*nnn*	Average device busy delay time. The average number of milliseconds of delay for an I/O request because the device was busy. The *nnn* is the 3- or 4-character device address.	SMF74
DVS-*nnn*	Service time in milliseconds for the specified device. The *nnn* is the 3- or 4-character device address.	SMF74
ENL-GSRB	Percent of CPU busy time that the processor was executing as a global SRB in the enabled state.	CMF-01
ENL-LSRB	Percent of CPU busy time that the processor was executing as a local SRB in the enabled state.	CMF-01
ENL-TCB	Percent of CPU busy time that the processor was executing in TCB mode in the enabled state.	CMF-01

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 5 of 12)

Measure	Description	Record Type
ENL-TOT	Percent of CPU busy time that the processor was executing in the enabled state.	CMF-01
ERR-*nnn*	Percent of time during the measurement interval that the specified device was in error recovery; *nnn* is the 3- or 4-character device address.	CMF-05
EXP-AAV	Average number of available expanded storage 4K page frames.	SMF71
IOIRATE	Rate per second at which the processor handled I/O interruptions.	SMF70
IOTPI	Percent of total I/O interrupts for the processor that were handled by the TPI instruction.	SMF70
LCAP-##	Percent of the logical processor utilization for a logical partition relative to its weight factor, where the partition is specified by ##. Valid values are hexadecimal digits between 0 and FF. The partition number is displayed under the column No. of the CMF MONITOR Online view LPARSTAZ.	SMF70
LPU-##	Average percent of logical processor utilization for a logical partition relative to the weight factor of the partition specified by ##. Valid values are hexadecimal digits between 0 and FF. The partition number is displayed under the column No. of the CMF MONITOR Online view LPARSTAZ.	SMF70
MAX3420	Maximum number of 3420 type tape drives that were concurrently allocated.	CMF05TDA
MAX3480	Maximum number of 3480 type tape drives that were concurrently allocated.	CMF05TD8
MAX3490	Maximum number of 3490 type tape drives that were concurrently allocated.	CMF05TD9
MAX3590	Maximum number of 3590 type tape drives that were concurrently allocated.	CMF05MDV
NUCPAGES	Average number of page frames in the nucleus, in K-bytes.	SMF71
NTU-AVG	Average number of TSO users.	SMF70
NTU-MAX	Maximum number of TSO users.	SMF70
NTU-MIN	Minimum number of TSO users.	SMF70
OMVS-AVG	Average number of OMVS address spaces.	SMF70
OMVS-MAX	Maximum number of OMVS address spaces.	SMF70
OMVS-MIN	Minimum number of OMVS address spaces.	SMF70
OUS-*nnn*	Average number of users on the SRM queue ready to execute for the specified domain. Ready-user average is stored by the SRM in the DMDT. The *nnn* is the domain number.	CMF-04
PAB-*nnn*	Rate per second at which the specified performance group consumed service while transactions were resident in storage. The *nnn* is the performance group number.	SMF72
PAGEDPR	Demand paging rate from DASD.	SMF71
PAGEINS	Total number of pages transferred from auxiliary storage to central storage, including VIO, swap, hiperspace, and block paging.	SMF71
PAGEIO	Total number of pages transferred between auxiliary storage and central storage, including VIO, swap, hiperspace, and block paging.	SMF71

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 6 of 12)

Measure	Description	Record Type
PAGEOUTS	Total number of pages transferred from central storage to auxiliary storage, including VIO, swap, and hiperspace paging.	SMF71
PAGERECL	Total number of page reclaims, including VIO.	SMF71
PAGESEC	Total paging rate in pages per second between auxiliary storage and central storage, including VIO, swap, hiperspace, and block paging.	SMF71
PAGESMIG	Average rate of page migration from expanded storage to auxiliary storage.	SMF71
PAGESTRN	Average paging transfer rate to expanded storage.	SMF71
PAGETIME	Average number of milliseconds needed to complete an I/O request to a local page data set.	SMF75
PCAP-##	Percent of the physical processor utilization for a logical partition relative to its weight factor, where the partition is specified by ##. Valid values are hexadecimal digits between 0 and FF. The partition number is displayed under the column No. of the CMF MONITOR Online view LPARSTAZ.	SMF70
PCP-*nnn*	Percent of total TCB and SRB service units consumed by the specified performance group. The *nnn* is the performance group number.	SMF72
PEN-*nnn*	Average number of milliseconds an I/O request must wait for hardware (such as a channel path or control unit) and time between the SSCH pending at the channel and the device active on the subchannel. The time also includes delays caused by another processor reserving this device in a shared DASD environment. The *nnn* is the 3- or 4-character device address.	SMF74
PGINPROC	Average ASM queue length as seen by the SRM. Average value does not consider samples when there was no queue.	CMF-09
PGT-*nnn*	Percent of the total of all service units consumed by the specified performance group. The *nnn* is the performance group number.	SMF72
PIO-*nnn*	Percent of total IOC service units consumed by the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
PME-*nnn*	Percent of total MSO service units consumed by the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
PPB	Percent of CPU busy time that the processor was executing in problem state.	CMF-01
PPPAGES	Average number of page frames in the private area, in K-bytes; includes fixed non-LSQA frames.	SMF71
PPU-##	Average percent of physical processor utilization for a logical partition relative to the weight factor for the partition specified by ##. Valid values are hexadecimal digits between 0 and FF. The partition number is displayed under the column No. of the CMF MONITOR Online view LPARSTAZ.	SMF70
PRIPAGI	Private area page-in rate per second, excluding VIO and SWAP.	SMF71
PRIPAGO	Private area page-out rate per second, excluding VIO and SWAP.	SMF71
PRIRECL	Private area page reclaim rate per minute.	SMF71
PSB-*nnn*	Percent of total SRB service units consumed by the specified performance group. The *nnn* is the three-digit performance group number.	SMF72

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 7 of 12)

Measure	Description	Record Type
PSR-*nnn*	Number of swaps per minute for the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
PSV-*nnn*	Rate per second at which the specified performance group consumed service while transactions were active but not necessarily in storage. The *nnn* is the three-digit performance group number.	SMF72
PSW-*nnn*	Total swaps for the performance group. The *nnn* is the three-digit performance group number.	SMF72
PTB-*nnn*	Percent of total TCB service units consumed by the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
PTE-*nnn*	Total transactions ended for the performance group. The *nnn* is the three-digit performance group number.	SMF72
PTR-*nnn*	Number of transactions ended per minute for the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
PTT-*nnn*	Average elapsed time (in seconds) for all transactions ended in the specified performance group. The *nnn* is the three-digit performance group number.	SMF72
QDP-*nnn*	Maximum queue depth of the device. The *nnn* is the 3- or 4-character device address.	CMF-05
QL/*xx-nn*	Queue length measure where xx is one of the following valid address space types: BA Batch users IR In and ready to execute IN In storage OR Out of storage and ready to execute OW Out of storage and waiting to execute LR Logically out of storage and ready to execute LW Logically out of storage and waiting to execute ST Started users TS TSO users nn Percent of time or range that an address space type had a specified queue length. Valid queue lengths are 0 through 99. You can also specify one of the following values: AV Requests the average queue length MN Requests the minimum queue length MX Requests the maximum queue length Note: Because queue lengths are summarized in the SMF type 70 records in ranges, such as 16 through 20, a queue length request of QL/IN-16 yields the same results as a request for QL/IN-20. Refer to the IBM reference manual, *System Programming Library: System Management Facilities (SMF)*, for a full description of the queue length distributions in the SMF type 70 records.	SMF70
QTM-*nnn*	Average number of milliseconds an I/O request for device *nnn* must wait on an IOS queue before an SSCH instruction is issued.	SMF74
RMCTADJC	Time to process 1/16 of a service unit in microseconds.	SMF72
RWC-*nnnn*	Ratio of read requests to write requests from cache for control unit *nnnn* (read requests/write requests).	CMF-27

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 8 of 12)

Measure	Description	Record Type
RWD-*nnnn*	Ratio of read requests to write requests from cache for device *nnnn* (read requests/write requests).	CMF-27
SKA-*n*	Average CSA usage by storage key ID (*n*) as a percentage of total CSA available above and below the 16-megabyte line. Valid storage keys are (0,1,2,3,4,5,6,7,8), where 8 is 8-F storage keys.	SMF78
SKM-*n*	Minimum CSA usage by storage key ID (*n*) as a percentage of total CSA available above and below the 16-megabyte line. Valid storage keys are (0,1,2,3,4,5,6,7,8), where 8 is 8-F storage keys.	SMF78
SKX-*n*	Maximum CSA usage by storage key ID (*n*) as a percentage of total CSA available above and below the 16-megabyte line. Valid storage keys are (0,1,2,3,4,5,6,7,8), where 8 is 8-F storage keys.	SMF78
SPA-*nnn*	Average CSA/SQA usage by subpool ID (*nnn*) as a percentage of total CSA/SQA available below the 16-megabyte line. Valid CSA subpool IDs are 227, 228, 231, 241. Valid SQA subpool IDs are 226, 239, 245.	SMF78
SPM-*nnn*	Percentage of total CSA/SQA available below the 16-megabyte line. The *nnn* is the subpool ID. Valid CSA subpool IDs are 227, 228, 231, 241. Valid SQA subpool IDs are 226, 239, 245.	SMF78
SPX-*nnn*	Maximum CSA/SQA usage by subpool ID (*nnn*) as a percentage of total CSA/SQA available below the 16-megabyte line. Valid CSA subpool IDs are 227, 228, 231, 241. Valid SQA subpool IDs are 226, 239, 245.	SMF78
SQA-AVG	Average SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line. (Area contains used and free SQA storage.)	SMF78
SQA-MAX	Maximum SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line. (Area contains used and free SQA storage.)	SMF78
SQA-MIN	Minumum SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line. (Area contains used and free SQA storage.)	SMF78
SQF-AVG	Average free SQA available within SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line.	SMF78
SQF-MAX	Maximum free SQA available within SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line.	SMF78
SQF-MIN	Minimum free SQA available within SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line.	SMF78
SQU-AVG	Average SQA used within SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line.	SMF78
SQU-MAX	Maximum SQA used within SQA allocated area as percentage of total SQA available above and below the 16-megabyte line.	SMF78
SQU-MIN	Minimum SQA used within SQA allocated area as a percentage of total SQA available above and below the 16-megabyte line.	SMF78
SRV-ABS	Rate per second at which service is consumed while transactions are resident in central storage.	SMF72

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 9 of 12)

Measure	Description	Record Type
SRV-CPU	Average rate per second at which transactions that were active but not necessarily in storage used TCB and SRB service units.	SMF72
SRV-I/O	Average rate per second at which transactions that were active but not necessarily in storage used IOC service units.	SMF72
SRV-MEM	Average rate per second at which transactions that were active but not necessarily in storage used MSO service units.	SMF72
SRV-SRB	Average rate per second at which transactions that were active but not necessarily in storage used SRB service units.	SMF72
SRV-TCB	Average rate per second at which transactions that were active but not necessarily in storage used TCB service units.	SMF72
SRV-TOT	Average rate per second at which transactions that were active but not necessarily in storage used ALL service units.	SMF72
SSC-*nnn*	Start subchannel count, where *nnn* is the device address.	SMF74
STC-AVG	Average number of started tasks.	SMF70
STC-CPU	Percent of time during the measurement interval that the CPU was executing on behalf of a started task.	SMF70
STC-MAX	Maximum number of started users.	SMF70
STC-MIN	Minimum number of started users.	SMF70
SUP	Percent of CPU busy time that the processor was in the supervisor state.	CMF-01
SUPPAGES	Average number of CSA pageable frames, in K-bytes.	SMF71
SUSEC	Rate at which service units are processed (service units per second).	SMF72
SWAPAGI	Page swap-in rate per second.	SMF71
SWAPAGO	Page swap-out rate per second.	SMF71
SWAPMIN	Swaps per minute.	SMF71
SWP-APS	Number of swap-outs due to APPC WAIT.	SMF71
SWP-ASD	Number of swap-outs to auxiliary storage directly.	SMF71
SWP-AST	Number of swap-outs to auxiliary storage total.	SMF71
SWP-ATR	Number of swap-outs to auxiliary storage by transition. This includes logical swaps that became physical swaps to auxiliary storage and swaps to expanded storage that were migrated to auxiliary storage.	SMF71
SWP-AXS	Number of swap-outs due to an auxiliary storage shortage. Such a shortage occurs when a percentage of all local page data set slots is allocated. This percentage value is an SRM-modifiable constant in the MCT (field MCCASMT1); the default is 70.	SMF71
SWP-DW	Number of swaps due to a detected wait. SRM detects a wait when an address space in storage is not dispatched for a processor-dependent period of time.	SMF71

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 10 of 12)

Measure	Description	Record Type
SWP-ENQ	Number of swaps due to an enqueue exchange. Such an exchange occurs when one address space tries to enqueue on a resource held by another address space. The address space holding the resource is treated as nonswappable for the SRM-defined interval in the RMPT (field name RMPTERV). This value is user-defined in member IEAOPT of SYS1.PARMLIB.	SMF71
SWP-ESD	Number of swap-outs to expanded storage directly.	SMF71
SWP-ESE	Number of swap-outs to expanded storage effectively. This includes only those swaps to expanded storage that were not migrated to auxiliary storage.	SMF71
SWP-EXC	Number of exchange swaps based on the SRM recommendation value. A user was swapped out so another user with a higher workload level in the same domain could be swapped in. This SRM action keeps the MPL within the target MPL for that domain.	SMF71
SWP-ICS	Number of swap-outs due to the need to improve central storage usage.	SMF71
SWP-IPS	Number of swap-outs due to the need to improve the system paging rate.	SMF71
SWP-ITR	Number of candidates for logical swap due to a wait for input buffers at a terminal. One of the following actions will occur: • logical swap-out followed by a logical swap-in • logical swap-out followed by a physical swap-out due to a detected long think time • physical swap-out due to input terminal wait	SMF71
SWP-LSE	Number of effective logical swap-outs. This includes only those logical swaps that did not result in a physical swap to any medium.	SMF71
SWP-LSI	Number of logical swap-ins. When a logical swap-out does not result in a detected long think-time swap, it is logically swapped back in.	SMF71
SWP-LSO	Number of logical swap-outs. The number of candidates for logical swap that are not physically swapped out.	SMF71
SWP-LST	Number of logical swap-outs total.	SMF71
SWP-LTT	Number of detected long think-time swaps. A logical swap-out fails to be logically swapped in.	SMF71
SWP-LW	Number of swaps due to long waits. A long wait occurs when a program issues a WAIT,LONG=YES macro.	SMF71
SWP-MIG	Number of swap-outs to expanded storage that were migrated to auxiliary storage.	SMF71
SWP-MRS	Number of swap-outs made to make room to swap-in a user who has been swapped out too long.	SMF71
SWP-OTR	Number of candidates for logical swap due to a wait for output buffers at a terminal. One of the following actions will occur: • logical swap-out followed by a logical swap-in • logical swap-out followed by a physical swap-out due to a detected long think time • physical swap-out due to input terminal wait	SMF71

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 11 of 12)

Measure	Description	Record Type
SWP-REQ	Number of swaps caused by the REQSWAP SYSEVENT. REQSWAP is issued when the CONFIG storage command is issued and the address space that occupies the storage to be taken offline must be swapped out. REQSWAP also is issued when the PPT marks an EOB as nonswappable so that the address space can be swapped out and its LSQA swapped back in to preferred storage.	SMF71
SWP-RSS	Number of swaps due to shortage of pageable storage. Either the SRM or the RSM can detect a shortage of available real page frames. Users with the most fixed frames are swapped out.	SMF71
SWP-TOT	Total number of swap sequences. A swap sequence is a swap-out and a swap-in of an address space.	SMF71
SWP-TWI	Number of terminal I/O wait swap-ins.	SMF71
SWP-TWO	Number of terminal I/O wait swap-outs.	SMF71
SWP-TWT	Number of swap-outs due to input terminal wait. The number of candidates for logical swap that resulted in a physical swap-out.	SMF71
SWP-TXS	Number of swaps due to transition to nonswappable. A transition swap occurs when the TRANSWAP SYSEVENT is issued. An address space is swapped out so its LSQA can be swapped back in to preferred storage.	SMF71
SWP-UNI	Number of unilateral swaps. The SRM swaps out an address space without swapping in another address space. This occurs when the MPL of a domain exceeds the target MPL specified for the domain.	SMF71
SYSPAGI	System area page-in rate per second, excluding VIO.	SMF71
SYSPAGO	System area page-out rate per second, excluding VIO.	SMF71
SYST	Percent of CPU busy time that the processor was executing in key zero.	CMF-01
TAPES	The highest of MAX3420, MAX3480, MAX3490, or MAX3590.	CMF-05
TPL-*nnn*	Average target multiprogramming level for the specified domain. The TMPL stored by the SRM in the domain table (DMDT). The *nnn* is the domain number.	CMF-04
TSO-ABS	Rate at which TSO users who logged off during the measurement interval consumed service units per second while transactions were resident in central storage.	CMF-21
TSO-COMM	Total number of TSO commands.	CMF-20
TSO-COMR	Rate per minute at which TSO commands are issued when there are commands to measure in a record interval. TSO commands are monitored using SYSEVENT 0 (TSEVENT).	CMF-20
TSO-CPU	Percent of time during the measurement interval that the CPU was executing on behalf of a TSO user.	CMF-01
TSO-PAGR	Page rate per second for TSO users who logged off during the measurement interval.	CMF-21
TSO-PAGS	Average number of pages stolen per TSO session.	CMF-21
TSO-RESP	Average response time in seconds for all TSO commands timed during the measurement interval. Response time is the difference between SYSEVENTs 0 (TSEVENT) and 34 (TPUT).	CMF-20

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Table A-1 Values for EXCEPTS and GRAPH Statements (Part 12 of 12)

Measure	Description	Record Type
TSO-SERV	Rate at which TSO users who logged off during the measurement interval consumed service units per second while transactions were active.	CMF-21
TSO-SWAP	Average number of swap sequences per TSO session.	CMF-21
TSO-SWPR	Swap rate per minute for TSO users who logged off during the measurement interval.	CMF-21
TSO-TRNS	Average number of transactions per TSO session.	CMF-21
VIOPAGI	VIO page-in rate per second.	SMF71
VIOPAGO	VIO page-out rate per second.	SMF71
VIORECL	VIO page reclaim rate per minute.	SMF71

Traceable Data Fields

Control block field names and descriptions for traceable data fields are outlined in the following tables. These field names are acceptable values for the FIELD parameter of the Extractor TRACE76 control statement and MEASURE parameter of both the Analyzer GRAPH and EXCEPTS control statements.

The following control blocks field names are discussed in this section:

- Auxiliary Storage Manager Vector Table (ASMVT)
- System Resource Management Domain Table (SRM)
- Operations Measurement Data Gatherer Area (OMDG)
- System Resource Management Data Area (SRM)
- RSM Address Space Block Extension (RAX)
- RSM Control and Enumeration Area
- System Management Facilities Data Area (SMCA)

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Auxiliary Storage Manager Vector Table

Table A-2 lists the control-block field names used with the Analyzer EXCEPTS and GRAPH report control statements and with the Extractor TRACE76 statement.

Table A-2 Auxiliary Storage Manager Vector Table (ASMVT)

Field	Description
ASMBKSLT	Count of unreserved local slots pages.
ASMERRS	Bad slots on local page data sets.
ASMIORQC	Count of I/O requests completed and returned to RSM.
ASMIORQR	Count of I/O requests received by I/O control.
ASMNVSC	Total local slots allocated for non-VIO private area.
ASMSLOTS	Total local slots (sum of slots in open local page data sets).
ASMVSC	Total local slots allocated for VIO private area pages.

System Resource Management Domain Table

The traceable data fields for the System Resource Management (SRM) Domain Table are valid only for data collected on systems running in compatibility mode. These fields include one set of unique values for the Extractor TRACE76 statement and another set of values for the Analyzer EXCEPTS and GRAPH report control statements. The values are outlined in the following two tables:

- Table A-3 for Extractor values
- Table A-4 for Analyzer values

SRM Extractor Values:

Trace data fields provided in Table A-3 can be defined to the FIELD parameter of the Extractor TRACE76 statement.

Table A-3 System Resource Management Domain Table—Extractor Values

Field	Description
DMDTCIDX	Domain contention index field.
DMDTINCU	Users per domain in storage field.
DMDTCMPL	Current domain multiprogramming level field.
DMDTOUTU	Users per domain out of storage field.
DMDTRUA	Average number of ready users field.

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Table A-3 System Resource Management Domain Table—Extractor Values

DMDTMPLT	Current domain multiprogramming level target field.
DMDTTWET	Average elapsed time for the domain, in milliseconds, for first period TSO transaction field (does not include delay imposed by SRM to meet response time objective). This value is calculated only for a domain with a performance group that specifies RTO in Period 1.
DMDTTWSR	Time weighted service rate for a domain field.

Analyzer Values:

Trace data fields provided in Table A-4 contain variable information, such as device addresses, which reflects how the fields are reported in a graph. In defining a field to the MEASURE= parameter of the EXCEPTS or GRAPH statements, specify the full name of the measure—do not define the variable information.

Table A-4 System Resource Management Domain Table—Analyzer Values

Field	Description
DMCDX*xxx*	Domain contention index * 256 from domain field DMDTCIDX, where *xxx* is the domain number.
DMINU*xxx*	Users per domain in storage from domain field DMDTINCU, where *xxx* is the domain number.
DMMPL*xxx*	Current multiprogramming level from domain field DMDTCMPL, where *xxx* is the domain number.
DMOUT*xxx*	Users per domain out of storage from domain field DMDTOUTU, where *xxx* is the domain number.
DMRUA*xxx*	Average number of ready users * 16 from domain field DMDTRUA, where *xxx* is the domain number.
DMTAR*xxx*	Current multiprogramming level target from domain field DMDTMPLT, where *xxx* is the domain number.
DMTWE*xxx*	Average elapsed time, in milliseconds, for first period TSO transaction (does not include delay imposed by SRM to meet response time objective) from domain field DMDTTWET, where *xxx* is the domain number.
DMTWS*xxx*	Time weighted service rate for a domain from domain field DMDTTWSR, where *xxx* is the domain number.

Operations Measurement Data Gatherer Area

Table A-5 describes the fields that appear in the Operations Measurement Data Gatherer Area (OMDG).

Table A-5 Operations Measurement Data Gatherer Area (OMDG)

Field	Description
OMDGAMRE	Maximum queue size of the action message retention facility (AMRF).

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Table A-5 Operations Measurement Data Gatherer Area (OMDG)

OMDGCMDI	Number of commands per second.
OMDGOREB	Maximum queue size of operator reply entries (OREs).
OMDGWQEB	Maximum queue size of the message line (WTO) queue elements (WQEs).
OMDGWTLI	Number of writes to the log (WTLs) per second.
OMDGWTOI	Number of message lines (WTOs) per second.

System Resource Management Data Area

Table A-6 describes the fields that appear in the System Resource Management Data Area.

Table A-6 System Resource Management (SRM) Data Areas (Part 1 of 3)

Field	Description
CCVCPUCT	Number of online CPUs.
CCVENQCT	Number of users nonswappable for enqueue reasons.
CCVIMBBT	Time of last CPU imbalance.
CCVLGUTL	Long term CPU utilization * 256.
CCVRBSTD	Recent base time of day comp.
CCVRBSWT	Recent base system wait time.
CCVUTILP	System CPU utilization.
CCVWTDB	Alternate wait management. **Note:** This field displays valid data only in LPAR mode in MVS 5.1 or later.
LSCTCNT	Current number of logically swapped users for terminal wait.
LSCTCNTW	Number of users logically swapped for a long wait or detected wait.
LSCTMTE	Maximum think time allowed for logical swap candidate.
MCVFRCNT	Number of pages needed to be stolen by force steal routine.
MCVMGAGE	Extended storage area migration.
MCVSBFQA	Short term available frame count average.
MCVSBIMT	Time of day when storage was last considered out of balance.
MCVSBLTF	Long term percentage of eligible storage that is actually fixed.
MCVSBLTS	Long term steal criteria average.
MCVSBRVF	Storage contention factor used for computing the storage load balancing recommendations.
MCVSBSIG	Frame count threshold for significant storage users.
MCVSIPR	Common page-in rate.
MCVSTCRI	Highest system UIC.
MCVTWSS	Common target working set size.

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Table A-6 System Resource Management (SRM) Data Areas (Part 2 of 3)

Field	Description
RCVAFQA	Average available frame count.
RCVASMQA	ASM queue length average.
RCVAVQC	AVQ low count.
RCVCPUA	CPU usage average * 16.
RCVDPR	Demand paging rate.
RCVFXIOP	Percentage of central storage that is fixed or allocated for paging.
RCVMFXA	Average number of fixed frames for the system.
RCVMSPP	Page delay time, in milliseconds, excluding swap paging.
RCVPAGRT	Total paging rate.
RCVPTR	Paging rate.
RCVSWPTM	Time, in milliseconds, used by ASM to process a request to transfer a group of pages to or from a data set.
RCVUICA	UIC average.
RMCAAWSC	APPC verb service request wait swap count.
RMCADWSC	Detected wait physical swap count.
RMCAEXSC	Exchange on recommendation value swap count.
RMCAFHLD	Number of swaps failed because of an outstanding HOLD SYSEVENT.
RMCAICSC	Improved central storage utilization swap count.
RMCAIPSC	Improved demand page-in rate swap count.
RMCALFS1	Number of logical swap applications in long wait or detected wait that were physically swapped.
RMCALFSC	Count of logically swapped users in terminal wait that become physically swapped.
RMCALSS1	Total logical swap count for applications in long wait or detected wait.
RMCALSSC	Terminal wait logical swap count total.
RMCALWSC	Long wait physical swap count.
RMCAMRSC	Make room for an out-too-long address space swap count.
RMCANQSC	CPU enqueue exchange swap count.
RMCAOISC	OMVS input wait.
RMCAOOSC	OMVS output wait.
RMCARQSC	Requested swap count.
RMCARSSC	Central storage shortage swap count.
RMCATISC	Terminal input swap count.
RMCATOSC	Terminal output swap count.
RMCATSSC	Count of transition swaps.
RMCAUSSC	Unilateral swap-out count.

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Table A-6 System Resource Management (SRM) Data Areas (Part 3 of 3)

Field	Description
RMCAXSSC	Auxiliary storage shortage swap count.
RMCTTRPC	Number of pages used for transaction elements.

RSM Address Space Block Extension (RAX)

Fields in the RSM Address Space Block Extension are described in Table A-7.

Table A-7 RSM Address Space Block Extension (RAX)

Field	Description
RAXESCT	Number of pages on extended storage.
RAXFMCT	Number of frames currently in use by this address space.

RSM Control and Enumeration Area for MVS/XA

Fields in the RSM Control and Enumeration Area are described in Table A-8.

Table A-8 RSM Control and Enumeration Area (RCE) (Part 1 of 2)

Field	Description
RCEAEC	Total number of expanded storage E-frames currently on the available ESTE queue.
RCEAECLO	Available ESTE queue low threshold.
RCEAECOK	Available ESTE queue satisfactory threshold.
RCEAFCLO	Available central storage frame queue low threshold.
RCEAFC	Total number of frames currently on all available frame queues.
RCEAFCOK	Available central storage frame queue satisfactory threshold.
RCEBELFX	Total number of currently fixed pages that are backed below 16MB real: the sum of page-fixed LSQA, SQA (excluding reserved SQA), and V=R allocated pages.
RCECOMAL	Number of frames allocated to common.
RCECOMPI	Number of common area pages paged-in.
RCECOMPO	Number of common area pages paged-out.
RCECOMRC	Number of common area pages that have been reclaimed from an available frame queue.
RCEDFRS	Number of times a deferred frame allocation has been satisfied.
RCEESINU	Number of expanded storage E-frames in use.
RCEESREA	Number of pages (non-VIO) read from expanded storage.
RCEESWRT	Number of pages written out to expanded storage.

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Table A-8 RSM Control and Enumeration Area (RCE) (Part 2 of 2)

Field	Description
RCEHSPEM	Total number of hiperspace pages migrated from expanded storage to auxiliary storage.
RCEHSPER	Total number of hiperspace pages read from expanded storage into central storage.
RCEHSPEW	Total number of hiperspace pages written to expanded storage from central storage.
RCEHSPPI	Total number of hiperspace pages paged-in from auxiliary storage.
RCEHSPPO	Total number of hiperspace pages paged-out to auxiliary storage.
RCELPAPI	Number of PLPA and PLPA directory pages paged-in.
RCELPARC	Number of PLPA and PLPA directory pages that have been reclaimed from an available frame queue.
RCEMVBEL	Number of central storage pages moved from below the 16 megabyte line.
RCENWSF	Total number of changed nonworking set pages and secondary working set pages which have completed migration.
RCEPAGMV	Number of times a frame was moved from one frame to another.
RCEPOOL	Number of frames currently available to the system, including frames backing permanent storage (nucleus frames, hardware storage area frames, FLPA frames or fixed BLDL frames), bad frames, and offline frames.
RCESPFR	Number of frames available by swap-out without requiring I/O.
RCESWPPI	Total number of pages requiring I/O to swap-in.
RCESWPPO	Total number of pages requiring I/O to swap-out.
RCETOTFX	Total number of pages currently fixed: the sum of page fixed LSQA, SQA (excluding reserved SQA), and V=R allocated pages.
RCETOTPI	Total number of pages paged-in excluding swap-in and VIO page-in.
RCETOTPO	Total number of pages paged-out, excluding swap-out, move-out of VIO pages, and page-out of VIO pages.
RCETOTRC	Total number of times a page was reclaimed from an available frame queue.
RCEVIOME	Number of VIO data set pages written out to expanded storage.
RCEVIOMG	Number of VIO data set pages migrated from expanded storage to auxiliary storage.
RCEVIOPI	Total number of VIO pages paged-in, excluding swap-in.
RCEVIOPO	Total number of VIO pages, excluding swap-out, moved out or paged out.
RCEVIORE	Number of VIO data set pages read from expanded storage.
RCEVIORU	Number of times a VIO data set page was reused.
RCEWSDNE	Total number of primary working set pages which have completed migration.

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System Management Facilities Control Area

Fields that appear in the System Management Facilities Control Area (SMCA) are described in Table A-9.

Table A-9 System Management Facilities (SMF) Control Area (SMCA)

Field	Description
SMCABFLS	Number of records lost because of a shortage of buffer.
SMCABFWT	Number of buffers written.
SMCACNBF	Current number of buffers.
SMCADSCT	Number of records lost because of a full data set.
SMCANMFL	Current number of full buffers.
SMCARCWT	Number of records written.

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