MAINVIEW® for OS/390

User Guide and Reference

Version 2.6

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bmcsoftware

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- order or download product documentation
- report a problem or ask a question
- subscribe to receive e-mail notices when new product versions are released
- find worldwide BMC Software support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

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Before Contacting BMC Software

Before you contact BMC Software, have the following information available so that a technical support analyst can begin working on your problem immediately:

- 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 program temporary fix (PTF)
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or PTF
- 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 MAINVIEW for OS/390, a flexible and comprehensive performance-management tool that is designed to help you achieve maximum system efficiency.

This user guide helps you use MAINVIEW to

- monitor workload activity by service-level objectives and system resource usage
- monitor individual address space activity by system resource usage
- detect delays caused by resource bottlenecks and contention for system resources
- perform a wide range of systems programmer tasks, such as analyzing common storage, simulating an OS/390 console, and more
- detect problems or potential problems through the use of exception thresholds and the Exception Monitor

Throughout this book, references to OS/390 support also include support for MVS and z/OS.

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Who Should Read This Book

This book is intended for anyone who is responsible for correcting transient or chronic system problems, applying system maintenance, or tuning the system to achieve maximum performance. In most organizations, systems analysts, systems programmers, and computer operators assume these responsibilities.

Note: If you are responsible for setting up and maintaining MAINVIEW, you should first complete the tasks in the *MAINVIEW® Common Customization Guide* to

- establish the MAINVIEW environment
- set up MAINVIEW itself

How This Book Is Organized

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

Chapter/Appendix Number and Title		Description of Task
	Chapter 1, “Introducing MAINVIEW for OS/390”	describes how to begin using MAINVIEW for OS/390 to detect or anticipate performance problems
	Chapter 2, “Using MAINVIEW to Solve Performance Problems”	describes how to begin using MAINVIEW for OS/390 to detect or anticipate performance problems
	Chapter 3, “Controlling the OS/390 Data Collectors”	describes the OS/390 data collectors, how they work, and how to use the DCSTAT view to control them
	Chapter 4, “Controlling COMMON STORAGE MONITOR Data Collectors”	describes how to control starting and stopping the COMMON STORAGE MONITOR data collectors
	Chapter 5, “Controlling Job Step Data Collection”	describes how to collect and report job step level data for specified jobs or job steps
	Chapter 6, “Using the System Utilities”	describes the system utilities, which help you simulate an operator console, monitor storage usage, and perform a number of systems programmer tasks
	Chapter 7, “Using the Exception Monitor”	describes how to use the Exception Monitor, one of the fastest methods for detecting performance problems
	Chapter 8, “MAINVIEW Alarm Manager”	discusses MAINVIEW Alarm Manager, which works in conjunction with MAINVIEW for OS/390, as well as other MAINVIEW products, to provide alarms
	Chapter 9, “Graphing Your Data”	describes how to use Graph Manager to display, customize, print, or save a chart
	Chapter 10, “MAINVIEW Batch Optimizer Support”	describes how to set up the MAINVIEW batch environment, generate the MAINVIEW batch report JCL, and manage the MAINVIEW batch report JCL members

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Chapter/Appendix Number and Title		Description of Task
	Chapter 11, “The MVScope Facility”	describes the MVScope facility, which helps determine the causes of program looping or delays
	Chapter 12, “Before Calling Customer Support”	discusses what you should do if you encounter specific system problems
	Appendix A, “Understanding Terminology in a View Field”	discusses the standard set of terms and measurements used to describe the information displayed in a view

Related Documentation

BMC Software products are supported by several types of documentation:

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

Note: The messages that MAINVIEW for OS/390 generates are available in an MVS data set that is downloaded during installation. For each message, the data set includes an explanation and suggests a user response. The MVS data set is called *HLQ*.MSGS (where *HLQ* is the high-level qualifier that is specified during installation).

In addition to this book and the online help, you can find useful information in the publications listed in the following table. As “Online and Printed Books” on page xx explains, these publications are available on request from BMC Software.

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Category	Document	Purpose
Required Reading	*MAINVIEW® Quick Reference*	introduces the MAINVIEW family of products and lists the commands used to manage the MAINVIEW windows environment
	Using MAINVIEW®	explains the MAINVIEW environment
	MAINVIEW® for OS/390 Getting Started	introduces all major MAINVIEW features in a step-by-step workbook format; you should work through this book and familiarize yourself with its contents
	MAINVIEW® Common Customization Guide	tells you how to perform the implementation tasks common to all MAINVIEW products
	MAINVIEW® for OS/390 Customization Guide	explains how to complete the installation procedure that you began in the *MAINVIEW® Common Customization Guide*
	MAINVIEW® Administration Guide	describes MAINVIEW administrative functions
	MAINVIEW® Installation Requirements Guide	contains prerequisite information that is required for the installation of MAINVIEW products on OS/390 and z/OS systems
Recommended Reading	*CMF® MONITOR Batch User Guide and Reference*	explains how to use the Extractor
	MAINVIEW® Alternate Access Implementation and User Guide	explains how to access MAINVIEW through MAINVIEW Alternate Access
	MAINVIEW® Solutions Guide	documents the automated solutions distributed by BMC Software to run under MAINVIEW AutoOPERATOR
	MAINVIEW® SYSPROG Services User Guide and Reference	describes how to use the SYSPROG services
	Implementing Security for MAINVIEW® Products	describes how to secure various views and services

Online and Printed Books

The books that accompany BMC Software products are available in online format and printed format. If you are a Windows or Unix user, you can view online books with Acrobat Reader from Adobe Systems. The reader is provided at no cost, as explained in “To Access Online Books.” You can also obtain additional printed books from BMC Software, as explained in “To Request Additional Printed Books.”

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Online Help

The MAINVIEW for OS/390 product includes online Help. In the MAINVIEW for OS/390 ISPF interface, you can access Help by pressing **PF1** from any ISPF panel.

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), and maintenance announcements accompany maintenance releases. The latest versions of the release notes and other notices are available on the Web at **www.bmc.com/support.html**.

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Conventions

This book uses the following general conventions:

Item	Format	Example
information that you are instructed to type	bolded and in Times 10 pt. font	Type **SEARCH DB** in the designated field.
specific (standard) keyboard key names	bolded and in Times 10 pt. font	Press **Enter**.
field names, text on a panel	bolded and in Times 10 pt. font	Type the appropriate entry in the **Command** field.
directories, file names, Web addresses	bolded and in Times 10 pt. font	The BMC Software home page is at **www.bmc.com**.
nonspecific key names, option names	every letter capitalized	Use the HELP function key. KEEPDICTIONARY option
MVS calls, commands, control statements, keywords, parameters, reserved words	every letter capitalized	Use the SEARCH command to find a particular object. The product generates the SQL TABLE statement next.
commands that can be shortened	required letters capitalized; other letters in lowercase	To clear the screen, type **RESet**.

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

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

This book uses the following types of special text:

Note: Notes contain important information that you should consider.

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

Tip: Tips contain useful information that might improve product performance or that might make procedures easier to follow.

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Special Characters

This book uses the following special characters in MAINVIEW command notation:

Item	Use	Example
. (period)	Used to direct a command to a specific window without changing the default window specification.	W2.VIEWS
; (semicolon)	Used to separate two or more independent commands.	VIEWS;W3;JFLOW;ASU
? (question mark)	Used as a wildcard character for a single character.	W3;JFLOWS LGS?2
* (asterisk)	Used with the CONtext command to specify the system onto which you are currently logged. Used with the TIME command to specify the current time or date (or both).	CONtext * MVMVS TIME * *
= (equal sign)	Used with the CONtext command to specify the system currently active in the window. Used with the TIME command to retain the time or date (or both) set by a previously issued TIME command.	CONtext = = TIME = =

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Chapter 1 Introducing MAINVIEW for OS/390

MAINVIEW for OS/390 is a system-management application that provides a wide range of services and functions to help you manage the performance of your entire system. Built upon MAINVIEW architecture, MAINVIEW for OS/390 employs the MAINVIEW window interface to provide easy, intuitive access to all of the system-performance data that you need.

To use MAINVIEW for OS/390 to its fullest advantage, you should have a good understanding of some of the key concepts and terms that pertain to all aspects of using the product.

This chapter provides some background information about MAINVIEW for OS/390. You can also refer to *Using MAINVIEW®* for more detailed information about the MAINVIEW architecture and interface.

Note: While this chapter explains many of the key MAINVIEW window interface terms and concepts, *MAINVIEW® Quick Reference* is the primary reference tool for understanding how to use the interface. *MAINVIEW® Quick Reference* introduces the MAINVIEW family of products and lists the commands used to manage the MAINVIEW windows environment.

To display information about a topic, on the **COMMAND** line type **HELP <topic_id>** where *topic_id* is the name of the desired topic. This book refers you to specific topic IDs where appropriate.

This chapter includes the following topics:

Activities Monitored by MAINVIEW for OS/390 1-2
Displayed Information 1-7
Navigating in MAINVIEW for OS/390 1-12
Using MAINVIEW for OS/390 on Multiple Systems 1-24

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Activities Monitored by MAINVIEW for OS/390

MAINVIEW for OS/390 monitors workload activity, individual address space activity, and system resource activity. In addition, MAINVIEW for OS/390 is designed to meet one of the most pressing needs in today's OS/390 performance management world: the need for flexibility.

Examine some of the areas in which MAINVIEW for OS/390 provides you with the power of flexibility:

- workload performance
- job performance
- system resource utilization
- exception thresholds

Workload Performance

MAINVIEW for OS/390 allows your site to define workloads that make sense to *your* organization. With MAINVIEW for OS/390, your product administrator can group any combination of address spaces together to create a workload. You can then monitor all of these address spaces as a single entity, so you can tell immediately whether the address spaces are receiving the level of service that they require.

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MAINVIEW for OS/390 allows your product administrator to create the following types of workloads:

This Workload Type	Contains
ASCH	address spaces performing APPC (Advanced Program-to-Program Communications) work
Batch	address spaces running batch jobs
OMVS	address spaces running OS/390 UNIX System Services applications
Started task	address spaces running started tasks
TSO	address spaces running TSO sessions
Composite	combinations of other workloads

Also, depending on the level of OS/390 that you are running, MAINVIEW for OS/390 creates one or more additional types of workloads for you, as shown in this table:

If You Are Running	MAINVIEW for OS/390 Creates
WLM in Compatibility mode	a *performance group workload* for each performance group defined in the current IEAIPS*xx* member
WLM in Goal mode	a *service class workload* and a *WLM workload* for each service class and WLM workload that you defined to OS/390 through the WLM dialog boxes

Here is an example of how a few workloads can be defined to meet your specific needs.

Example:

Suppose you create a batch workload called BATS1W to monitor all batch jobs running during first shift in initiator class W. First, you define a TSO workload called TSOSHFT1 to monitor all first-shift TSO user IDs. Next, you create a started task workload called STCSHFT1 to monitor all first shift started tasks. Finally, you define a composite workload called SHIFT1, consisting of BATS1W, TSOSHFT1, and STCSHFT1. You can now use SHIFT1 to monitor all first-shift work as a single entity.

Carefully defined workloads can significantly reduce the amount of time and effort required to keep track of resource use and levels of service for all departments in your enterprise. The *MAINVIEW® for OS/390 Customization Guide* explains how to define workloads; Chapter 2, “Using MAINVIEW to Solve Performance Problems,” of this user guide tells you how to monitor workload performance.

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After your workloads are defined, MAINVIEW for OS/390 monitors the performance of each workload in terms of

- how well it is meeting its service-level objective

  Unlike other OS/390 performance tools, MAINVIEW for OS/390 lets you establish service objectives in terms that make sense to everyone: *response time* for TSO workloads, and *turnaround time* for batch workloads. After you have set the initial service-level objectives, you can easily update them to reflect the changing needs of your organization.

  The *MAINVIEW® for OS/390 Customization Guide* explains how to define workload definitions and set service objectives for them. "Workload Service Objectives" on page 2-17 tells you how to monitor the workloads to make sure their service objectives are met.

- Its consumption of system resources, such as CPU time or use of DASD or other I/O devices

  When a workload experiences a delay due to system resources, MAINVIEW for OS/390 not only identifies one or more sources of the delay but also displays the relative contribution of each source to the overall delay time. You can then quickly determine which resource requires immediate attention.

Job Performance

MAINVIEW for OS/390 monitors each address space (or *job*) in terms of its consumption of system resources and the delays that it experiences.

You can display this information for a single job, or for all of the jobs within a given workload, service class/performance group, domain—whatever criteria best suit your needs.

"Workloads/Jobs Being Served by System Resources" on page 2-17 explains how to obtain information about address space activity.

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System Resources

MAINVIEW for OS/390 keeps track of the performance of each system resource and reports on how efficiently that resource is utilized by workloads. By doing so, MAINVIEW for OS/390 quickly detects problem situations where service objectives are not being met because of resource overutilization and contention. This information also helps you identify those resources that are underutilized, so that you can take action to fully optimize their performance.

MAINVIEW for OS/390 gathers performance information about

- overall system performance
- key processor aspects, including CPUs, PR/SM LPARs (Processor Resource/System Manager logical partitions), and MDF (Multiple Domain Facility) domains
- the entire I/O configuration, including channel paths, logical control units, and DASD and tape devices
- SMS (system managed storage) groups
- central, expanded, and virtual storage
- page data sets and swap data sets
- data spaces and hiperspaces
- System Resource Manager and its views of domains, MPL (multi-programming level) control, logical swaps, and expanded storage control
- ENQUEUE and RESERVE
- delays caused by contention for resources
- Workload License Charges (WLC)
- cache
- data set usage
- XCF

“System Resource Utilization” on page 2-21 tells you how to use MAINVIEW for OS/390 to manage these system resources.

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Exception Thresholds

MAINVIEW for OS/390 currently provides two discrete functions to monitor exception thresholds:

- The Exception Monitor

  When optimizing your system, your site undoubtedly regards some indicators as more important than others. The MAINVIEW for OS/390 Exception Monitor enables your site to set thresholds for the indicators that are deemed most important. The Exception Monitor watches those indicators continuously. If the thresholds are exceeded, the Exception Monitor issues a warning message so that you can take steps to correct the problem *before* service is affected.

  The *MAINVIEW® for OS/390 Customization Guide* tells your product administrator how to select system indicators and set thresholds for them. When that task is done, Chapter 7, "Using the Exception Monitor," tells you how to use the Exception Monitor.

- MAINVIEW Alarm Manager

  MAINVIEW Alarm Manager, like the Exception Monitor, enables your site to set thresholds for important indicators. MAINVIEW Alarm Manager allows you to trigger alarms, based on thresholds, and then it sends the alarms to the alarm view and/or to MAINVIEW AutoOPERATOR (if it is executing on the same OS/390 image). For more details, see Chapter 8, "MAINVIEW Alarm Manager."

System-Monitored Time Frames

Although MAINVIEW for OS/390 continually gathers and stores information about workloads, address spaces, system resources, delays, and thresholds, *you* control when and how often that information is displayed.

MAINVIEW for OS/390 allows you to display the same data in two different time frames:

Time Frame	Description
Real time	Information as it exists at the moment of inquiry. MAINVIEW for OS/390 refreshes most of its performance data every 15 seconds, to provide you with the most timely information. (The 15-second interval is hardcoded and therefore cannot be changed.)

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Time Frame	Description
Interval	Cumulative information since the completion of the last full interval. When real-time data indicates a potential problem, interval data tells you whether or not the problem is statistically significant. The MAINVIEW for OS/390 interval is determined by what is specified on the *CMF Extractor REPORT* statement. This value is usually between 15 and 30 minutes.

Historical Data

In addition, MAINVIEW for OS/390 allows you to effectively re-create the operating environment as it existed during a particular time period in the past. This feature, called the historical database, stores information about your operating environment at the end of each interval, so that you can compare your current system to what it was doing yesterday, last week, or last month—all on the same screen. You can use this information to determine whether current behavior is an anomaly or part of a trend.

For information about using the historical database, see “Using Historical Data to Solve Problems” on page 2-25, or type **HELP TIME** on any MAINVIEW **COMMAND** line.

Displayed Information

MAINVIEW for OS/390 displays the information that it gathers in a *view*. When a view is selected for display, a structured query is executed against MAINVIEW for OS/390’s collection of data to retrieve the relevant information. The data is formatted according to the associated set of instructions for the selected view.

MAINVIEW for OS/390 provides over 300 views, each focusing on a different aspect of system performance.

With MAINVIEW for OS/390, you can change a view’s format—or *form*—without affecting its underlying query. For information about how this task is accomplished, type **HELP FORM** on any MAINVIEW **COMMAND** line.

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Understanding the MAINVIEW Window Interface

All MAINVIEW products use either the MAINVIEW window interface or the MAINVIEW standard ISPF panel interface (or a combination of both). MAINVIEW for OS/390 operates primarily in the window environment.

In the MAINVIEW window environment, each view is displayed in its own *window*. The top row of each window, called a *window information line*, tells you, among other things, the number and status of the window; the name of the view; the system, date, and time reflected by the view; and the name of the MAINVIEW product that you are currently using. A typical window information line looks like this:

```
W1 =DEVSTAT=========SJSCSTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D=583
```

Everything below this line is called the *display area*. The top three lines of the MAINVIEW window interface are called the *window control area*. The control area consists of the following lines and fields:

- Information Display line (which contains the current date and time)
- COMMAND line
- SCROLL field
- CURR WIN (current window) field
- ALT WIN (alternate window) field

The window information line displays a lot of information; however, its exact appearance depends on many factors. For information about any of these fields, place the cursor on the field and press **PF1** (HELP). The window information line and its fields are also discussed in detail in Chapter 3 of *MAINVIEW® for OS/390 Getting Started.*

View Categories

Four kinds of views are available in MAINVIEW products:

- *Menu views*—allow you to hyperlink to other views. Some menus hyperlink to views that display information about your system; some menus hyperlink to more specific views or menus that allow you to focus on the information that you need.

- *Tabular views*—consist of rows and columns of data. Each field in a given row addresses the same job, workload, or resource. Most views are tabular.

- *Detail views*—provide detailed information about a particular job or resource. Although detail views might resemble tabular views, the fields in a detail view are actually completely independent from one another. JINFO, CPUINFO, and SYSINFO are all detail views.

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- *Summary views*—compress several rows of data into a single row based on certain criteria. For example, a summary view focusing on LCU performance might compress the Channel path field so that each channel path is represented by a single row of data. There are two types of summary views: tabular and detail. All summary views are created from tabular views by using a view customization option called GROUP BY. For more information, type **HELP CUSTOM** on the **COMMAND** line, and then select the **GROUP BY** option.

MAINVIEW for OS/390 provides tabular and detail views to help you monitor discrete areas of system activity and perform various system programmer and administrative tasks. MAINVIEW for OS/390 tabular and detail views are divided into the following categories:

- Workload activity views, which monitor all aspects of a workload's performance.

- Job activity views, which monitor the performance of an individual address space.

- Workload delay views, which report on workload delays caused by resource contention and bottlenecks.

- System activity views, which display information about the performance and utilization of each system resource.

- System utility views, which allow you to perform a wide variety of system-related tasks, such as

  — displaying and altering CSA and SQA storage
  — adding to or modifying linklist data sets
  — modifying dispatching priorities
  — loading, replacing, or deleting LPA modules
  — terminating an address space
  — simulating an MCS console

- Administrative views, which help you manage various aspects of the MAINVIEW for OS/390 product.

In addition, MAINVIEW for OS/390 lets you create your own views to help you focus on performance aspects that are critical to your applications. These views are stored in the USER view category.

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Customizing Views and Help Text to Meet Your Needs

One of the primary advantages of the MAINVIEW for OS/390 window interface is the ability to customize all views and help text to meet the particular needs of your site.

Note: Tabular menu views, such as MAIN, cannot be customized, nor can Easy Menu (EZMENU) type views.

- **View Customization**

  With the MAINVIEW view customization facility, you can

  — sort on multiple columns
  — rearrange columns
  — graph the data
  — modify the view so that certain columns are completely hidden, thus displaying only the data that you need

  To enter the view customization facility, type **CUSTom** on the **COMMAND** line. For explicit instructions on how to customize MAINVIEW for OS/390 views, type **HELP CUSTOM** on the **COMMAND** line.

- **Help Text Customization**

  To create your own help text, see the *MAINVIEW® Common Customization Guide*. You can store this help text in your own private help text library, or make it accessible to all MAINVIEW for OS/390 users at your site.

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Getting Help on Views

No matter how you customize a MAINVIEW view by using the CUSTom command, the online help always draws from the most current information and is always accurate.

The different types of available online help are described in Table 1-1.

Table 1-1 Online Help Available for MAINVIEW Products

To Display This	Do This
Help on a view	Place the cursor on the view name on the window information line and press **PF1**. Alternatively, on the **COMMAND** line, type **HELP <view_name>**. View help displays other topics that tell you which parameters are currently in effect, which fields are included and excluded within the view, which fields have hyperlinks and to where, and so on.
Help on a field that appears on a view	Place the cursor on the field and press **PF1**.
Help on a field on the window information line	Place the cursor on the field and press **PF1**.
Help on a command or topic pertaining to the MAINVIEW window interface itself	On the **COMMAND** line, type **HELP <topic_id>**, where *topic_id* is the ID of the topic as listed in *MAINVIEW® Quick Reference*. (For example, HELP ASU provides help on the ASU command.) Alternatively, place the cursor on the **COMMAND** line and press **PF1** to display the MAINVIEW help tutorial. Select either Beginning or Advanced topics, or type **INDEX** to display all of the available topics.

Using Job Views

MAINVIEW for OS/390 has some features that apply to all job views. When you are familiar with these features, you might find them very helpful.

Viewing Inactive Jobs

You can check the status (the phase of execution) of a job, even if it is no longer active.

To view inactive jobs, use the ASGFL1C or ASGFLXC parameter. ASGFL1C is an excluded field in job views that shows status: ACTIVE, ENDED, ABENDED, or GONE. ASGFLXC is an excluded field in job views that shows the execution phase of a job when it last existed. For more information about these parameters and their values, type **HELP <parm_name>** on the **COMMAND** line, where *parm_name* is either parameter: ASGFL1C or ASGFLXC.

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To view jobs in a specific phase of execution, on the **COMMAND** line type

<view_name> <parm_name> (<phase>)

where

view_name	Is any job view name.
parm_name	Is ASGFL1C or ASGFLXC.
phase	Is ACTIVE, ENDED, ABENDED or GONE for ASGFL1C; is MEMTERM, MEMINIT, RTM1/2, RCT, ACTIVE, ABENDED, or ENDED for ASGFLXC. You can specify an asterisk (*) for *phase* to see jobs in all phases of execution.

Navigating in MAINVIEW for OS/390

Thus far, you have learned that MAINVIEW for OS/390 displays the information that it collects in the form of views—one view for each type of activity, area of interest, and time frame.

Three methods exist for displaying these views and for displaying the rest of the services provided by MAINVIEW for OS/390:

- hyperlinks
- menus
- commands

After you become comfortable with each method, you will most likely find that using them in combination affords you the most flexibility and control.

Using Hyperlinks

A *hyperlink* is a way of executing a command without explicitly entering it. You can think of a hyperlink as a fast path to another view or command. When you place your cursor on a field for which a hyperlink exists and press **Enter**, the underlying command is executed and its output is displayed. In most cases, this output is another view.

The field names for which a hyperlink exists appear on your terminal in a different color. On monochrome terminals, hyperlinked fields appear in *bold*.

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All MAINVIEW window interface products allow you to establish your own hyperlinks. After you start using MAINVIEW for OS/390, you might find that you habitually follow a path through the product that is not supported by the default hyperlinks. To find out how to override these defaults and create your own hyperlinks, type **HELP HYPERLINK** on the **COMMAND** line.

The following example illustrates one way you might use hyperlinks.

Example:

The DEVSTAT view, which analyzes the performance of direct access storage devices (DASD), is shown in Figure 1-1.

Figure 1-1 DEVSTAT View Showing the Performance of DASD Devices

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
>W1 =DEVSTAT===========SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D==583
C Volser Dev  LCU MX  Storage   I/O       Resp. Time IOSQ Conn Disc Pend D/S Dl
- ------ Num  Num --  Group    /Sec       0...50.100 Time Time Time Time Opn --
  TSG322 83AE 0B7              0.54 240.9          + 60.1 100. 0.43 80.0  29
  SPLD26 8326 0B7              0.08 30.57                 2.12 0.06 28.3
  RECN02 870F 0BE              0.42 27.33            25.8 1.19 0.02 0.29
  BAB321 836A 0B7              7.86 25.97            20.8 3.12 1.29 0.79  54
  SPLB22 8324 0B7              0.08 25.32                 2.14 0.04 23.1
  DB2003 8328 0B7              0.08 24.85                 2.17 0.04 22.6
  SPLE28 8327 0B7              0.08 24.62                 2.14 0.04 22.4
  SYM019 830E 0B7              0.08 23.66                 2.13 0.06 21.4
  TSG305 8318 0B7              0.11 22.38                 2.90 0.03 19.4   6
  PAGC30 8348 0B7              24.1 22.26            13.0 6.66 0.20 2.36
  SMFD2E 832B 0B7              0.08 21.41                 2.13 0.06 19.2
  BAB201 831A 0B7              0.08 21.28                 2.15 0.03 19.1
  PAGA21 831E 0B7              0.08 20.47                 2.14 0.06 18.2
  EMPD52 832C 0B7              0.08 20.19                 2.11 0.06 18.0
  SMFG34 830D 0B7              0.08 20.03                 2.12 0.06 17.8
  BAB200 8319 0B7              0.08 19.79                 2.14 0.06 17.6
  EMPR52 832D 0B7              0.08 19.38                 2.14 0.06 17.1
  SYM040 8316 0B7              0.08 19.22                 2.14 0.03 17.0
  SMFE36 830B 0B7              0.08 19.19                 2.12 0.07 17.0
  SMFB2C 8329 0B7              0.08 18.82                 2.14 0.04 16.6
  SMFA32 831C 0B7              0.08 17.49                 2.14 0.06 15.2
  PAGC31 8320 0B7              7.99 17.41             1.4 12.8 0.63 2.60
  PAGG3B 8309 0B7              0.08 17.22                 2.14 0.02 15.0
  TSG304 8317 0B7              0.08 16.22                 2.14 0.06 14.0   1
  TSG330 8338 0B7              0.10 16.20                 1.79 0.04 14.3  12
  SPOOL1 832F 0B7              0.08 15.60                 2.14 0.03 13.4
```

You can see that device 83AE (Volser TSG322) has a very high service time. To find out why, place the cursor on device number (Dev Num) 83AE and press **Enter**.

The hyperlink displays the DEVINFO view, as shown in Figure 1-2 on page 1-14. You might need to scroll down to see the entire view.

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Figure 1-2 Using a Hyperlink

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 W1 =DEVSTAT==DEVINFO==SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Volser......... TSG322 % Allocated.... 100.00 Avg Serv Time..  257.50
    Device Number..   83AE % Utilized.....   3.06 Avg IOSQ Time..   46.65
    Type...........   3390 % Active.......   4.17 Avg Act Time...  210.85
    LCU Number.....    0B7 % Connected....   3.02 Avg Conn Time..  152.81
    Status.........    RDY % Disconn......   0.03 Avg Dsc Time...    1.76
    Mount Status...    PRV % Pending......   1.11 Avg Pnd Time...   56.27
    % Mount Pend...        % Req Queued...   2.29 Avg DPB Delay..
    SSCH/Sec.......   0.20 % Dev Queued...   0.23 Avg CUB Delay..    0.01
    SSCH/Sec....(R)        % Q+CPU Wait...        Avg DvB Delay..   53.44
    Total SSCH.....    175 % Efficiency...  99.77 % Reserved.....
    % In Use.......   2.25 Avg Q Depth....   0.01 % Resv Shr.....
    % Delaying.....        Max Q Depth....   4.00 % Error Rec....
    Curr DS open...     31
    Avg DS open....     65
```

From this point, you can select other hyperlinked fields to display other views in whatever order you want. You can open new windows to display these views. Using hyperlinks to display increasingly detailed information about device 83AE is the fastest way to locate the source of its inordinately high service time.

Using Menus

MAINVIEW for OS/390 presents you with two different types of menus:

- Easy Menus
- View menus

Easy Menus

An Easy Menu consists of a series of options, all of which hyperlink to either data views or to other menus specific to that particular option. The names of all Easy Menus are prefixed with the letters EZM.

The following example illustrates how you might use an Easy Menu.

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Example:

The JOVER view, which gives an overview of performance and utilization by jobs on your system, is shown in Figure 1-3.

Figure 1-3 JOVER View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JOVER=============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D==273
 C Jobname  T SrvClass Step MBO Total Total  %Dly    %Dly  %CPU  EXCP DmdP SwpP
 - -------- - -------- Data ---  Dly%  Use%  Idle Unknown  Util  /Sec /Sec /Sec
   AAOMH41  S STCNRM   NO   NO 100.0                        0.1
   BAOSFS2  T TSONRM   NO   NO  33.33 66.67                 0.1  25.7
   MQM20WH0 S STCNRM   NO   NO  33.33 33.33         33.33              0.7
   IMSM17X  S STCNRM   NO   NO  20.00               80.00
   MSM17X   S STCNRM   NO   NO  20.00               80.00
   CSQDCHIN S STCNRM   NO   NO  16.67               83.33
   BOLDBS1  T TSONRM   NO   NO  16.67       83.33
   CSQDMSTR S STCNRM   NO   NO  16.67               83.33              4.0
   OLTE     S STCNRM   NO   NO  16.67 16.67         66.67   0.3   0.3
   XTSTFCAS S STCPAS   NO   NO  16.67               83.33   0.2        2.7
   JES2     S STCNRM   NO   NO  16.67               83.33              1.7
   OLTG     S STCNRM   NO   NO  16.67 16.67         66.67   0.5
   XTSTIPAS S STCPAS  YES   NO   8.33  8.33         83.33   4.3   0.3 63.7
   IEFSCHAS S SYSTEM   NO   NO                     100.00
   OMVS     S SYSTEM   NO   NO                     100.00
   GRS      S GRS      NO   NO        16.67         83.33   0.5        2.7
   ANTAS000 S STCNRM   NO   NO 100.00  0.1           2.3
   ANTMAIN  S SYSTEM   NO   NO                    100.00   0.1
```

You can see that the job named BAOSFS2 is delayed quite heavily.

Step 1 To access a variety of information about this job, position the cursor directly on **BAOSFS2** in the **Jobname** field, and then press **Enter**.

The Job Menu, EZMJOB, is displayed, as shown in Figure 1-4 on page 1-16.

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Figure 1-4 EZMJOB Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JOVER====EZMJOB===DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                    Job Menu
                              Timeframe - Interval

             Current Job ->  BAOSFS2

     Activity                +----------------------+    Resource Usage
   . Using Resources         |   Place cursor on    |  . Data Sets Allocated
   . Delay Reasons           |    menu item and     |  . Data Sets Open
   . Status                  |     press ENTER      |  . Data Set Usage and Dela
   . Last 10 intervals       +----------------------+  . Data Spaces
   . Overview                                          . Detail
   . Paging                                            . SRM Service Units
   . Trending                                          . Storage Used
   . Workflow

     SYSPROG Services
   > Actions
   > MVScope CPU Tracing
   > Performance
   > Storage                                           . Return...
```

Step 2 Move the cursor to any of the EZMJOB Activity or Resource Usage options and press **Enter** to display information specific to BAOSFS2, the name of the job from which you invoked this Easy Menu.

The SYSPROG Services options give you quick access to services that allow you to monitor and manipulate aspects of a particular job's performance.

Easy Menu options have been given descriptive, intuitive names that intentionally correspond to some aspect of system performance. This feature allows you to use MAINVIEW for OS/390 quickly and easily, without having to learn the names and functions of specific views. For this example, the Delay Reasons option would be a logical place to start.

View Menus

A View menu displays a list of other views. The MAIN menu is an example of a View menu. Each item on this menu displays a list of submenus. You select an activity or view from a View menu by using the S line command or by placing the cursor on the desired option and pressing **Enter**.

Figure 1-5 on page 1-17 depicts the MAINVIEW for OS/390 MAIN menu.

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Figure 1-5 MAINVIEW for OS/390 MAIN Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 W1 =MAIN==============SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D===28
C View Name  Description
- ---------- ------------------------------
  ADMIN      Administrative views
  DIAG       Diagnostic Control Views
  DMON       Device data views
  EZMDEVS    Device Menu - Interval
  EZMDEVSR   Device Menu - Realtime
  EZMENQR    Enqueue Activity - Realtime
  EZMENV     Environment Settings
  EZMJOBS    Jobs Menu - Interval
  EZMJOBSR   Jobs Menu - Realtime
  EZMSPS     SYSPROG Easy Menu
  EZMSTEPS   Steps Menu - Interval
  EZMWLDS    Non-WLM Workloads - Interval
  EZMWLDSR   Non-WLM Workloads - Realtime
  EZMWLM     WLM Workloads - Interval
  EZMWLMR    WLM Workloads - Realtime
  EZM390     Primary Menu - Interval
  EZM390R    Primary Menu - Realtime
  JOBACT     Job activity views
  MVXVIEWS   MainView Explorer Views
  OPS        Operational Views
  RMON       Resource views
  STEPACT    Job step activity views
  SYSACT     System activity views
  USER       User-created views
  UTILITY    System utilities
  VIEWS      All Views
```

Step 1 Type **S** in the **C** column next to JOBACT to display a list of the views belonging to that category.

Although this action is similar to hyperlinking, View menus always display a view or list from which you can select other views; strict use of hyperlinks might or might not display such views.

Step 2 Press **Enter**.

The JOBACT menu is displayed, as shown in Figure 1-6 on page 1-18.

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Figure 1-6 Selecting a View by Using the View Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 W1 =JOBACT============SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D===33
C View Name  Description
- ---------- ------------------------------
  JCPU       Interval job CPU utilization
  JCPUR      Realtime job CPU utilization
  JCPUZ      Summary job CPU utilization
  JESTATR    Realtime job desired state
  JIO        Interval job I/O utilization
  JIOR       Realtime job I/O utilization
  JIOZ       Summary job I/O utilization
  JOVER      Interval job overview
  JOVERR     Realtime job overview
  JOVERZ     Summary job overview
  JPAGDM     Interval job demand paging
  JPAGDMR    Realtime job demand paging
  JPAGDMZ    Summary job demand paging
  JPAGOV     Interval job paging overview
  JPAGOVR    Realtime job paging overview
  JPAGOVZ    Summary job paging overview
  JPAGSW     Interval job swap paging
  JPAGSWR    Realtime job swap paging
  JPAGSWZ    Summary job swap paging
  JSRM       Interval job SRM SU usage
  JSRMR      Realtime job SRM SU usage
  JSRMZ      Summary job SRM SU usage
  JSTAT      Detailed Job status
  JSTATZ     Summary Detailed Job status
  JSTOR      Interval job storage usage
  JSTORR     Realtime job storage usage
```

JOBACT lists all of the views that belong to the job activity category.

Using Commands

As an alternative to using hyperlinks or menus, you can display a view—or issue a MAINVIEW window interface command—by typing the view name or command on the **COMMAND** line.

Note: MAINVIEW window interface commands are available to all products that use the MAINVIEW window interface. To review the MAINVIEW window interface commands, see *MAINVIEW® Quick Reference*.

You can filter data by specifying parameters with your view commands.

For example, to display the JOVER view only for jobs beginning with the letter C, type **JOVER C***, using the wildcard character * to represent any characters following C.

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Displaying Multiple Views Simultaneously

To display multiple views:

Step 1 On the **COMMAND** line, type <**view_name**>, where *view_name* is the name of the view that you wish to display.

Step 2 On the **COMMAND** line, type **HS** (horizontal split); *do not press **Enter** yet.*

Step 3 Move the cursor to where you would like the top of the second view to appear (perhaps halfway down the current view).

Step 4 Press **Enter**.

MAINVIEW for OS/390 sets the **CUR WIN** field to 2.

Step 5 On the **COMMAND** line, type the name of another view.

Step 6 Press **Enter**.

You now have two views on your screen. You can have as many as 20 views displayed simultaneously.

When issuing a command with multiple views open, make sure the number in the **CUR WIN** field reflects the number of the target view for that command.

If you have multiple windows open, you can use a shortcut to specify multiple views and parameters at one time. Use the ISPF delimiter (usually a semicolon) as shown in the next example.

Example:

Type the JOVER and JSTOR commands with these parameters:

W1.JOVER C*; W2.JSTOR DC*

The JOVER view for all jobs beginning with a C is displayed in window 1, and the JSTOR view for all jobs beginning with the prefix DC is displayed in window 2, as shown in Figure 1-7.

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Figure 1-7 JOVER and JSTOR Views with Filter Conditions Applied

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 2        ALT WIN ===>
 >W1 -JOVER-------------SYSE-----*--------DDMMMYYYY--HH:MM:SS----MVMVS----D----5
 C Jobname  T SrvClass Step  MBO Total Total  %Dly    %Dly  %CPU  EXCP DmdP SwpP
 - -------- - -------- Data  ---  Dly%  Use%  Idle Unknown  Util  /Sec /Sec /Sec
   CNMNETE  S SYSSTC   NO    NO   1.24  1.49         97.26   0.3   0.0  0.0
   CMDIYKP5 S STCPAS   NO    NO   1.00  7.71         91.29   0.8   0.4  0.0
   CONSOLE  S SYSTEM   NO    NO   0.97  2.52         96.52   0.3   0.2  0.1
   CMDIYKC5 S STCPAS   NO    NO   0.25               99.75   0.0
   CATALOG  S SYSTEM   NO    NO   0.25  1.00         98.76   0.2        0.0

  W2 =JSTOR=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====9
 C Jobname  T SrvClass Step  Avg   Avg    Avg  Avg  Avg   Avg   Avg   Avg   Avg
 - -------- - -------- Data Frame  Cent   Expd User Hspc   Fix Slots --VIO  NVIO
   DC$HSME  S STCNRM   NO    711   586    125    0    0    66  2455     0  2455
   DC$TCPIP S SYSSTC   NO    772   495     77    0    0    74  5126     0  5126
   DC$BBI   S STCNRM   NO   7491   454     37    0    0   126   924     0   924
   DC$PROE  S STCNRM   NO   7175    82     93    0    0    47   150     0   150
   DC$EXT   S STCNRM   NO   7171   154     17    0    0    36   142     0   142
   DC$RMM   S STCNRM   NO    748    61     87    0    0    52   495     0   49
   DC$RES   S STCNRM   NO   7103    90     13    0    0    55   140     0   140
   DC$SNALK S STCNRM   NO    772    58     14    0    0    34   100     0   100
   DC$OAM   S SYSSTC   NO    762    41     21    0    0    33   445     0   445
```

View parameters allow you to filter the data that is displayed in a view so that only the values that meet the selection criteria are shown. The commands W1.JOVER C* and W2.JSTOR DC* placed a filter on the Jobname column so that only those jobs beginning with a C or with the prefix DC are displayed.

The next section explains in greater detail how to use view parameters.

Using View Parameters

Most views have been defined with a set of parameters. Use the view help information to discover the parameters defined for a specific view.

Using Positional Parameters

When you use *positional parameters*, you supply values for the parameters in a predetermined order. To find out the parameters and their order for a given view, display the view's online help, place the cursor on the highlighted term **positional parameters**, and then press **Enter**.

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Example:

Suppose you want to use the JFLOW view to display only those jobs that are experiencing a delay higher than 5 percent.

Step 1 Display the online help for JFLOW.

Step 2 Hyperlink to the PARAMETERS topic by placing the cursor on the highlighted term **positional parameters** and pressing **Enter**.

This topic tells you that the parameters for the JFLOW view are [Jobname =], [Delay % >], and Status. The Jobname column is in the first parameter position, Delay % > is in the second position, and Status is in the third position.

Next, you want to display all active jobs with a delay higher than 5 percent.

Step 3 Type **JFLOW * 5**.

An altered version of JFLOW is displayed, as shown in Figure 1-8 on page 1-21.

Figure 1-8 JFLOW View Output

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
>W1 =JFLOW=============SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D===12
C Jobname  T SrvClass       Workflow %           Delay %        Main Reason
- -------- - --------       0.....50...100       0.....50...100 ---------------
  DC$SVIEW S STCSYS                        100.0                Enqueue
  CTSACS   S STCNRM                        100.0                Enqueue
  CTSACD   S STCNRM                        100.0                Enqueue
  CTSGATE  S STCNRM                        100.0                Enqueue
  BOLGBG3  T TSONRM     0.5                 99.5                Enqueue
  I6AM2ACT B BATNRM     0.2                 98.4                Enqueue
  BSDBBJ1B B BATNRM                         25.0                Wait for CPU
  I6ARCHIV B BATNRM                         25.0                Wait for CPU
  MMLKXBP  S STCPAS    84.4                 15.6                Wait for CPU
  CNMPROCC S STCLOW    35.2                  8.4                Wait for CPU
  I6A3PASB B BATNRM    19.2                  6.6                Wait for CPU
  IMS71X   B BATNRM     8.6                  5.0                Wait for CPU
```

Even though Delay % > is the sixth *column*, it was defined as the second *parameter*. Thus, a 5 was entered in the second position after JFLOW (JFLOW * 5).

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When you specify a value for any view parameter other than the first parameter, all preceding parameters must be accounted for by the wildcard character, * (asterisk). Therefore, an asterisk was placed in the first position. This wildcard character does not affect the view output but serves as a placeholder so that you can use the view's positional parameters correctly.

Note: If a column is not defined as a parameter by default, you can make it a parameter by typing **CUST** on the **COMMAND** line, and then choosing the **L** (Filter) and **P** (Parameters) options.

For more information, type **HELP CUSTOM** on the **COMMAND** line,.

Using the Keyword Parameter

Instead of using JFLOW positional parameters, you could use the Delay % > column's *keyword* (or *element name*) to achieve the same result. An element name is simply the name by which MAINVIEW for OS/390 refers to a column internally.

When you checked the view help for JFLOW, you saw that the element name for Delay % > is ASIDLYP. Instead of issuing **JFLOW * 5**, type **JFLOW ASIDLYP(5)** to display the exact same data.

Using the PARm Command

If a view is already displayed, you can use the PARm command in place of the view name to supply new parameters. PARm is much faster than using the view names because the PARm command places a filter on the existing data, rather than retrieving new data from the PAS.

PARm works both for positional and keyword parameters. That is, assuming that JFLOW is displayed, as shown in Figure 1-8 on page 1-21, the command **PARm * 7** redisplays JFLOW, listing only those jobs delayed for more than seven percent of the interval.

Alternatively, the command **PARm ASIDLYP(7)** achieves the same result.

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Using Combinations

You can use hyperlinks, menus, parameters, and commands interchangeably.

For example, you access MAINVIEW for OS/390 and want to see a list of the available workload views.

Step 1 From the EZMVS primary menu, move the cursor to the MAIN View option.

Step 1 From the MAIN menu, place the cursor on the **Workload Activity Views** option and press **Enter**.

The Workload Activity Views menu is displayed, as shown in Figure 1-9 on page 1-23.

Figure 1-9 Workload Activity Views Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =WORKACT===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===24
 C View Name  Description
 - ---------- ------------------------------
   WCPU       Interval Wkld CPU utilization
   WCPUR      Realtime Wkld CPU utilization
   WIO        Interval Wkld I/O utilization
   WIOR       Realtime Wkld I/O utilization
   WOBJ       Interval Wkld service objectiv
   WOBJR      Realtime Wkld service objectiv
   WOVER      Interval Wkld overview
   WOVERR     Realtime Wkld overview
   WPAGDM     Interval Wkld demand paging
   WPAGDMR    Realtime Wkld demand paging
   WPAGOV     Interval Wkld paging overview
   WPAGOVR    Realtime Wkld paging overview
   WPAGSW     Interval Wkld swap paging
   WPAGSWR    Realtime Wkld swap paging
   WRT        Interval TSO Wkld response tim
   WRTR       Realtime TSO Wkld response tim
   WSRM       Interval Wkld SRM SU usage
   WSRMR      Realtime Wkld SRM SU usage
```

Step 2 Select a view from the menu (Menu mode).

Step 3 Modify the screen by typing **SOrt** on the **COMMAND** line (Command mode).

Step 4 On the **COMMAND** line, type **CUST** to invoke the view customization facility and tailor the view to suit your needs.

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Step 5 When you finish customizing the view, explore system performance by using hyperlinks; that is, jump from view to view by placing the cursor on a highlighted field and pressing **Enter**.

Note: If a hyperlink does not exist for a desired view and you do not want to establish one, you can always display the view that you want by typing its name (and parameters) on the **COMMAND** line. You can also retrace as many as 20 steps in a window by pressing **PF3** repeatedly, or you can return to the MAIN menu or EZM390 menu at any time by typing the view name on the **COMMAND** line.

Using MAINVIEW for OS/390 on Multiple Systems

One of the greatest benefits of the MAINVIEW window interface is the ability to control multiple local and remote systems, access different products on those systems, and compare and contrast data from different time periods—all on the same screen, *all at the same time*.

There are two ways to monitor multiple systems from MAINVIEW for OS/390:

- Using the MAINVIEW Single System Image (SSI) function, you can retrieve data from multiple systems in a single view.
- Using the MAINVIEW window interface, you can open up to 20 windows and control a different aspect of system performance in each window, looking at various systems and using various views.

  Note: Twenty windows can be opened concurrently on an MVS/ESA system.

With MAINVIEW architecture, you can do all of this from a single user session, rather than initiating multiple sessions under the control of a session manager.

To monitor other systems, you can specify a *target* (the name of an OS/390 image, such as SYSA or SYSB) or an *SSI context* (a group of targets across multiple systems or plexes that looks and acts like a single target).

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Using Single System Image (SSI)

MAINVIEW offers you the ability to combine data from many target systems into a single view and work with the information as if it were from a single system—hence, a *Single System Image* (SSI). In any multisystem environment where CASs (coordinating address spaces) are configured to communicate with each other, views are enabled for SSI mode. You can define an SSI context outside of sysplex boundaries, in whatever configuration best suits your purposes.

A summary view can combine data from multiple OS/390 images into a single row.

To use SSI, follow these steps:

Step 1 Make sure your CASs are configured to communicate with each other and are running on BBI version 3.2 or later.

Step 2 Define an SSI context.

These steps are discussed in the *MAINVIEW® Common Customization Guide.*

Note: The SSI context ALL is predefined to include all active SSI contexts at your site. However, context ALL can be customized to include only certain SSI contexts. See the *MAINVIEW® Common Customization Guide* for details.

Step 3 Use the CONtext command with the SSI context name to see the data. See "Using the CONtext Command" on page 1-26 for more information.

You do not need a sysplex configuration to use the MAINVIEW SSI support. The data from any MAINVIEW for OS/390 product that connects to a MAINVIEW CAS, where cross-system communication is established, can be included in a view in SSI mode.

To create your own SSI context definitions, Plex Manager (shipped with all MAINVIEW products) provides a set of views; see the *MAINVIEW® Common Customization Guide*.

Note: Be sure to keep the names of your sysplexes unique; otherwise, you might assume that you are viewing one sysplex, when in fact you are viewing a different sysplex by the same name.

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Dynamic Fields

Two fields, **SSI Target** and **SSI System**, can be set to appear dynamically in tabular views when you access an SSI context. **SSI Target** is a single OS/390 image (as defined in TGTDEF, a Plex Manager ADMIN view). **SSI System** is the CAS system being monitored (as defined in CASDEF, a Plex Manager ADMIN view). Figure 1-10 on page 1-28 shows how these fields appear in a view.

You decide whether one, both, or neither of these fields stays in a view. You can use the INclude and EXclude commands; for example, type **INclude TARGET** on the **COMMAND** line to make the **SSI Target** field appear, regardless of the default setting at your site. Similarly, type **EXclude SYSTEM** on the **COMMAND** line to hide the **SSI System** field. (Of course, both commands work with either field.) You can also enter View Customization mode and use the exclude toggle command to display or hide the fields.

Using the CONtext Command

The CONtext command gets you into SSI mode. This section provides an overview of the CONtext command.

- To access an SSI context, type

  CONtext <ssi_name> <product_ID>

  where

ssi_name	Is the name of the SSI context (one or more OS/390 images). Specify **ALL** for all active contexts. This is a required parameter.
product_ID	Is the product identifier (CMF, MVMVS, PLEXMGR). This is an optional parameter. The default value is the current product that you are using. (The values * and = also specify the current product.)

  When you access an SSI context, the window information line reflects the product and locations accessed.

  — To view data in all active targets, type

  CON ALL

  — To view data in all active targets being monitored by MAINVIEW for OS/390, type

  CON ALL MVMVS

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- If you want to access a single target (whether or not your site has an SSI context defined), type

  CONtext <target_name> <product_ID>

  where

target_name	Is the name of the OS/390 target that you wish to access. This is a required parameter. An asterisk (*) in this field specifies the local system to which you originally logged on. An equal sign (=) retains the current target you are using.
product_ID	Is the product identifier (CMF, MVMVS, PLEXMGR). This is an optional parameter. The default value is the current product that you are using. (The values * and = also specify the current product.)

For more information about the CONtext command and its parameters, type **HELP CONtext** on the **COMMAND** line.

Examples

Note: If your company has defined any contexts, substitute their names in place of PRODUCTN in the following statements.

- To view device data from all of your production systems, on the **COMMAND** line type

  CON PRODUCTN MVMVS; DEVSTAT

- To view a subset of the data retrieved by PRODUCTN (in this example, to limit the data to devices running on SYSB), perform the following actions:

  — On the **COMMAND** line, type **CON PRODUCTN**.

  — Type the SCOpe command:

  SCO SYSB

  The DEVSTAT view is displayed.

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Using SSI to Check on Devices:

Suppose you want to check on devices being shared by systems in your sysplex to see if any devices are experiencing high levels of contention.

Step 1 On the **COMMAND** line, type **DEVSTAT**.

Step 2 Type **CONtext ALL**.

In the example shown in Figure 1-10, the DEVSTAT view with CONtext ALL specified includes OS/390 images SYSB and SYSC.

Figure 1-10 DEVSTAT View with CONtext ALL Specified

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
>W1 =DEVSTAT==========(ALL======*=======)DDMMMYYYY==HH:MM:SS====MVMVS====D=1741
C Volser SSI      SSI      Dev  LCU MX  Storage   I/O       Resp. Time IOSQ Con
- ------ Target   System   Num  Num --  Group    /Sec       0...50.100 Time Tim
  TSG322 SJSE     SJSE     83AE 0E8              0.11 847.4          + 255. 183
  TSG322 SJSD     SJSD     83AE 0E8              0.20 447.9          + 66.2 113
  CKPI01 SJSE     SJSE     8300 0E8              0.02 424.8          + 260. 2.1
  PAGG3B SJSD     SJSD     8309 0E8              0.02 416.2          + 203. 2.1
  TSG322 SJSCXTSM SJSCXTSM 83AE 0B7              0.22 331.2          +      187
  PAGC31 SJSD     SJSD     8320 0E8              0.02 303.3          + 203. 2.1
  TSG323 SJSE     SJSE     8333 0E8              0.02 297.1          + 260. 2.1
  MIS902 SJSD     SJSD     8343 0E8              0.02 267.8          + 203. 2.1
  EMPR52 SJSE     SJSE     832D 0E8              0.02 236.7          + 208. 2.2
  PAGF49 SJSE     SJSE     8307 0E8              0.02 222.5          +      2.1
  HSM402 SJSD     SJSD     83D9 0E8              0.02 212.1          + 203. 2.1
  SMFE36 SJSD     SJSD     830B 0E8              0.02 201.1          +      2.1
  SYM038 SJSD     SJSD     8315 0E8              0.02 170.1          +      2.1
  SMFF37 SJSD     SJSD     830C 0E8              0.02 152.6          +      2.1
  SYM019 SJSE     SJSE     830E 0E8              0.02 143.8          +      2.1
  ES430P SJSCXTSM SJSCXTSM 83C6 0B7              0.04 137.3          + 128. 2.1
  SMFG34 SJSE     SJSE     830D 0E8              0.02 126.4          +      2.1
  TSG304 SJSD     SJSD     8317 0E8              0.02 120.1          +      2.1
  SMFI01 SJSE     SJSE     8304 0E8              0.02 112.0          +      2.1
  PAGF49 SJSD     SJSD     8307 0E8              0.02 109.5          +      2.1
  SYM036 SJSE     SJSE     8313 0E8              0.02 106.4          +      2.1
  SYM019 SJSD     SJSD     830E 0E8              0.02 105.9          +      2.1
  SYSP15 SJSD     SJSD     8308 0E8              0.04 103.5          +      1.4
  SYM037 SJSD     SJSD     8314 0E8              0.02 102.0          +      2.1
  BAB306 SJSD     SJSD     835B 0E8              0.87 101.6          + 56.4 2.6
  PAGB23 SJSD     SJSD     831F 0E8              0.02 95.69                 2.1
```

Suppose that you are concerned about the high response time shown for device number 83AE.

Step 3 Hyperlink on one of the **Volser** field lines where the **Dev Num** is 83AE.

Step 4 From the resulting Device Activity Menu (EZMDEV, which is specific to device 83AE), as shown in Figure 1-11 on page 1-29, hyperlink on **Jobs Using Volume**.

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Figure 1-11 Device Activity Menu for Device 83AE

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
>W1 =DEVSTAT==EZMDEV==(ALL======SJSD====)DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                Device Activity Menu

          Current Device ->    83AE
                  Volser ->    TSG322

     This Device               +----------------------+    All Devices
   . Cache Statistics          |   Place cursor on    | . Cache Overview
   . Data Sets Allocated       |    menu item and     | . Channel Utilization
   . Data Sets Open            |     press ENTER      | . LCU Overview
   . Detailed Info             +----------------------+ . SMS Overview
   . Jobs Delayed by Volume                             . Tape Activity
   . Jobs Using Volume
   . Data Set Usage and Delay
   . Overview

     SYSPROG Services
   > I/O Subsystem
   > MVScope I/O Tracing                                . Return...
   > Utilities
```

The resulting view, JUDEV, shows you how device 83AE is being used and the percentage of time that each job used that device, as shown in Figure 1-12.

Figure 1-12 JUDEV View Showing Jobs That Use Device 83AE

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
>W1 =JUDEV============(ALL======*=======)DDMMMYYYY==HH:MM:SS====MVMVS====D====5
C Jobname  SSI      SSI      T SrvClass UDV%     %Use  Dev Volser Type Mnt  Res
- -------- Target   System   - -------- ----  ThisJob  Num ------ ---- Sta  Tim
  B30KPJSL SJSE     SJSE     S STCNRM    1.57    0.26 83AE TSG322 3390 PRV 830.
  DC$STG   SJSCXTSM SJSCXTSM S STCNRM    4.14    0.05 83AE TSG322 3390 PRV 320.
  XCFAS    SJSE     SJSE     S SYSTEM    4.26    3.07 83AE TSG322 3390 PRV 830.
  XCFAS    SJSD     SJSD     S SYSTEM    2.15    1.29 83AE TSG322 3390 PRV 358.
  XCFAS    SJSCXTSM SJSCXTSM S SYSTEM    3.56    3.30 83AE TSG322 3390 PRV 320.
```

Step 5 For more information about how to check on shared devices, type **HELP CONtext** or **HELP SCOpe** on the **COMMAND** line.

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What Happens if a System in Your Context Goes Down?

If one of the systems in your sysplex goes down while you are using MAINVIEW for OS/390 with an SSI context, you are notified immediately with a message similar to the one shown in Figure 1-13.

Figure 1-13 Error Message for System Failures in Your Context

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =JOVER============(ALL======*=======)DDMMMYYYY==HH:MM:SS====MVMVS====D=====
 BBMXV331I Target SYSC     left the SSI context
```

Understanding Restrictions

You cannot use the SYSPROG, CSMON, or CONSOLE utilities in SSI mode, nor can you use the WKLIST view in SSI mode.

Accessing Another Target

If you want to access a single target (whether or not your site has an SSI context defined), on the **COMMAND** line, type

CONtext <target_name> <product_ID>

where

target_name Is the name of the OS/390 system you wish to access. This is a required parameter. An asterisk (*) in this field specifies the local system to which you originally logged on. An equal sign (=) retains the current target that you are using.

product_ID Is the product identifier (CMF, MVMVS, PLEXMGR). This is an optional parameter. The default value is the current product that you are using. (The values * and = also default to the current product.)

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Using Multiple Views to Compare Remote Data

If you want to view systems that are not defined to an SSI context, or if you want to investigate problems on one system while monitoring another system, use the CONtext command with multiple windows active.

Example:

Suppose you are responsible for three OS/390 systems: SJSC, SJSD, and SJSE. Rather than having three terminals, each devoted to a separate system, you want to survey the health of each of your systems simultaneously—all on the same screen.

To activate multiple views, follow this procedure:

Step 1 Starting with SJSD, display the SYSSTAT view in window 1.

SYSSTAT displays an overview of all important system activity, as shown in Figure 1-14.

Figure 1-14 SYSSTAT View Showing SJSD Activity

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 2        ALT WIN ===>
 W2 =SYSSTAT===========SJSD=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSD   28.5   4.1   1.4  23.1 406.3  21.2         5.3  15.9 345.1
```

Step 2 Open a second window and use the **CONtext** command to set that window to SJSE.

For more information about the CONtext command, type **HELP CONtext** on any MAINVIEW **COMMAND** line or see “Using the CONtext Command” on page 1-26.

Now, any views directed to window 2 automatically reflect the activity on SJSE—you will not have to use the CONtext command again on this system.

After displaying SYSSTAT in window 2, your screen looks like Figure 1-15 on page 1-32.

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Figure 1-15 SYSSTAT View Showing SJSD and SJSE Activity

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
 W2 -SYSSTAT-----------SJSD-----*--------DDMMMYYYY--HH:MM:SS----MVMVS----D----1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSD   28.5   4.1   1.4  23.1 406.3  21.2         5.3  15.9 345.1


 W1 =SYSSTAT===========SJSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSE   20.7              20.7 268.3  12.4              12.4  64.1
```

Step 3 Open a third window and use the **CONtext** command to set that window to SJSC.

SYSSTAT is displayed again in window 3, as shown in Figure 1-16.

Figure 1-16 SYSSTAT View Showing SJSD, SJSE, and SJSC Activity

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 3        ALT WIN ===>
 W2 -SYSSTAT-----------SJSD-----*--------DDMMMYYYY--HH:MM:SS----MVMVS----D----1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSD   20.4   0.9   0.3  19.2 132.1  18.1              18.1  90.6


 W1 -SYSSTAT-----------SJSE-----*--------DDMMMYYYY--HH:MM:SS----MVMVS----D----1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSE   19.3         0.3  19.0 177.5  16.3              16.3  82.9


 W3 =SYSSTAT===========SJSC=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
- -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
  SJSC   37.9   0.2   1.9  35.8 311.6  33.8         1.9  31.9 132.8
```

With just a few simple commands, you have a complete overview of all your systems. You can quickly spot the difference between local problems and more pervasive, serious problems—one glance can tell you whether a problem on SJSD is confined to that system or propagated across all systems.

Because MAINVIEW for OS/390 windows are completely independent from each other, you can solve a problem on one system—using hyperlinks to jump from view to view until you find the cause—while still monitoring your other systems.

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Additionally, after you arrange the windows the way that you want them, you can use the SAVESCR command to save the entire screen for displaying later. The next time that you want to display that window configuration, on the **COMMAND** line type **SCR** followed by the name that you assigned to the screen.

See “Using Screen Definitions to Solve Problems” on page 2-31 for more information.

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Chapter 2 Using MAINVIEW to Solve Performance Problems

This chapter explains how to begin using MAINVIEW for OS/390 to detect performance problems or potential problems. If you are not an experienced performance analyst, or if you have never used a tool like MAINVIEW for OS/390 before, you should find the information in this chapter especially helpful.

This chapter includes the following topics:

Using MAINVIEW Easy Menus 2-2
Using MAINVIEW for OS/390 Views. 2-15
Using Historical Data to Solve Problems 2-25
Using Screen Definitions to Solve Problems 2-31
Manipulating Data Spaces 2-35
Performance Scenarios 2-46

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Using MAINVIEW Easy Menus

MAINVIEW for OS/390 offers a quick, convenient way to use the product with little introduction and without having to remember view names. This interface consists of a set of views with two primary menus:

- OS/390 Easy Menu—described in “OS/390 Easy Menu” on this page
- OS/390 Fast Menu—described in “OS/390 Fast Menu Utility” on page 2-13

OS/390 Easy Menu

The OS/390 Easy Menu, shown in Figure 2-1, is presented as the initial screen when you access MAINVIEW for OS/390. All options on this menu hyperlink to high-level views or submenus and have been given succinct, descriptive names, allowing you to quickly access the data that you need.

Figure 2-1 OS/390 Easy Menu, EZM390

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZM390============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                OS/390 Easy Menu
    Activity                 Time frame - Interval      Utilities
  > System Overview         +----------------------+  > SYSPROG Services
  > Jobs                    |   Place cursor on    |  . Program and I/O Trace
  > Devices                 |    menu item and     |  > Data Compression
  > Data Set Usage          |     press ENTER      |  > Alarm Management
  > Storage                 +----------------------+  > OS/390 Fast Menu
  > XCF Monitoring                                    > RMF-like Menus
  > Coupling Facility                                 > Environment Settings
  > WLM Workloads                                     . Return...
  > Non-WLM Workloads
```

Note: If you do not have both MAINVIEW for OS/390 and CMF MONITOR installed, the RMF-like Menus option is not available to you, and the note * - CMF Only appears on your menu.

Options on this menu are grouped into two categories:

- Activity options

  Activity options display submenus that give you an overview of a particular aspect of your system’s performance. From these overview submenus, you can selectively display information about a particular element by hyperlinking to a menu that is specific to the element.

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- Utilities options

  Utilities options display submenus from which you can access a variety of information. The OS/390 Easy Menu options are described in the following pages.

System Overview Activity

The EZM390 System Overview option displays the EZMSYS view, as shown in Figure 2-2. Options on this menu are divided into two categories:

- Activity options

  Activity options display views showing the key performance areas of activity on your system.

- Configuration options

  Configuration options display views that provide information about how your individual systems are configured.

Figure 2-2 EZMSYS—OS/390 System Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMSYS============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                              OS/390 System Menu
    Activity                                            Configuration
  . System Overview         +----------------------+  > Real Storage
  . Workload Overview       |   Place cursor on    |  > Common Storage
  . CPU Activity            |    menu item and     |  . Data Spaces
  > SRM Activity            |     press ENTER      |
  . System Exceptions       +----------------------+  . Return...
  . Enqueue Conflicts
  . System Trends
  > LPAR Information
```

From EZMSYS, you can hyperlink to a wide variety of system-related information, allowing you to get a comprehensive account of system performance.

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Jobs Activity

The EZM390 Jobs option displays the EZMJOBS menu, as shown in Figure 2-3. Options on this menu are divided into three categories:

- Resource Usage options

  Resource Usage options display views showing jobs that are consuming a specific type of resource.

- Delays options

  Delays options display views showing jobs that are delayed for a specific reason.

- General options

  General options display data of a general nature pertaining to jobs.

Figure 2-3 EZMJOBS—Jobs Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZMJOBS===========DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                 Jobs Easy Menu
     Resource Usage           Time frame - Interval      Delays
   . Overview                +----------------------+  . Overview
   . Common Storage          |   Place cursor on    |  . Data Sets
   . CPU                     |    menu item and     |  . Devices
   . Data Sets               |     press ENTER      |  . Enqueues
   . Devices                 +----------------------+  . HSM
   . Enqueues                                          . JES
   . HSM                       General                 . SRM Service Units
   . I/O                     . Overview                . Storage
   . Paging                  . Abends                  . Subsystem
   . SRM Service Units       . Status                  . XCF
   . Storage                 > Steps                   . WTOR
                             . Workflow                . Return...
```

Devices Activity

The EZM390 Devices option displays the EZMDEVS menu, as shown in Figure 2-4. Options on this menu are divided into two categories:

- Devices options

  Devices options display views showing device-related information.

- Utilities option

  The Utilities option displays the MVScope I/O tracing feature, which hyperlinks to the MVScope utility, allowing you to trace I/O on any given device or multiple devices.

Figure 2-4 EZMDEVS—Devices Activity Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZMDEVS===========DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                              Devices Activity Menu
     Devices                 Time frame - Interval      Utilities
   . DASD Utilization       +----------------------+  . MVScope I/O Tracing
   . Cache Overview         |   Place cursor on    |
   . Channel Utilization    |    menu item and     |
   . Device Delays          |     press ENTER      |
   . LCU Overview           +----------------------+
   . SMS Overview
   . Tape Activity                                   . Return...
```

Data Set Usage Activity

The EZM390 Data Set Usage option displays the EZMDS menu, as shown in Figure 2-5 on page 2-6. Options on this menu are divided into two categories:

- Detail Views options

  Detail Views displays data by usage categories and shows multiple lines of data per entity for each category (that is, Volume, Jobname, and Data Set Name).

- Summary Views options

  Summary Views displays the same data as Detail Views; however, the data is summarized by specific category and shows only one line per entity in that category.

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Figure 2-5 EZMDS—Data Set Usage Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZM390===EZMDS====DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                Data Set Usage Menu
     Detail Views             Time frame - Interval      Summary Views
   . Usage by Volume         +----------------------+  . Usage by Volume
   . Usage by Jobname        |   Place cursor on    |  . Usage by Jobname
   . Usage by Data Set Name  |    menu item and     |  . Usage by Data Set Name
                             |     press ENTER      |
                             +----------------------+  . Return...
```

Storage Activity

The EZM390 Storage option displays the EZMSTOR menu, as shown in Figure 2-6. Options on this menu direct you to data relating to types of storage, paging, and swapping.

Figure 2-6 EZMSTOR—Storage Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZMSTOR===========DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                Storage Easy Menu
                              Timeframe - Interval
   . Central Storage         +----------------------+  . Logical Swap Ctl.
   . Expanded Storage        |   Place cursor on    |  . Workload Paging
   . Common Storage          |    menu item and     |  . Job Paging
   . System Paging           |     press ENTER      |
   . System Swapping         +----------------------+
   . Page Data Sets
   . Swap Data Sets                                     . Return...
```

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XCF Monitoring Activity

The EZM390 XCF Monitoring option displays the EZMXCF menu, as shown in Figure 2-7. Options on this menu are divided into two categories:

- Usage by options

  Usage by options display XCF data sorted by System, Path, or XCF Member.

- Configuration options

  Configuration options display data pertaining to the XCF configuration within a specific context.

Figure 2-7 EZMXCF—XCF Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                 SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMXCF============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                XCF Easy Menu
   Usage by                  Time frame - Interval      Configuration
  . System                  +----------------------+  . CTC Connections
  . Path                    |   Place cursor on    |  . CF Structures
  . XCF Member              |    menu item and     |  . CF Lists
                            |     press ENTER      |
                            +----------------------+  . Return...
```

Coupling Facility Activity

The EZM390 Coupling Facility option displays the EZMCF menu, as shown in Figure 2-8 on page 2-8. Options on this menu are divided into two categories:

- Sysplex options

  The Sysplex category allows you to access the overview, status, requests, storage, and utilization of the coupling facilities.

- Structures options

  The Structures category provides access to summaries about structure, activity, and all users of each coupling facility.

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Figure 2-8 EZMCF—Coupling Facility Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZM390===EZMCF====DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                Coupling Facility
     Sysplex                  Time frame - Interval      Structures
   . Overview                +----------------------+  . Status
   . Status                  |   Place cursor on    |  . Activity
   . Requests                |    menu item and     |  . Users
   . Storage                 |     press ENTER      |
                             +----------------------+  . Return...
```

The options on this menu hyperlink to status or summary views containing information about each coupling facility. These status and summary views have built-in hyperlinks to more detailed views.

WLM Workloads Activity

The EZM390 WLM Workloads option displays the EZMWLM menu, as shown in Figure 2-9. Options on this menu are divided into four categories, with options related to workload monitoring and service policy management.

Figure 2-9 EZMWLM—WLM Monitoring Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMWLM============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                 WLM Monitoring
    WLM Policy Status                                  Workload Overview
  . Sysplex Summary         +----------------------+  . WLM Workloads
  . Sysplex Trends          |   Place cursor on    |  . Service Classes
  . System Summary          |    menu item and     |  . Report Classes
                            |     press ENTER      |  . Periods
    WLM WorkManagers        +----------------------+  . Goals Not Met
  . Subsystem Delays                                  . Delays
  . Server Spaces            Goal Mode Conversion     . Jobs
                            . Resources by Period     . Enclaves
                                                      . Response Time
                                                      . Return...
```

For more information about this option, see “Performance of Workloads” on page 2-16.

Non-WLM Workloads Activity

The EZM390 Non-WLM Workloads option displays the EZMWLDS menu, as shown in Figure 2-10. Options on this menu are divided into three categories:

- Resource Usage options

  Resource Usage options display views showing non-WLM workloads (workloads not based on WLM data) that are consuming a specific type of resource.

- Delays options

  Delays options display views that show non-WLM workloads that are delayed for a specific reason.

- General options

  General options display data of a general nature pertaining to workloads.

Figure 2-10 EZMWLDS—Workloads Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZMWLDS===========DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                Workloads Easy Menu
     Resource Usage            Time frame - Interval      Delays
   . Overview                 +----------------------+  . Overview
   . CPU                      |   Place cursor on    |  . SRM
   . I/O                      |    menu item and     |  . Storage
   . Paging                   |     press ENTER      |  . Subsystem
   . SRM                      +----------------------+  . Return...
   . Storage
                                General
                              . Overview
                              . Transactions
                              . Objectives
                              . Workflow
                              . Batch Turnaround
```

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SYSPROG Services Utility

The EZM390 SYSPROG Services option displays the EZMSPROG menu, as shown in Figure 2-11. All of these services are action-oriented and allow you to modify a certain aspect of your OS/390 system.

Figure 2-11 EZMSPROG—SYSPROG Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMSPROG==========DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                              SYSPROG Easy Menu
    Job                                                   System
  > Actions                +----------------------+  > Actions
  > Performance            |   Place cursor on    |  > Dump Services
  > Storage                |    menu item and     |  > Information
                           |     press ENTER      |  > Performance
                           +----------------------+  > Storage
                                                     > Utilities
    Device
  > I/O Subsystem                                      Advanced
  > Realtime Performance                             > SYSPROG Fast Menu
  > Utilities
                                                     . Return...
```

Options on this menu are divided into four categories:

- Job Info options
- System Info options
- Device Info options
- Advanced options

Each option produces a pop-up menu, which is displayed in the center of the screen. The pop-up menu provides a listing of views in each category. For detailed information about SYSPROG services, refer to the *MAINVIEW® SYSPROG Services User Guide and Reference*.

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Program and I/O Trace Utility

The EZM390 Program and I/O Trace option displays the MSLIST view, which lets you create, edit, initialize, or view MVScope monitor sets, as shown in Figure 2-12.

Figure 2-12 MSLIST View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 Cmd Monitor Set      Status    Samp  Sampled  Traced Sampling  Sampling CPU I/O
 --- -----------      ------    Types Job      Device Date      Start     ct  ct
     BMVIYK42002MAR10 Analyzed  IO    *        /02AD  10MAR2002 14:21:54  2
     BMVIYK42002MAR10 Analyzed  IO    *        /0225  10MAR2002 14:21:25  2
     BMVIYK42002MAR10 Analyzed  CPUIO XCFAS    /02AD  10MAR2002 14:20:42  3
     Template Monset  Ready     CPU
```

For more information about MVScope, see Chapter 10, “MAINVIEW Batch Optimizer Support.”

OS/390 Data Compression Utility

The EZM390 Data Compression option displays the EZDAC view, which gives you a menu for the Data Accelerator views, as shown in Figure 2-13. The hyperlinks to these views are active only if you have the BMC Software Data Accelerator product installed.

Figure 2-13 EZDAC—OS/390 Data Compression Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1     ALT WIN ===>
W1=EZDAC=============SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVDAC====D====1
                                      OS/390 Data Compression

   Data Accelerator Views                                Tools and Menus
 * Compression Statistics                              . Return
 * REGISET Statistics
 * SMS Dataset Statistics
```

Alarm Management Utility

The EZM390 Alarm Management option displays the EZALARM menu, as shown in Figure 2-14. MAINVIEW Alarm Manager allows you to monitor thresholds on critical OS/390 performance criteria. When these thresholds are exceeded, alarms are issued to the ALARM view and the exception information is passed on to MAINVIEW AutoOPERATOR for possible further action.

Figure 2-14 EZALARM—MVALARM Easy Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                  SCROLL ===> CSR
CURR WIN ===> 1     ALT WIN ===>
 W1 =EZALARM==========SJSCDAVM=*========DDMMMYYYY==HH:MM:SS====MVALARM==D====1
                              Alarm Administration
      Set Up/Modify Alarms                                  Advanced Options
                               +----------------------+
    . List Alarm Groups        |   Place cursor on    |  . Add Alarm Definition
    . List Alarm Definition    |   menu item and      |  . Edit Alarm Definition
    . All Alarm Definitions    |     press ENTER      |  . View Alarm Definition
                               +----------------------+
                                                          Alarm Diagnostics

                                                        . Current Alarms
                                                        . Alarm History
                                                        . Alarm Summary
```

Options on this menu are divided into these categories:

- Set Up/Modify Alarms options

  Set Up/Modify Alarms options allows you to display, set up, and modify the alarm groups and definitions.

- Advanced Options

  Advanced Options items display pop-up menus that hyperlink you to specific alarm definitions where you can make modifications.

- Alarm Diagnostics

  Alarm Diagnostics items display views that list current alarm messages, all alarm messages, and a summary of all alarm messages by severity levels.

Note: Hyperlinks to the EZALARM views are active only if MAINVIEW Alarm products are installed.

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OS/390 Fast Menu Utility

The OS/390 Fast Menu, EZMFAST, is an expanded version of EZM390. Both menus contain the same basic options; however, the options on the OS/390 Easy Menu display broad overviews, whereas the options on the OS/390 Fast Menu offer a more detailed look at MAINVIEW for OS/390 data, as shown in Figure 2-15.

Figure 2-15 OS/390 Fast Menu—EZMFAST

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZM390===EZMFAST==DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                  OS/390 Fast Menu
     Jobs                       Timeframe - Interval      Workloads
   . Overview                 +----------------------+  . Overview
   . Workflow                 |   Place cursor on    |  . Workflow
   . Delay Reasons            |    menu item and     |  . Delay Reasons
   . Batch Overview           |     press ENTER      |  > Response Time
   . TSO Overview             +----------------------+  . Service Objectives
   . Job Step Overview                                  > WLM Workloads

     System                                               Utilities
   . Overview                                           > SYSPROG Services
   . Configuration              Devices                 . Common Storage
   . Trending                 . Cache Overview          > Data Compression
   > SRM Activity             . Channel Utilization     > Alarm Management
   > Storage Activity         . DASD Utilization        . Exception Monitor
   > LPAR Utilization         > Data Set Usage          . Console
   > Coupling Facility        . Device Delays           > Environment Settings
   . Enqueue Conflicts        . HSM Activity            > Other Views
                              > LCU Overview            . Return...
                              > SMS Overview
                              > Tape Activity
```

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RMF-like Menus Utility

The EZM390 RMF-like Menus option displays an EZMCMF menu, as shown in Figure 2-16. The options on this menu hyperlink you to other menus with function options similar to those options provided by the IBM RMF product.

Figure 2-16 EZMCMF—RMF-like Menus

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZM390===EZMCMF===DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                 RMF-like Menus
    Menus                                          Return
  > Monitor II Menu         +----------------------+
  > Monitor III Menu        |    Place cursor on   |  . Return...
                            |     menu item and    |
                            |      press ENTER     |
                            +----------------------+
```

Environment Settings Utility

The EZM390 Environment Settings option displays an EZMENV menu, as shown in Figure 2-17 on page 2-15.

Options on this menu are divided into three categories:

- Change System options

  Change System options allow you to change the context of the OS/390 images and the MAINVIEW product from which you are viewing the data.

- Change Timeframe options

  Change Timeframe options hyperlink you to the primary menu for the Realtime (EZM390R) or Interval (EZM390) views.

- Miscellaneous options

  Miscellaneous options display views that pertain to the maintenance of your MAINVIEW environment.

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Figure 2-17 EZMENV—Environment Settings Menu

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMENV============DXTSTJ===*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1

                              Environment Settings
    Change System                                          Change Timeframe
  . Select Target           +----------------------+  . Show Realtime Menus
  . Select SSI Context      |   Place cursor on    |  . Show Interval Menus
  . Select product          |    menu item and     |
                            |     press ENTER      |
                            +----------------------+

                              Miscellaneous
                            . Historical Data Sets
                            . Workload Definitions
                            > All Views
```

Using MAINVIEW for OS/390 Views

This section tells you how to use MAINVIEW for OS/390 views to find out where your problems are occurring and why. It anticipates some of the most commonly asked questions regarding system performance and points you to the views that contain the information that you need. The information is listed under the following categories:

- “System Performance in General” on page 2-16
- “Workload Service Objectives” on page 2-17
- “System Resource Utilization” on page 2-21

You might find that your questions, when answered, simply lead to more questions. You might be able to answer the questions by using predefined hyperlinks, or you might need to type a view name with its parameters on the **COMMAND** line.

Refer to the online help to find everything that you need to know about a given view:

- whether you can use a predefined hyperlink to get to that view from the view currently displayed
- what parameters to type on the line to extract the precise information that you need
- what each field on the view contains

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System Performance in General

The views listed in the table below pertain to general aspects of system performance, rather than focusing on a specific system component.

Tip: These views provide excellent starting points from which to begin delving into more specific areas of system performance. After displaying one of these views, you can immediately begin selecting hyperlinks to answer more detailed questions.

Table 2-1 Using Views to Answer General Performance Questions

To Answer the Question	Use the View
Is the system experiencing any problems with resource shortages? (How busy are CPU, I/O devices, and so forth?)	SYSPERF
How is the system performing, both now and over the current interval? (How busy are the processor, I/O devices, and the paging and swapping subsystem?)	SYSSTAT
How significant is the information provided by SYSSTAT—what are the values of the key indicators over the last 60 intervals?	SYSSUM
How well is the system performing at a more detailed level?	SYSINFO
How well are workloads being served by system resources?	WOVER WOVERR
How well are individual address spaces being served by system resources?	JOVER JOVERR
How are CPUs performing, both now and over the last interval?	CPUSTAT
How are CPUs performing at a more detailed level?	CPUINFO
What is the current system configuration?	SYSCNFG
How successfully is the coupling facility running?	EZMCF

Performance of Workloads

Perhaps the single most important indicator of system performance is whether or not the system is meeting the needs of its workloads. To find out, two useful questions to ask are as follows:

- How well are workloads meeting their service objectives?
- How well are workloads/jobs being served by systems resources?

If the answers to the questions in this section are positive, chances are that your system is in good shape. If the answers are negative, you must ask additional questions to find out why and to pinpoint the exact source of the problem.

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"Scenario 4: Why Is MFGTSO Not Meeting Its Service Objectives?" on page 2-57 illustrates just one of the investigative paths that you might follow when you discover that a workload is not receiving adequate system attention.

Workload Service Objectives

Questions and views that might help pinpoint workload service objectives are listed in the following table.

Table 2-2 Using Views to Answer Workload Service Questions

To Answer the Question	Use the View
How well are WLM workloads meeting the objectives set in their service policies?	EZMWLM (Goals not met.)
How well are all workloads meeting their service objectives?	WOBJ
What is the average response time for TSO workloads?	WRT
What is the average turnaround time for batch jobs?	WTA

When using these views, it is important to know that while WRT and WTA always contain data for each workload, WOBJ displays data only for workloads that have service objectives that include the *current* time.

Workloads/Jobs Being Served by System Resources

To check any aspect of system performance related to WLM workloads, use the WLM workload monitoring views (listed in Table 2-3). A menu of these views (called EZMWLM) is available from the MAINVIEW for OS/390 MAIN Menu. You can also type **EZMWLM** on the **COMMAND** line.

Table 2-3 Using Views to Answer System Performance Questions (Part 1 of 2)

To Answer the Question	Use the Views
How well are workloads being served by system resources? How well are jobs being served by system resources?	WOVER WOVERR JOVER JOVERR JSOVER JSOVERZ
How well are workloads being served by the CPU? How well are jobs being served by the CPU?	WCPU WCPUR JCPU JCPUR JSCPU
How well are workloads being served by I/O devices? How well are jobs being served by I/O devices?	WIO WIOR JIO JIOR JSIO

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Table 2-3 Using Views to Answer System Performance Questions (Part 2 of 2)

To Answer the Question	Use the Views
How well are workloads being served by central and expanded storage? How well are jobs being served by central and expanded storage?	WSTORD JSTORD
How well are workloads being served by the paging subsystem? How well are jobs being served by the paging subsystem?	WPAGOV WPAGOVR JPAGOV JPAGOVR JSPAGOV
How well are workloads being served by demand paging? How well are jobs being served by demand paging?	WPAGDM WPAGDMR JPAGDM JPAGDMR
How many resources are being consumed during the interval?	JSUSE JSUSEZ JUSE JUSER WUSE WUSER
How well are workloads being served by swap paging? How well are jobs being served by swap paging?	WPAGSW WPAGSWR JPAGSW JPAGSWR
How many SRM service units are being consumed by workloads? How many SRM service units are being consumed by jobs?	WSRM WSRMR JSRM JSRMR JSSRM

Where and Why Delays Are Occurring

This section answers these questions:

- Which resources are experiencing contention?
- Which workloads and jobs are being delayed as a result of that contention?

The answers to these questions will help you identify the resources that are experiencing the most contention and the address spaces that are competing for those resources. MAINVIEW identifies the percentage of the total delay for which each individual device is responsible. In this way, the most severely impacted resources are clearly identified.

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Devices Experiencing Contention

To identify devices that are experiencing contention, the following questions and views can be helpful.

Table 2-4 Identifying Devices in Contention

To Answer the Question	Use the View
Which devices are being used by jobs?	DUJOB
Which devices are delaying jobs?	DDJOB

Workloads Delayed and Causes

To identify the workloads that are delayed and the reason for the delays, the following questions and views can be helpful.

Table 2-5 Identifying Workloads That Are Delayed

To Answer the Question	Use the View
What is the total delay that workloads have experienced during the current interval or session?	WDELAY WDELAYR
Which workloads are being delayed by storage constraints?	WSTORD
Which workloads are being delayed by SRM?	WSRMD
How efficiently are workloads being served by the system during the current interval or session?	WFLOW

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Jobs Delayed and Causes

To identify delayed jobs, the following questions and views can help you find the delays and the reasons for those delays.

Table 2-6 Identifying Delayed Jobs

To Answer the Question	Use the Views
What is the total delay that jobs have experienced during this interval or session?	JDELAY JDELAYR JDELAYZ JSDELAY JSDELAYZ
Which jobs are being delayed by a device?	JDDEV
Which jobs are using those devices?	JUDEV
Which resources are contributing to the total delay?	JINFO JSINFO JSDELAY JSDELAYZ
Which jobs are being delayed by storage constraints?	JSTORD JSTORDR
Which jobs are being delayed by paging activity?	JSPAGOV
Which jobs are being terminated during multiple intervals?	JSTERM JSTERMZ
Which jobs are enqueue resources?	JUENQ
Which jobs are being delayed by enqueues?	JDENQ
Which jobs are being delayed by SRM?	JSRMD JSRMDR JSUSE
How efficiently are jobs being served by the system during the current interval or session?	JFLOW JFLOWR JSIO JSSRM JSUSEZ
Which jobs are experiencing subsystem-related delays?	JSUBD JSUBDR
Which jobs are experiencing Hierarchical Storage Manager-related delays?	JHSMD JHSMSTAT
Which jobs are experiencing cross-system coupling facility-related delays?	JXCFD
Which jobs are experiencing WTOR-related delays?	JMSGD
Which jobs are experiencing JES-related delays?	JJESD

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System Resource Utilization

Your best defense against delays caused by resource contention is to closely monitor resource utilization. Thus, you can spot resources that are being overutilized and take steps to correct the problem *before* delays occur. You can also identify underutilized resources and redistribute work to them, thus balancing the workload across the entire resource configuration.

A complete understanding of resource utilization can be assembled by finding answers to these questions:

- Is the processor complex overutilized?
- How efficient is the I/O configuration?
- How efficient are the SMS storage groups?
- Is storage being used efficiently?
- How efficient is the paging subsystem?
- Are data spaces performing satisfactorily?
- Which resources are experiencing enqueue?
- Is SRM configured for maximum throughput?
- How efficient is the LPAR-defined capacity?

This information can help you quickly detect abnormal uses of a resource—such as a batch job in a CPU loop—thus avoiding costly exploitation of the resource. It can also help you evaluate the efficiency of tuning changes made to your system.

Overutilized Processor Complex

To detect an overutilized CPU and the LPAR status, the following questions and views are helpful in detecting abnormalities.

Table 2-7 Detecting an Overutilized CPU

To Answer the Question	Use the View
How busy are the CPUs in the complex and who is using them, both now and over the last interval?	CPUSTAT
Where is more detailed information about a particular CPU?	CPUINFO
What is the status of the logical partitions (LPARs) and MDF domains?	LPARSTAT
What are the WLM-managed weight values for the LPAR cluster?	LPARCLUS

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I/O Configuration Efficiency

To evaluate I/O configuration efficiency, these questions and views are helpful.

Table 2-8 Evaluating I/O Configuration Efficiency

To Answer the Question	Use the View
How are DASD and tape devices performing—how quickly are requests being satisfied?	DEVSTAT
How is a particular I/O device performing?	DEVINFO
What I/O activity has occurred for a particular job or volser?	DSIO
How busy are the channel paths, both now and over the last interval?	CPSTAT
How well is the logical control unit performing—how quickly did devices provide service over the last interval?	LCUSTAT
How is a particular logical control unit performing?	LCUINFO

Efficient SMS Storage Group

Using DFSMS, you can define an SMS storage group so that MAINVIEW for OS/390 will monitor a group of devices as a single entity.

Table 2-9 Monitoring Storage Groups

To Answer the Question	Use the View
How are the devices within each storage group performing?	SMSSTAT
Where is more detailed information about a particular storage group?	SMSINFO

Efficient Use of Storage

To evaluate storage use, these questions and views are helpful in making assessments about your storage use.

Table 2-10 Evaluating Efficient Use of Storage

To Answer the Question	Use the View
How much contention is occurring for central and expanded storage, both now and over the last interval?	PGINFO
How often are pages being moved between central, expanded, and auxiliary storage?	ESINFO
How were storage frames allocated over the last interval?	FRMINFO
How much swapping activity has occurred? How efficient has expanded storage been in reducing the need for physical swapping?	SWPINFO

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XCF Performance

To evaluate the XCF performance, the following questions and views are helpful.

Table 2-11 Evaluating XCF Performance

To Answer the Question	Use the View
How is the performance between the various systems in the sysplex?	XCFSYS
How well are the various paths being utilized?	XCFPTH
Where is the message traffic originating?	XCFMBR

Efficient Paging Subsystem

To evaluate the efficiency of the paging subsystem, the following questions and views are helpful.

Table 2-12 Evaluating the Efficiency of a Paging Subsystem

To Answer the Question	Use the View
Are any page data sets causing performance problems?	PGDSTAT
Where is more detailed information about a single page data set?	PGDINFO
Are any swap data sets causing performance problems?	SWDSTAT
Where is more detailed information about a single swap data set?	SWDINFO

Data Space Performance

To evaluate the performance of data spaces, these questions and views are helpful in providing data space information.

Table 2-13 Evaluating the Performance of Data Spaces

To Answer the Question	Use the View
Are any data spaces experiencing performance problems?	DSPCSTAT
Where is more detailed information about a single data space?	DSPCINFO

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Enqueued Resources

To find enqueued resources, the following question and view can be helpful.

Table 2-14 Finding Enqueued Resources

To Answer the Question	Use the View
Which resources are enqueued and by whom?	ENQSTAT

SRM Domain and Values

To evaluate the SRM domain and values, these questions and views can help.

Table 2-15 Evaluating the SRM Domain and Values

To Answer the Question	Use the View
How is performance within each SRM domain?	DMNSTAT DMNSTATR
What are the SRM MPL adjustment values?	MPLSTAT
What are the SRM criteria values for expanded storage?	SRMESCT
What are the SRM criteria values for logical swapping?	SRMLSCT
What are the SRM values in SYS1.PARMLIB(1EAOPTxx)?	SRMOPT

Efficient LPAR Defined Capacity

Defined Capacity is a user-defined value that determines the size of a logical partition (LPAR). It is set based on millions of service units per hour (MSU/hr). With Variable Workload License Charges (VWLC), when the four-hour rolling average exceeds this value, WLM will soft cap the LPAR.

To monitor Defined Capacity usage, these questions and views can help.

Table 2-16 Monitoring Defined Capacity Usage

To Answer the Question	Use the View
What is the current MSU utilization per LPAR, and what is the historical four-hour rolling average per LPAR?	LPARCAP LPARCAPZ
Where is more detailed information about a particular LPAR, and when does the peak CPU usage occur?	LPARCAPZ

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Using Historical Data to Solve Problems

The ability to look at data from the past (called *historical data*) is an extremely powerful tool in performance problem-solving tasks.

Displaying Historical Data

When you access historical data, MAINVIEW for OS/390 presents data from the most recent interval specified and the preceding intervals. Using the TIME command, you can specify intervals from any time frame for which data exists on your system.

- To determine the times and dates for which data is available, on the **COMMAND** line, type **DSLIST** (or you might need to type **VIEW DSLIST**).

  Data from time periods that do not fall between the From Date and To Date categories is not immediately available for any of the following reasons:

  — Data was not collected.
  — Data was archived.
  — Data was overwritten by new data.

  See your product administrator if you need access to such data. Administrators should consult the *MAINVIEW® Common Customization Guide*.

- To find out the times that are associated with the intervals in the current session, on the **COMMAND** line, type **SYSSUM**.

  From SYSSUM, you can hyperlink to any single historical interval. For example, when you hyperlink on the **Time** field, the SYSINFO view displays data from that **Time** interval.

- Use the TIME command to retrieve a set of intervals (see “Using the TIME Command” on page 2-27).

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Using Dynamic Fields with Historical Data

When working with historical data, you can use dynamic fields to see the time, date, and hour that the data was collected.

Field Name	Displays
Interval Date	date that the data was collected
Intvl Time	ending time of the interval during which the data was collected
Hr (hour)	hour of day that the data was collected; for example, when Intvl Time shows 8:30, Hr shows 8

Whether the dynamic fields are automatically displayed depends on whether you are using historical data and also depends on your MAINVIEW parameter settings.

The **Intvl Time** field automatically appears when you access historical data; the **Interval Date** field does not appear. To display these fields when they are hidden:

Step 1 On the **COMMAND** line, type **CUST**.

Step 2 On the **COMMAND** line, type **E** (Excluded).

Interval Date and **Intvl Time** can be set to appear automatically. To control the default display of the date and time fields:

Step 1 On the **OPTION** line, type **MVParms**.

Step 2 Select Option 2, **Information Display Parameters**.

Step 3 In the **Show Time** and **Show Date** fields, type **Y** (Yes) or **N** (No).

Note the following points about viewing historical data:

- Some views (for example, the DSIO and DCSTAT views) do not allow historical time frames.
- Some views (for example, DSLIST) do not display historical data. (DSLIST is simply a list of data sets.)
- You can use the TIME command to display historical data even with detail views (for example, JINFO). Although a detail view displays only the last interval in a time frame, you can use the TIME command (as with other views). See “Using the TIME Command” on page 2-27.

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Using the TIME Command

- When you issue the TIME command with no parameters, MAINVIEW for OS/390 prompts you for the parameters on a pop-up window.
- The syntax for the TIME command is

```
TIME [<date> <time> [<duration> | NEXT | PREV]] [DOW mask TOD mask]
```

where

date — Is the ending date of the data that you want to view. This is a required parameter. An asterisk (*) gives you the default value, the current date.

Specify the date in the same format as the current date, which always appears in the upper left corner of the screen.

You can change the format of the date by selecting Option 0 on the MAINVIEW Selection Menu, and then selecting Option 4 on the MAINVIEW Parameter Editors Menu.

time — Is the ending time of the data that you want to view. This is a required parameter. An asterisk (*) gives you the default value, the current time.

Specify the time in the format hh:mm.

duration — Is the time period over which you want your data summarized. This is an optional parameter. The default is one recording interval (usually 15 or 30 minutes).

Specify the duration in the format *nnnnu*, where

nnnn	Indicates the number of hours, minutes, or intervals in the duration.
u	Indicates the unit of time: I (intervals), M (minutes), H (hours), D (up to 416 days), or W (up to 59 weeks).
TODAY or TDAY	Specifies today's intervals since midnight.
MONTH	Specifies one month.

NEXT — Is specified *instead* of the duration parameter. NEXT uses the duration value currently in effect to cycle forward by the duration amount.

PREV — Is specified *instead* of the duration parameter. PREV uses the duration value currently in effect to cycle backward by the duration amount.

DOW mask — Limits the selected intervals to end on specific days of the week.

TOD mask — Limits the selected intervals to end within a specific time of the day.

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Tip: In place of the date, time, or duration parameters, you can use

An asterisk (*)—To specify the default value. The default values are: the current date, the current time, and one recording interval.

An equal sign (=)—To specify the most recently requested date, time, or duration.

Examples of Using the TIME Command

The following examples demonstrate several different uses of the TIME command. The appearance of the date depends on the date format in use. The format for the date in these examples is *mm/dd/yyyy.*

Example 1:

Assume that today is June 10, 2001. To retrieve data from one week ago at 9:25 A.M., type

TIME 06/03/2001 09:25

This command displays data from the end of the interval that contains 9:25; that is, the interval between 9:15 and 9:30.

Example 2:

To display data from the next interval starting on the same date and time as the last interval specified, type

TIME = = NEXT

The NEXT parameter steps forward one Extractor interval (the default) from the date and time last specified. Specifically, data from June 3 during the interval 9:30-9:45 is displayed.

You might find it useful to set one PF key to issue **TIME = = NEXT** and another PF key to issue **TIME = = PREV**. This method allows you to cycle quickly through recording intervals without having to manually type the TIME command and all of its parameters.

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Example 3:

To display data from the three-hour period ending on June 6, 2001 at 12 noon, type

TIME 06/06/2001 12:00 3h

Assuming 15-minute intervals, the duration field contains 180M—four intervals per hour.

Example 4:

To display data from the next day during the same time period, type

TIME 06/07/2001 = =

The equal sign in this position retains the time that you specified most recently, 12:00, and the duration you most recently specified, 3h.

Example 5:

To display data that includes the 30-minute interval ending at 8:00 on June 16, type

TIME 06/16/2001 08:00 30M

Example 6:

To display data from earlier today at 9:00, type

TIME * 9:00

The asterisk in this position indicates the current date.

Example 7:

To reestablish the current time frame, type

TIME * * *

Example 8:

To display data that includes all intervals ending on prime shifts for weekdays from last month, type

TIME ENDOFMONTH 23:59 MONTH WEEKDAYS PRIMESH

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Example 9:

Sometimes the window information line does not look the way you might expect after entering the TIME command. Suppose you type

TIME * 11:00 4I

You expect the window information line to look like this:

```
H1=SYSSTAT=========SYSB=====*=====DDMMMYYYY===11:00====60M=MVMVS====D====2>
```

However, it looks something like this:

```
H1=SYSSTAT=========SYSB=====*=====DDMMMYYYY===10:45====45M=MVMVS====D====2>
```

When the time field contains an earlier time and the duration field contains a lower duration than you expect, that means that data was not available during one or more of the intervals that you requested. In this example, data was not recorded between 10:45 and 11:00, so the time field shows 10:45.

Example 10:

Suppose you want to examine yesterday's system performance at 4:00 P.M. and compare it to what the system is doing now.

To do this, perform the following steps:

Step 1 Display the SYSSTAT view in window 1.

Step 2 Create a second window.

2.A Type **HSplit** or **VSplit**.

2.B Move the cursor to where you want the new window to begin.

2.C Press **Enter**.

Step 3 On the **COMMAND** line, set the time frame for window 2, specifying yesterday's date and 4:00 P.M.:

TIME 09/09/YYYY 16:00

Step 4 On the **COMMAND** line, type **SYSSTAT**.

The CURR WIN field is automatically set to window 2, so the output will be displayed in that window.

Your screen looks like Figure 2-18 on page 2-31.

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Figure 2-18 SYSSTAT in Two Time Periods

```
10NOVYYYY   09:51:35 -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS ----------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 2        ALT WIN ===>
  W1 -SYSSTAT-----------SYSE-----*--------10NOVYYYY--09:48:35----MVMVS----D----1
 C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
 - -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
   SYSE   24.3   0.2   1.0  23.1  62.6  21.6              21.6  12.6

  H2 =SYSSTAT===========SYSE=====*========09NOVYYYY==16:00:10====MVMVS====D====1
 C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
 - -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
   SYSE   26.1   0.6   1.9  23.6  55.9  35.3         4.7  30.6 211.7
```

You can compare the system performance of today with yesterday. Note that the window status indicator for window 2 changed from T2 to H2. The H stands for historical data.

If you need more information about the TIME command, you might want to take a look at Chapter 5, “Displaying Historical Data,” in *MAINVIEW® for OS/390 Getting Started*.

Using Screen Definitions to Solve Problems

If you frequently experience problems in a given area—for example, excessive CPU utilization—you might want to create a *screen definition* so that you can start debugging the problem immediately.

To create a screen definition, follow this procedure:

Step 1 Open multiple windows.

Step 2 Display a different view in each window; for example, JCPU in window 1, CPUSTAT in window 2, and WCPU in window 3.

Step 3 On the **COMMAND** line, type **SAVEScreen**.

Step 4 Assign a unique name to the screen definition; for example, CPUDATA.

Step 5 The next time you notice that CPU utilization is high, on the **COMMAND** line type **SCReen CPUDATA**.

All three views are displayed in the exact same configuration that you saved. You can divide the display area into a maximum of 20 windows.

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Note: MAINVIEW for OS/390 ships several screen definitions to help you get started in solving performance problems: MMRSCR01, MMRSCR02, MMRSCR03, and the default screen definition, MVMVS. These screen definitions should help you form ideas for creating your own definitions. All of them provide a starting point from which you might begin using hyperlinks to explore system performance.

The following example demonstrates how you might use screen definitions.

Example:

Suppose you find that you frequently display a particular combination of views, and that you always display the views in the same windows, as shown in Figure 2-19.

Figure 2-19 Sample Window Configuration

```
10NOVYYYY   09:51:35 -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS ----------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 3        ALT WIN ===>
  W1 -SYSSTAT-----------SYSE-----*--------10NOVYYYY==HH:MM:SS----MVMVS----D----1
 C SMFID %Util %Util %Util %Util  I/O  %Ut-R %Ut-R %Ut-R %Ut-R  I/O
 - -----   CPU   Bat   TSO   STC  Intr   CPU   Bat   TSO   STC IntrR
   SYSE   30.5         4.2  26.3 101.8  18.8         4.7  14.1  26.3

  W2 -WOBJ--------------SYSE-----*--------10NOVYYYY--10:01:35----MVMVS----D---49
 C Workload Typ #AS       % Service Objective  Tran   Tran   Job  Jobs
 - -------- --- ---       0.......50......100  Rate  Total Total  /Min
   TSONRM   SCL  16 250.0  *****************+  0.37     31
   STCLOW   SCL   1 100.0  *****************
   SYSTEM   SCL  17 76.00  *************
   STCPAS   SCL   6 48.00  ********
  W3 =WKLIST============SYSE=====*========10NOVYYYY==10:02:13====MVMVS====D===65
 C Workload Type Description                    Istatus Cstatus Obj Begin End
 - -------- ---- ------------------------------ ------- ------- --- ----- -----
   ALLASCH  ASCH All ASCH Address Spaces        Active  Active  NO  00:00 00:00
   ALLBAT   BAT  All Batch Address Spaces       Active  Active  NO  00:00 00:00
   ALLOMVS  OMVS All Open MVS Address Spaces    Active  Active  NO  00:00 00:00
   ALLSTC   STC  All Started Tasks              Active  Active  NO  00:00 00:00
   ALLTSO   TSO  All TSO Address Spaces         Active  Active  NO  00:00 00:00
   ALLWKLDS COMP All Address Spaces             Active  Active  NO  00:00 00:00
   APPC     WKLD APPC Workload                  Active  Active  YES 00:00 23:59
```

The screen is divided into three windows, each window containing information about a different performance aspect:

- Window 1 contains the SYSSTAT view, which displays an overview of the entire system.
- Window 2 contains WOBJ, which shows how well workloads are meeting their service objectives.

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- Window 3 contains WKLIST, which allows you access to any workload on the system.

Without the ability to create screen definitions, each time that you require this information, you have to type the commands explicitly to display each view and direct the output to one of the three windows—a rather tedious process, especially if you perform it often.

If you create a screen definition, however (perhaps under a name such as OVERVW), you can type **SCReen OVERVW** on the **COMMAND** line at any time to display the SYSSTAT, WOBJ, and WKLIST views in the exact same configuration, as shown in Figure 2-19 on page 2-32.

Selecting an Initial Display

After you become experienced with MAINVIEW for OS/390, you might find that you want to see a particular screen definition immediately when you initialize MAINVIEW for OS/390. You can do this by specifying a screen definition as an *initial display.* For information about choosing an initial display, type **HELP FIRSTSCREEN** on the **COMMAND** line.

Note: Only a screen definition can be designated as the initial display; views are not eligible.

Selecting a Different Screen for Each MAINVIEW Product

Because the MAINVIEW Parameters Editors menu affects all MAINVIEW products, the screen definition that you name for one product is displayed the next time that you access *any* MAINVIEW product.

If you would rather have a unique screen definition for each MAINVIEW product—one for CMF MONITOR, one for MAINVIEW for OS/390, and so on—perform the following steps:

Step 1 Create a screen definition for a single MAINVIEW product—for example, MAINVIEW for OS/390.

See “Using Screen Definitions to Solve Problems” on page 2-31 for information about creating screen definitions. Give the screen definition the same name as the product identifier. For MAINVIEW for OS/390, you would name the screen definition MVMVS.

Step 2 To display the MAINVIEW Parameter Editors menu, type **MVParms** on the **COMMAND** line.

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Step 3 Select **2 - DISPLAY**.

Step 4 Make sure the **Initial screen** field is blank.

This step is important because MAINVIEW displays whatever is in the **Initial screen** field first. So, if you *explicitly* specify MVMVS, MAINVIEW for OS/390 tries to display the MVMVS screen definition for *every* MAINVIEW product, not just MAINVIEW for OS/390.

When the **Initial screen** field is blank, MAINVIEW looks for a screen definition by the same name as the product that is being initialized. In other words, by leaving this field blank, you *implicitly* specify that you want MVMVS displayed only when you are entering MAINVIEW for OS/390.

Step 5 Create screen definitions for your other MAINVIEW products by using these identifiers:

MAINVIEW for OS/390	MVMVS
CMF MONITOR	CMF
PLEX MANAGER	PLEXMGR
MAINVIEW VistaPoint	MVVP
MAINVIEW for DB2	MVDB2
MAINVIEW for CICS	MVCICS
MAINVIEW for IMS	MVIMS
MAINVIEW for MQSeries	MVMQ

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Manipulating Data Spaces

Data space views provide details about system data spaces, displaying data space contents, and allowing authorized users to change the contents dynamically. Data space views can be displayed only on systems running MVS SP 5.1 and later.

The four data space views are as follows:

- DSPCZ—displays all owners (address spaces) of data spaces that exist on the system.
- DSPCINFO—provides details about a single data space.
- DSPCSTAT—displays all system data spaces for a particular owner.
- DSPCDUMP—displays the contents of the selected data space.

Note: Data spaces that are designated as hiperspaces are displayed on DSPCZ only.

Understanding Security Issues with Data Space Views

Due to the sensitive nature of the contents of the DSPCDUMP view, it is secured by default. You *must* be an authorized user in order to view and modify the contents of the DSPCDUMP view.

Refer to *Implementing Security for MAINVIEW® Products* for information about how to authorize users to view and/or modify the data space addresses and contents.

Accessing the Data Space Views

The data space views should be accessed from the summary view, DSPCZ, in order to filter the information for the data space that you are interested in displaying.

Step 1 To display the DSPCZ view, type **DSPCZ** on the **COMMAND** line.

The DSPCZ view is displayed, as shown in Figure 2-20 on page 2-36.

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Figure 2-20 DSPCZ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =DSPCZ=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===35
C Owner                                  Fetch   Cur   Max
-  Name    Count ASID K Type  Scope  Ref Prot   Size  Size
  *MASTER*    16 0001 0 Basic All    Ena ****  67141 67141
  AAODBG41     1 0176 8 Basic Single Ena Yes     359   359
  AAORMB4      1 0050 8 Basic Single Ena Yes     359   359
  AAOTSHE      1 001F 8 Basic Single Ena Yes     899   899
  ANTAS000     1 000D 8 Basic Common Ena No      768   768
  ANTMAIN      1 000C 0 Basic Common Ena No     3840  3840
  APPC         8 0031 1 Basic Single Ena Yes    388K  388K
  CICS4103     1 0059 8 Basic Single Ena Yes    4096  512K
  CMRCAS       8 0058 4 Basic Single Ena No       83 62526
  CNMNETE     21 002A 6 Basic ****** Ena Yes    512K  512K
  CONSOLE     14 000A 0 Basic ****** Ena ****   110K  154K
  CSQ1CHIN     1 0045 8 Basic Single Ena Yes     512   512
  DB2GDBM1     1 0060 7 Hiper All    Ena Yes    512K  512K
  DB2IR2G      2 005F 0 Basic Single Dis Yes    512K  512K
  DC$BBI       1 0016 8 Basic Single Ena Yes    1799  1799
  DUMPSRV      3 0005 0 Basic Single Ena Yes    512K  512K
```

The DSPCZ view provides high-level information about all data spaces on the system. The data spaces are sorted by the owner's name.

Step 2 Hyperlink on one of the address spaces listed in the **Owner Name** field to display the DSPCSTAT view, as shown in Figure 2-21.

Note: Your screen might look different, depending on the data space to which you hyperlinked.

Figure 2-21 DSPCSTAT View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =DSPCZ=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===35
 C DataSpc  Owner                              Fetch HSpac Cast          Cur Max
 - Name     Name     ASID K Type  Scope   Ref Prot  Type  Out   Share  Size Size
   CKVRJES2 *MASTER* 0001 1 Basic All     Ena No    ***** ****  ****   512K 512K
   JES2IRDS *MASTER* 0001 1 Basic All     Ena Yes   ***** ****  ****     35   35
   IRR0000B *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****     11   11
   IRR0000A *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00009 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00008 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00007 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00006 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00005 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      4    4
   IRR00004 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****     11   11
   IRR00003 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****     16   16
   IRR00002 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      3    3
   IRR00001 *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      2    2
   ATBINDSP *MASTER* 0001 1 Basic All     Ena Yes   ***** ****  ****  2558425584
   SDUMPRSD *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****   512K 512K
   IRR0000C *MASTER* 0001 0 Basic All     Ena Yes   ***** ****  ****      2    2
```

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The DSPCSTAT view provides a list of data spaces owned by the address that you selected in DSPCZ.

Step 3 To view detailed information about a particular data space, hyperlink on one of the entries in the **DataSpc Name** field.

The DSPCINFO view is displayed, as shown in Figure 2-22.

Figure 2-22 DSPCINFO View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =DSPCZ====DSPCINFO=SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1

    -DataSpace-          -----DataSpace-----
      Name..... DAULAT     STOKEN........... 8000680200000122
      Type..... Basic      ASTE Real Address         01C6C480
      Scope.... All        Cur Size(4k blks)             2442
      Reference Dis        Max Size(4k blks)             2442
      FProt.... No         #of Users........
      HiperSpc. ******   ------Storage------
      CastOut.. ****       Real.............
      Share.... ****       Expanded.........
      Key......        0   Auxilliary.......

    ---Owner---          ---Owner Tokens----
      Name..... BMVMDR1T   STOKEN........... 0000008400000001
      ASID.....     0021   TTOKEN(0-7)......
      ASCB..... 00FA3E80   TTOKEN(8-15).....
      TCB...... 007E1BD8
```

The DSPCINFO view provides detailed information about the data space that you selected in DSPCSTAT.

Step 4 To view or modify the contents of the data space, hyperlink on the data space name displayed in DSPCINFO.

The DSPCDUMP view is displayed, as shown in Figure 2-23 on page 2-38.

Note: You must be authorized to view and modify the fields displayed in DSPCDUMP.

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Figure 2-23 Hyperlinking to the DSPCDUMP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Dspc Name.. BBIDIV1
   Addr Space. AAOTSHD
   Start Addr. 00000000
   Size in 4Ks 00000383
               Offset    Hexadecimal                            Character
               00000000  C2C2C9C4 C9E54040 C4D7C9D5 E3F34040   BBIDIV  DPINT3
               00000010  C2D7D6F2 F7F5F201 E3E2C8C4 000000A2   BPO2752.TSHD..s
               00000020  000000A1 00000000 00365023 70060000   .........&.....
               00000030  19980226 00000000 00000000 00000000   p.............
               00000040  00000000 00000000 C8C2C2F5 F5F1F040   ........HBB5510
               00000050  F1F5F3F0 F1F3F1F7 F9F6F7F2 00000000  153013179672....
               00000060  00000000 00000000 C4D7C9D5 E3F34040    ........DPINT3
               00000070  C2D7D6F2 F7F5F201 E3E2C8C4 000000A1  BPO2752.TSHD....
               00000080  000000A1 00000001 02193599 24610000  ...........r./..
               00000090  19980221 00000000 20503151 21510000  .p.......&......
               000000A0  19980222 00000000 C8C2C2F5 F5F1F040  ..p......HBB5510
               000000B0  F1F5F1F0 F1F3F1F7 F9F6F7F2 00000000  151013179672....
               000000C0  00000000 00000000 00000000 00384000  ................
               000000D0  00000383 00000001 0000000F 0000DCC0  ..c...........{
```

The DSPCDUMP view displays the data space name, the owning address space name, the starting address, and the length of the data spaces in 4K pages, followed by the three columns of data described below:

- The **Offset** field—shows the offset (such as 00000010 or 0000030) from the start address where the data is located.
- The **Hexadecimal** field—displays contents of the data space 32 bytes to a row, with spaces inserted every 4 bytes to look like a dump.
- The **Character** field—displays the contents of the data space in alphanumeric representation.

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Modifying the Contents of a Data Space

The contents of a data space should be modified only by knowledgeable users who are authorized by system security. The following values can be changed in the DSPCDUMP view:

- **Start Addr**
- **Hexadecimal** (data space contents)

Values are changed by typing over the current value. Changes in the **Hexadecimal** field can be reversed immediately by typing **CANcel** on the **COMMAND** line.

Warning! If the start address is changed, any previously made changes cannot be undone with the CANcel command.

For example, if you change the hexadecimal value from D3D6E5C5 to C8C1E3C5, and then you change the start address, the CANcel command will not restore D3D6E5C5. It must be typed manually.

Using the Test Program

This section describes how to modify the contents of a data space by using a test program provided by BMC Software.

The test program, called BBD9DSIV, is located in the BBLINK library. The test program creates two separate data spaces, then loads test data and waits. The test program is used in the following exercises to illustrate how to modify the contents of a data space.

Note: The test program will terminate automatically after approximately three hours. You can cancel it at any time while it is running.

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To practice the steps involved in changing data space contents, follow this procedure:

Step 1 Copy the test program JCL BBD9DSIV from the BBSAMP library into one of your data sets, as shown in Figure 2-24, and then modify the JCL as instructed in the Instructions section.

Figure 2-24 JCL for the BBD9DSIV Test Program

```
//BBD9DSIV JOB (ACCOUNT),'YOUR NAME'
//*********************************************************************
//*                                                                   *
//*  This JOB creates two Data Spaces to verify the Data Space        *
//*  enhancement PTFs.                                                *
//*                                                                   *
//*********************************************************************
//DSIVSTEP EXEC PGM=BBD9DSIV
//STEPLIB  DD  DISP=SHR,DSN=*prefix*.BBLINK
//SYSPRINT DD  *
//*                                                                   *
//*********************************************************************
//*                                                                   *
//*  Instructions                                                     *
//*  ------------                                                     *
//*                                                                   *
//*  1. Tailor this JCL as follows:                                   *
//*                                                                   *
//*     A. Replace the JOB card above with one that satisfies         *
//*        your installation's standards.                             *
//*                                                                   *
//*     B. Change '*prefix*' in the //STEPLIB statement to the        *
//*        high level qualifier you have used for your BBLINK         *
//*        distribution libraries.                                    *
//*                                                                   *
//*     C. Submit this job. It will create 2 Data Spaces that can     *
//*        be used for testing the Data Space enhancements PTFs.      *
//*                                                                   *
//*                                                                   *
//*********************************************************************
```

Step 2 Display DSPCZ in MAINVIEW for OS/390, and then submit the JCL that you tailored in the previous step.

The owner's name for our example is BMVSLKV, as shown in Figure 2-25 on page 2-41.

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Figure 2-25 DSPCZ View, Displaying Owner of Test Program, BMVSLKV

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =DSPCZ============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===37
C  Owner                                      Fetch  Cur    Max
-  Name    Count  ASID  K  Type  Scope  Ref  Prot  Size   Size
   *MASTER*   15  0001  1  Basic All    Ena  ****  1617  71617
   AAODJ41     1  0054  8  Basic Single Ena  Yes    359    359
   AAOTSHD     1  0027  8  Basic Single Ena  Yes    899    899
   APPC        7  0031  1  Basic Single Ena  Yes   381K   381K
   BITPCC5     8  0068  8  Basic Single Ena  Yes     83  62526
   BMVSLK1V    2  0018  0  Basic ****** Dis  No    2442   2442
   CMDJENCH    8  006A  4  Basic Single Ena  No      83  62526
   CNMNETD    18  0028  6  Basic ****** Ena  Yes   512K   512K
   CONSOLE    18   00A  0  Basic ****** Ena  **** 87589   122K
   CSQ3CHIN    1  003D  8  Basic Single Ena  Yes    512    512
   DC$BBI      1  0013  8  Basic Single Ena  Yes   1799   1799
```

Step 3 When *your* job is displayed in the **Owner Name** field, hyperlink on it.

In the example shown in Figure 2-26, the DSPCSTAT view is displayed, showing the two test data spaces, DSPCONE and DSPCTWO.

Figure 2-26 DSPCSTAT View, Displaying the Test Data Space Names, DSPCONE and DSPCTWO

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =DSPCZ====DSPCSTAT=SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D=====2
C DataSpc Owner                                  Fetch HSpac Cast       Cur   Max
- Name     Name      ASID  K  Type   Scope  Ref Prot  Type  Out  Share Size Size
  DSPCONE  BMVSLK1V  0018  0  Basic  All    Dis No    ***** **** ****  2442 2442
  DSPCTWO  BMVSLK1V  0018  0  Basic  Single Dis No    ***** **** ****  2442 2442
```

Step 4 From DSPCSTAT, hyperlink on **DSPCONE**.

The DSPCINFO view is displayed, as shown in the example in Figure 2-27 on page 2-42.

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Figure 2-27 DSPCINFO View, Showing Data Space Details

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =DSPCZ====DSPCINFO=SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
    -DataSpace-          -----DataSpace-----
      Name..... DSPCONE    STOKEN........... 800054020000008B
      Type..... Basic      ASTE Real Address         01F26780
      Scope.... All        Cur Size(4k blks)             2442
      Reference Dis        Max Size(4k blks)             2442
      FProt.... No         #of Users........
      HiperSpc. ******   ------Storage------
      CastOut.. ****       Real.............
      Share.... ****       Expanded.........
      Key......        0   Auxilliary.......

    ---Owner---          ---Owner Tokens----
      Name..... BMVSLK1V   STOKEN........... 0000006000000001
      ASID.....     0018   TTOKEN(0-7)...... 0000006000000001
      ASCB..... 00F88400   TTOKEN(8-15)..... 00000004007E3D20
      TCB...... 007E3D20
```

Step 5 From DSPCINFO, hyperlink on the name **DSPCONE**.

The DSPCDUMP view is displayed, as shown in the example in Figure 2-28. You can change the starting address and data space contents from this view.

Figure 2-28 Changing Starting Address and Data Space in DSPCDUMP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
  Dspc Name.. DSPCONE
  Addr Space. BMVSLK1V
  Start Addr. 00000000
  Size in 4Ks 0000098A
              Offset    Hexadecimal                            Character
              00000000  E3C8C9E2 40C9E240 C140E3C5 E2E340E3   THIS IS A TEST T
              00000010  C8C9E240 C9E240C1 40E3C5E2 E340E3C8   HIS IS A TEST TH
              00000020  C9E240C9 E240C140 40E3C8C9 E240C9E2   IS IS A  THIS IS
              00000030  40C140E3 C5E2E340 E3C8C9E2 40C9E240    A TEST THIS IS
              00000040  C140E3C5 E2E340E3 C8C9E240 C9E240C1   A TEST THIS IS A
              00000050  40E3C5E2 E3C8C9E2 40C9E240 C140E3C5    TESTHIS IS A TE
              00000060  E2E340E3 C8C9E240 C9E240C1 40E3C5E2   ST THIS IS A TES
              00000070  E340E3C8 C9E240C9 E240C140 40E3C8C9   T THIS IS A  THI
              00000080  E240C9E2 40C140E3 C5E2E340 E3C8C9E2   S IS A TEST THIS
              00000090  40C9E240 C140E3C5 E2E340E3 C8C9E240    IS A TEST THIS
              000000A0  C9E240C1 40E3C5E2 E3C8C9E2 40C9E240   IS A TESTHIS IS
              000000B0  C140E3C5 E2E340E3 C8C9E240 C9E240C1   A TEST THIS IS A
              000000C0  40E3C5E2 E340E3C8 C9E240C9 E240C140    TEST THIS IS A
```

The starting address is 00000000 and the sample text reads `THIS IS A TEST`.

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Changing the Start Address

To change the start address, follow this procedure:

Step 1 In the DSPCDUMP view, move the cursor to the **Start Addr** field, type the desired address, and then press **Enter**.

In this exercise, as shown in Figure 2-29, you are using 00000090.

Figure 2-29 Start Address Change in DSPCDUMP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Dspc Name.. DSPCONE
   Addr Space. BMVSLK1V
   Start Addr. 00000090
   Size in 4Ks 0000098A
               Offset    Hexadecimal                            Character
               00000090  40C9E240 C140E3C5 E2E340E3 C8C9E240    IS A TEST THIS
               000000A0  C9E240C1 40E3C5E2 E3C8C9E2 40C9E240   IS A TESTHIS IS
               000000B0  C140E3C5 E2E340E3 C8C9E240 C9E240C1   A TEST THIS IS A
               000000C0  40E3C5E2 E340E3C8 C9E240C9 E240C140    TEST THIS IS A
               000000D0  40E3C8C9 E240C9E2 40C140E3 C5E2E340    THIS IS A TEST
               000000E0  E3C8C9E2 40C9E240 C140E3C5 E2E340E3   THIS IS A TEST T
               000000F0  C8C9E240 C9E240C1 40E3C5E2 E3C8C9E2   HIS IS A TESTHIS
               00000100  40C9E240 C140E3C5 E2E340E3 C8C9E240    IS A TEST THIS
               00000110  C9E240C1 40E3C5E2 E340E3C8 C9E240C9   IS A TEST THIS I
               00000120  E240C140 40E3C8C9 E240C9E2 40C140E3   S A  THIS IS A T
               00000130  C5E2E340 E3C8C9E2 40C9E240 C140E3C5   EST THIS IS A TE
               00000140  E2E340E3 C8C9E240 C9E240C1 40E3C5E2   ST THIS IS A TES
               00000150  E3C8C9E2 40C9E240 C140E3C5 E2E340E3   THIS IS A TEST T
               00000160  C8C9E240 C9E240C1 40E3C5E2 E340E3C8   HIS IS A TEST TH
```

Step 2 For the number 00000090 in the **Offset** field, replace the 9 with a **0** and press **Enter**.

The **Start Addr** field displays the original address.

Changing the Contents of the Data Space

To change the contents of a data space, follow this procedure:

Step 1 Move the cursor to the line in the **Offset** field that corresponds to the line of characters that you want to change.

For this exercise, use the offset 00000000.

Step 2 Type an uppercase or lowercase **Z** (Zap) over the first character, as shown in Figure 2-30 on page 2-44, but do *not* press **Enter** yet.

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Figure 2-30 Changing Data Space Contents in DSPCDUMP

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Dspc Name.. DSPCONE
   Addr Space. BMVSLK1V
   Start Addr. 00000000
   Size in 4Ks 0000098A
               Offset    Hexadecimal                            Character
               z0000000  E3C8C9E2 40C9E240 C140E3C5 E2E340E3   THIS IS A TEST T
               00000010  C8C9E240 C9E240C1 40E3C5E2 E340E3C8   HIS IS A TEST TH
               00000020  C9E240C9 E240C140 40E3C8C9 E240C9E2   IS IS A  THIS IS
               00000030  40C140E3 C5E2E340 E3C8C9E2 40C9E240    A TEST THIS IS
               00000040  C140E3C5 E2E340E3 C8C9E240 C9E240C1   A TEST THIS IS A
```

Step 3 Place the cursor in the **Hexadecimal** field that you want to change, and then type over the characters.

In this example, replace E3C8C9E2 with **A38881A3**.

Step 4 Press **Enter**.

In the **Character** field, the word *THIS* has been replaced by the word *that*, as shown in Figure 2-31. This change is displayed and also made in storage as soon as you press **Enter**.

Figure 2-31 DSPCDUMP View, with Data Space Changes Applied

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Dspc Name.. DSPCONE
   Addr Space. BMVSLK1V
   Start Addr. 00000000
   Size in 4Ks 0000098A
               Offset    Hexadecimal                            Character
               00000000  A38881A3 40C9E240 C140E3C5 E2E340E3   that IS A TEST T
               00000010  C8C9E240 C9E240C1 40E3C5E2 E340E3C8   HIS IS A TEST TH
               00000020  C9E240C9 E240C140 40E3C8C9 E240C9E2   IS IS A  THIS IS
               00000030  40C140E3 C5E2E340 E3C8C9E2 40C9E240    A TEST THIS IS
```

Note: All input data is ignored that is not typed in both the **Offset** and **Hexadecimal** fields on the *same* line.

You *must* type an uppercase or lowercase Z in the first space in the **Offset** field to avoid getting an error message. Typing a Z in the **Offset** field is a precaution against changes being made if keyboard characters are inadvertently typed.

Step 5 Move the cursor to the **COMMAND** line and type **CANcel**.

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The original hexadecimal characters are restored and the **Character** field has reverted back to the word *THIS*.

Warning! When the **Start Addr** field has been changed after a field modification is made, you cannot use the CANcel command to restore the original contents. You must type data manually by using the Z command.

Error Messages

Messages explaining an error or omission are usually displayed immediately following an incorrect request. However, some key sequences cause an error character (E) to be displayed.

The steps in this section create an error condition indicated by the character E, and then determine the cause of the error and how to correct it.

Step 1 Move the cursor to the third line in the **Offset** field.

Step 2 Type a **Z** in the second or third character position.

Step 3 Move the cursor to the **Hexadecimal** field, and replace the characters with anything (such as **C1C1C1C1**); then press **Enter**.

The contents of the data space do not change this time. The character E is displayed before the **Dspc Name** field (left side of screen), as shown in Figure 2-32.

Figure 2-32 DSPCDUMP Error Message Prompt

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =DSPCDUMP==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
E  Dspc Name.. DSPCONE
   Addr Space. BMVSLK1V
   Start Addr. 00000000
   Size in 4Ks 0000098A
               Offset    Hexadecimal                           Character
               00000000  E3C8C9E2 40C9E240 C140E3C5 E2E340E3   THIS IS A TEST T
               00000010  C8C9E240 C9E240C1 40E3C5E2 E340E3C8   HIS IS A TEST TH
               00000020  C9E240C9 E240C140 40E3C8C9 E240C9E2   IS IS A  THIS IS
               00000030  40C140E3 C5E2E340 E3C8C9E2 40C9E240    A TEST THIS IS
```

Step 4 Hyperlink on the **E** character to display the related message.

In this case, the message is `You must specify a ‘z’ or ‘Z’ in the offset field.`

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Even though you did type a **Z**, it was in the wrong character position. The Z must always be in the first character position of the **Offset** field, on the same horizontal line where you are typing over the hexadecimal characters.

Step 5 Press **Enter** to remove the E, and then retry your change.

You can cancel your test program when you have finished this tutorial; otherwise, it will be terminated in approximately three hours.

Performance Scenarios

Each scenario in this section opens with a hypothetical performance problem, then moves through a succession of views until the source of the problem is pinpointed.

Note that these scenarios illustrate only the most common path through MAINVIEW for OS/390. Depending on your level of expertise, you might want to select a different, more sophisticated problem-solving methodology.

Scenario 1: Why Did NITEBAT Finish So Late?

The job NITEBAT finished well past its scheduled completion time last night. As a result, activity in several areas of the company has been delayed. It is your job to figure out why this situation happened and to prevent it from happening again.

NITEBAT was supposed to finish at 1:20 A.M. this morning. Your first step, then, is to look at the system as it existed at 1:20 A.M. and begin gathering clues.

To do so, follow this procedure:

Step 1 On the **COMMAND** line, type the TIME command for window 1 (using the format *mm/dd/yyyy*):

TIME 11/10/2001 01:20:00

Until you specify otherwise, all views displayed in window 1 automatically retrieve data from the historical database for the interval between 1:15 and 1:30 A.M. (the interval containing 1:20).

You know for certain that NITEBAT experienced considerable delay last night, but you want to determine whether any other workloads were delayed.

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Step 2 On the **COMMAND** line, type **WDELAY**.

The WDELAY view is displayed, as shown in Figure 2-33.

Figure 2-33 WDELAY View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =WDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===34
 C Workload T #AS        Total Delay%   %Dly  %Dly  %Dly  %Dly  %Dly  %Dly  %Dly
 - -------- - ---        0....50...100   CPU   Dev  Stor   ENQ   SRM  Subs  Idle
   BATJOBS  B   4  83.01 ***********     2.5   4.2   1.3  75.0
   PGRP0030 P  21  22.76 ***            21.6   1.2   0.1   1.6
   ALLSTC   S  84  16.19 **             13.3   3.0   0.1   0.4
   ALLWKLDS C  90   1.11                       0.7         0.4
   ALLBAT   B   1
   TEMPCMP  C   8
   JCBATCH  B
   ALLOMVS  O
   PAYBAT   B   1
   PAYROLL  C   6
   PAYTSO   T   5
   PGRP0041 P
   PGRP0000 P  30
```

Scanning the Total Delay% column, you discover that no workload was as critically delayed as BATJOBS, the workload containing NITEBAT. BATJOBS spent 83 percent of the interval waiting for one or more resources. Of the total delay, 75 percent was due to enqueue contention. How much of this delay was experienced by NITEBAT in particular? Were other jobs in BATJOBS affected by enqueue delay as well?

To answer these questions, you can type **JDELAY** on the **COMMAND** line, or you can rely on MAINVIEW for OS/390 predefined hyperlinks to anticipate your information needs. You decide to take the easier route.

Step 3 Position your cursor beneath the **%DLY ENQ** field and press **Enter** to hyperlink to JDELAY, as shown in Figure 2-34.

Figure 2-34 JDELAY View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =JDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 C Jobname  T SrvClass        Total Delay %   %Dly  %Dly  %Dly  %Dly  %Dly  %Dly
 - -------- - --------        0.....50...100   CPU   DEV  Stor   ENQ   SRM  Subs
   NITEBAT  B PGRP0336 100.00 **************                     100.0
   LGS11Q1  B PGRP0336  45.42 *******        38.00  3.64  0.52  3.26
   DDBBKUP  B PGRP0336  39.32 ******         24.38 11.79  3.15
   LGS6CPRS B PGRP0336  26.09 ****           23.91  2.17
```

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JDELAY breaks down the BATJOBS workload into its individual jobs and reports on the delays experienced by each job. As you can see, NITEBAT was delayed the longest of all jobs in BATJOBS—a total delay of 100 percent, and all of it due to enqueue contention.

The next logical step is to identify the enqueue resource causing the delay. As soon as you identify the resource, you can find out why NITEBAT spent so much time contending for it.

Step 4 On the line pertaining to NITEBAT, move your cursor to the **%DLY ENQ** field and press **Enter**.

MAINVIEW for OS/390 hyperlinks to the JDENQ view, as shown in Figure 2-35.

Figure 2-35 JDENQ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =JDENQ=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
C Waiting  %Dly Wait Major    Minor RName ENQ    Owning   Owner ENQ    ENQ
- Job-----  ENQ Want QName--- ------------Status Job----- SysId Scope- Start
  SYSB     1.22 Excl SYSZTIOT    = \      Ended  SYSB     SYSB  System 01:10
  MIM      3.26 Excl SYSDSN   LGS1.CNTL   Ended  LGS11    SYSB  System 01:23
  LGS11Q1  3.26 Excl SYSDSN   LGS1.CNTL   Ended  LGS11    SYSB  System 01:23
  NITEBAT 100.0 Excl SYSDSN   SYS.MCS.MCS Ended  DDBBKUP  SYSB  System 01:01
```

The Waiting Job column tells you that NITEBAT is waiting for the logical enqueue resource identified by the major name SYSDSN, indicating that the resource is a data set. The minor name, SYS.MCS.MCS, is the name of the data set itself. And as you can see from the Owning Job column, a job called DDBBKUP currently owns the resource.

Step 5 To find out more about this job, position your cursor under **Minor RName** and press **Enter** to display the JUENQ view, as shown in Figure 2-36.

Figure 2-36 JUENQ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =JDENQ====JUENQ====SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
C Owning   %Use Ownr Major    Minor RName    ENQ    Waiting  Waitr ENQ    ENQ
- Job-----  ENQ Has- QName--- -------------- Status Job----- SysId Scope- Start
  DDBBKUP  97.2 Excl SYSDSN   SYS.MCS.MCS    Ended  NITEBAT  SYSB  System 01:01:
```

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There is the problem. DDBBKUP has been assigned exclusive (Excl) use of this enqueue resource, holding it for 97 percent during the 1:15 to 1:30 A.M. interval. All other jobs, including NITEBAT, are restricted from this resource until DDBBKUP completes execution.

Now that you know what caused last night's delay, you are in position to ensure that it does not happen again. One solution is to reschedule DDBBKUP so that it runs after NITEBAT has completed (although your site might prefer an alternative method).

Scenario 2: Why Is ENGM Using So Much CSA Storage?

As part of your daily routine, you display the WARN view to check on Exception Monitor warning messages. One of the WARN messages indicates that job ENGM is currently consuming 25 percent of CSA. You must find out why, and then correct the problem before the CSA shortage affects other jobs.

You know there is a MAINVIEW for OS/390 system utility to help you troubleshoot this problem, but you do not know which command to use to access it. To find out, follow this procedure:

Step 1 On the **COMMAND** line, type **MAIN** to display the View Selection panel.

Step 2 Select **UTILITY** to see a list of the MAINVIEW for OS/390 system utilities, as shown in Figure 2-37.

Figure 2-37 UTILITY View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =UTILITY===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 C View Name  Description
 - ---------- ------------------------------
   CONSOLES   List of available consoles
   CSMON      Common storage monitor
   EMSTAT     Exception Administration Dial.
   SYSPROG    System programmer services
   WARN       SYSPROG Warning records
```

CSMON, Common storage monitor, is the tool that you need.

Step 3 Position your cursor under **CSMON** and press **Enter**.

The Common Storage Summary panel is displayed, as shown in Figure 2-38 on page 2-50.

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Figure 2-38 Common Storage Summary Panel, Ranking Jobs using Common Storage

```
---------------------------- Common Storage Summary -------------- Row 1 of 55
COMMAND ===>                                                  SCROLL ===> PAGE
                                                              TARGET - SYSE
Valid line commands are:                Valid COMMANDs are:
S - Select storage display criteria   F      - Find a name in the list
                                      O      - Order list by any field name
                                      G      - Graph allocated common storage
                                      STAT   - Common storage monitor status
CSA: 3596K ( 29%) ECSA: 3596K ( 41%)  DETAIL - Display detail for allocations
SQA: 10 7K ( 48%) ESQA: 9792K ( 35%)  OVER   - Overview of common storage usage
                                                                        *
 Name     X ASID    CSA<16M    CSA>16M    SQA<16M    SQA>16M      Total   %
-------------------------------------------------------------------------------
 ENGM     *  151      21152    4010672      17480      74560    4123864 35.69
 **UNKN**      0     148392    1054160     141512    2185584    3529648 30.55
 NETB         43      23344     983576         72      20528    1027520  8.89
 CMFXAWT      53      43504     638912        464      34552     717432  6.21
 HIPERC       59      56072     325416        688        408     382584  3.31
 PMOPROC  *   45      32544     329536       4680        592     367352  3.18
 CASB         51      20464     266696         72        416     287648  2.49
 MAINVUB      93      61440     215880       8264        896     286480  2.48
 X37B     *   49      18416     211792         72        672     230952  2.00
 CSRP     *   15      22296     183408         72       4864     210640  1.82
```

The Common Storage Summary panel lists all jobs using common storage, ranking them in order from the highest consumption level to the lowest level.

As you can see, COMMON STORAGE MONITOR does not operate in the MAINVIEW window environment. Accordingly, your current system (SYSE) is listed in the **TARGET** field in the upper right-hand corner of your screen, rather than on the MAINVIEW window information line. You will return to the MAINVIEW window environment when you end your COMMON STORAGE MONITOR session.

Because ENGM is flagged with an asterisk, you know that it is no longer active. However, it is still holding 4 MB of CSA storage and a considerable amount of SQA storage as well.

Frequently, storage attributed to a job is actually used by many jobs; therefore, freeing all storage attributed to a terminated job might cause a system failure even though most of the storage can safely be freed. Before freeing the storage allocated by ENGM, you will want to see a list of the actual storage areas abandoned by the job.

Step 4 Type an **S** (Select) next to **ENGM** (the job name), and then press **Enter**.

The Selection and Sort Criteria for Storage Areas panel is displayed, as shown in Figure 2-39 on page 2-51.

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Figure 2-39 Selection and Sort Criteria for Storage Areas Panel

```
---------------- Selection and Sort Criteria for Storage Areas ----------------
COMMAND ===>
                      Selection Criteria for Storage Areas

   NAME     ===> ENGM    ASID  ===> 151   (Omit for all owners)
   SUBPOOLS ===> ALL   (226, 227, 228, 231, 239, 241, 245;
                        DRF, CSA, SQA, FIX, PAG, or ALL)
   RMODE    ===> ANY   (Enter 24, 31 or ANY)
   KEY      ===> ALL   (Storage key 0 through 15, or ALL)
   STARTING ===> YES   (Enter NO to exclude job names of STARTING)
   ACTIVE   ===> YES   (Enter NO to exclude active address spaces; show only *)
   LENGTH   ===> 0            TO  ===> MAX          (Range in decimal or hex)
   B DATE   ===> 11/10/YYYY  B TIME  ===> 14:52:53  (Beginning date and time)
   E DATE   ===> 11/10/YYYY  E TIME  ===> 23:59:59  (Ending date and time)

                                 Sort Criteria
   SORT BY  ===> LENGTH      (Valid sort fields are:
                              NAME, ASID, START, LENGTH, SP KEY, TIME, HEADER)
   DIR.     ===> D    (A=Ascending, D=Descending)

Press ENTER key to display storage areas
Enter END command to cancel request
```

To identify common attributes or patterns, you might want to sort the data on various fields.

Step 5 Sort the storage by size first and look for large blocks of storage and repetitions of the same size.

Step 6 When you find a large number of a repetitious size, check the subpool and key, which might be the same.

Having numerous blocks with the same size, subpool, and key is suspicious, and they might be allocated at a single location. This information is useful in finding and correcting a coding error. (This analysis could lead to the access code of some vendor product, which might be good information to pass on to the vendor.)

Sorting the data by time might identify clusters of activity.

Step 7 Examine the console log to determine what was occurring at these times. By using the CSMON browse feature, you can browse the contents of these blocks to see if they contain activity that ties them to a particular event.

After assessing these possibilities, you can then make a knowledgeable decision about the blocks of storage that you want to free.

Step 8 Press **Enter** to display storage areas for ENGM.

Your screen now displays the allocated common storage areas for ENGM, as shown in Figure 2-40 on page 2-52.

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Figure 2-40 Allocated Common Storage Areas View

```
------------------------ Allocated Common Storage Areas -----------------------
COMMAND ===>                                                  SCROLL ===> PAGE
                                                         Row 1       of    4583
Valid line commands are:               Valid COMMANDs are:
B - Browse common storage              F - Find a text string in header
A - Alter common storage               L - Locate a value in the ordered field
F - Free common storage                O - Order data by specified field

  Name    X ASID    Start  Length  SP Key   Date      Time     Storage Header
-------------------------------------------------------------------------------
  ENGM      151  01841008 1150968 245  0 11/10/YYYY 14:52:53 *STQE5..*........*
  ENGM      151  114B3000 1114112 241  6 11/10/YYYY 14:52:53 *CSLA.....*......*
  ENGM      151  11A73010 1060848 231  0 11/10/YYYY 14:52:53 *RMA ............*
  ENGM      151  11240028 1028056 227  6 11/10/YYYY 14:52:53 *...-...HT -.....*
  ENGM      151  11D92000  544768 241  5 11/10/YYYY 14:52:53 *................*
  ENGM      151  01FD9010  503792 245  0 11/10/YYYY 14:52:53 *....... ........*
  ENGM      151  115C3000  454656 228  6 11/10/YYYY 14:52:53 *CSLA..0.........*
  ENGM      151  0249D6C8  440632 245  0 11/10/YYYY 14:52:53 *................*
  ENGM      151  0F36C000  405504 231  7 11/10/YYYY 14:52:53 *TRACE TABLE:  CS*
  ENGM      151  0F5D5040  397248 241  0 11/10/YYYY 14:52:53 *................*
  ENGM      151  1092F240  376256 228  6 11/10/YYYY 14:52:53 *CSRCPAB.EZAZCSRB*
  ENGM      151  0FCDF000  364544 241  4 11/10/YYYY 14:52:53 *SYSEVENT INTERCE*
```

Step 9 Next to the blocks of common storage that you want to free, type an **F** (free), and then press **Enter**.

A pop-up window, Confirm Free for Storage Area, is displayed with the description of the storage area that you have selected, as shown in Figure 2-41.

Figure 2-41 Confirm Free for Storage Area Pop-Up Window

```
------------------------ Allocated Common Storage Areas -----------------------
COMMAND ===>                                                  SCROLL ===> PAGE
                                                         Row 1       of    4583
Valid line commands are:               Valid COMMANDs are:
B - Browse common storage              F - Find a text string in header
A - Alter common storage               L - Locate a value in the ordered field
F - Free common storage                O - Order data by specified field

  Name    X ASID    Start  Length  SP Key   Date      Time     Storage Header
-------------------------------------------------------------------------------
F ENGM      151  0EFDD000 2301920 228  3 11/10/YYYY 14:52:53 *BBXCSST 2000.314*
F ENGM      151  01      Confirm Free for Storage Area        STQE5..*........*
  ENGM      151  11                                           CSLA.....*......*
  ENGM      151  11        (Press HELP for Cautions)          RMA ............*
  ENGM      151  11                                           ...-...HT -.....*
F ENGM      151  11    Address: 0EFDD000  Subpool: 228        ................*
  ENGM      151  01    Length:  2301920   Key:     4          ....... ........*
  ENGM      151  11                                           CSLA..0.........*
  ENGM      151  02      Set free confirmation off            ................*
  ENGM      151  0F                                           TRACE TABLE:  CS*
  ENGM      151  0F      Press ENTER to confirm FREE          ................*
  ENGM      151  10            END to cancel FREE             CSRCPAB.EZAZCSRB*
  ENGM      151  0F                                           SYSEVENT INTERCE*
  ENGM      151  11AF9618   77712 228  3 11/10/YYYY 14:21:47  ................*
```

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Step 10 To free multiple blocks, type a / (slash) on the left side of `Set free confirmation off` before you press **Enter**.

Warning! Use the Free command with extreme caution. Indiscriminate freeing of common storage can cause system or component failure.

Step 11 When you are finished, press **PF3** (END) a few times to return to the UTILITY view.

Step 12 Type **WARN** to ensure that a CSA shortage no longer exists.

When the original warning message disappears, you know that the problem is solved.

Scenario 3: Is the Problem on Another System?

As you survey the system, you notice from the WRT view that the workload, TSO1, experienced an extremely high response time during performance period 3—a full 17.43 seconds. Performance period 3 is typically characterized by both heavy computations and heavy I/O. Which one is responsible for the TSO1 delay?

Step 1 To begin your investigation, type **WDELAY** on the **COMMAND** line to display an overview of all workload delays, as shown in Figure 2-42 on page 2-54.

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Figure 2-42 WDELAY View, Showing All Workload Delays

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
>W1 =WDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===55
C Workload Intvl T #AS        Total Delay%   %Dly  %Dly  %Dly  %Dly  %Dly  %Dly
- -------- Time- - ---        0....50...100   CPU   Dev  Stor   ENQ   SRM  Subs
   TSO1     14:42 T   3  75.01  ********    14.77  60.3
   STCNRM   14:44 S  39   3.52               0.69  0.03  0.08  2.46        0.25
   STC      14:44 W  48   3.04               0.62  0.03  0.13  1.97        0.29
   ALLBAT   14:44 B   3   2.63               2.53  0.04        0.07
   BATCH    14:44 W   3   2.63               2.53  0.04        0.07
   BATNRM   14:44 S   3   2.63               2.53  0.04        0.07
   ALLSTC   14:44 S 106   1.92               0.21  0.01  0.04  0.54        1.13
   SYSTEM   14:44 S  17   1.71               0.02        0.00  0.01        1.67
   GABY     14:44 S   6   1.57               0.39        0.51              0.67
   STCPAS   14:44 S   6   1.57               0.39        0.51              0.67
   GABY9    14:44 S   6   1.57               0.39        0.51              0.67
   TST      14:44 S   2   1.37               0.49        0.88
   ALLWKLDS 14:44 C 135   0.78               0.12  0.00  0.02  0.21        0.44
   SYSTEM   14:44 W  58   0.73               0.03        0.00  0.00        0.70
   GRS      14:44 S   1   0.63               0.63
   GABY2    14:44 S  31   0.45               0.36  0.02  0.02  0.04
   SYSSTC   14:44 S  41   0.33               0.03                          0.29
   JES2     14:44 S   2   0.29               0.29
   GABY1    14:44 S   2   0.29               0.29
```

As you can see, workload TSO1 has been experiencing a delay of 75 percent during the current interval, and 60 percent of that delay was due to some type of device. How widespread is the problem—were all of the address spaces in TSO1 delayed?

To find out, open another window by using the VS (vertical split) command.

Step 2 On the **COMMAND** line, type **VS**, but do *not* press **Enter** yet.

Step 3 Position your cursor at the **#AS** field.

Step 4 Press **Enter**.

Step 5 In the **ALT WIN** field, type **2**.

Step 6 Hyperlink on workload **TSO1**.

The JDELAY view is displayed in window 2, as shown in Figure 2-43 on page 2-55.

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Figure 2-43 WDELAY and JDELAY Views

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 2        ALT WIN ===>
 >W1 -WDELAY------- >W2 =JDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS
 C Workload Intvl T | C Jobname  Intvl T SrvClass        Total Delay %   %Dly  %
 - -------- Time- - | - -------- Time- - --------        0.....50...100   CPU
   TSO1     14:57 B |   USER1    14:57 T PGRP0002  93.29 **************  0.36
   BATCH    14:57 W |   LGS12    14:57 T PGRP0002  12.88 **              0.60
   BATNRM   14:57 S |   DSF1     14:57 T PGRP0001   5.60 *
   TST      14:57 S |
   SYSTEM   14:57 S |
   ALLSTC   14:57 S |
   ALLWKLDS 14:57 C |
   TESTCOMP 14:57 C |
   TSO      14:57 W |
   TSONRM   14:57 S |
   ALLTSO   14:57 T |
   GABY9    14:57 S |
   STCPAS   14:57 S |
   GABY     14:57 S |
   SYSTEM   14:57 W |
   GRS      14:57 S |
```

JDELAY reports the delays experienced by each job in TSO1. As you can see, the job USER1 has been delayed 93.29 percent of the current interval, 92.93 percent of which was spent waiting for a device.

To find out which device is responsible, open another window by using the HS (horizontal split) command:

Step 7 On the **COMMAND** line, type **HS**, but do *not* press **Enter** yet.

Step 8 Position your cursor about halfway down the screen.

Step 9 Press **Enter**.

Step 10 In the **ALT WIN** field, type **3** to direct the forthcoming view to the new window.

Step 11 Position the cursor on the JDELAY **%Dly DEV** field.

Step 12 Press **Enter**.

The DDJOB view is displayed in window 3, as shown in Figure 2-44 on page 2-56.

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Figure 2-44 WDELAY, JDELAY, and DDJOB Views

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 3        ALT WIN ===>
 >W1 -WDELAY------- >W2 =JDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS
 C Workload Intvl T | C Jobname  Intvl T SrvClass        Total Delay %   %Dly  %
 - -------- Time- - | - -------- Time- - --------        0.....50...100   CPU
   TSO1     14:57 B |   USER1    14:57 T PGRP0002  93.29 **************  0.36
   BATCH    14:57 W |   LGS12    14:57 T PGRP0002  12.88 **              0.60
   BATNRM   14:57 S |   DSF1     14:57 T PGRP0001   5.60 *
   TST      14:57 S |
   SYSTEM   14:57 S |
   ALLSTC   14:57 S |
 >W3 =DDJOB=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====5
 C Volser Intvl  Dev Type  LCU  Resp  Act. %Delay  %Delay Jobname  T SrvClass De
 - ------ Time-  Num ----  Num  Time  Rate AnyJob ThisJob -------- - --------  T
   SYSR2C 15:11  287 3380  02C  8.86  2.52  61.03   75.01 USER1    T PGRP0002 RE
   STRBC1 15:11  2A5 3390  02C  8.06  0.65   0.52    0.43 USER1    T PGRP0002 IO
```

DDJOB identifies all devices causing job delays and pinpoints the cause of each delay. As you can see from the %Delay ThisJob column, the device identified by Volser SYSR2C delayed USER1 75 percent of the last interval.

Using the MAINVIEW for OS/390 hyperlinks, available on most fields, you can explore any problem to the desired degree of depth. For example, you can hyperlink from Volser SYSR2C to DEVINFO, which shows detailed information about the device specified; from there, you can hyperlink to other fields.

You can also use the CONtext command, with an SSI context name if your site has defined one, to see if there is contention for your device on another system. For information about using CONtext and SSI, see “Using MAINVIEW for OS/390 on Multiple Systems” on page 1-24.

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Scenario 4: Why Is MFGTSO Not Meeting Its Service Objectives?

A phone call from Manufacturing informs you that the department's TSO users are not receiving adequate response time. You have to find out why and resolve the problem.

Your first step is to verify that a problem actually exists. You know that the workload for the department, MFGTSO, is supposed to have a response time of 3 seconds for 99 percent of its transactions. How successful is MFGTSO in meeting this objective?

To find out, follow this procedure:

Step 1 On the **COMMAND** line, type **WOBJ MFGTSO**.

The WOBJ view is displayed, as shown in Figure 2-45.

Figure 2-45 WOBJ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =WOBJ==============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
 C Workload Intvl Typ #AS       % Service Objective  Tran   Tran   Job  Jobs
 - -------- Time- --- ---       0.......50......100  Rate  Total Total  /Min
   MFGTS0   15:33 TSO  14  65.0 ************         0.04    337
```

As you can see, a problem does indeed exist—MFGTSO is meeting only 65 percent of its service objectives. Obviously MFGTSO is experiencing a delay somewhere in the system.

Step 2 Position your cursor in the **Workload** field, and then press **Enter** to hyperlink on **MFGTSO**.

A menu displays a range of view choices, all specific to MFGTSO, as shown in Figure 2-46 on page 2-58.

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Figure 2-46 Workload Menu for MFGTSO

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =WOBJ=====EZMWORK==SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                  Workload Menu
                               Timeframe - Interval

        Current Workload ->  MFGTSO

     Activity                +----------------------+    Resource Usage
   . Overview                |   Place cursor on    |  . Service Objectives
   . Workflow                |    menu item and     |  . SRM Service Units
   . Delay Reasons           |     press ENTER      |  . Response times
   . Using Resources         +----------------------+  . Address Spaces
   . Paging
   . Trending                                          . Administration
                                                       . Return...
```

Step 3 Place the cursor on **Delay Reasons**, and then press **Enter** to determine the causes of any delays to MFGTSO address spaces.

The WDELAY view is displayed, as shown in Figure 2-47.

Figure 2-47 WDELAY View, Showing Causes of Delay

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =WOBJ=====WDELAY===SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
 C Workload Intvl T #AS        Total Delay%   %Dly  %Dly  %Dly  %Dly  %Dly  %Dly
 - -------- Time- - ---        0....50...100   CPU   Dev  Stor   ENQ   SRM  Subs
   MFGTSO   15:33 T  33  45.03 *****         11.26   8.8             25.04
```

According to the Total Delay% column, MFGTSO spent 45 percent of the last interval waiting for one or more resources. The **%Dly SRM** field tells you that the highest portion of the delay, 25 percent, was due to SRM swapping.

To find out what kind of swapout is causing the delay, you need the WSRMD view, which tells you how long a workload is delayed due to SRM-recommended swapouts.

Step 4 Hyperlink on **%Dly SRM** or, on the **COMMAND** line type **WSRMD MFGTSO**.

The WSRMD view is displayed, as shown in Figure 2-48 on page 2-59.

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Figure 2-48 WSRMD View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =WOBJ=====WSRMD====SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
 C Workload Intvl Typ #AS  %Dly  %Dly  %Dly  %Dly  %Dly  %Dly  %Dly  %Dly  %Dly
 - -------- Time- --- ---   SRM  AuxS RealS ReqSw NqxSw ExcSw UniSw TrnSw   RTO
   MFGTSO   15:33 SCL   5  25.0               0.8              18.2
```

One look at the WSRMD **%Dly UniSw** field tells you that the highest portion of the total delay, 18.2 percent, is due to unilateral swapout. What is causing this delay? Is this a system-wide problem, or is it confined solely to the domain containing MFGTSO? To find out, you continue the investigation.

Step 5 Position your cursor under the **%Dly UniSw** field, and then press **Enter** to hyperlink to the SWPINFO view, as shown in Figure 2-49.

Figure 2-49 SWPINFO View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===>          ALT WIN ===>
  W1 =SWPINFO===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Swap           Swap      Log      Log     Expd     Expd      Aux    Total
   Reason       --Rate   -Swaps   Effect   Direct   Effect   Direct    Swaps
   Term In...      0.8    100.0      0.0      0.0    100.0      0.0     6.35
   Term Out..      2.6    100.0      0.0      0.0    100.0      0.0    20.63
   Det. wait.      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Long wait.      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Unilateral      8.2      0.0      0.0    100.0    100.0      0.0    65.08
   Enqueue...      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Exchange..      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Request...      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Aux. stor.      0.0      0.0      0.0      0.0      0.0      0.0     0.00
   Cent. stor      1.0    100.0      0.0      0.0    100.0      0.0     7.94
   Total Swap     12.6     95.7      0.0      4.3    100.0      0.0   100.00
```

According to the information displayed in the Swap Rate column, the total unilateral swap rate is indeed quite high: 8.2 swaps per second. Clearly, this is a system-wide problem. The probable explanation is that an SRM MPL adjustment threshold has been exceeded, and that SRM attempts to compensate are adversely affecting the MFGTSO performance.

To prove your theory, you need additional information about how SRM is operating.

Step 6 On the **COMMAND** line, type **MPLSTAT**.

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The SRM system MPL thresholds and their current values are displayed, as shown in Figure 2-50.

Figure 2-50 MPLSTAT View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MPLSTAT===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Keyword      Low     Curr     High   Effect   Comb   Description
   -------   Thresh    Value   Thresh   ------    Ind   --------------------
   RCCCPUT      128      104      128      Inc     No   CPU Utilization
   RCCCPUP        0      104        0     None    Yes   CPU Utilization
   RCCMSPT       20      100       40      Dec    Yes   Page delay time
   RCCPDLT        0        0        0     None     No   Page delay time
   RCCPTRT       60        0       80      Inc     No   Page fault rate
   PAGERTn       10        0        0     None    Yes   Demand paging rate
   RCCASMT     1000        0       90      Inc     No   ASM queue length
   RCCUICT        2      180        4      Inc     No   Unref Interval Count
   RCCFXTT       66       38       72      Inc     No   % of storage fixed
   RCCFXET       82       28       88      Inc     No   %storage <16M fixed
```

Your theory is correct. According to the RCCMSPT row, the system's high threshold is set for 40 milliseconds and the current value is 100. SRM is trying to reduce the work in the system by lowering domain MPLs.

One solution is to simply change the page delay time high threshold to 100 or higher. Before doing so, however, you must first ensure that you will not cause another problem by increasing the burden on the page data set configuration.

Step 7 To survey the configuration's current status, display the PGDSTAT view, as shown in Figure 2-51.

Figure 2-51 PGDSTAT View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =PGDSTAT===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 C DS Intvl PGDS  Volser  Dev Sts %Slts  Page I/O Rq AvgPg V %Busy Dataset Name
 - -- Time- Type- ------  Num ---  Used XfrTm   Rate / I/O - ----- -------------
    0 08:31 PLPA  MVSD12  D12 OK  64.24 37.44   0.05  0.64 N       PAGE.VMVSD12.
    1 08:31 COMN  MVSD12  D12 OK   0.52                    N       PAGE.VMVSD12.
    3 08:31 LOCL  MVSD12  D12 OK  92.31 25.21   1.25  7.95 Y 38.04 PAGE.VPAGE01.
    4 08:31 LOCL  MVSD12  D12 OK   5.01  4.62   0.94  2.94 N  2.59 PAGE.VPAGE02.
    5 08:31 LOCL  PAGEC1  917 OK   6.38 14.20   0.27  3.64 N  0.52 PAGE.VPAGEC1.
    6 08:31 LOCL  PAGEC1  917 OK   5.43 15.19   0.13  7.30 N  0.52 PAGE.VPAGEC2.
    7 08:31 LOCL  PAGEC1  917 OK  18.82 17.64   0.15  8.06 N  0.52 PAGE.VPAGEC3.
    8 08:31 LOCL  PAGEC1  917 OK  16.23  9.71   0.13  9.58 N       PAGE.VPAGEC4.
```

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It is a good thing that you checked. PAGE.VPAGE01.LOCAL is the only local data set enabled for VIO and is already under heavy demand. If you do not add another VIO-enabled data set before changing the RCCMSPT threshold, you will create a significant local paging delay.

To add another VIO-enabled data set, follow this procedure:

Step 1 On the **COMMAND** line, type **HS** (horizontal split) to open another window, and then press **Enter**.

Step 2 On the **COMMAND** line, type **CONSOLE** to simulate the OS/390 console, and then press **Enter**.

Step 3 On the **COMMAND** line, type **MVS PAGEADD**, and then press **Enter**.

Now that you have added an additional data set to offset the load on PAGE.VPAGE01.LOCAL, you can adjust both thresholds for RCCMSPT safely.

To adjust both thresholds while still using the CONSOLE view:

Step 1 Access SYS1.PARMLIB(IEAIPS*xx*) in edit mode.

Step 2 Assign higher values to RCCMSPL and RCCMSPH.

Step 3 Issue the **SET** command to refresh the SRM IPS.

Because of these increased values, SRM should no longer attempt to reduce work in the system.

Was this the correct solution? Is MFGTSO now meeting its service objective?

To find out, display WOBJ, as shown in Figure 2-52.

Figure 2-52 WOBJ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 >W1 =WOBJ=============SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D====4
C Workload Intvl Typ #AS       % Service Objective  Tran   Tran   Job  Jobs
 - -------- Time- --- ---       0.......50......100  Rate  Total Total  /Min
   JCTEST   09:28 TSO   4 101.3 ******************+  0.61    325
   MFGTS0   09:28 TSO  10 112.0 ******************+  0.57    418
```

You can see that MFGTSO is now successfully meeting its service objectives.

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Chapter 3 Controlling the OS/390 Data Collectors

This chapter introduces the OS/390 data collectors, explains how they work, describes how to use the DCSTAT view to control them, and lists the views affected by turning off each collector. It includes the following topics:

Data Collectors 3-2
Controlling the OS/390 Data Collectors 3-6
Turning Off OS/390 Data Collectors and Resulting Effect on Views . . . 3-8

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Data Collectors

The OS/390 data collectors are programs that extract system information from OS/390 control blocks for use by both MAINVIEW for OS/390 and CMF MONITOR.

At least one data collector exists for each aspect of system performance. For example, the PGDS collector collects only data associated with paging delays, while the ASEV and ASTM collectors focus on data related to address space activity.

Here is how the data collectors work:

1. At the beginning of every CMF Extractor interval, an *interval record* is created for *each* category of data to be collected. An interval record is what data collectors use to store the data collected during the Extractor interval.

2. Each category of data has its own uniquely named record: the LPAR collector stores its data in the LPRE record, the CPTH collector uses the CXRE record, and so on.

3. As soon as the interval begins, each collector collects its data from OS/390 control blocks, from the CMF Extractor, and from other collectors.

4. Subsequently, each collector periodically collects its data. The times at which collectors gather data are determined by a preset rate called a *sample rate* (also called a *collector rate*). Each collector has its own associated sample rate.

   A sample rate is simply a multiple of the *base cycle*, which is preset by MAINVIEW for OS/390 at a second. Therefore, if a collector's sample rate is 15, the collector gathers its data once every 15 seconds.

5. The data collectors deposit the data in their records. Data for interval views is deposited in fields called *interval counters*; real-time data is placed in a *delta counter*. Each counter treats its data a little differently. If you are interested in these differences, see "How the Counters Work" on page 3-4.

6. At the end of the CMF Extractor interval, every interval record—one for each collector—is written to the historical database. Then a new set of interval records is created, and the process begins again.

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In general, MAINVIEW for OS/390 terminates a recording interval at the frequency specified by your CMF Extractor REPORT control statement. However, Workload Management (WLM) resets its data when

— a service policy is activated

  Example: **VARY WLM,POLICY=**

— a new IPS or ICS is set

  Example: **SET IPS=** or **SET ICS=**

— the workload management mode changes

  Example: **MODIFY WLM,MODE=**

When you enter any of these system commands, MAINVIEW for OS/390 immediately terminates the current recording interval and starts a new interval.

How a View is Created

It is important to understand how collected data relates to what you see on your screen. When you request a view from MAINVIEW for OS/390 or CMF MONITOR, the following actions occur:

- MAINVIEW for OS/390 or CMF checks the view's definition to determine the data that the view requires. For example, the CPSTAT view definition tells MAINVIEW for OS/390 to get data from the CXRE record (which stores data gathered by the CPTH collector).
- MAINVIEW for OS/390 accesses the applicable record (in this example, the current CXRE record). Because CPSTAT is an interval view, MAINVIEW for OS/390 takes the data from the CXRE interval counter, as opposed to its delta counters.
- MAINVIEW for OS/390 formats the data according to the specifications in the view definition. This formatted data is now considered a complete view.
- The view is displayed on your monitor.

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How the Counters Work

Each interval record can contain two kinds of data: interval counters and delta counters. The data in each kind of counter is treated a bit differently, as described here:

- An *interval counter* is accumulated over a single interval.

  For example, suppose a collector's sample rate is 5 seconds and the interval is 15 minutes. At the beginning of the interval, the collector gathers its initial data. This data is written to the interval counter and is immediately reflected in the associated interval views. Five seconds later, additional data is gathered. The collector adds this new data to the initial data that was already in the interval data.

  This process is repeated five seconds later and continues for 15 minutes (the end of the interval), at which point a new interval record is created with new interval data fields reset to zero. Views display interval data as average values over all of the samples accumulated during the interval.

- A *delta counter* is used to compute the difference between values at the beginning and end of each sample.

  For example, suppose a collector's sample rate is 15 seconds. At the beginning of the interval the collector gathers its initial data and places it in the delta counter. Fifteen seconds later, a new batch of data arrives. The collector then calculates the *difference* between the new values and the initial values. This data is used to fulfill requests for real-time data.

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How OS/390 Data Collectors Work with the Extractor

Both the OS/390 data collectors and the CMF Extractor run in the OS/390 PAS. Although the Extractor can be run separately from the data collectors (through the DC=STOP parameter), the opposite is not entirely true. Many collectors depend on data supplied by the Extractor.

Table 3-1 lists the MAINVIEW for OS/390 data collectors that depend on data supplied by the Extractor and the required CMF Extractor sampler.

Table 3-1 Data Collectors and CMF Extractor Samplers

Data Collector	CMF Extractor Sampler
DEVX	DEVICE CLASS=DASD|TAPE
CPU	CPU
SPAG	PAGING
CACH	CACHE
PGDS	ASMDATA

If you are planning to use any views that fall into these categories, you must keep the Extractor active with the appropriate samplers.

Despite these dependencies, the OS/390 data collectors and the Extractor are actually discrete entities that can be controlled quite separately, as shown in Table 3-2.

Table 3-2 Controlling the CMF Extractor and OS/390 Data Collectors

To Do This	Follow This Procedure
Start or stop all of the OS/390 data collectors at once	Specify the DC=START or DC=STOP parameter in the JCL used to initialize the OS/390 PAS. If the PAS is already active, issue **MVS MODIFY DC=START** or **MVS MODIFY DC=STOP** against the PAS.
Start or stop individual OS/390 data collectors	Use the DCSTAT view as described in “Controlling the OS/390 Data Collectors” on page 3-6.
Change the CMF Extractor samplers before PAS initialization	Specify a new control statement member suffix on the CPM or IPM parameter in the JCL used to initialize the OS/390 PAS.
Change the CMF Extractor samplers after PAS initialization	Use the **MVS MODIFY CPM=*xx*** or **IPM=*xx*** command against the PAS, where *xx* is the suffix of another CMF control statement member containing a different set of samplers.

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These parameters are described in more detail in “Manually Customizing MAINVIEW for OS/390” in the *MAINVIEW® for OS/390 Customization Guide.*

Controlling the OS/390 Data Collectors

Use the DCSTAT view to control individual OS/390 data collectors. The DCSTAT view is shown in Figure 3-1.

Figure 3-1 DCSTAT View

```
10AUG2001  17:27:29 -------- MAINVIEW WINDOW INTERFACE MVMVS ------------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =DCSTAT============SJSD=====*========10AUG2001==17:27:29====MVMVS====D===38
C Name Data Collector Description     Status
- ---- ------------------------------ --------
  AOC  AutoOperator Control           Inactive
  ASEV Address Space Event            Active
  ASTM Address Space Timed            Active
  CACH Cache                          Active
  CFAC Coupling Facility              Active
  CPTH Channel Path                   Active
  CPU  CPU                            Active
  CPUD CPU Delay                      Active
  CSRE Common Storage                 Active
  DEVX Device                         Active
  DOMN SRM Domain                     Active
  ENQ  Enqueue and Enque Delay        Active
  HSMD HSM Delay                      Active
  IOQ  I/O Queuing Delay              Active
  JESD JES Delay                      Active
  JSTM Job Step Timed                 Active
  LCU  Logical Control Unit           Active
  LPAR Logical Partition              Active
  MSCP MVScope                        Active
  MSGD MSG Delay                      Active
  PGDS Page and Swap Data Set         Active
  PIOD Paging I/O Delay               Active
  RWRN Resolve Warning                Active
  SCPU System CPU                     Active
  SMS  System Managed Storage         Active
  SPAG System Paging                  Active
  SRMD SRM Delay                      Active
  SSUM System Summary                 Active
  SSWP System Swap Activity           Active
  SYST System                         Active
  WADR WLM Address Space              Active
  WKLD Workload                       Active
  WPRX WLM Extended Period            Active
  WSSM WLM Subsystem                  Active
  WUSM Delay and Use Summary          Active
  XCF  XCF                            Active
  XCFD XCF Delay                      Active
```

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The following table describes the DCSTAT view fields:

Field Name	Description
Collector	identifies the name of the data collector
Description	identifies the type of data collected
Status	identifies the current status of the data collector. Possible values are Active and Inactive.

Using DCSTAT

Use DCSTAT to display the current status of the OS/390 PAS data collectors and to enable or disable any collector.

Warning! To activate a collector, the collector must have been turned off through DCSTAT after initialization of the OS/390 PAS. You cannot activate a collector that was not originally activated when the PAS was initialized.

In addition, because the OS/390 data collectors are shared by both MAINVIEW for OS/390 and CMO, deactivating a collector in one product affects the other product. See “Controlling the OS/390 Data Collectors” on page 3-6 for more information.

Table 3-3 provides the procedure for enabling and disabling collectors through DCSTAT.

Table 3-3 Enabling and Disabling Collectors from DCSTAT

To Do This	Follow This Procedure
Activate an inactive collector	Type **A** next to the collector name, and then press **Enter**. The collector becomes active immediately. Because the collector was not active throughout the current interval, the data for the current interval could be slightly inaccurate.
Deactivate a collector immediately	Type **D** next to the collector name, and then press **Enter**. The collector is deactivated immediately.

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Turning Off OS/390 Data Collectors and Resulting Effect on Views

Table 3-4 lists the views that are affected by turning off each of the OS/390 data collectors and describes how the views in MAINVIEW for OS/390 and CMF MONITOR are affected.

Table 3-4 OS/390 Data Collectors and Product Views (Part 1 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
ASEV	ARD		X	When ASEV is turned off, all of these views contain invalid data. In addition, address spaces that are started after the collector is turned off do not appear on the views, and address spaces that are terminated after the collector is turned off are not removed from the views.
	ARDZ		X	
	ASD		X	
	ASDZ		X	
	ASRM		X	
	ASRMZ		X	
	DDJOB	X	X	
	DUJOB	X	X	
	JCPU	X	X	
	JCPUR	X		
	JCPUZ	X	X	
	JDDEV	X	X	
	JDDEVZ	X	X	
	JDELAY	X	X	
	JDELAYR	X		
	JDELAYZ	X	X	
	JDENQ	X	X	
	JDENQZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JHSMD	X	X	
	JHSMDZ	X	X	
	JINFO	X	X	
	JIO	X	X	
	JIOR	X		
	JIOZ	X	X	
	JOVER	X		
	JOVERR	X		
	JOVERZ	X	X	
	JPAGDM	X	X	
	JPAGDMR	X		
	JPAGDMZ	X	X	
	JPAGOV	X	X	
	JPAGOVR	X		
	JPAGOVZ	X	X	
	JPAGSW	X	X	
	JPAGSWR	X		
	JPAGSWZ	X	X	
	JPAGDM	X	X	
	JPAGDMR	X		
	JPAGDMZ	X	X	
	JPAGOV	X	X	
	JPAGOVR	X		

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Table 3-4 OS/390 Data Collectors and Product Views (Part 2 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
ASEV *(continued)*	JPAGSW	X	X	When ASEV is turned off, all of these views contain invalid data. In addition, address spaces that are started after the collector is turned off do not appear on the views, and address spaces that are terminated after the collector is turned off are not removed from the views.
	JPAGSWR	X		
	JPAGSWZ	X	X	
	JSABENDZ	X		
	JSCPU	X		
	JSCPUZ	X		
	JSDELAY	X		
	JSDELAYZ	X		
	JSINFO	X		
	JSIO	X		
	JSIOZ	X		
	JSOVER	X		
	JSOVERZ	X		
	JSPAGOV	X		
	JSPAGOVZ	X		
	JSRM	X	X	
	JSRMD	X	X	
	JSRMDR	X		
	JSRMDZ	X	X	
	JSRMR	X		
	JSRMZ	X		
	JSTERM	X		
	JSTERMZ	X		
	JSTOR	X	X	
	JSTORD	X	X	
	JSTORDR	X		
	JSTORR	X		
	JSTORZ	X	X	
	JSUBD	X	X	
	JSUBDR	X	X	
	JSUSE	X		
	JSUSEZ	X		
	JSSRM	X		
	JSSRMZ	X		
	JSSTOR	X		
	JSSTORD	X		
	JSSTORDZ	X		
	JSSTORZ	X		
	JSSRMD	X		
	JSSRMDZ	X		
	JSSUBD	X	X	
	JSSUBDZ	X	X	
	JUDEV	X	X	
	JUDEVZ	X	X	
	JUENQ	X	X	
	JUENQZ	X	X	
	JUSE	X		
	JUSEZ		X	
	SYSSUM	X	X	
	TRX	X		
	WCPU	X	X	
	WCPUR	X		
	WDELAY	X	X	
	WDELAYR	X	X	
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X		

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Table 3-4 OS/390 Data Collectors and Product Views (Part 3 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
ASEV *(continued)*	WIO	X		When ASEV is turned off, all of these views contain invalid data. In addition, address spaces that are started after the collector is turned off do not appear on the views, and address spaces that are terminated after the collector is turned off are not removed from the views.
	WIOR	X	X	
	WOBJ	X		
	WOVER	X	X	
	WOVERR	X		
	WPAGDM			
	WPAGDMR			
	WPAGOV	X		
	WPAGOVR	X		
	WPAGSW	X	X	
	WPAGSWR	X		
	WRT	X		
	WRTR	X		
	WSRM	X	X	
	WSRMD	X	X	
	WSRMR	X		
	WSTOR	X	X	
	WSTORD	X	X	
	WSTORR	X		
	WSUBD	X	X	
	WSUBDR	X	X	
	WTA	X		
	WUSE	X	X	
ASTM	ARD		X	When ASTM is turned off, all of these views contain invalid data, although the address space names that appear on each view are correct.
	ARDZ		X	
	ASD		X	
	ASDZ		X	
	ASRM		X	
	ASRMZ		X	
	DDJOB	X	X	
	DUJOB	X	X	
	JCPU	X	X	
	JCPUR	X		
	JCPUZ	X	X	
	JDDEV	X	X	
	JDDEVZ	X	X	
	JDELAY	X	X	
	JDELAYR	X		
	JDELAYZ	X	X	
	JDENQ	X	X	
	JDENQZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JINFO	X	X	
	JIO	X	X	
	JIOR	X		
	JIOZ	X	X	
	JOVER	X	X	
	JOVERR	X		
	JOVERZ	X	X	
	JPAGDM	X	X	
	JPAGDMR	X		
	JPAGDMZ	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 4 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
ASTM *(continued)*	JPAGOV	X	X	When ASTM is turned off, all of these views contain invalid data, although the address space names that appear on each view are correct.
	JPAGOVR	X		
	JPAGOVZ	X	X	
	JPAGSW|	X	X	
	JPAGSWR	X	X	
	JPAGSWZ	X	X	
	JSRM	X	X	
	JSRMD	X	X	
	JSRMZ	X	X	
	JSRMDZ	X	X	
	JSRMDR	X		
	JSRMR	X		
	JSTOR	X	X	
	JSTORD	X	X	
	JSTORDR	X		
	JSTORR	X		
	JSTORZ	X	X	
	JUDEV	X	X	
	JUDEVZ	X	X	
	JUENQ	X	X	
	JUENQZ	X	X	
	JUSE	X	X	
	JUSEZ	X	X	
	SYSSUM	X		
	TRX		X	
	WCPU	X	X	
	WCPUR	X		
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WIO	X	X	
	WIOR	X		
	WOBJ	X		
	WOVER	X	X	
	WOVERR	X		
	WPAGDM	X	X	
	WPAGDMR	X		
	WPAGOV	X		
	WPAGOVR	X		
	WPAGSW	X	X	
	WPAGSWR	X		
	WRT	X		
	WRTR	X		
	WSRM	X	X	
	WSRMD	X	X	
	WSRMR	X		
	WSTOR	X	X	
	WSTORD	X	X	
	WSTORR	X		
	WTA	X		
	WUSE	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 5 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
CACH	CACHSTAT CACHSTAZ	X X	X X	When CACH is turned off at the beginning of an interval, all fields reflecting cache activity are either blank or contain zeros. When CACH is turned off in the middle of an interval, these fields contain invalid data.
CFAC	CFCINFO CFINFO CFMON CFOVER CFOVERZ CFREQ CFREQZ CFSINFO CFSTAT CFSTOR CFSTORZ CFSTRUC CFSTRUCZ CFSTSTAT CFUINFO CFUSTAT	X X X X X X X X X X X X X X X X X	X X X X X X X X X X X X X X X X X	When CFAC is turned off at the beginning of an interval, all fields containing coupling facility data are either blank or contain zeros. If CFAC is turned off in the middle of an interval, these fields contain invalid data.
CPTH	CPSTAT CHANNEL	X	 X	If CPTH is turned off at the beginning of an interval, all fields reflecting channel path activity are either blank or contain zeros. If CPTH is turned off in the middle of an interval, these fields contain invalid data.
CPU	CPUSTAT CPUINFO	X X		If CPU is turned off at the beginning of an interval, all fields reflecting CPU activity are either blank or contain zeros. If CPU is turned off in the middle of an interval, these fields contain invalid data.

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Table 3-4 OS/390 Data Collectors and Product Views (Part 6 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
CPUD	JCPU	X	X	If CPUD is turned off at the beginning of an interval, all fields containing CPU delay percentages are either blank or contain zeros. If CPUD is turned off in the middle of an interval, these fields contain invalid data.
	JCPUR	X		
	JCPUZ	X	X	
	JDELAY	X	X	
	JDELAYR	X		
	JDELAYZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JOVER	X	X	
	JOVERR	X		
	JOVERZ	X	X	
	WCPU	X	X	
	WCPUR	X		
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WOVER	X	X	
	WOVERR	X		
CSRE	CSASUM	X	X	If CSRE is turned off at the beginning of an interval, all fields reflecting CSA data collection will be impacted and data will be invalid.
	STORCS	X	X	
	SYSPERF			
DEVX	CDEV	X	X	If DEVX is turned off at the beginning of an interval, all fields reflecting device activity are either blank or contain zeros. If DEVX is turned off in the middle of an interval, these fields contain invalid data.
	DEV	X	X	
	DDJOB	X	X	
	DEVINFO	X	X	
	DEVSTAT	X	X	
	DEVSTATZ	X	X	
	DUJOB	X	X	
	JDDEV	X	X	
	JUDEV	X	X	
	LDEV	X	X	
	PDEV	X	X	
	SDEV	X	X	
	SMSINFO	X	X	
	SMSSTAT	X	X	
DOMN	DDMN		X	If DOMN is turned off at the beginning of an interval, all fields reflecting domain activity are either blank or contain zeros. If DOMN is turned off in the middle of an interval, these fields contain invalid data.
	DMNSTAT	X		
	DMNSTATR	X		

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Table 3-4 OS/390 Data Collectors and Product Views (Part 7 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
ENQ	ENQSTAT	X	X	If ENQ is turned off at the beginning of an interval, all fields reflecting enqueue activity are either blank or contain zeros. If ENQ is turned off in the middle of an interval, these fields contain invalid data.
	JDENQ	X	X	
	JDENQZ	X	X	
	JUENQ	X	X	
	JUENQZ	X	X	
HSMD	JDELAY	X	X	If HSMD is turned off at the beginning of an interval, all fields containing Hierarchical Storage Manager data are either blank or contain zeros. If HSMD is turned off in the middle of an interval, these fields contain invalid data.
	JDELAYR	X		
	JDELAYZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JHSMD	X	X	
	JHSMSTAT	X	X	
	JOVER	X	X	
	JOVERR	X		
	JSUBD	X	X	
	JSUBDR	X		
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WOVER	X	X	
	WOVERR	X		
IOQ	DDJOB	X	X	If IOQ is turned off at the beginning of an interval, all fields containing device delay percentages are either blank or contain zeros. If IOQ is turned off in the middle of an interval, these fields contain invalid data.
	DSDSN	X	X	
	DSDSNZ	X	X	
	DSJOB	X	X	
	DSJOBZ	X	X	
	DSVOL	X	X	
	DSVOLZ	X	X	
	DUJOB	X	X	
	JDDEV	X	X	
	JDELAY	X	X	
	JDELAYR	X		
	JDELAYZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JIO	X	X	
	JOVER	X	X	
	JOVERR	X		
	JUDEV	X	X	
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WIO	X	X	
	WOVER	X	X	
	WOVERR	X		

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Table 3-4 OS/390 Data Collectors and Product Views (Part 8 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
JESD	ARD		X	If JESD is turned off at the beginning of an interval, all fields reflecting JES-related delays are either blank or contain zeros.
	ARDZ		X	
	ASD		X	
	ASDZ		X	
	ASRM		X	
	ASRMZ		X	
	JCPU	X		If JESD is turned off in the middle of an interval, these fields contain invalid data.
	JCPUZ	X		
	JDDEV	X	X	
	JDDEVZ	X	X	
	JDENQ	X	X	
	JDENQZ	X	X	
	JHSMD	X	X	
	JHSMDZ	X	X	
	JIO	X		
	JIOZ	X		
	JJESD	X	X	
	JJESDZ	X	X	
	JOVER	X		
	JOVERZ	X		
	JPAGOV	X		
	JPAGOVZ	X		
	JPAGSW	X		
	JPAGSWZ	X		
	JSRM	X		
	JSRMD	X		
	JSRMDZ	X		
	JSTORD	X		
	JSTORDZ	X		
	JMSGD	X		
	JMSGDZ	X		
	JSUBD	X		
	JSUBDZ	X		
	JUDEV	X		
	JUDEVZ	X		
	JUENQ	X		
	JUENQZ	X	X	
	JUSE	X	X	
	JUSEZ	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 9 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
JSTM	JSABENDZ JSCPU JSCPUZ JSDELAY JSDELAYZ JSINFO JSIO JSIOZ JSOVER JSOVERZ JSPAGOV JSPAGOVZ JSSRM JSSRMZ JSSTOR JSSTORD JSSTORDZ JSSTORZ JSSRMD JSSRMDZ JSSUBD JSSUBDZ JSUSE JSUSEZ	X X X X X X X X X X X X X X X X X X X X X X X X		If JSTM is turned off at the beginning of an interval, all fields reflecting job step activity are either blank or contain zeros. If JSTM is turned off in the middle of an interval, these fields contain invalid data.
LCU	IOQ LCUINFO LCUSTAT	 X X	X X X	If LCU is turned off at the beginning of an interval, all fields reflecting logical control unit activity are either blank or contain zeros. If LCU is turned off in the middle of an interval, these fields contain invalid data.
LPAR	LPARSTAT	X	X	If LPAR is turned off at the beginning of an interval, all fields reflecting logical partition activity are either blank or contain zeros. If LPAR is turned off in the middle of an interval, these fields contain invalid data.
MSDG	JMSGD JMSGDZ JSUBD JSUBDR JSUBDZ	X X X X X	X X X X	If MSGD is turned off at the beginning of an interval, all fields reflecting WTOR delay activity are either blank or contain zeros. If MSGD is turned off in the middle of an interval, these fields contain invalid data.

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Table 3-4 OS/390 Data Collectors and Product Views (Part 10 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
PGDS	PGDINFO	X	X	If PGDS is turned off at the beginning of an interval, all fields reflecting page delay and swap data set activity are either blank or contain zeros. If PGDS is turned off in the middle of an interval, these fields contain invalid data.
	PGDSTAT	X		
	PGSPP		X	
	PGSPS		X	
	SWDINFO	X	X	
	SWDSTAT	X		
PIOD	JDELAY	X	X	If PIOD is turned off at the beginning of an interval, all fields containing storage delay percentages are either blank or contain zeros. If PIOD is turned off in the middle of an interval, these fields contain invalid data.
	JDELAYR	X		
	JDELAYZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JOVER	X	X	
	JOVERR	X		
	JOVERZ	X	X	
	JPAGOV	X	X	
	JPAGOVR	X		
	JPAGOVZ	X	X	
	JSTORD	X	X	
	JSTORDZ	X	X	
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WOVER	X	X	
	WOVERR	X		
	WPAGOV	X		
	WPAGOVR	X		
	WSTORD	X	X	
SCPU	SRCS		X	If SCPU is turned off at the beginning of an interval, all fields reflecting system-wide CPU activity are either blank or contain zeros. If SCPU is turned off in the middle of an interval, these fields contain invalid data.
	SYSINFO	X		
	SYSOVER	X	X	
	SYSPERF	X		
	SYSSTAT	X		
	SYSSUM			
SMS	SMSINFO	X	X	If SMS is turned off at the beginning of an interval, all fields reflecting system-managed storage are either blank or contain zeros. If SMS is turned off in the middle of an interval, these fields contain invalid data.
	SMSTAT	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 11 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
SPAG	ESINFO FRMINFO PGINFO SYSPAG SRCS SYSOVER SYSSUM	X X X X X	 X X X 	If SPAG is turned off at the beginning of an interval, all fields reflecting system-wide paging activity are either blank or contain zeros. If SPAG is turned off in the middle of an interval, these fields contain invalid data.
SRMD	JDELAY JDELAYR JDELAYZ JFLOW JFLOWZ JOVER JOVERR JSRMD WDELAY WDELAYR WDELAYZ WFLOW WFLOWZ WOVER WOVERR WSRMD	X X X X X X X X X X X X X X X X	X X X X X X X X X X X X	If SRMD is turned off at the beginning of an interval, all fields containing SRM delay percentages are either blank or contain zeros. If SRMD is turned off in the middle of an interval, these fields contain invalid data.
SSUM	SYSOVER SYSPERF SYSSUM	X X	X	If SSUM is turned off at the beginning of an interval, all fields reflecting system-wide summary data are either blank or contain zeros. If SSUM is turned off in the middle of an interval, these fields contain invalid data.
SSWP	SWPINFO SYSOVER SYSSUM	X X X	 X	If SSWP is turned off at the beginning of an interval, all fields reflecting system-wide swap activity are either blank or contain zeros. If SSWP is turned off in the middle of an interval, these fields contain invalid data.
SYST	MPLSTAT SRCS SRMLSCT SRMOPT SYSCNFG SYSINFO SYSPERF SYSSTAT	X X X X X X	 X	If SYST is turned off at the beginning of an interval, all fields reflecting SRM activity, system-wide statistics, or system-wide constants are either blank or contain zeros. If SYST is turned off in the middle of an interval, these fields contain invalid data.

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Table 3-4 OS/390 Data Collectors and Product Views (Part 12 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
WADR	WNASSC	X	X	If WADR is turned off at the beginning of an interval, all WLM job-level data and enclave data will be impacted. After the interval, no data will be available. If WADR is turned off in the middle of an interval, these fields contain invalid data.
	WMENCLAS	X	X	
	WMENCLV	X	X	
	WMENCLVZ	X	X	
	WMJDLAY	X	X	
	WMJDLAYZ	X	X	
	WMJINFO	X	X	
	WMJOVER	X	X	
	WMJOVERZ	X	X	
WKLD	SYSSUM	X		All fields in these views are affected. If the OS/390 PAS is initialized with WKLD turned off, all fields are blank. If WKLD is turned off at the beginning of an interval, only the Workload Name field contains data. If WKLD is turned off in the middle of an interval, the Workload Name field lists the active workloads, but the remaining fields contain invalid data.
	TRX		X	
	WCPU	X	X	
	WCPUR	X		
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WIO	X	X	
	WIOR	X		
	WOBJ	X		
	WOVER	X	X	
	WOVERR	X		
	WPAGDM	X	X	
	WPAGDMR	X		
	WPAGOV	X		
	WPAGOVR	X		
	WPAGSW	X	X	
	WPAGSWR	X		
	WRT	X		
	WRTR	X		
	WSRM	X	X	
	WSRMD	X	X	
	WSRMR	X		
	WSTOR	X	X	
	WSTORD	X	X	
	WSTORR	X		
	WTA	X		
	WUSE	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 13 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
WPRX	WMCNVT	X	X	If WPRX is turned off at the beginning of an interval, all fields reflecting WLM report and service classes are either blank or contain zeros. If WPRX is turned off in the middle of an interval, these fields contain invalid data.
	WMCNVTR	X		
	WMCNVTRZ	X		
	WMCNVTZ	X	X	
	WMDLY	X	X	
	WMDLYR	X		
	WMDLYRZ	X		
	WMDLYZ	X	X	
	WMPRD	X	X	
	WMPRDR	X		
	WMPRDRZ	X		
	WMPRDZ	X	X	
	WMRCLS	X	X	
	WMRCLSR	X		
	WMRCLSRZ	X		
	WMRCLSZ	X	X	
	WMRTD	X	X	
	WMRTDR	X	X	
	WMSCLS	X	X	
	WMSCLSR			
	WMWKLD	X	X	
	WMWKLDR	X		
WSSM	WMWKM	X	X	If WSSM is turned off at the beginning of an interval, all fields reflecting subsystem work manager activity are either blank or contain zeros. If WSSM is turned off in the middle of an interval, these fields contain invalid data.
	WMWKMZ	X	X	

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Table 3-4 OS/390 Data Collectors and Product Views (Part 14 of 14)

Collector	View Affected	In OS/390	In CMF	Effect of Turning Off Collector
WUSM	DDJOB	X	X	If WUSM is turned off at the beginning of the interval, all delay or use percentage fields in any job, workload, or device view are either blank or contain zeros. If WUSM is turned off in the middle of an interval, these fields contain invalid data.
	DUJOB	X	X	
	JCPU	X	X	
	JCPUR	X		
	JDDEV	X	X	
	JDELAY	X	X	
	JDELAYR	X		
	JDELAYZ	X	X	
	JFLOW	X	X	
	JFLOWZ	X	X	
	JIO	X	X	
	JOVER	X	X	
	JOVERR	X		
	JPAGOV	X	X	
	JPAGOVR	X		
	JSRMD	X	X	
	JSTORD	X	X	
	JUDEV	X	X	
	WCPU	X	X	
	WCPUR	X		
	WDELAY	X	X	
	WDELAYR	X		
	WDELAYZ	X	X	
	WFLOW	X	X	
	WFLOWZ	X	X	
	WIO	X	X	
	WOVER	X	X	
	WOVERR	X		
	WPAGOV	X		
	WPAGOVR	X		
	WSRMD	X	X	
	WSTORD	X	X	
XCF	XCFCTC	X		If XCF is turned off at the beginning of an interval, all fields reflecting cross-system coupling facility delay activity are either blank or contain zeros. If XCF is turned off in the middle of an interval, these fields contain invalid data.
	XCFCF	X		
	XCFPTH	X		
	XCFPTHR	X		
	XCFMBR	X		
	XCFMBRR	X		
	XCFSYS	X		
	XCFSYSR	X		
XCFD	JSUBD	X	X	If XCFD is turned off at the beginning of an interval, all fields reflecting cross-system coupling facility delay activity are either blank or contain zeros. If XCFD is turned off in the middle of an interval, these fields contain invalid data.
	JSUBDR	X		
	JSUBDZ	X	X	
	JXCFD	X	X	
	JXCFDZ	X	X	

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Chapter 4 Controlling COMMON STORAGE MONITOR Data Collectors

Both MAINVIEW for OS/390 and CMF MONITOR require the COMMON STORAGE MONITOR (CSMON) data collectors. The *MAINVIEW® for OS/390 Customization Guide* describes how to customize COMMON STORAGE MONITOR as either a subsystem or as a started task.

- If defined as a subsystem, COMMON STORAGE MONITOR starts automatically at IPL. To stop the COMMON STORAGE MONITOR data collectors, use the instructions in "Manually Customizing MAINVIEW for OS/390" in the *MAINVIEW® for OS/390 Customization Guide.*

- If defined as a started task, use the instructions in this chapter to control starting and stopping the COMMON STORAGE MONITOR data collectors.

This chapter includes the following topics:

Starting COMMON STORAGE MONITOR Data Collectors 4-2
Stopping COMMON STORAGE MONITOR Data Collectors 4-3

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Starting COMMON STORAGE MONITOR Data Collectors

If COMMON STORAGE MONITOR is set up to run as a started task, you can use either of these methods to start the data collectors:

- To manually start COMMON STORAGE MONITOR on an as-needed basis, issue the following OS/390 START command at any time after an IPL is complete:

  S BB$CSMON

- To start COMMON STORAGE MONITOR automatically after an IPL, add this command to the SYS1.PARMLIB member IEFSSN*xx*:

  BBXS,BB$CSMON,'START <parameter>'

  where

BBXS	Is the subsystem identification.	
BB$CSMON	Is the name of the procedure containing the START command JCL. BB$CSMON must reside in SYS1.PROCLIB.	
parameter	Is the monitoring option for COMMON STORAGE MONITOR. Parameters include the following choices:	
	TSU, STC, BATCH, or ALL	Is a type of address space that is monitored.
	CSA, SQA, or BOTH	Is a type of storage that is monitored for GETMAINs.
	BELOW or ANY	Defines whether the storage allocation requests are monitored below the 16 MB line only or anywhere for the type of storage specified.
	512K to 100K	Is an optional field that allows you to define a specific amount of ECSA storage for the COMMON STORAGE MONITOR table. (Each table entry is 32 bytes.) BMC Software recommends that this field be left blank to allow COMMON STORAGE MONITOR to calculate the maximum number of entries that it can maintain in ECSA, based on the type of defined address space and storage monitoring.

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Stopping COMMON STORAGE MONITOR Data Collectors

The method used to stop the COMMON STORAGE MONITOR data collectors varies, depending on how COMMON STORAGE MONITOR is running.

- If COMMON STORAGE MONITOR is running as a started task, type this command at the OS/390 console:

  BBXS,BB$CSMON,OPT=STOP

- If COMMON STORAGE MONITOR is running as a subsystem, follow these steps:

Step 1 Remove this statement from SYS1.PARMLIB(IEFSSN*xx*):

BBXS,BB$CSMON,'START <parameter>'

Step 2 Re-IPL.

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Chapter 5 Controlling Job Step Data Collection

MAINVIEW for OS/390 provides an option that enables you to collect and report job step-level data for specified jobs or job steps. This option is initiated through the BBDJST00 PARMLIB member and requires the job step data collector to be active. BBDJST00 allows you to specify the jobs or job steps that you might want to monitor. It also allows you to activate Batch Optimizer support in MAINVIEW for OS/390.

No job steps are monitored if the BBDJST00 PARMLIB member does not exist, is empty, or does not contain any keyword values between the <include> and </include> keywords.

This chapter includes the following topics:

BBDJST00 PARMLIB Member 5-2
BBDJST00 Syntax 5-2

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BBDJST00 PARMLIB Member

Using the BBDJST00 PARMLIB member

- allows you to eliminate collection of job step-related information for single-step address spaces where the information collected at the step level would be identical to that information collected at the address space level
- allows you to specify only the jobs or job steps that you want MAINVIEW for OS/390 to monitor, thus reducing potential overhead
- allows you to maintain control over the impact on historical data sets by limiting the number of job steps being monitored
- allows you to activate Batch Optimizer support in MAINVIEW for OS/390

To activate a newly edited PARMLIB member, modify the PAS with **DC=STOP** followed by **DC=START**.

BBDJST00 Syntax

These general syntax rules apply to BBDJST00:

- All comment lines must begin with a hyphen (-) in column 1.
- Any comment following a data value must be preceded by a hyphen (-).
- All other lines must begin with a keyword value or contain a data value that is associated with the previous keyword value (for example, <jobname> is a keyword value and jobname XYZ is a data value).
- At least one <include> keyword must be specified.
- Any data value that exceeds the allowable length for the associated keyword will be truncated.
- Standard wildcard use is allowed, where ? is a placeholder for a single wildcard character and * denotes any number of wildcard characters.

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State of Controlling Keyword Values

The following keyword values control the state of the keywords that follow. There are three states: *include*, *exclude*, and *MBO*.

- When in the include state, a criteria match will cause the job or job step to be monitored.
- When in the exclude state, a criteria match will cause the job or job step to be excluded from monitoring.
- When in the MBO state, a criteria match will cause Batch Optimizer-managed jobs to be monitored.

Keyword Value	Description
<include>	Must be specified before all other keyword values. It indicates that the following keyword values specify data values to be included for job step monitoring. The <include> keyword value cannot be nested within another <include>. **Note**: There is no data value associated with <include>.
</include>	Indicates the end of an include section. It is a required keyword value. **Note**: There is no data value associated with </include>.
<exclude>	Is used to define a section where global exclusions are specified. It can also be embedded between the <include> and </include> keyword values as part of a criteria set. **Note**: There is no data value associated with <exclude>.
</exclude>	Indicates the end of an exclude section. It is required when there is a preceding <exclude> keyword value. **Note**: There is no data value associated with </exclude>.
<MBO>	Must be specified outside <include> and <exclude> keywords. It indicates that Batch Optimizer is active.
</MBO>	Indicates the end of an MBO section. It is required when there is a preceding <MBO> keyword.

Criteria Selection Keywords

The following criteria selection keyword values are used to define sets of criteria that must be met before a job or job step is selected for monitoring. The data values associated with the keyword specify the criteria (that is, <jobname> is a keyword value and the job name next to the value is the data value).

Note: There is no data value associated with keyword values preceded with a slash (/). The slash denotes the end of the keyword criteria.

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Keyword Value	Description
<sysname>	Used to select jobs running on the specified system to be monitored at the step level when the <sysname> keyword falls within an <include> set. This value excludes jobs running on the specified system from being monitored at the step level when the <sysname> keyword falls within an <exclude> set.
</sysname>	Indicates the end of a system name criteria set and is required when there is a preceding <sysname> keyword value.
<jobname>	Used to select jobs to be monitored at the step level when the <jobname> keyword falls within an <include> set. When the <jobname> keyword falls within an <exclude> set, it excludes jobs from being monitored at the step level. Acceptable data values can be up to eight characters in length. Wildcards are allowed in the specified job names.
</jobname>	Indicates the end of a job name criteria set and is required when there is a preceding <jobname> keyword value.
<svcclass>	Used to select jobs within a certain service class to be monitored at the step level when the <svcclass> keyword falls within an <include> set. When the <svcclass> keyword falls within an <exclude> set, it excludes jobs within a certain service class from being monitored at the step level. Acceptable data values can be up to eight characters in length. Wildcards are allowed in the service classes specified.
</svcclass>	Indicates the end of a service class criteria set and is required when there is a preceding <svcclass> keyword value.
<jobclass>	Used to select jobs within a certain job class when the <jobclass> keyword falls within an <include> set. When the <jobclass> keyword falls within an <exclude> set, it excludes jobs within a certain job class from being monitored at the step level. Acceptable data values can be up to eight characters in length. Wildcards are allowed in the job classes specified.
</jobclass>	Indicates the end of a job class criteria set and is required when there is a preceding <jobclass> keyword value.
<type>	Used to select jobs of a certain type to be monitored at the step level when the <type> keyword falls within an <include> set. This value excludes jobs of a certain type from being monitored at the step level when the <type> keyword falls within an <exclude> set. Acceptable data values are as follows: J – Batch jobs S – Started tasks T – TSO address spaces
</type>	Indicates the end of a job type criteria set and is required when there is a preceding <type> keyword value.
<stepname>	Used to select job steps to be monitored when the <stepname> keyword falls within an <include> set. When the <stepname> keyword falls within an <exclude> set, it excludes job steps from being monitored. Acceptable data values can be up to eight characters in length. Wildcards are allowed in the step names specified.
</stepname>	Indicates the end of a job step name criteria set and is required when there is a preceding <stepname> keyword value.

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Keyword Value	Description
<pgmname>	Used to select job steps that execute a certain program name to be monitored when the <pgmname> keyword falls within an <include> set. When the <pgmname> keyword falls within an <exclude> set, it excludes job steps that execute a certain program name from being monitored. Acceptable data values can be up to eight characters in length. Wildcards are allowed in the program names specified. At the time of initialization, the program name is unknown for job steps in progress. This criteria will be ignored when determining whether those job steps will be monitored.
</pgmname>	Indicates the end of a job step program name criteria set and is required when there is a preceding <pgmname> keyword value.

Nested Criteria

Nested criteria sets can be created by specifying a keyword value within another keyword value to indicate that several requirements must be met before a step will be monitored. Nesting can be identified when two or more criteria selection keywords are specified as part of a set where all criteria must be met in order for a job or job step to be included or excluded from monitoring.

When criteria selection keywords are specified individually (not embedded within another criteria selection), any one criterion must be met in order for a job or job step to be included or excluded from monitoring.

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Example

The example shown in Figure 5-1 demonstrates a configured member.

Figure 5-1 Example BBDJST00 PARMLIB Member for Job Step Data Collection

```
- The BBDJST00 parmlib member is used for specifying the jobs and/or
- steps that you wish the MVMVS data collector to monitor at the
- step level.  All comment lines must begin with a hyphen '-' in
- column 1.  All other lines must begin with a keyword tag or be a
- continuation of a keyword tag.
<include>
  <jobname>       CMD???P*,XTST?PAS      - Select MVS product center
    <svcclass>    STCPAS                 - test PAS address spaces
      <exclude>                          - but don't monitor any AUTH*
        <stepname>  AUTH*                - or CLEAR* steps
                    CLEAR*
        </stepname>
      </exclude>
    </svcclass>
  </jobname>
  <jobname>       BMVJEN*                - Select all CMF Analyzer batch
    <type>        J                      - jobs with jobname BMVJEN*
      <pgmname>   CMFANLYZ
      </pgmname>
    </type>
  </jobname>
  <pgmname>       CMFANLYZ               - Select all CMF Analyzer steps
    <jobname>     BMVPTR*                - in jobs named BMVPTR*
    </jobname>
    <jobclass>    W                      - OR those CMFANLYZ jobs that
    </jobclass>                          - are long running
  </pgmname>
</include>                             - Indicate end of global inclusions
- Now specify the global exclusions.  This exclusion list will apply
- to any job or step previously selected for inclusion, i.e. if the
- global inclusion list above results in a job or step being selected
- for step level monitoring, but that job or step also matches the
- criteria specified in the global exclusion list, the job or step will
- NOT be monitored.
<exclude>                                - Specify global exclusions here
  <type>          T                      - Exclude all TSO address spaces
  </type>
  <jobclass>      F                    - Exclude short-running batch jobs
  </jobclass>
<exclude>                              - Indicate end of global exclusions
```

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Chapter 6 Using the System Utilities

This chapter discusses the system utilities, which can assist you in

- simulating an operator console
- monitoring and analyzing common storage usage
- performing a wide range of system programmer tasks, such as viewing and modifying various OS/390 internal structures and lists

The chapter includes the following topics:

Selecting a System Utility. 6-2
Simulating an Operator Console. 6-3
Monitoring Common Storage Usage 6-4

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All system utilities are available for both local and remote systems. When you are in an SSI context, you must issue the SCOPE command to indicate the particular system that you want before using a utility. For example, if your SSI context is defined as SYSB, SYSC, and SYSD and you want to access CSMON on SYSC, you must issue the command **SCOPE SYSC** before using CSMON.

Selecting a System Utility

System utilities can be accessed by either typing the view name on the **COMMAND** line or selecting the view name from the UTILITY view, as shown in Figure 6-1.

Figure 6-1 UTILITY View Output

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =UTILITY===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 C View Name  Description
 - ---------- ------------------------------
   CONSOLES   List of available consoles
   CSMON      Common storage monitor
   EMSTAT     Exception Administration Dial.
   SYSPROG    System programmer services
   WARN       SYSPROG Warning records
```

From the UTILITY view, select the desired system utility, as described in Table 6-1, by placing your cursor beneath the appropriate option and pressing **Enter**.

Table 6-1 Selecting a System Utility from the UTILITY View

To Do This	Select	For More Information
Simulate an operator console	**CONSOLES**	See “Simulating an Operator Console” on page 6-3.
Analyze common storage usage	**CSMON**	See “Monitoring Common Storage Usage” on page 6-4.
See a list of all distributed and user-defined screens in the current context	**SCREENS**	Press **PF1** while viewing the SCREENS view.
Perform various system programmer tasks	**SYSPROG**	See *MAINVIEW® SYSPROG Services User Guide and Reference.*

The following sections describe how these tasks are performed.

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Simulating an Operator Console

You can simulate the OS/390 operator console for any system that you have authority to access. By simulating an operator console, you can control system activity by monitoring system message traffic and entering your own MCS operator commands.

Step 1 From the UTILITY view, hyperlink from **CONSOLES** to display a list of the consoles to which you have access.

An example of such a list is shown in Figure 6-2.

Figure 6-2 Simulated Console Selection Panel

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =CONSOLES==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===22
  Console Ucb  Type   Console  Console
  ------- ---  ------ Name     Type
  1       0C1  SYS    SYSBM001              SYSB
  12      022  SYS    SYSDA001              SYSD
  13      024  SYS    SYSDA003              SYSD
  15      026  SYS    SYSDA005              SYSD
  2       0C2  SYS    SYSBA001              SYSB
  25      022  SYS    SYSGA001              SYSG
  3       0C3  SYS    SYSBA002              SYSB
  31      030  SYS    SYSHA001              SYSH
  38      021  MASTER SYSAM001              SYSA
  40      023  SYS    SYSAA002              SYSA
  41      024  SYS    SYSAA003              SYSA
  49      021  SYS    SYSCM001              SYSC
  51      023  SYS    SYSCA002              SYSC
  53      025  SYS    SYSCA004              SYSC
  55      027  SYS    SYSCA006              SYSC
  60      062  SYS    SYSCA011              SYSC
  74      021  SYS    SYSEM001     3279-3B
  75      022  SYS    SYSEA001     3278-2
```

Step 2 To select a console, move your cursor to the appropriate line in the Console column, and then press **Enter**.

Step 3 On the **COMMAND** line of the CONSOLE view, type any OS/390 operator command within the normal restrictions. Begin each command with a slash (/). For example, type **/d r,l** to display outstanding reply messages.

Although the actual MCS console is updated as soon as it receives a message or a command is typed, the simulated console displayed on your screen is *not* updated until you press **Enter**.

Note: Your product administrator might have chosen to restrict the ability to look at a console or to enter console commands. If so, a message is displayed when you try to select a console or enter a command.

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Monitoring Common Storage Usage

To access COMMON STORAGE MONITOR (CSMON), do *one* of the following:

- On the **COMMAND** line, type **CSMON**.
- Select the **CSMON** option from the UTILITY view.

The Common Storage Summary panel is displayed, as shown in Figure 6-3 on page 6-5.

COMMON STORAGE MONITOR does not employ the MAINVIEW window interface. When you select the CSMON option, your current window configuration is replaced with the Common Storage Summary panel in the standard ISPF panel environment. The MAINVIEW window configuration will be displayed again after you end your COMMON STORAGE MONITOR session.

Additionally, because there is no window information line available, the current system identifier or complex context name appears in the **TARGET** field located in the upper right-hand corner of each Common Storage Summary panel.

Note: This chapter assumes that COMMON STORAGE MONITOR data-collection services have already been started for your site. If not, see your system administrator. If you are planning to use complex contexts, be sure that COMMON STORAGE MONITOR is running on all systems defined in the contexts.

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Using the Common Storage Summary Panel

The Common Storage Summary panel, shown in Figure 6-3, displays the total amount of common storage that is currently in use (that is, storage for which a GETMAIN has been issued without a subsequent FREEMAIN). Common storage is divided into CSA (common service area) and SQA (system queue area) above and below the 16-MB line.

Figure 6-3 Common Storage Summary Panel

```
---------------------------- Common Storage Summary ------------- Row 1 of 226
 COMMAND ===>                                                  SCROLL ===> PAGE
                                                               TARGET - CXTSTH
 Valid line commands are:              Valid COMMANDs are:
 S - Select storage display criteria   F      - Find a name in the list
                                       O      - Order list by any field name
                                       G      - Graph allocated common storage
                                       STAT   - Common storage monitor status
 CSA: 4492K ( 39%) ECSA:  300M ( 20%)  DETAIL - Display detail for allocations
 SQA:  964K ( 56%) ESQA:   14M ( 99%)  OVER   - Overview of common storage usage
                                                                        *
   Name     X ASID    CSA<16M    CSA>16M    SQA<16M    SQA>16M      Total   %
 ------------------------------------------------------------------------------
   *SYSTEM* *    0     103992    9814336     258824    7871184   18048336 23.00
   *MASTER*      1      98792    2120080     162720    2361344    4742936  6.04
   DC$CAS       66      16424    3975640          0        720    3992784  5.09
   XTSTHCAS     72        992    3378440          0        608    3380040  4.31
   BCVDCASC    114        992    3129856          0        608    3131456  3.99
   IMS61D       52     310392    2785408       2928        792    3099520  3.95
   XTSTICAS     73        992    3085816          0        608    3087416  3.93
   IMFCAS      190        864    3018632          0        608    3020104  3.85
   BCVSCASC    131        992    3000568          0        608    3002168  3.83
   AAOCASC1    115        864    2979848          0        608    2981320  3.80
   CMRCAS3     183        864    2979848          0        608    2981320  3.80
```

Each unique job name/ASID combination to which storage is attributed is represented by a row on the screen. The screen is initially sorted in descending order by the Total allocated storage column. An asterisk (*) appears above that column.

Table 6-2 on page 6-6 shows the tasks you can perform from the Common Storage Summary panel.

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Table 6-2 Tasks Performed from the Common Storage Summary Panel

To Do This	Type This Command	For More Information
Find the summary line for a job name	**F** <**name>**, where *name* is the job name that you want to find	N/A
Order (sort) on output column	**O** <**name>**, where *name* is the output column that you want to order	See “Ordering Output Columns” on page 6-7.
Graph common storage areas allocated by individual address spaces	**G**	See “Graphing Common Storage Areas” on page 6-8.
Summarize the status of the COMMON STORAGE MONITOR data collector	**STAT** (Only used when CSMON collects the data.)	See “Displaying Detailed Allocation Data” on page 6-11.
Display detail allocation data	DETAIL (**D**) or **S** (line command)	See “Displaying Detailed Allocation Data” on page 6-11 and “Using the Allocated Common Storage Areas Panel (Detail Data)” on page 6-14.
Summarize common storage usage	**OVER**	See “Summarizing Common Storage Usage” on page 6-9.

The Common Storage Summary panel contains the following output fields:

Field	Description
CSA	size of the Common Service Area (CSA) and the percentage currently allocated
ECSA	size of the Extended Common Service Area (ECSA) and the percentage currently allocated
SQA	size of the System Queue Area (SQA) and the percentage currently allocated
ESQA	size of the Extended System Queue Area (ESQA) and the percentage currently allocated The percentage allocated does not include fragmented available storage. The OVER command provides fragmentation information.
Name	name of the address space (job, TSO user ID, and so on) to which ownership of the storage is attributed When IBM VSM tracking data is used, this is the name assigned according to the OWNER parameter on the GETMAIN or STORAGE macro.
X	column where an asterisk (*) indicates that the storage is still allocated but the job that allocated the storage has been terminated
ASID	address space identifier (in decimals) of the address space that was active when the common storage area was acquired

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Field	Description
CSA<16M	amount of CSA below 16 MB that is allocated by the address space
CSA>16M	amount of CSA above 16 MB that is allocated by the address space
SQA<16M	amount of SQA below 16 MB that is allocated by the address space
SQA>16M	amount of SQA above 16 MB that is allocated by the address space
Total	total amount of common storage allocated by the address space
%	percentage of total allocated common storage used by the address space

Ordering Output Columns

The Common Storage Summary panel is ordered initially by the Total column in descending order.

To reorder output columns, type **O <name>** on the **COMMAND** line to sort an output column, where *name* is the name of the column that you want to order. Column names can be abbreviated to their first four characters. An asterisk (*) appears above the column by which the configuration is ordered.

Here is some information about the resulting configuration:

- When you sort on the Name or ASID column, the rows are reordered in ascending alphanumeric order.
- When you sort on the CSA<, CSA>, SQA<, SQA>, Total, or % columns, the rows are reordered in descending numeric order.
- When you sort on the X (second) column, the rows are reordered in descending sequence. All rows with an asterisk (*) in the X column are displayed first, and the Name column is used as a secondary sort key in ascending sequence.

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Graphing Common Storage Areas

To graph common storage areas allocated by individual address spaces, type **G** on the **COMMAND** line.

Address spaces are graphically displayed in a stacked horizontal bar chart, divided into as many as four parts:

- CSA above the 16-MB line
- SQA above the 16-MB line
- CSA below the 16-MB line
- SQA below the 16-MB line

The address spaces shown correspond to the order of those address spaces displayed in the Common Storage Summary panel.

Note: *If your terminal supports GDDM graphics* and you have GDDM release 1, version 2 or later, you will see a high-resolution color chart. To print a copy of a high-resolution graph, press the GDDM Hardcopy PF key (default is **PF4/16**).

If your terminal does not support GDDM graphics, you will see a low-resolution chart with character symbols. Use the ISPF-defined Print PF key to print the graph.

Note the following points:

- To scroll the graph vertically, use the PF keys.
- To update the data displayed, press **Enter**.
- To transfer to the Generalized Graphic Facility (GGF), press the HELP PF key.

From GGF, you can modify the graph parameters and customize your own graphs (for example, change colors or various characteristics of the legend). You can save modifications in a chart definition for retrieval at a later time.

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Summarizing Common Storage Usage

To summarize common storage usage, type **OVER** on the **COMMAND** line.

The CS Monitor Common Storage Overview panel is displayed, as shown in Figure 6-4.

Figure 6-4 CS Monitor Common Storage Overview Panel

```
----------------- CS MONITOR COMMON STORAGE OVERVIEW AT 10:14 -----------------
 COMMAND ===>                                                  SCROLL ===> PAGE
                                                               TARGET - CXTSTH
 To graphically display this data, enter a graph type on the command line above.
 Valid graph types are: BAR , PIE , and 3D .  Then select the data items to be
 graphed by entering S in the columns and rows below.

        Storage           _ CSA         _ ECSA          _ SQA         _ ESQA
   -----------------   -----------   ------------    -----------   ------------
 _  Requested          1550K   35%      68M   23%     574K   60%      13M   97%
 _  Fragmented          105K    2%    1239K    0%       -     -        -     -
 _  Converted to SQA      0K    0%     436K    0%       -     -        -     -
                       =====  ====   ======  ====    =====  ====   ======  ====
 _  Total Allocated    1656K   37%      69M   23%     574K   60%      13M   97%

 _  Largest Area       2500K   56%     227M   76%     352K   37%       6K    0%
 _  Next Largest        112K    2%     488K    0%       3K    0%       5K    0%
 _  Remainder           224K    5%    2832K    1%      34K    4%     420K    3%
                       =====  ====   ======  ====    =====  ====   ======  ====
 _ Total Unallocated   2836K   63%     230M   77%     389K   40%     432K    3%

 _ Total Storage       4492K  100%     300M  100%     964K  100%      14M  100%
```

The CS Monitor Common Storage Overview panel contains the following fields:

Field	Description
Requested	Actual amount of storage requested from the pool of available common storage. OS/390 allocates storage in 4K byte blocks, but requests can be made in units as small as 8 bytes.
Fragmented	Free storage areas less than one page (4,096 bytes) in size. This storage is available for requests, but because it is noncontiguous, and because CSA is multiple key storage, it might not be usable for most requests. SQA is not prone to fragmentation, so dashes appear for this category under the SQA and ESQA columns.
Converted to SQA	Amount of CSA or ECSA used to satisfy requests for SQA or ESQA (when there was insufficient SQA or ESQA storage available). Dashes appear for this category under the SQA and ESQA columns.

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Field	Description
Total Allocated	Total amount of 4K storage blocks allocated. This is the sum of requested, fragmented, and converted storage.
Largest Area	Largest contiguous area that is not allocated. It is available for OS/390 to satisfy requests to obtain storage.
Next Largest	Second largest contiguous area that is not allocated.
Remainder	Remaining amount of storage area that is not allocated. It can be used by OS/390 to satisfy requests to obtain storage.
Total Unallocated	Total amount of storage that is not allocated. This is the sum of the **Largest Area**, **Next Largest**, and **Remainder** fields.
Total Storage	Total amount of storage (allocated plus unallocated) reserved by OS/390 at IPL time to satisfy requests to obtain common storage.

Creating Graphs and Charts

To graph or chart the data presented on the CS Monitor Common Storage Overview panel, use these commands:

Command	Description
BAR	Produces a bar graph.
PIE	Produces a pie chart.
3D	Produces a three-dimensional surface chart on terminals supporting high-resolution graphics.

After specifying the type of chart, select the fields that you want to graph. Type **S** next to the column headings and storage categories that you want to graph. You must select at least one column and one storage category.

When the graph is displayed:

Step 1 Press **Enter** to update the data.

Step 2 Press the HELP PF key to transfer to the Generalized Graphic Facility (GGF).

You can modify the graph parameters and customize your own graphs from GGF. For example, you can alter the chart color and legend and save these modifications in a chart definition for future retrieval.

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Displaying Detailed Allocation Data

The DETAIL command provides the ability to display information for every block of allocated common storage (one row of information per block) or for a subset of allocated common storage, based on your selection criteria.

To display information for individual allocations, do *one* of these steps:

- On the **COMMAND** line of the Common Storage Summary panel, type **DETAIL**.
- Select a specific row on the Common Storage Summary panel, and then type **S** in the line command field to the left of the Name column.

The Selection and Sort Criteria for Storage Areas panel is displayed, as shown in Figure 6-5.

Figure 6-5 Selection and Sort Criteria for Storage Areas Panel

```
---------------- Selection and Sort Criteria for Storage Areas ----------------
 COMMAND ===>
                       Selection Criteria for Storage Areas

    NAME     ===> *         ASID  ===>       (Omit for all owners)
    SUBPOOLS ===> ALL   (226, 227, 228, 231, 239, 241, 245;
                         DRF, CSA, SQA, FIX, PAG, or ALL)
    RMODE    ===> ANY   (Enter 24, 31 or ANY)
    KEY      ===> ALL   (Storage key 0 through 15, or ALL)
    STARTING ===> YES   (Enter NO to exclude job names of STARTING)
    ACTIVE   ===> YES   (Enter NO to exclude active address spaces; show only *)
    LENGTH   ===> 0            TO  ===> MAX          (Range in decimal or hex)
    B DATE   ===> 06/08/YYYY  B TIME  ===> 23:58:05  (Beginning date and time)
    E DATE   ===> 06/09/YYYY  E TIME  ===> 23:59:59  (Ending date and time)

                                  Sort Criteria
    SORT BY  ===> LENGTH      (Valid sort fields are:
                               NAME, ASID, START, LENGTH, SP KEY, TIME, HEADER)
    DIR.     ===> D    (A=Ascending, D=Descending)

 Press ENTER key to display storage areas
 Enter END command to cancel request
```

The Selection and Sort Criteria for Storage Areas panel provides the ability to select the storage blocks that will be displayed by specifying desired attributes. It also provides the ability to specify how the data will be sorted initially.

When displayed initially, the panel contains default values that result in the display of all allocated common storage being sorted in descending sequence by block size.

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Use the panel to select allocated storage based on

- complete or partial job name
- an ASID instead of or in addition to a job name
- storage classification (for example, CSA, SQA) or a specific subpool number
- size range or a specific length
- subpool and/or storage key

In addition, use the panel for the following tasks:

- Exclude storage areas allocated by job name STARTING (only applicable when CSMON collects the data).

- Select addresses that are above or below the line.

- Specify a date and time range.

- Select options for sorting common storage allocation data by NAME, ASID, START, LENGTH, SP, KEY, TIME, or HEADER columns. They can be sorted in either ascending or descending order.

The Selection and Sort Criteria for Storage Areas panel contains the following fields:

Field	Description
NAME	Identifies the job name for which common storage is allocated. An asterisk (*) can be specified at the end to indicate all names beginning with those specific letters. The asterisk (*) can represent • all allocations for the specified name • all allocations for names beginning with specified characters **Note**: The initial value is * if you type the DETAIL command. If you type **S** in the line command field, the initial value is the job name from the selected row.
ASID	Is the address space identification number. **Note**: The initial value is blank if you type the DETAIL command. If you type **S** in the line command field, the initial value is the ASID from the selected row.

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Field	Description
SUBPOOLS	Identifies the subpool. It can be any one of the following values: 226 SQA, fixed, key zero, not fetch protected, below 16 MB only 227 CSA, fixed, multiple key, fetch protected 228 CSA, fixed, multiple key, not fetch protected 231 CSA, pageable, multiple key, fetch protected 239 SQA, fixed, key zero, fetch protected 241 CSA, pageable, multiple key, not fetch protected 245 SQA, fixed, key zero, not fetch protected CSA Subpools 227, 228, 231, and 241 DRF Disabled Reference Storage (SQA subpools 247 and 248) FIX Page Fixed Storage (subpools 226, 227, 228, 239, 245, 247, and 248) PAG Pageable Storage (subpools 231 and 241) SQA Subpools 226, 239, 245, 247, and 248 ALL All CSA and SQA subpools **Note**: When displaying detailed allocations, the subpools with the following attributes are in colors for easy identification: • Disabled Reference Storage (DRF) - Pink • Pageable Storage (PAG) - Green • Page Fixed Storage (FIX) - Red
RMODE	Optionally limits the data to storage above or below the 16-MB line. It can be one of the following values: 31 Storage above the 16-MB line 24 Storage below the 16-MB line ANY All storage (both above or below the 16-MB line)
KEY	Identifies the storage key. It can be any one of the following values: 0 Supervisor and other system functions that require access to privileged areas of storage 1 Job Entry Subsystem (JES) and job scheduler 2 Virtual Storage Personal Computing (VSPC) 3 Availability Manager (AVM) 4 Used by BMC Software 5 Data management, including IOS, ASM, block processor, and OPEN/CLOSE/EOV 6 Telecommunications (TCAM and VTAM) 7 Information Management System (IMS) 8, 9 Problem programs occupying virtual=virtual (V=V) storage 10-15 Problem programs occupying virtual=real (V=R) storage ALL All of the above storage keys; the default

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Field	Description
STARTING	Includes or excludes the job names of STARTING (only applicable when CSMON collects the data). It can be one of the following values: NO Exclude job names of STARTING (TSO users during logon). YES Include job names of STARTING; the default.
ACTIVE	Includes or excludes active address spaces. It can be one of the following values: NO Exclude storage areas allocated by address spaces that are still active. Only storage areas allocated by address spaces flagged with an * are shown. YES Include storage areas allocated by all address spaces.
LENGTH	Selects allocated blocks with a length greater than or equal to the minimum (first value) and less than or equal to the maximum (second value). MAX may be specified as the second value.
B DATE	Is the beginning Gregorian date (*mm/dd/yyyy*) of the common storage allocations to be included in the configuration.
B TIME	Is the beginning time (*hh:mm:ss*) of the common storage allocations to be included in the configuration.
E DATE	Is the ending Gregorian date (*mm/dd/yyyy*) of the common storage allocations to be included in the configuration.
E TIME	Is the ending time (*hh:mm:ss*) of the common storage allocations to be included in the configuration.
SORT BY	Identifies the sort field criteria. The valid values are NAME, ASID, START, LENGTH, SP KEY, TIME, and HEADER.
DIR	Identifies the sort order: Ascending or Descending.

Using the Allocated Common Storage Areas Panel (Detail Data)

The Allocated Common Storage Areas panel, shown in Figure 6-6, displays the data that you requested on the previous panel. It also provides commands to do the following tasks:

- re-sort the data (O)
- locate the row containing the closest match in the ordered column to the value specified (L)
- find the specified string in the heading data (F)

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You can also use line commands to

- free a block of storage (F)
- browse the block (B)
- alter the contents of a block (A)

Figure 6-6 Allocated Common Storage Areas Panel

```
------------------------ Allocated Common Storage Areas -----------------------
 COMMAND ===>                                                  SCROLL ===> PAGE
                                                          Row 1       of     204
 Valid line commands are:               Valid COMMANDs are:
 B - Browse common storage              F - Find a text string in header
 A - Alter common storage               L - Locate a value in the ordered field
 F - Free common storage                O - Order data by specified field

   Name    X ASID    Start  Length  SP Key   Date      Time     Storage Header
 -------------------------------------------------------------------------------
   DC$TCPIP   106 1724A000 1548288 241  6  6/09/YYYY  0:10:02 *...... ....0.1..*
   DC$TCPIP   106 17484558 1198760 241  0  6/09/YYYY  0:10:01 *Licensed Materia*
   DC$TCPIP   106 170DD0C0 1048384 241  6  6/09/YYYY  0:10:03 *..c..........1..*
   DC$TCPIP   106 171DDFC0  262208 241  6  6/09/YYYY  0:10:03 *......e......1..*
   DC$TCPIP   106 17233000   94208 241  6  6/09/YYYY  0:10:03 *..u.......?0.1..*
   DC$TCPIP   106 170CE000   61440 241  6  6/09/YYYY  0:10:03 *..-...c....0.1..*
   DC$TCPIP   106 17073000   49152 241  6  6/09/YYYY  0:10:11 *...........0.1..*
   DC$TCPIP   106 1722A400   35840 241  6  6/09/YYYY  0:10:03 *...........0.1..*
   DC$TCPIP   106 170C6000   32768 241  6  6/09/YYYY  0:10:03 *..0......."0.1¢.*
   DC$TCPIP   106 1709A000   32768 241  6  6/09/YYYY  0:10:09 *..-......."0.1¢.*
   DC$TCPIP   106 16F67C00   29696 241  6  6/09/YYYY  0:40:14 *.......-...0.1..*
   DC$TCPIP   106 17088C00   29696 231  6  6/09/YYYY  0:40:14 *...h.6@....0.X..*
   DC$TCPIP   106 1767CA80   21888 228  6  6/09/YYYY  0:10:02 *EZBITCOM03/06/01*
   DC$TCPIP   106 17225000   20480 231  6  6/09/YYYY  0:10:03 *..d........0.X..*
```

The subpools are displayed by the following colors in the Allocated Common Storage Areas panel:

- DRF—pink
- PAG—green
- FIX—red

Table 6-3 on page 6-16 shows the tasks that you can perform from the Allocated Common Storage Areas panel.

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Table 6-3 Allocated Common Storage Areas Panel Tasks

To Do This	Type Command	For More Information
Find a text string in the 16-byte storage header output field	**F <text>** where *text* is the text string that you want to find. To find the next occurrence of the specified string, press the PF (FIND) key.	N/A
Locate a value in the ordered output field	**L <value>** where *value* is the value that you want to locate in the sorted column.	N/A
Sort data in a specified output field (column)	**O <name>** where *name* is the name of the column that you want to order. The sorted column is highlighted.	See “Ordering Detail Data” on page 6-17.
Display a common storage area	**B** line command	See “Browsing and Altering a Common Storage Area” on page 6-17.
Alter a common storage area	**A** line command Use the ALTER command with extreme caution. Indiscriminate altering of common storage can cause system or component failure.	See “Browsing and Altering a Common Storage Area” on page 6-17 and “Altering a Common Storage Area” on page 6-19.
Free a common storage area	**F** line command Use the FREE command with extreme caution. Indiscriminate freeing of common storage can cause a system failure.	See “Freeing Common Storage” on page 6-21.

The Allocated Common Storage Areas panel contains the following output fields:

Field	Description
Name	name of the owner of the common storage area
X	indicator of terminated or unknown jobs: % Job name is not known. * Job in control when the GETMAIN was issued has been terminated. (The row is displayed in red.)
ASID	ASID of the owner of the common storage address space
Start	starting address of an allocated area of common storage
Length	length (in decimals) of the allocated storage area
SP	subpool of the allocated storage area
Key	storage key of the allocated storage area

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Field	Description
Date	Gregorian date (*mm/dd/yyyy*) when the common storage was allocated
Time	time (*hh.mm.ss*) when the common storage was allocated
Storage Header	first 16 bytes (in EBCDIC) of the allocated storage area

Ordering Detail Data

The data in the Allocated Common Storage Areas panel can be sorted on any column. Field names can be abbreviated to their first two characters. The ordered field name is displayed in white. (On monochrome terminals, a bar is displayed above the sorted column.)

The Allocated Common Storage Areas panel can be sorted in one of the following ways:

- Display the Selection and Sort Criteria for Storage Areas panel. On the **COMMAND** line, type **O** (for Order), followed by the heading of the column by which you want to sort, and then press **Enter**.

  Note: The Name, ASID, Start, Length, SP, Key, Time, and Header (Storage Header) columns can be sorted in Ascending (A) or Descending (D) order.

- Display the Allocated Common Storage Areas panel. To sort a column in a certain direction, type **O** <**name**> <**direction**> on the **COMMAND** line, where *direction* is A (Ascending) or D (Descending) order.

Browsing and Altering a Common Storage Area

To display the contents of a selected block of common storage, type **B** (Browse) on the line to the left of the **Name** field that you want to browse.

To alter a selected block of common storage, type **A** (Alter) on the line to the left of the **Name** field that you want to alter.

Note: Changes in a common storage area can be made in Alter mode only.

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The Browse Storage or Alter Storage panel is displayed. Figure 6-7 shows an example of the Alter Storage panel in a Common Storage Monitor panel.

Figure 6-7 Alter Storage Panel from Line Command A

```
----------------------------- Common Storage Monitor -------- Alter Storage
COMMAND ===>                                                 SCROLL ===> PAGE

Jobname DC$BBI   Beginning address 18AFBC08 Size 5112     Subpool 241  Key 0

  Address    Offset               Hexadecimal                   Character
--------------------------------------------------------------------------------
  18AFBC08  00000000   47F0F02E 2800C4E7 E2D4D8E2 4040F0F8  *.00...DXSMQS  08*
  18AFBC18  00000010   61F2F361 F9F760F1 F54BF0F8 60F2F7F0  */23/97-15.08-270*
  18AFBC28  00000020   60F0F0F0 F060C2C1 E2C5F5F1 F00090EC  *-0000-BASE510...*
  18AFBC38  00000030   D00C18CF 41800FFE 4188C002 18FDBFDF  *.........h......*
  18AFBC48  00000040   D0084770 C07A18DF 58008140 41F00052  *.....:....a .0..*
  18AFBC58  00000050   BFF28166 1B110A78 D76F1000 1000D202  *.2a.....P?....K.*
  18AFBC68  00000060   10018167 D2031050 D0085010 D00850D0  *..a.K..&..&...&.*
  18AFBC78  00000070   10049801 D01458D0 D008D207 D048CED0  *..q.......K.....*
  18AFBC88  00000080   41500000 41400000 1871D502 816A7000  *.&... ....N.a...*
  18AFBC98  00000090   4780C09A 5870A030 18514160 70304A66  *...........-..¢.*
  18AFBCA8  000000A0   00001255 4770C464 5850A00C D20060E8  *......D..&..K.-Y*
  18AFBCB8  000000B0   5000D203 60E9501B D20760ED 501FD217  *&.K.-Z&.K.-.&.K.*
  18AFBCC8  000000C0   61255001 D217613D 506FD22F 60F5503F  */.&.K./.&?K.-5&.*
  18AFBCD8  000000D0   D2076155 50E0BF2F 502BD22F 615F2064  *K./.&...&.K./...*
  18AFBCE8  000000E0   D22F618F 2094D207 61BF2130 D20761C7  *K./..mK./...K./G*
  18AFBCF8  000000F0   2138D203 61CF2028 D21B61D7 211441E0  *..K./...K./P....*
  18AFBD08  00000100   00144110 82E0D503 2110100A 4780C11C  *....b.N.......A.*
  18AFBD18  00000110   4110100E 46E0C106 411082E0 D20961F3  *......A...b.K./3*
  18AFBD28  00000120   1000BF2F 5037D203 61D32174 9102A00B  *....&.K./L..j...*
  18AFBD38  00000130   47E0C18C 411000E8 950050B8 4770C148  *..A....Yn.&...A.*
  18AFBD48  00000140   411012A8 47F0C14C 4110136A 4010615D  *...y.0A<.... ./)*
  18AFBD58  00000150   41116000 58305037 58230170 D2071000  *..-...&.....K...*
  18AFBD68  00000160   2074D203 100A2008 D22F100E 200CD22F  *..K.....K.....K.*
```

The Alter Storage panel in the Common Storage Monitor panel contains the following output fields:

Field	Description
Address	starting storage address for the line of data being displayed
Offset	hexadecimal offset of each line of data within the storage area
Hexadecimal	hexadecimal dump of the storage area; each line displays 16 bytes of data
Character	character representation of each line of data, enclosed within asterisks

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The Alter Storage panel provides the ability to modify the contents of a block of common storage. The block is displayed in a table that can be scrolled to any location in the subject block of common storage. The modifiable fields are displayed in green (highlighted on monochrome monitors).

To change the contents in storage, type over the displayed data. The storage will be updated when the request is confirmed, if the modified contents are still the same as the contents were when displayed.

Note: Only areas that are displayed simultaneously can be modified at the same time.

Altering a Common Storage Area

To alter a common storage area, follow this procedure.

Warning! Alter a common storage area with extreme caution. Indiscriminate altering of common storage can cause system or component failure.

Step 1 In the **Hexadecimal** or **Character** field, type over the data that you want to change.

Step 2 Press **Enter**.

The message `CONFIRM ALTER` is displayed in the upper right corner of the screen.

Figure 6-8 on page 6-20 shows an Alter Storage panel that was altered.

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Figure 6-8 Configuration for Changes to Alter Storage Panel

```
---------------------------- Common Storage Monitor----------- CONFIRM ALTER
COMMAND ===>                                                  SCROLL ===> PAGE

Jobname DC$BBI   Beginning address 18C68260 Size 32160    Subpool 241  Key 0

  Address    Offset               Hexadecimal                   Character
-------------------------------------------------------------------------------
  18C68260  00000000 > 00000000 00000000 00000000 17838460  *.............cd-*
  18C68270  00000010   00000000 00000000 00000000 00000000  *................*
  18C68280  00000020   00000000 00000000 18AA9FA8 18ABD5D8  *...........y..NQ*
  18C68290  00000030   00000000 18AA6988 00000000 18AF1C48  *.......h........*
  18C682A0  00000040   00000000 00000000 00000000 00000000  *................*
  18C682B0  00000050   00000000 00000000 00000000 00000000  *................*
  18C682C0  00000060   00000000 179B6E48 18AAA350 18ABEBA0  *......>...t&....*
  18C682D0  00000070   18AEFA48 00000000 00000000 00000000  *................*
  18C682E0  00000080   00000000 00000000 18AC19E0 18A987D0  *.............zg.*
  18C682F0  00000090   17A017F8 00000000 00000000 18AD2CF8  *...8...........8*
  18C68300  000000A0   179C4720 00000000 00000000 18AAADF8  *...............8*
  18C68310  000000B0   00000000 00000000 00000000 00000000  *................*
  18C68320  000000C0   00000000 00000000 18AACA60 00000000  *...........-....*
  18C68330  000000D0   00000000 00000000 18ACA2E0 00000000  *..........s.....*
  18C68340  000000E0   00000000 00000000 18AB6AE8 00000000  *...........Y....*
  18C68350  000000F0   00000000 185F3530 00000000 00000000  *................*
  18C68360  00000100   18A9C000 18ACCA40 00000000 00000000  *.z..... ........*
  18C68370  00000110   00000000 18AE4690 18AED020 17D20000  *.............K..*
  18C68380  00000120   00000000 00000000 00000000 00000000  *................*
  18C68390  00000130   18AA5C20 00000000 00000000 00000000  *..*.............*
  18C683A0  00000140   00000000 00000000 00000000 00000000  *................*
  18C683B0  00000150   18AD2180 00000000 00000000 00000000  *................*
  18C683C0  00000160   18AB3EA8 00000000 18AEDA48 185F36A0  *...y...........*
```

When you type over a character, its color changes to red immediately. When you press **Enter**, the changed characters are displayed in pink, the remaining input fields are changed to output fields, and their color changes to turquoise. A yellow greater than sign (>) is also inserted on the right side of the offset column of each changed line.

From this Alter Storage panel, you can cancel changes, submit changes, or exit the panel.

If You Want to	Do This
Cancel the changes that you entered	If you cancel the alter request by typing **CANCEL** on the COMMAND line, the overtyping is removed and the original contents of the storage block are displayed again.

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If You Want to	Do This
Exit the panel	If you abort the alter request using the END command, the data fields change back to input fields (green) and the overtyped data is displayed in pink. The Allocated Common Storage Areas panel is displayed again.
Update the common storage as displayed	Press **Enter** again. The storage is updated.

Freeing Common Storage

To free blocks of common storage, use the DETAIL command in the Common Storage Summary panel to locate the storage that you want to free. In the Allocated Common Storage Areas panel, type **F** in the command field next to the name of the storage, and then press **Enter**.

A pop-up window, Confirm Free for Storage Area, is displayed with the description of the storage area that you have selected, as shown in Figure 6-9.

Figure 6-9 Pop-Up Window Describing Selected Storage Area

```
------------------------ Allocated Common Storage Areas -----------------------
 COMMAND ===>                                                  SCROLL ===> PAGE
                                                            Row 1       of       5
 Valid line commands are:               Valid COMMANDs are:
 B - Browse common storage              F - Find a text string in header
 A - Alter common storage               L - Locate a value in the ordered field
 F - Free common storage                O - Order data by specified field
                            -------
   Name    X ASID    Start  Length  SP Key   Date      Time     Storage Header
 ---------------------------------------------------------------------------
 F VAM3CSA *   41 15EE9C00     256 241  3  6/10/YYYY 10:38:41 *................*
 F VAM3CSA *   40 15 .---- Confirm Free for Storage Area ----. PINION..........*
   VAM3CSA *   41 15 |                                       | PINION..........*
   VAM3CSA *   40 15 |       (Press HELP for Cautions)       | PINION..........*
 F VAM3CSA *   40 15 |                                       | PINION..........*
******************** |   Address: 15EE9C00  Subpool: 241     | *****************
                     |   Length:  256       Key:     3       |
                     |                                       |
                     |     Set free confirmation off         |
                     |                                       |
                     |     Press ENTER to confirm FREE       |
                     |           END to cancel FREE          |
                     '---------------------------------------'
```

If you are freeing multiple blocks, you can avoid future prompts by typing a / (slash) on the left side of `Set free confirmation off` before you press **Enter**.

Warning! Use the FREE command with extreme caution. Indiscriminate freeing of common storage can cause system or component failure.

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When You Want to	Do This
Exit the Free Common Storage panel	Press **END**. END cancels the free request. The Allocated Common Storage Areas panel is displayed again.
Confirm the FREE request	Press **Enter** again. The entire block of storage selected is freed and the Allocated Common Storage Areas Monitor panel is displayed again.

Common Storage Areas Excluded from the FREE Command

Several control blocks are defined in the exclusion table. The table is not all-inclusive, but the listed blocks are used by OS/390 after the address space that was active during their allocation has ended. Their presence does not reflect an error condition but rather the design of OS/390.

When you issue a FREE command, if a match is found on the control block acronym at the specified offset in a storage block, your FREE request is disallowed and the following ISPF message is issued:

```
FREE REJECTED
```

Note: You can override the exclusion table by using the ALTER command to change the acronym.

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Chapter 7 Using the Exception Monitor

This chapter contains the information that you need to use the Exception Monitor. It explains what the Exception Monitor is and how it works. It also tells you how to display the current status related to the Exception Monitor.

For information about setting up and controlling the Exception Monitor, or about using the Exception Monitor Member List to create, delete, or update control statement members, see the *MAINVIEW® for OS/390 Customization Guide*.

This chapter includes the following topics:

Defining the Exception Monitor 7-2
Displaying Current Status 7-3

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Defining the Exception Monitor

The Exception Monitor provides one of the fastest and easiest methods for detecting performance problems or potential problems.

For each system resource, your product administrator can specify an upper limit for utilization called a *threshold.* The Exception Monitor continuously monitors the resource at specified intervals and generates a warning message if that threshold is exceeded. These messages are displayed in both the WARN view and the OS/390 console. By closely monitoring Exception Monitor messages, you can take steps to correct problems or potential problems before they severely impact performance.

Note: To address potential problems automatically, you might want to set up a MAINVIEW AutoOPERATOR Solution so that it is triggered by incoming warning messages. See the *MAINVIEW® Solutions Guide* for more information.

How the Exception Monitor Knows What to Monitor

The Exception Monitor monitors system resources according to the *samplers* that are specified in the currently active *control statement member.*

A sampler is a program that monitors a particular aspect of system performance. MAINVIEW for OS/390 provides a diverse set of samplers from which to select. You can monitor things such as enqueue conflict, various types of I/O activity, CPU utilization, and so on.

The samplers used by MAINVIEW for OS/390, available from the WARN view, are collectively called the *Exception Monitors.* They are listed in the *MAINVIEW® SYSPROG Services User Guide and Reference*.

A control statement member is simply a collection of one or more samplers. Each member contains the initial threshold settings for its constituent samplers, which you can either keep or alter.

Only one control statement member can be active at a time. MAINVIEW for OS/390 ships two default control statement members, PWSCPM00 (which is modifiable) and PWSCMPXA (which is not modifiable). Both of these control statement members contain all of the samplers available with MAINVIEW for OS/390 and therefore monitor every possible aspect of system performance. However, using the Exception Monitor Member List, you or your product administrator can create your own control statement members to contain a subset of samplers, thus monitoring only specific areas of performance.

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The following example illustrates how you might use the Exception Monitor to gather information about a particular aspect of system performance.

Example:

Suppose that for resource planning purposes, your site wants to record how often CPU2 on SYSA is utilized beyond 75 percent of its capacity. After accessing the Exception Monitor on SYSA, perform the following tasks:

Step 1 Set a threshold of 75 percent for CPU2 by modifying the sampler called CPU and supplying a value of **75** in the **CPU2** field.

Step 2 Create a control statement member called PWSCPMC2. Select the CPU sampler for inclusion into PWSCPMC2.

At this point, you decide that you would like to monitor channel path utilization and the paging subsystem simultaneously.

Step 3 Add the samplers CHA and PAG to PWSCPMC2.

Step 4 Start the Exception Monitor with the PWSCPMC2 control statement member.

The Exception Monitor will now monitor the CPUs, channel paths, and paging subsystem according to the thresholds that you set. When CPU2 is utilized above 75 percent of its capacity, the Exception Monitor sends a warning message to both the WARN view and the OS/390 console.

Displaying Current Status

There are three categories of status information related to the Exception Monitor:

1. status of the Exception Monitor
2. currently outstanding system exception messages
3. a list of samplers running in the currently executing control statement member

This section tells you how to display each type of status information.

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Displaying Current Exception Monitor Status

To display the current status of the Exception Monitor, use the EMSTAT view, as shown in Figure 7-1.

Figure 7-1 EMSTAT View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EMSTAT==========SYSC=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===1
    System Id................     SYSC
     Exception Monitor Status   Active
     Current Member.......... PWSCPM00
     Current Exceptions......       19
```

The EMSTAT view provides information about Exception Monitor performance, as described in the following table:

To Determine	See This Field
which system you are on	**System Id** field
whether the Exception Monitor is active or inactive	**Exception Monitor Status** field
which control statement member is currently executing (if the Exception Monitor status is Active)	**Current Member** field
how many messages are currently outstanding	**Current Exceptions** field

Note: To check the status on another system, use the CONtext command to access the system, and then display the EMSTAT view. For example, typing **CONtext SYSB =; EMSTAT** on the **COMMAND** line displays the EMSTAT view on SYSB.

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Displaying System Exception Messages

To display the currently outstanding exception messages, use the WARN view or the OS/390 console. The WARN view looks like Figure 7-2.

Figure 7-2 WARN View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =WARN=============SYSC=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==48
  Time     Exception Description
  -------- ---------------------
  16:19:24 CPU 0 USAGE IS  25%
  16:19:24 CPU 1 USAGE IS  23%
  16:19:24 CSA  USAGE IS  25%;  3412K ARE FREE
  16:19:24 ECSA USAGE IS  44%; 17224K ARE FREE
  16:19:24 PAGE FIXED MEMORY = 26292K
  16:19:24 PAGING RATE IS    1 PER SECOND.
  16:19:24 ---------------------------------------------------------------
  16:18:49 CPU 1 USAGE IS  15%
  16:18:49 CSA  USAGE IS  25%;  3412K ARE FREE
  16:18:49 ECSA USAGE IS  44%; 17224K ARE FREE
  16:18:49 PAGE FIXED MEMORY = 26328K
  16:18:49 ---------------------------------------------------------------
  16:18:13 CSA  USAGE IS  25%;  3412K ARE FREE
  16:18:13 ECSA USAGE IS  44%; 17224K ARE FREE
  16:18:13 PAGE FIXED MEMORY = 26720K
  16:18:13 ---------------------------------------------------------------
```

As soon as the detected exception no longer exists, the appropriate message is automatically deleted from the WARN view.

Note: The Exception Monitor does not use the session journal.

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Chapter 8 MAINVIEW Alarm Manager

This chapter discusses MAINVIEW Alarm Manager, which works in conjunction with MAINVIEW for OS/390, as well as other MAINVIEW products, to provide alarms. These alarms display messages that can alert you when system resources are overutilized.

For complete information on MAINVIEW Alarm Manager, please refer to the *MAINVIEW® Alarm Manager User Guide*.

This chapter includes the following topics:

Alarm Definitions 8-2
MAINVIEW Alarm Manager Views 8-3
Alarm Reporting 8-3

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Other products that use MAINVIEW Alarm Manager are

- CMF MONITOR
- MAINVIEW® for CICS
- MAINVIEW® for DB2®
- MAINVIEW® for IMS
- MAINVIEW® for MQSeries
- MAINVIEW® VistaPoint™

MAINVIEW Alarm Manager is capable of simultaneously monitoring multiple systems. This means that MAINVIEW Alarm Manager installed on one system keeps track of your entire sysplex.

Alarm Definitions

Alarm definitions consist of

- threshold and filter criteria
- the view, product, and contexts for which the criteria are established
- message IDs and message text
- monitoring frequency and time periods
- hyperlinks to views, extended help, or MAINVIEW AutoOPERATOR commands

Threshold conditions are derived from thresholds in MAINVIEW for OS/390. Alarm definitions are stored in a parameter library member read by MAINVIEW Alarm Manager at MVALARM PAS initialization.

Threshold conditions are defined as one of five priority levels:

- Informational
- Warning
- Minor
- Major
- Critical

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MAINVIEW Alarm Manager Views

MAINVIEW Alarm Manager is structured with a hierarchy of views, beginning with the Easy Menu view, EZALARM, as shown in Figure 8-1.

Figure 8-1 EZALARM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> CSR
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZALARM==========DXTSTH===*========DDMMMYYYY==HH:MM:SS====MVALARM==D==1
                              MVALARM Easy Menu
     Display Alarms                                       Set Up/Modify Alarms
   . Current Alarms          +----------------------+  . List Alarm Groups
   . Alarm History           |   Place cursor on    |  . List Alarm Definitions
   . Alarm Summary           |    menu item and     |
                             |     press ENTER      |    Advanced Options
                             +----------------------+  . Add Alarm Definition
                                                       . Edit Alarm Definition
                                                       . View Alarm Definition
```

You can hyperlink from EZALARM to other views to display alarms or to edit or view alarm definitions. When you add or edit an alarm definition, you can customize the alarm messages, as well as the threshold levels, the monitoring frequency, and the action that is taken when an alarm occurs.

Alarm Reporting

Alarms can be reported in one of the following ways:

- as WTOs on the OS/390 image where MAINVIEW Alarm Manager is executing
- as a list of alarm messages displayed in MAINVIEW Alarm Manager ALARM or ALARMH views
- by being passed directly to the MAINVIEW AutoOPERATOR Rules Processor interface, if MAINVIEW AutoOPERATOR is running on the same OS/390 image as MAINVIEW Alarm Manager

MAINVIEW Alarm Manager also issues End messages when alarm conditions cease. End messages can also be reported in any of the three destinations listed for alarms.

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Chapter 9 Graphing Your Data

Most MAINVIEW for OS/390 and CMF MONITOR views come with graphs that depict the data in pictorial form. You can change these graphs, or create graphs of your own, by using a component of MAINVIEW called Graph Manager. This chapter explains how to use Graph Manager to display, customize, or print a chart, or save it in a picture file for later retrieval.

This chapter includes the following topics:

Before You Begin 9-2
Displaying a Chart 9-2
Customizing Graphs 9-2
Printing a Chart 9-6

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Before You Begin

To save a chart definition, the BBTLIB data set must be allocated to your user ID. At most sites, the data set is automatically allocated when you access MAINVIEW. If the BBTLIB data set is not allocated to your user ID, see the *MAINVIEW® Common Customization Guide* or your system administrator for information about how to allocate the data set.

Displaying a Chart

To display a chart, follow this procedure:

Step 1 Display the view for which you want to see the chart.

Step 2 On the **COMMAND** line, type **GRAph**.

The view is replaced by a full-screen chart of the view data.

The MAINVIEW window interface accesses either high-resolution charts or low-resolution charts, depending on your terminal type. High-resolution terminals require the use of GDDM and include the 3279, 3179G, 3290, and 3274G terminals. Low-resolution terminals, which include 3277, 3278, 3178, and so on, use ISPF dialog-management services instead of GDDM. These charts use characters such as asterisks and dashes to represent graphics.

Customizing Graphs

You might want to customize the graph that was originally distributed with a particular view—in this example, the view JFLOW. You want to save the graph with JFLOW so that it is displayed every time you issue the GRAPH command from JFLOW. Although there are several ways to accomplish this goal, the recommended procedure is as follows:

Step 1 Display JFLOW.

Step 2 On the **COMMAND** line, type **CUST** to enter view customization.

Step 3 Select Option **G** (Graph).

The dynamic customization window for the Graph option looks like Figure 9-1 on page 9-3.

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Figure 9-1 Graph Option

```
----------------------< Graph - Specify columns for graphing>------------------
X=> A       Chart Type => $MBARH   Library => D       (D-dist, S-site, Userid)
1=> J   5=>     Title  => Interval job workflow and delay
2=> L   6=>     X-axis => Jobname              Select X-axis and Y-axis columns
3=>     7=>     Y-axis => Percentage           and enter optional titles.
4=>     8=>                  Preview chart => N (Y/N)
-------------------------------------------------------------------------------
```

Step 4 If you want to make one or more of the changes described in the following table, use the associated instructions:

To Change	Do This
the element used for the X-axis	In the **X** field, type the appropriate column letter.
elements used for the Y-axis	In fields **1** through **8**, type the appropriate column letter.
the title of the graph	In the **Title** field, type the new title.
X-axis label	In the **X-axis** field, type the new label.
Y-axis label	In the **Y-axis** field, type the new label.
chart type	If you know the name of the *chart definition* that you want to use, in the **Chart Type** field, type its name. (To see a list of chart definition names and their descriptions, press **PF1** and scroll down until the list is visible.) If you do not know the name, continue following the numbered steps.

Step 5 In the **Preview chart** field, type **Y**, and then press **Enter** to test your changes.

Step 6 Press **PF3** (End) to return to view customization.

Step 7 If you are satisfied with your changes, press **PF3** to exit view customization.

Step 8 Be sure to save your modifications by typing **YES** in the **Save changes** field.

Step 9 If you want to change the chart type, but do not know which type to use, continue with this procedure. If you do *not* need to change the chart type and have completed your specifications, turn to “Printing a Chart” on page 9-6.

Step 10 From view customization, in the **Preview chart**, type **Y**, and then press **Enter** to display the graph.

Step 11 Press **PF1** to enter Graph Manager.

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The Chart Selection panel is displayed.

Note: For specific information about the fields and options available from this panel, press **PF1** (Help).

If you have a high-resolution terminal, the Chart Selection panel looks like Figure 9-2.

Figure 9-2 High-Resolution Chart Selection Panel

```
----------------------- CHART SELECTION -  $MBARH ------------------ CHART: 1
OPTION  ===>                                            HARDCOPY PFKEY ==> 4

   A - List, select, update chart definitions           MULTIPLE CHART ==> N
   B - Display data item selection list                 CHART LOCATION ==>
   C - Redefine current chart specifications             1 L.half   2 R.half
   blank - Generate chart                               3 L.top    4 R.top
                                                        5 L.bottom 6 R.bottom
CHART TYPE  ==> 6  (Enter one of the chart types listed)
CHART TITLE ==> Interval job workflow and delay         COMMON HEADING ==> N

1 Line graph   4 Overlay surf 7 Stacked bar  10 3D bar   A Annotation only
2 Scatterplot  5 Histogram    8 Overlay bar  11 3D surf  T Tabular display
3 Stacked surf 6 Multiple bar 9 Pie chart               I ICU (GDDM)

Data items currently selected:
X-axis: ASGNAME  (not used for pie charts)
Y-axis: ASIWKFL  ASIDLYP
```

If you have a low-resolution terminal, the panel looks like Figure 9-3.

Figure 9-3 Low-Resolution Chart Selection Panel

```
------------------------- CHART SELECTION -  $MBARH -------------------------
OPTION  ===>

   A - List, select, update chart definitions          LEGEND POSITION  ==> R
   B - Display data item selection list                (B=bottom,T=top,R=right)
   C - Redefine current axis range and labels
   blank - Generate chart

CHART TYPE  ==> 3   (Enter one of the chart types listed)
CHART TITLE ==> Interval job workflow and delay

 1 Line graph    2 Scatterplot   3 Stacked bar   4 Overlay bar    5 Pie chart

Data items currently selected:
X-axis: ASGNAME  (not used for pie charts)
Y-axis: ASIWKFL  ASIDLYP



For hardcopy of a displayed chart, press the ISPF defined PRINT PFK.
```

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Step 12 From the Chart Selection panel, select Option **A** to choose a new chart type.

The Chart Definition panel is displayed, containing a list of predefined chart definitions.

Step 13 Type an **S** next to the chart definition that you want to display.

Step 14 Press **Enter** twice to see the chart that you selected.

Step 15 Continue selecting and displaying different chart definitions until you find the one that you want to use for JFLOW.

- If you do not find the definition you want, or if you find one but want to make changes to it, go to Step 16.
- If you are satisfied with one of the distributed definitions, go to Step 17.

Step 16 If you do not find the chart type that you want in one of the distributed definitions, or if you want to change one of the distributed versions, you must create a new chart definition. To do this, follow this procedure:

16.A Select the distributed definition that is *most similar* to the chart type that you want to use.

16.B Press **Enter** to return to the Chart Selection panel.

16.C Change the chart type by typing the number corresponding to the chart type that you want in the **CHART TYPE** field.

If you have a high-resolution terminal, you can now select Option **C** and make additional changes to your graph in the Chart Axes panel.

16.D When you are satisfied with your changes, select Option **A** from the Chart Selection panel.

16.E In the **CHART DEFINITION NAME** field, assign a name to your customized chart.

16.F Save the chart. Select *one* of these choices:

- To save the chart in your site-wide chart library, type an **S i**n the **CHART LIBRARY** field.
- To save the chart in your personal chart library, type your user ID in the **CHART LIBRARY** field. (You cannot save a customized chart in the distributed library.)

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16.G To add (or replace) your chart definition, type an **A** in the **OPTION** field.

Step 17 Press **PF3** (End) until you return to view customization.

Notice how the chart definition that you selected is now displayed in the **CHART TYPE** field.

Step 18 Make any other necessary changes in the Graph dynamic window, and then press **Enter**.

Step 19 Press **PF3** to save the chart and exit view customization.

The modified chart is now saved with JFLOW and will be displayed every time you type **GRAph** from that view.

Printing a Chart

Low-resolution graphics are printed by using the ISPF PRINT command.

For high-resolution graphics, follow this procedure:

Step 1 Display the chart that you want to print or transfer.

Notice the number of the PF key that has been assigned to HARDCOPY in the lower right-hand corner of your screen. If you want to change this PF key definition, press **PF1**, and then specify the new number in the **HARDCOPY PFKEY** field on the Chart Selection panel.

Step 2 Press the Hardcopy PF key.

The Graphics Transfer panel is displayed, as shown in Figure 9-4 on page 9-7.

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Figure 9-4 Graphics Transfer Panel

```
----------------------------  GRAPHICS TRANSFER  ---------------------------
OPTION  ===>

   1  QUEUE - transfer screen image to the GDDM print request queue data set
   2  SAVE  - transfer screen image to a permanent picture file (GDF)
   3  PLOT  - transfer screen image to an attached plotter
   4  PRINT - transfer screen image to an attached printer

Queued request:  (option 1)
   Printer name      ==> LSPRB32  (VTAM node name or GDDM nickname)
   Number of copies  ==> 1
   Separator page    ==> NO
   Page width (cols) ==> 75
   Page depth (rows) ==> 60

Picture file: (option 2)
   Data set name     ==>
   Member name or    ==>
    Member prefix     ==>        (the next 2-digit sequential number will be
                                 appended to this prefix)

Press ENTER   to generate picture transfer
Press END KEY to cancel request
```

Note: For specific information about the fields and options available from this panel, press **PF1** (Help).

Step 3 Select the task that you want to perform from the following table and follow the procedure specified:

To Do This	Follow This Procedure
Transfer a chart to the GDDM print-request queue data set.	1. In the **OPTION** field, type **1** (Queue). 2. Complete the **Queued request** fields on the Graphics Transfer panel. 3. Press **Enter**.

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To Do This	Follow This Procedure
Transfer the graph to a picture file on auxiliary storage for later display. A *picture file* is a member of a partitioned data set (PDS) stored in Graphics Data Format (GDF).	1. If you or your site does not already have a graphics PDS, allocate one on auxiliary storage with these attributes: **RECFM=F** or **FB** **LRECL=400** 2. In the **OPTION** field, type **2** (Save). 3. In the **Data set name** field, specify the name of the PDS. 4. In the **Member name** field, specify the member name that you want to use, or in the **Member prefix** field, specify a prefix of up to six characters. 5. Press **Enter**. *About member prefixes*: The **Member prefix** field allows you to logically group a set of related graphs. Graph Manager appends a two-digit suffix (01–99) to the prefix for each unique graph. For example, if you specified the prefix TAXES, the first graph is saved as TAXES01, the second graph as TAXES02, and so on. Then, when you are ready to display all of the TAXES graphs, you can use the PICture command to display the graphs in numerical order.
Transfer the graph to an attached plotter. A plotter can be attached to a 3179G or 3270 PC/G(.X).	In the **OPTION** field, type **3** (Plot), and then press **Enter**.
Transfer the graph to a locally attached printer.	In the **OPTION** field, type **4** (Print), and then press **Enter**.

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Chapter 10 MAINVIEW Batch Optimizer Support

MAINVIEW Batch Optimizer is a specialized set of components designed to manage batch jobs, reduce elapsed processing times, and provide more efficient use of available resources.

This support is available only to the customer who has both MAINVIEW for OS/390 and MAINVIEW Batch Optimizer installed.

This chapter includes the following topics:

Displaying MAINVIEW Batch Optimizer Information 10-2
Activating MAINVIEW Batch Optimizer Support 10-3

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MAINVIEW Batch Optimizer

- identifies a batch job that is under the control of MAINVIEW Batch Optimizer
- determines whether a job is the originating job or a split step from another address space
- supplies the system name, address space ID, step number, and job select time of the HOME job for any split-step address space
- links all split-step address spaces back to the originating batch job

Displaying MAINVIEW Batch Optimizer Information

There are two ways to display MAINVIEW Batch Optimizer information.

Method 1

Step 1 In EZM390 (which is an OS/390 Easy Menu), move the cursor to the **Jobs** field under **Activity**, and then press **Enter**.

This action hyperlinks to EZMJOBS, which is a Jobs Easy Menu.

Step 2 In EZMJOBS, move the cursor to the **Overview** field under **General**, and then press **Enter**.

This action hyperlinks to JOVERZ.

Step 3 In JOVERZ, move the cursor to the **MBO** field and press **Enter** if the field is YES. (If the field is NO, you cannot hyperlink to the JSBOVERZ view.)

This action hyperlinks to JSBOVER. JSBOVER displays activity for a single Batch Optimizer job or displays overall Batch Optimizer activities within the complex. It provides very helpful information, such as

- job name
- step name
- job type
- system name
- elapse time
- reasons for wait
- total delay percentage

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- CPU utilization
- step status
- job completion code

Method 2

Step 1 From any OS/390 view, type **JOVER** on the **COMMAND** line.

This displays JOVER.

Step 2 In JOVER, move the cursor to the **MBO** field and press **Enter** if the field is YES. (If the field is NO, you cannot hyperlink to the JSBOVER view.)

This action hyperlinks to JSBOVER. JSBOVER can display activity for a single Batch Optimizer job or display overall Batch Optimizer activities within the complex.

Activating MAINVIEW Batch Optimizer Support

To activate Batch Optimizer support in MAINVIEW for OS/390, you need to define a PARMLIB member, BBDJST00, in the UBBPARM. BBDJST00 is a PARMLIB member for the job step. It should contain the following elements:

<MBO>
</MBO>

Please refer to Chapter 5, “Controlling Job Step Data Collection,” for more information about how to update BBDJST00.

Figure 10-1 on page 10-4 shows an example of how to invoke Batch Optimizer support. Figure 10-2 on page 10-4 shows the JSBOVER view, if you want to display activity for a single Batch Optimizer job.

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Figure 10-1 Invoking Batch Optimizer Support

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                              SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
>W1 =JOVER=============SJSCXTSM=*========DDMMMYYYY==HH:MM:SS====MVMVS====D==273======
C Jobname  T SrvClass Step MBO Total Total  %Dly    %Dly  %CPU  EXCP DmdP SwpP    Avg
- -------- - -------- Data ---  Dly%  Use%  Idle Unknown  Util  /Sec /Sec /Sec  Frame
  RCHMXN2  T TSO      NO   NO              100.0                                   591
  RDAKCH2  T AUSTSO   NO   NO              100.0                                   591
  RIHDXM6  T TSO      NO   NO                      100.00                         1200
  RDAEAS   T AUSTSO   NO   NO             100.00                                  1526
  RDAMZL2  T AUSTSO   NO   NO             100.00                                  1345
  INIT     S SYSSTC   NO   NO                      100.00                         1774
  RCDHLK4  T TSO      NO   NO             100.00                                  2489
  RIHDXM5  T TSO      NO   NO             100.00                                  4219
  SMXC     S SYSTEM   NO   NO                      100.00                         3494
  BPXAS    S STCGEN   NO   NO                      100.00                         3649
  RIHCTS5  T TSO      NO   NO             100.00                                  8659
  RIHROB2  T TSO      NO   NO             100.00                                  9099
  TRACE    S STCGEN   NO   NO                      100.00                         2449
  OMIIEPZM S PRODSTC  NO   NO                      100.00                         8129
  KWMWTORI B BATCH   YES  YES 100.00                                              1568
  DWBAERKR B BATCH   YES  YES   9.47 76.12          14.41  1.6 169.12             1264
  RDADAC4U B BATCH   YES  YES   5.82 30.55          63.64  0.8  32.23             3620
  RDAJMPX  B BATCH   YES  YES             100.00                                  2510
```

Figure 10-2 Displaying Activity for a Single Batch Optimizer Job

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                              SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
>W1 =JSBOVER=============ALL=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==273====
C Jobname    Stepname   Step    Job          System     Elapsed     JES       Wait Re
- --------   --------    Num    Type          Name      StepTime    JobId     -------
  MRFSEQ00   RCUSEQ00      1 Home Job       SYSO        00:00:05    JOB06493
  MRFSEQ00   CAPUMAIN      2 Home Job       SYSO        00:00:04    JOB06493
  MRFSEQ00   ICPUMAIN      3 Home Job       SYSO        00:00:03    JOB06493
  MRFSEQ00   RVPUMAIN      4 Home Job       SYSO        00:00:05    JOB06493
  MRFSEQ00   STPCOND       5 Home Job       SYSO        00:00:00    JOB06493
```

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Chapter 11 The MVScope Facility

This chapter describes the MVScope facility, which

- traces CPU usage down to the CSECT level
- traces I/O usage down to the channel program level

MVScope enables you to specify one of three sampling types: CPU, IO, and CPUIO. You can initiate MVScope CPU and I/O sampling from views in MAINVIEW or from the console. MVScope can also be invoked as a MAINVIEW AutoOPERATOR action if an alert is generated as a result of an alarm produced by MAINVIEW Alarm Manager. You can also customize sampling parameters.

This chapter includes the following topics:

Security Issues When Using MVScope 11-2
MVScope Installation Verification Program 11-4
Quick Start 11-9
Tutorial 11-25
Summary of MVScope Views 11-47
Frequently Asked Questions 11-75

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When MVScope is invoked, it creates a monitor set. The monitor set is a set of MAINVIEW records that contains the following information:

- name of the job or devices sampled
- date and time of the set of samples
- tracing parameters
- samples collected

MVScope creates the monitor set automatically when you start MVScope against a specific job from a MAINVIEW view or from the console. You can also create and customize a monitor set from specific views.

MAINVIEW writes monitor sets to its history files at the end of the interval when the monitor set has been analyzed.

Security Issues When Using MVScope

The MAINVIEW security interface allows you to control access to MAINVIEW resources by means of your External Security Manager (ESM).

Warning! Because of the sensitive nature of some of the data collected by MVScope, your security administrator might grant access to MVScope actions and views on a user-by-user basis. The resource "MVMVS MVScope provide I/O data" from the Security Resource Definition can allow sensitive data to be displayed in the MSICCW view if security is disabled.

The PAS must have read access to all of the program libraries in order for MVScope to map the program module, regardless of the level of access for a user. Your security administrator must make sure that the PAS is started with read access enabled if you use MVScope. (For example, the parameter in ACF2 might be set to READALL. Refer to your ESM documentation for the correct parameter.) If you are not using MVScope, the read parameter does not have to be enabled.

By default, security is enabled for all MVScope actions and views. You can enable or disable security for the MVScope actions either collectively or individually. Figure 11-1 on page 11-3 shows some of the MVScope views and actions that can be secured (your screen might look different).

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Figure 11-1 View for Enabling and Disabling MVScope Security

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =SERDEF============SYSE=====*========(00 BROWSE        )====MVMVS====D==117
 CMD Description                              Enab Change Comment
 --- ------------                             ---- --------------
    MVScope Messages                         Yes
    MVScope - Action - STOp a Monitor Set    Yes
    MVMVS MVScope provide I/O data           Yes
    MVMVS Primary Action - MVSCOPE           Yes
    MVScope - Action - MONitor start         Yes
    MVScope - Action - M command Dxre        Yes
    MVScope - Action - M command Asiw        Yes
    MVScope - Action - M command Wusr        Yes
    MVScope - Action - M command Asre        Yes
    MVScope - Action - M command WusrEnq     Yes
    MVScope - Action - M command WusrHSM     Yes
    MVScope - Action - M command WusrJES     Yes
    MVScope - Action - M command WusrMSG     Yes
    MVScope - Action - M command WusrWkld    Yes
    MVScope - Action - M command WusrXCF     Yes
    MVScope - Action - DELete a Monitor Set  Yes
    MVScope - Action - CHAnge a Monitor Set  Yes
    MVScope - Action - ADD MS line command   Yes
    MVScope - Action - ADD a Monitor Set     Yes
    MVScope Named CSECT Virt Stor - Table D  Yes
    MVScope Named Program Virt Stor - Table  Yes
    MVScope Program Virt Stor - Table Data   Yes
    MVScope PSW Sample - Table Data          Yes
    MVScope Time Buckets - Table Data        Yes
    MVScope Time 8 Buckets - Table Data      Yes
    MVScope Virtual Storage - Table Data     Yes
    MVScope Volume Extent - Table Data       Yes
    MVScope DD Entry - Table Data            Yes
    MVScope Execution Unit - Table Data      Yes
    MVScope Volume Extent Used - Table Data  Yes
    MVScope CCW and I/O data - Table Data    Yes
    MVScope I/O Interrupt - Table Data       Yes
    MVScope Monitor Set - Table Data         Yes
```

Generally, the MVScope resources listed in Figure 11-1 as *Table Data* pertain to views, while resources listed as *Action* pertain to commands that a user can actually perform.

Refer to *Implementing Security for MAINVIEW® Products* for instructions on how to authorize users for MAINVIEW for OS/390.

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MVScope Installation Verification Program

MVScope has an Installation Verification Program (IVP) that generates CPU and I/O activity. You should use this program to verify that MVScope analyzes CPU and I/O activity correctly. You will use the IVP in the following sections to illustrate how to use MVScope.

The job to run the MVScope IVP is distributed with MAINVIEW as member BBD9MAIV of the BBSAMP library. The steps for running the MVScope IVP are described in the next few sections.

Installing the Installation Verification Program

Copy the sample file BBD9MAIV from the BBSAMP library to one of your data sets. Tailor the JCL, as shown in Figure 11-2 and described in "Tailoring the JCL" to satisfy your site's requirements.

Figure 11-2 Tailoring JCL for Your Site

```
//BBD9MAIV  JOB  (Account),'Your Name'
//MAIVSTEP EXEC PGM=BBD9MAIV
//STEPLIB DD DISP=SHR,DSN=*prefix*.BBLINK
//DD1  DD UNIT=*tunit*,SPACE=(CYL,(5)),VOL=SER=*volser*
//DD2  DD UNIT=*tunit*,SPACE=(CYL,(5)),VOL=SER=*volser*
```

Tailoring the JCL

To tailor the JCL, follow this procedure:

Step 1 Replace the job card shown in Figure 11-2 with a job card that satisfies your site's standards.

Make a note of the job name that you use, because this is the name that you will be monitoring in the views described in "Initiating MVScope Sampling of a Job" on page 11-5. Use a job class that allows the job to run for at least two minutes. The program will use a lot of CPU time.

Step 2 In the //STEPLIB statement, change `*prefix*` to the high-level qualifier that you have used for your distribution libraries.

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Step 3 In the //DD1 and //DD2 statements, change `*tunit*` to a valid unit name for temporary data sets at your site.

Step 4 In the //DD1 and //DD2 statements, change `*volser*` to the volume where you want to trace I/O activity.

If your site does not allow you to allocate data sets on specific volumes, you should delete the `VOL=SER=` keywords.

Initiating MVScope Sampling of a Job

To initiate MVScope sampling of this job, follow this procedure:

Step 1 Display the JUDEV view in MAINVIEW.

Step 2 Submit this job.

(In your example, as shown in Figure 11-4 on page 11-6, the job is named BMVSLKV.)

This action will allocate two temporary data sets, get 16 MB of virtual storage, and go into a continuous loop that references the storage and performs I/O to the data sets.

Step 3 When the JUDEV view shows this job using the device where you directed it to allocate the //DD1 and //DD2 data sets, type **M** next to that row to initiate monitoring, as shown in Figure 11-3.

Figure 11-3 M Line Command Next to Test Job

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JUDEV=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===42
 C Jobname  Intvl T SrvClass    %Use    %Use  Dev Volser Type Mnt  Resp  Act. %R
 - -------- Time- - -------- ThisJob AllJobs  Num ------ ---- Sta  Time  Rate Qu
 M BMVSLKV  11:11 B BATNRM      1.56    1.56  D06 PUBBC1 3390 PUB  24.0  0.30
   XTSTHPAS 11:11 S STCPAS      1.25    2.50  305 BAB314 3390 PRV   7.8  3.13
   BOLDSK4  11:11 T TSONRM      1.25    2.50  D27 TSG306 3390 STG   3.6  3.49
   BMVSLK2  11:11 T TSONRM      0.94    2.50  305 BAB314 3390 PRV   7.8  3.13
   BOLDSK4  11:11 T TSONRM      0.94    1.25  326 TSG900 3380 PRV   6.3  1.19
   *MASTER* 11:11 S SYSTEM      0.94    0.94  227 PAGD27 3380 PRV  13.2  1.05
   BMVSAUP4 11:11 S STCNRM      0.94    1.25  30B BAB320 3390 PRV   7.1  1.41
```

MVScope initiates sampling and displays the MSMONSET view with the selected job in the sampling state, as shown in Figure 11-4 on page 11-6.

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Figure 11-4 MSMONSET View with Selected Job in Sampling State

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
    Symptoms                                                Problem Analysis
  . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
    No samples              10:11:28 to 11:12:28      . Programs
  . Hot Instruction         17 CPU, 39 I/O samples    . I/Os
    Addr:  00006B48  35.3%  Sampling NOV 16, YYYY     . Traces
    Pgm:   BBD9MAIV         No sampling errors        > Maps
    CSECT: BBD9MAIV
    Ofst:   +0001B6         +----------------------+    Utilities
  . Hot Task                |   Place cursor on    |  > Monitored Job
    Addr:  007E39C8  94.1%  |    menu item and     |  > First Monitored Dev
    Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
  . Hot DASD Track          +----------------------+
    CCHH:  00E5000C  35.9%                            . Return ...
    Dsn:   SYS96158.T13504
```

Verifying the Analysis of MVScope

Use MSMONSET and other MVScope views as follows to verify that MVScope is sampling the CPU and I/O activity correctly and is reporting the results correctly:

Step 1 In MSMONSET, verify that the monitor set overview reported in the center column has the correct job name, device, date, and time.

Step 2 Verify that, initially, the monitor set is in the Sampling or Waiting state.

As soon as MVScope detects that the job is active, it starts CPU and I/O sampling and sets the monitor set's state to Sampling.

Step 3 Press **Enter** as sampling proceeds.

3.A Verify that both CPU and I/O counts increase.

3.B Verify that no more than 100 I/O samples are collected.

3.C Verify that sampling lasts only one minute.

Step 4 During sampling, observe the hot spots reported under the MSMONSET Symptoms heading on the left. Verify that a Hot Program, Hot Instruction, Hot Task, and Hot DASD Track are identified.

Step 5 Verify that after one minute, MVScope changes the monitor set state to Analyzing or Analyzed.

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Step 6 Cancel the Installation Verification Program.

Step 7 Verify that MSMONSET reports that the monitor set's state changes to Analyzed in less than five minutes.

Note: The Analyzing phase could be lengthened if MVScope is unable to quickly read the VTOC of the device where the //DD1 and //DD2 data sets are allocated, or if MVScope cannot quickly allocate and read the BBD9MAIV program from the //STEPLIB library.

Step 8 Verify that when the monitor set's state is Analyzed, MSMONSET displays

- the name of the busiest program
- the name of the program and CSECT containing the busiest instruction
- the name of the busiest task
- the data set name of the busiest DASD extent

Step 9 After the monitor set's state has changed to Analyzed, verify that the state changes at the start of the next interval to either Retained or Filed. If you have historical data sets and the state is Retained, wait one more interval for the state to change to Filed.

Step 10 If the PAS has historical data sets, verify that the monitor set state remains Filed until the historical data set is reused or otherwise becomes inaccessible to MAINVIEW. Verify that MVScope changes the monitor set's state to Dropped at that time.

You can use the DSLIST view to see and alter the state of the historical data sets.

Step 11 If you do not have any historical data sets, verify that the monitor set remains in the Retained state for five intervals, after which time MVScope changes the monitor set's state to Dropped.

Hyperlinking to Detailed Views

Refer to "MSMONSET View" on page 11-10 for a description of how to use hyperlinks from the MSMONSET view to analyze the samples in the monitor set.

Refer to "Summary of MVScope Views" on page 11-47 for a list of hyperlinks from MVScope views.

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BBDTMSDP PARMLIB Member

An optional PARMLIB member, BBDTMSDP, can be defined in the UBBPARM data set. This PARMLIB member allows you to specify and define default sampling parameters, which will be used for all monitoring sessions. MVScope uses the distributed default value for sampling parameters when BBDTMSDP is not defined in the PARMLIB.

Syntax Rules

The following syntax rules apply to the creation of BBDTMSDP:

- An asterisk (*) in column 1 indicates a comment record. (Note that comments do not appear in the parameter record.)
- Keywords must be separated by a blank.
- Keyword values must be preceded by an equal sign (=).
- A statement can be continued without explicit continuation characters.
- Use columns 1 through 80.

Statements

BBDTMSDP PARMLIB member statements are described in Table 11-1.

Table 11-1 BBDTMSDP PARMLIB Member Statements

PARMLIB Member	Description
MXDUR	Maximum number of seconds that sample occurs Default value: 60 Value range: 1–9999
MXDEV	Maximum number of devices to be monitored Default value: 100 Value range: 1–999
MXSAM	Maximum number of CPU samples to be taken Default value: 600 Value range: 1–99999
MXIOC	Maximum number of I/O samples to be taken Default value: 100 Value range: 1–9999
MXCCW	Maximum number of CCWs traced for each I/O sampled Default value: 25 Value range: 1–999
SAMRAT	Number of CPU samples per second Default value: 10 Value range: 1–999

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Examples

The following examples show valid ways of creating a BBDTMSDP PARMLIB member:

Example 1: BBDTMSDP PARMLIB member:

MXDUR=120 MXDEV=120 MXSAM=80 MXIOC=200 MXCCW=2 SAMRAT=10

Example 2: BBDTMSDP PARMLIB member with comment column:

***This is a MVScope Parmlib Member**
MXDUR=90 MXDEV=200 MXSAM=1000 MXIOC=140 MXCCW=26

Example 3: BBDTMSDP PARMLIB member using continuation:

MXDUR=90 MXDEV=200 MXSAM=1000 MXIOC=140 MXCCW=26

Quick Start

This section guides you through the basics of MVScope. This section is intended for users who are familiar with MAINVIEW views, hyperlinks, online help, and menu structures.

If you are new to MAINVIEW, you might want to complete the exercises in the *MAINVIEW® for OS/390 Getting Started* guide first. You might also want to review the detailed MVScope tutorial in “Tutorial” on page 11-25.

Before you begin, review the following key words so that when you see them you are familiar with their definitions.

MVScope Key Words

The following words take on special meaning when you are using MVScope:

- **monitor set**—a sampling profile and records for views
- **monitoring**—sampling CPU and I/O activity and analyzing the samples
- **primary view**—MVScope primary views that include MSLIST, MSMONSET, MSDIAG, MSDPROF, MSDCPU, MSDIO

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- **sampling**—for CPU: interrupting the CPUs and collecting instruction address samples; for I/O: tracing a specified number of I/O events for one or more devices, optionally filtered by job, and collecting I/O samples

- **tracing**—sampling a set of events in sequence, as for I/O sampling

MVScope Key Views

To begin using MVScope, you should be familiar with the two key views:

- MSLIST
- MSMONSET

MSLIST View

Display the MSLIST view by typing **MSLIST** on the **COMMAND** line of any MAINVIEW view. The MSLIST view is MVScope's primary administrative view. It shows all of the monitor sets and their states. You can execute several line commands against the monitor sets shown in MSLIST.

Refer to Table 11-4 on page 11-34 for a list of commands that you can issue in MSLIST.

The MSLIST view is shown in Figure 11-5.

Figure 11-5 MSLIST View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====3
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     BMVSLK2YYYYNOV16 11:46 Analyzed  CPU   PCAUTH   /0D06  16NOVYYYY 11:31:38
     BMVWRW1YYYYNOV16 11:46 Filed     CPUIO AAOEYP01 /0252  16NOVYYYY 11:13:59
     Template Monset  11:46 Ready     CPU
```

MSMONSET View

Hyperlink to the MSMONSET view from the **Monitor Set** field in the MSLIST view. The MSMONSET view shows you all of the specific information for a monitor set—its status, date and time, and the hottest program, instruction, task and DASD extent. MSMONSET also provides hyperlinks to more detailed views that help you identify the instructions and I/Os causing the problems encountered with the monitored job or devices.

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The MSMONSET view shows the status of an individual monitor set, as shown in Figure 11-6.

Figure 11-6 MSMONSET View Showing Status of a Monitor Set

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
     Symptoms                                              Problem Analysis
   . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks a and SRBs
     Name:  BBD9MAIV  89.9%  10:55:06 to 11:56:07      . Programs
   . Hot Instruction         257 CPU, 100 I/O samples  . I/Os
     Addr:  00006B4E  29.2%  Analyzed NOV 16, YYYY     . Traces
     Pgm:   BBD9MAIV         No sampling errors        > Maps
     Csect: BBD0MAIV
     Ofst:   +0001B6         +----------------------+    Utilities
   . Hot Task                |   Place cursor on    |  > Monitored Job
     Addr:  007E39C8  89.5%  |    menu item and     |  > First Monitored Dev
     Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
   . Hot DASD Track          +----------------------+
     CCHH:  00E5000C  14.0%                          . Return ...
     Dsn:   SYS96158.T13504
```

Using MVScope

To begin using MVScope, follow the instructions on the next few pages to see how MVScope can help you collect symptoms of loops and I/O bottlenecks, and aid in problem analysis.

Using the Monitor Line Command

The M (Monitor) line command is the quickest way to monitor a job or device that is excessively busy. You can invoke the M line command from MAINVIEW views of jobs or devices.

To get started, follow these steps:

Step 1 On the **COMMAND** line, type **JUDEV** to display the JUDEV view.

When JUDEV is displayed, look for a job that is using a lot of I/O resources.

Step 2 In the **Command** field next to the job that you have selected, type **M**, as shown in Figure 11-7 on page 11-12.

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Figure 11-7 Starting MVScope

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JUDEV=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===42
 C Jobname  Intvl T SrvClass    %Use    %Use  Dev Volser  Type  Mnt  Resp  Act.
 - -------- Time- - -------- ThisJob AllJobs  Num ------  ----  Sta  Time  Rate
M BMVSLKV  14:34 B BATNRM    1.56   1.56  D06 PUBBC1 3390 PUB 24.0  0.30
  XTSTHPAS 14:34 S STCPAS    1.25   2.50  305 BAB314 3390 PRV  7.8  3.13
  BOLDSK4  14:34 T TSONRM    1.25   2.50  D27 TSG306 3390 STG  3.6  3.49
  BMVSLK2  14:34 T TSONRM    0.94   2.50  305 BAB314 3390 PRV  7.8  3.13
  BOLDSK4  14:34 T TSONRM    0.94   1.25  326 TSG900 3390 PRV  6.3  1.19
  *MASTER* 14:34 S SYSTEM    0.94   0.94  227 PAGD27 3380 PRV 13.2  1.05
  BMVSAUP4 14:34 S STCNRM    0.94   1.25  30B BAB320 3390 PRV  7.1  1.41
```

MVScope starts monitoring the job that you selected and displays the MSMONSET view. The MSMONSET view, as shown in Figure 11-8, shows the selected job in the sampling state.

Figure 11-8 MSMONSET View Showing Selected Job in Sampling State

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                              MVScope Monitor Set
    Symptoms                                            Problem Analysis
  . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
    No samples              13:42:08 to 14:42:08      . Programs
  . Hot Instruction         17 CPU, 39 I/O samples    . I/Os
    Addr:  00006B48  35.3%  Sampling NOV 16, YYYY     . Traces
    Pgm:   Unknown          No sampling errors        > Maps
    CSECT: Unknown
    Ofst:  Unknown          +----------------------+    Utilities
  . Hot Task                |   Place cursor on    |  > Monitored Job
    Addr:  007E39C8  94.1%  |    menu item and     |  > First Monitored Dev
    Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
  . Hot DASD Track          +----------------------+
    CCHH:  00E5000C  35.9%                            . Return ...
    Dsn:   SYS96158.T13504
```

Step 3 Press **Enter** to see the monitoring proceeding.

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Default Monitoring with the M Line Command

When you start MVScope by using the M line command, the type of sampling (CPU, IO, or CPUIO) is determined by the type of view in which you are located. The MVScope primary command can only be called from views using the record types shown in the following table:

Type of Record	Type of Sampling
ASIW	CPU
DSRE	CPUIO
DXRE	IO
WUSR	CPUIO

To determine the type of record with which your view is associated, follow these steps:

Step 1 Go into *hilevel*.BBACTDEF(BBMSAV03), and find the name of the view from which you want to run the MVScope primary command.

Step 2 Look in the record type column for the type of view. If the record type is listed in the previous table, the MVScope primary command will sample accordingly.

Note: If a view is not one of the listed types, the M line command is not available.

Step 3 If the view is listed as a JOIN view, scroll down until you see a list of the joined view types.

Step 4 Locate the joined view, and look for the base records that make up that joined view.

Note: Some joined views are made up of several other joined views. Keep scanning the entries until you can see the names of the base records.

Step 5 When you know the type of record for the view, refer to the previous table to determine the type of sampling that MVScope will perform for that view.

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Gathering Symptoms

To gather and explore symptoms, follow these steps:

Step 1 From MSMONSET, hyperlink to views that provide more details, such as information about the busiest program and busiest task—indicators of a possible CPU loop.

Step 2 Move to the Symptoms column on the left side of MSMONSET, place the cursor on **Hot Program**, and then press **Enter**.

The MSPGM view is displayed, as shown in Figure 11-9, showing the layout of a program (including the active CSECTs and instructions and how much of each has been used).

Figure 11-9 MSPGM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSPGM============SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D====8
 C Name      Intvl Type    Address    Length  CPU  CPU               Related Ps
 - ----      Time- ----    -------    ------   ct  shr% 0....50..100 SVC     Ke
   BBD9MAIV 14:45 Program    FF4800    6998  668   111  92.5 ***********
   BBD0MAIV 14:45 Csect      FF4800    6998  668   111  92.5 ***********
   BBD0MAIV 14:45  +00017E   FF4800    6B16    1    2   1.7
   BBD0MAIV 14:45  +000184   FF4800    6B1C    1    1   0.8
   BBD0MAIV 14:45  +00018A   FF4800    6B22    1   16  13.3 **
   BBD0MAIV 14:45  +000190   FF4800    6B28    1   15  12.5 **
   BBD0MAIV 14:45  +000194   FF4800    6B2C    1    3   2.5
   BBD0MAIV 14:45  +000198   FF4800    6B30    1    1   0.8
   BBD0MAIV 14:45  +0001B0   FF4800    6B48    1   27  22.5 ***
   BBD0MAIV 14:45  +0001B6   FF4800    6B4E    1   45  37.5 *****
```

Step 3 Scroll to the right.

The contents of the registers (when the instruction was most recently sampled) are displayed, as shown in Figure 11-10.

Figure 11-10 MSPGM View, Scrolled Right

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSPGM=============SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D==46
 C Name     Sta- AM GPR 0    GPR 1    GPR 2    GPR 3    GPR 4    GPR 5    GPR 6
 - ----     te   -- -------- -------- -------- -------- -------- -------- ------
  BBD9MAIV
  BBD0MAIV
  BBD0MAIV  SUPV 31 00000000 00F99008 010978D4 00FD83D8 01ACDA40 7FFFD460 810968
  BBD0MAIV  SUPV 31 00000000 00F9E010 010978D4 00FD83D8 00000C80 7FFFD460 810968
```

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Step 4 Press **PF3** to return to MSMONSET, place the cursor on **Hot Instruction**, and then press **Enter**.

The MSPGM view is displayed again, but this time the data relates to the hottest instruction.

Step 5 Press the **PF3** key to return to MSMONSET, place the cursor on **Hot Task**, and then press **Enter**.

The MSTPGM view is displayed, showing information about the busiest task, as shown in Figure 11-11.

Tip: Note that all of the instructions are close together in a single CSECT. This is what a tight loop looks like. The programmer could use this information to debug the looping program.

Figure 11-11 MSTPGM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSTPGM===========SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D==16
 C Name     Intvl Type      Address  Length  CPU                TCB/SRB  Task
 -  ----    Time-  ----    -------   ------  shr% 0....50..100 -------  ----
   IEAVESVC 14:49 Instrctn  A549AC        1   1.2                692E88  BBM9SZ20
   IEAVESVC 14:49 Program   FE5880      E1C                              BBM9SZ20
   IEAVESVC 14:49 Csect     FE5880      E1C                              BBM9SZ20
   IEAVESVC 14:49  +000234  FE5AB4        1   4.8                692E88  BBM9SZ20
   IEAVELK  14:49  +00034C  FE5BCC        1   3.6                692E88  BBM9SZ20
   IEAVELK  14:49 Program   FF3090     105C                              BBM9SZ20
   IEAVELK  14:49 Csect     FF3090     105C                              BBM9SZ20
   ISGSALC  14:49  +000496  FF3526        1  19.3                692E88  BBM9SZ20
   ISGSALC  14:49 Program   FFD678     1588                              BBM9SZ20
   ISGSALC  14:49 Csect     FFD678     1588                              BBM9SZ20
   ISGSALC  14:49  +000B90  FFE208        1   1.2                692E88  BBM9SZ20
   IEAVELK  14:49 Program  14195E8      238                              BBM9SZ20
   IEAVELK  14:49 Csect    14195E8      238                              BBM9SZ20
   ISGSALC  14:49  +000B90 1419740        1   1.2                692E88  BBM9SZ20
```

The MSTPGM view displays the programs used by the specific task or SRB.

Step 6 Press **PF3** to return to MSMONSET, place the cursor on **Hot DASD Track**, and then press **Enter**.

The MSITRACE view is displayed, as shown in Figure 11-12 on page 11-16.

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Figure 11-12 MSITRACE View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
>H1 =MSITRACE==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==35
C I/O Start   Jobname  I/O  Volser Data Set Name           Resp   0....50...100
- ----------- -------- Driv ------ -------------           Time
  14:37:50.18 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.7
  14:37:50.18 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   5.8 *
  14:37:50.20 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.8
  14:37:50.34 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.8
  14:37:50.35 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.8
  14:37:50.37 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.9 *
  14:37:50.47 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.4 *
  14:37:50.49 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   4.8 *
  14:37:50.63 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.2 *
  14:37:50.64 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   7.0 *
  14:37:50.65 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.6 *
  14:37:50.76 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000  15.0 **
  14:37:50.80 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.7
  14:37:50.80 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.6 *
  14:37:50.93 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000  20.0 ***
  14:37:50.96 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.2 *
  14:37:51.06 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   3.8
  14:37:51.07 14:45 BMVSLKV  EXCP PUBBC1 0D06 SYS97072.T133600.RA000   6.1 *
```

MSITRACE displays the I/Os for the busiest track whose I/Os are traced by MVScope.

Step 7 Press **PF3** to return to the MSMONSET view and explore the monitor set under the **Problem Analysis** section on the right-hand side.

You can hyperlink to more detailed views, as described in “Summary of MVScope Views” on page 11-47.

Exploring the Monitor Set

MVScope provides a wealth of detailed information about the sampled job and devices.

Step 1 To make it easier to navigate the monitor set, start by selecting **Maps** under the **Problem Analysis** heading.

As shown in Figure 11-13 on page 11-17, the map views show

- layout of programs in virtual storage
- hierarchy of tasks
- layout of data set extents on DASD
- data sets accessible to the monitored job

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Figure 11-13 MSMAP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
 W1=MSMONSET=MSMAP=====SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
     Symptoms                                            Problem Analysis
   . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
     Name:  BBD9MAIV  86.0%  14:03:03 to 14:04:03      . Programs
   . Hot Instruction         285 CPU, 100 I/O samples  . I/Os
     Addr:  00006B48  31.6%  Analyzed NOV 14, YYYY     . Traces
     Pgm:   BBD9MAIV         No sampling errors        > Maps
     CSECT: BBD0MAIV
     Ofst:   +0001B0         + Maps ================+    Utilities
   . Hot Task                . Virtual Storage      .  > Monitored Job
     Addr:  007E1988  86.0%  . Tasks Hierarchy      .  > First Monitored Dev
     Name:  BBD0MACP         . Disk Areas           .  . Monitor Sets
   . Hot DASD Track          . Data Sets            .
     CCHH:  00070000  14.0%  . Return...            .  . Return ...
     Dsn:   SYS96161.T15023  +----------------------+
```

Step 2 Select the various maps from the menu, and then review the information that they provide by hyperlinking from the menu items.

After returning to MSMONSET, you would normally hyperlink to the other families of views listed under Problem Analysis. For information about these problem-analysis views, refer to the following sections:

- “MSTASK View” on page 11-52
- “MSPROG View” on page 11-56
- “MSIOZ View” on page 11-58
- “MSRSRCZ View” on page 11-64

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Using MSLIST

When you begin using MVScope to monitor CPU and I/O contention, you might have several different monitor sets that you need to review. MSLIST is the administrative view that keeps track of all of your monitor sets.

To display monitor sets and views of selected monitors, follow these steps:

Step 1 From the MSMONSET view, select **Monitor Sets** from the **Utilities** section on the right-hand side.

MSLIST is displayed, as shown in Figure 11-14.

Figure 11-14 MSLIST View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     BMVSLK2YYYYNOV16 14:56 Analyzed  CPIO  PCAUTH   /0D06  16NOVYYYY 14:31:28
     BMVPCC3YYYYNOV16 14:56 Ready     CPU   PCAuth                   00:00:00
     BMVWRW1YYYYNOV16 14:56 Filed     CPUIO AAOEYP01 /0252  16NOVYYYY 14:13:59
     Template Monset  14:56 Ready     CPU
```

MSLIST not only displays all of your monitor sets, but it also allows you to add, change, stop, and delete monitor sets; hyperlink to the MSMONSET view for a particular monitor set; or hyperlink to detailed job views, device views, or other MVScope views.

Step 2 Put your cursor underneath a monitor set name, and press **Enter** to display views of the selected monitor set.

Because you have already tried some of the hyperlinks from MSMONSET in the preceding sections (see “Using MVScope” on page 11-11), there is no need to display the MSMONSET view from MSLIST. Instead, you can take a look at MSDIAG.

Looking at the Details of a Monitor Set

To see the contents of a monitor set, follow these steps:

Step 1 Move the cursor to the **Status** field of a monitor set in your MSLIST view, and then press **Enter**.

The MSDIAG view is displayed, as shown in Figure 11-15 on page 11-19.

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Figure 11-15 MSDIAG View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1       ALT WIN ===>
>W1 =MSDIAG===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
   Monitor Set Aspect     Monitor Set Name........  BMVSLK1YYYYNOV1714:56:15
 . Sampling Profile       Sample Type(s)..........  CPUIO
 . CPU Samples            Status..................  Filed
 . I/O Samples            Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

    MVScope Components
 CPU Sampler Status...... Ended
 Last CPU Sampler Error..
 I/O Tracer Status....... Ended
 Last I/O Tracer Error...
 Probe Status............ Ended
 Last Probe Error........
 Request Handler Status.. Waiting
 Last Req Handler Error..
 Mapper Status........... Waiting
 Last Mapper Error.......
```

MSDIAG is used to diagnose sampling errors or to get general information about what was sampled.

In Figure 11-15, note that three MVScope samplers were completed and two MVScope server subtasks are waiting for work.

Step 2 From the MSDIAG view, select **Sampling Profile** to display the MSDPROF view, as shown in Figure 11-16 on page 11-20.

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Figure 11-16 MSDPROF View Showing the Monitor Set Profile Details

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
>W =MSDPROF===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                          Monitor Set Name........  BMVSLK1YYYYNOV1714:55:15
                          Sample Type(s)..........  CPUIO
                          Status..................  Filed
                          Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

    Sampling Profile
 Profile Defined......... 14:55:15, NOV 17, YYYY
 Profile Changed......... 14:55:15, NOV 17, YYYY
 Change User ID.......... BMVSLK1
 Sampling Start.......... 14:55:16, NOV 17, YYYY
 Sampling End............ 14:56:16, NOV 17, YYYY
 Sample Buckets Filled...   107
 Monitor Set Filed....... 14:57:30, NOV 17, YYYY
 Monitor Set Dropped.....
 Monitor Set State....... Filed
 Previous State.......... Analyzed
 Prev-1 State............ Analyzing
 Prev-2 State............ Sampling
 Max Seconds to Sample...    60
 Max CPU Sampler Cycles..   600
 Max I/O Tracer Samples..   100
 Max CCWs per I/O Sample.    25
 Samples per Second........             20
 Max Devs to Monitor.......            100
```

The monitor set was last updated by BMVSLK1. It completed sampling and analysis and was filed with no errors. The sampling lasted one minute.

Step 3 Press **PF3** to return to MSDIAG.

Step 4 Select **CPU Samples** to display the MSDCPU view, as shown in Figure 11-17 on page 11-21.

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Figure 11-17 MSDCPU View Showing CPU Sampling Statistics

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                  SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
>W1 =MSDCPU============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===1
                          Monitor Set Name........  BMVSLK1YYYYNOV1714:55:15
                          Sample Type(s)..........  CPUIO
                          Status..................  Filed
                          Jobname.................  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

       CPU Samples
 CPU Samples Collected...      299
 Sample Buckets Filled...      107
 Busiest Pgm Sample Count      267
 Busiest Program CPU%....     89.3
 Busiest Program......... BBD9MAIV
 Busiest Instr Sample Cnt       92
 Busiest Instruction CPU%     30.8
 Busiest Instruction.....     6B4E
 Busiest Instruction Pgm. BBD9MAIV
 Busiest Instr CSECT..... BBD0MAIV
 Busiest Instr Offset....  +0001B6
 Busiest Task Sample Cnt.      264
 Busiest Task CPU%.......     88.3
 Busiest Task............ BBD0MACP
 Busiest TCB/SRB Address.   6F21A0
```

MSDCPU identifies the hot spots in the monitor set. In this case, 299 CPU busy samples were collected in the one minute of sampling and were stored in 107 buckets to be displayed in views as time slices of activity.

Step 5 Press **PF3** to return to MSDIAG.

Step 6 Select **I/O Samples** to display the MSDIO view, as shown in Figure 11-18 on page 11-22.

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Figure 11-18 MSDIO View Displaying I/O Trace Statistics

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSDIO=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                           Monitor Set Name........  BMVSLK1YYYYSEP2509:55:56
                           Sample Type(s)..........  CPUIO
                           Status..................  Filed
                           Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                           Last Error..............  No sampling errors

        I/O Samples
  I/O Samples Collected...  100
  Sample Buckets Filled...  107
  1st Device............. 5D06
  2nd Device.............
  3rd Device.............
  4th Device.............
  5th Device.............
  6th Device.............
  7th Device.............
  8th Device.............
  9th Device.............
  10th Device............
  Device Range 1  from....
                  to......
  Device Range 2  from....
                  to......
  Device Range 3  from....
                  to......
  Busiest Track I/O Count.  107
  Busiest Track (CCHH).... 7500
  Busiest Track Volser.... BAB317
  Busiest Track Data Set.. BMVMVS.LGO.ISPLLIB
```

MSDIO shows that only one device was monitored, and 100 I/Os issued by job BMVSLK1 were traced.

Step 7 Press **PF3** twice to return to the MSLIST view.

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Using MSLIST Administrative Commands

MSLIST allows you to enter three-character line commands to perform administrative functions. Type the first three letters of the command next to a monitor set listed in MSLIST to execute the command. The commands and functions are shown in the following table.

Command	Function
ADD	To add a monitor set based on the selected monitor set
CHAnge	To change the parameters of the selected monitor set
DELete	To delete the selected monitor set
MONitor	To start sampling for the selected monitor set
STOp	To stop waiting, sampling, or analyzing the selected monitor set
Note: You can only change and monitor sets that are in the READY state.	

For more information about administrative functions, refer to “Adding, Changing, and Deleting Monitor Sets” on page 11-33.

MVScope Messages

In addition to exception messages, MVScope provides explanations of special conditions in the MSXPLAIN view, as shown in Figure 11-19.

Figure 11-19 MSXPLAIN View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =MSXPLAIN==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====5


 This Monitor Set’s records have been filed in a Historical File.
 Enter END (PF3) to set the time frame to the interval when the
 Monitor Set was filed. Then try the hyperlink again. You can resume
 using the current time frame at any time by entering a "TIME * *"
 command.
```

MSXPLAIN tells you what is wrong and how to fix the problem.

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Hidden Fields in MVScope Views

Many of the MVScope views contain more detailed information in hidden fields.

To see these fields, follow these steps:

Step 1 On the **COMMAND** line, type **CUST**.

Step 2 When view customization is displayed, type **E** on the **COMMAND** line.

The hidden fields are displayed.

For more information about hidden fields, place the cursor on the field heading and press **PF1** (Help). Be sure to scroll to the right in the views to look for information that is in displayed fields, but does not fit on the screen. For more information about customizing your MVScope views, refer to *MAINVIEW® for OS/390 Getting Started*.

MVScope in Historical Mode

MVScope cannot sample jobs from views that are in historical mode. You can, however, use the ADD line and primary command in an MSLIST view that is in historical mode.

You have to view and issue commands against the newly created monitor sets in a time frame that includes the current interval.

Where to Go from Here

This is the end of your MVScope Quick Start tour. The section “Tutorial” on page 11-25 leads you step-by-step through the different features and views in the MVScope facility. For descriptions, screen prints, and a review of the views and how they are related, see “Summary of MVScope Views” on page 11-47.

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Tutorial

This tutorial provides a logical, step-by-step introduction to using the MVScope facility. It shows you how to sample your site's programs and I/Os, and describes the views that show you the details of your programs and I/O operations.

Starting MVScope

There are several different ways to start sampling a particular job or device:

- On any view **COMMAND** line, type **MSLIST**; or, from EZM390 select **MVScope**.

  The MSLIST view is displayed. In the MSLIST view, issue the **MON** line command.

- Issue the **M** line command in most MAINVIEW views that display jobs and devices.

- Hyperlink from a Ready monitor set in the MSLIST view to MSMONSET. On the **COMMAND** line in MSMONSET, type **MON**.

- On the **COMMAND** line of any MAINVIEW view, type the **MVScope** command.

- From a console, type the **MVS F** (modiFy) operator command when you are not in MAINVIEW.

Using the M Line Command

In this next example, you will monitor a combination of a job and the device that it is using.

Step 1 Display the JUDEV view.

Step 2 In the line command column, type **M** next to a job that you want to monitor, and then press **Enter**, as shown in Figure 11-20 on page 11-26.

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Figure 11-20 Using the M Line Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JUDEV=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===42
 C Jobname  Intvl T SrvClass    %Use    %Use  Dev Volser Type Mnt  Resp  Act. %R
 - -------- Time- - -------- ThisJob AllJobs  Num ------ ---- Sta  Time  Rate Qu
 M BMVSLKV  11:11 B BATNRM      1.56    1.56  D06 PUBBC1 3390 PUB  24.0  0.30
   XTSTHPAS 11:11 S STCPAS      1.25    2.50  305 BAB314 3390 PRV   7.8  3.13
   BOLDSK4  11:11 T TSONRM      1.25    2.50  D27 TSG306 3390 STG   3.6  3.49
   BMVSLK2  11:11 T TSONRM      0.94    2.50  305 BAB314 3390 PRV   7.8  3.13
   BOLDSK4  11:11 T TSONRM      0.94    1.25  326 TSG900 3380 PRV   6.3  1.19
   *MASTER* 11:11 S SYSTEM      0.94    0.94  227 PAGD27 3380 PRV  13.2  1.05
   BMVSAUP4 11:11 S STCNRM      0.94    1.25  30B BAB320 3390 PRV   7.1  1.41
```

MVScope starts sampling the job and device that you selected and displays the MSMONSET view, as shown in Figure 11-21. Notice that MSMONSET displays the job name, device number, sampling start time, and status of the sampling.

On the left side, MSMONSET shows hot spots in the set of CPU and I/O samples.

Figure 11-21 MSMONSET View with Job in Sampling State and Hot Spots

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
     Symptoms                                            Problem Analysis
   . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
     Name:  BBD9MAIV  89.9%  11:56:04 to 11:56:06      . Programs
   . Hot Instruction         257 CPU, 100 I/O samples  . I/Os
     Addr:  00006B4E  29.2%  Analyzed NOV 16, YYYY     . Traces
     Pgm:   BBD9MAIV         No sampling errors        > Maps
     Csect: BBD0MAIV
     Ofst:   +0001B6         +----------------------+    Utilities
   . Hot Task                |   Place cursor on    |  > Monitored Job
     Addr:  007E39C8  89.5%  |    menu item and     |  > First Monitored Dev
     Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
   . Hot DASD Track          +----------------------+
     CCHH:  00E5000C  14.0%                            . Return ...
     Dsn:   SYS96158.T13504
```

Step 3 Hyperlink from MSMONSET menu items to explore the monitor set.

Step 4 When the status has changed to ANALYZED, type **ADD** on the **COMMAND** line.

Step 5 When the MVScope Add Monitor Set panel is displayed, press **End** or **PF3** to create a new monitor set; you will use this monitor set in the next section.

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Using the MON Command in MSLIST

You can use the three-letter MON (MONitor) line command in the MSLIST view to start MVScope sampling on any monitor set that is in the Ready state. To do so, follow these steps:

Step 1 On the **COMMAND** line, type **MSLIST** to display the MSLIST view; or, select **Monitor Sets** from MSMONSET **Utilities** section.

Step 2 Look for a monitor set in the Ready state.

This is the new monitor set that you added.

Step 3 Type **MON** next to the monitor set in the Ready state, as shown in Figure 11-22.

Figure 11-22 MONitor Line Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====4
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     BMVSLK2YYYYNOV17 13:49 Analyzed  CPUIO BITYKC4  /0D3D  17NOVYYYY 13:45:19
     BMVSLK2YYYYNOV17 13:49 Analyzed  CPUIO BMVRTR2  /0D3D  17NOVYYYY 13:45:18
     BMVSLK2YYYYNOV17 13:49 Analyzed  CPUIO IMFCPAS  /0308  17NOVYYYY 13:45:17
     weekly           13:49 Ready     CPU   *MASTER*                  00:00:00
MON  BMVSLK2YYYYNOV17 13:49 Ready     CPUIO BMVDIDV  /0D06            00:00:00
     BMVSLK2YYYYNOV17 13:49 Filed     CPUIO BMVSLKV  /0D06  17NOVYYYY 12:43:19
     BMVPCC3YYYYNOV17 13:49 Ready     CPU   PCAUTH                    00:00:00
     BMVPCC3YYYYNOV17 13:49 Filed     CPU   RASP            17NOVYYYY 12:23:57
     BMVPCC3YYYYNOV17 13:49 Filed     CPUIO PCAUTH          17NOVYYYY 13:23:57
     Template Monset  13:49 Ready     CPU                             00:00:00
```

The example is the job named BMVDIDV. The status changes to Waiting and then quickly changes to Sampling.

Step 4 Hyperlink on any monitor set.

MVScope displays the MSMONSET view for the monitor set that you selected.

Step 5 When the status of the monitor set changes to Analyzed, type **ADD** on the **COMMAND** line.

A new monitor set is created that you can use in the next scenario.

Step 6 Give the new monitor set a name, and then press **End** or **PF3** to save it.

The MSMONSET view for the previous monitor set is redisplayed.

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Using the MON Command in MVScope Primary Views

You can use the three-letter MON (MONitor) command in the MVScope primary views called MSMONSET, MSDIAG, MSDPROF, MSDCPU, and MSDIO.

In this example, display the MSMONSET view for a monitor set that is in the Ready state, as shown in Figure 11-23.

Figure 11-23 MONitor Primary Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===> MONITOR                                        SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
 W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                              MVScope Monitor Set
    Symptoms                                             Problem Analysis
  . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
    No samples              13:51:28 to 13:51:30      . Programs
  . Hot Instruction         0 CPU, 0 I/O samples      . I/Os
    Addr:  No Samples       Ready NOV 17, YYYY . Traces
    Pgm:   No Samples       No sampling errors        > Maps
    CSECT: No Samples
    Ofst:  No Samples          +----------------------+    Utilities
  . Hot Task                   |   Place cursor on    |  > Monitored Job
    Addr:  No Samples          |    menu item and     |  > First Monitored Dev
    Name:  No Samples          |     press ENTER      |  . Monitor Sets
  . Hot DASD Track             +----------------------+
    CCHH:  No Samples                                     . Return ...
    Dsn:   Unknown
```

The monitor set's state is shown near the center of the view.

You can type the MON command in the line command field of MSMONSET to begin monitoring, but do *not* do that yet.

Starting MVScope from the COMMAND Line

You do not have to be in any specific OS/390 view to start MVScope when you know the job name or address of the device that you want to monitor. This feature keeps you from having to hyperlink through various views to find a particular job or activity.

For example, Figure 11-24 on page 11-29 shows the WDELAY view with the MVScope command typed on the **COMMAND** line.

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Figure 11-24 WDELAY View with Command on Command Line

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===> MVSCOPE CPU BMVSLKV                            SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =WDELAY============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===47
 C Workload Intvl T  #AS  Total Delay%    %Dly   %Dly  %Dly   %Dly   %Dly   %Dly
 - -------- Time- -  ---  0....50...100   CPU    Dev   Stor    ENQ    SRM   Subs
  GDBCOMP3 13.45 C      24.65 ***             2.5               0.1
  GDBTESTB 13.45 B      24.65 ***             2.5               0.1
  GDBCOMP1 13.45 C      24.65 ***             2.5               0.1
  STCSYS   13.45 S   1  12.98 **              9.9
  BATCH    13.45 W   2   1.27                 0.2               0.0
  BATNRM   13.45 S   2   1.27                 0.2               0.0
  ALLBAT   13.45 B   2   1.27                 0.2               0.0
  STC      13.45 W  40   0.71                 0.4   0.2         0.0   0.0
  ALLWKLDS 13.45 C  93   0.56                 0.2   0.1         0.0   0.0
  STCPAS   13.45 S   8   0.49                 0.4   0.1
  STCNRM   13.45 S  28   0.42                 0.1   0.3         0.0   0.0
  ALLSTC   13.45 S  74   0.41                 0.2   0.1         0.0   0.0
  SYSTEM   13.45 S  12   0.11                 0.1
  TSONRM   13.45 S  17   0.04                 0.0
```

Follow this syntax for starting MVScope on the **COMMAND** line:

`MVSCOPE` *`sssss jjjjjjj dddd`*

where

sssss	Is the type of sampling.
jjjjjjj	Is the job name.
dddd	Is the device address.

Required elements for specific sampling types are shown in Table 11-2.

Table 11-2 MVScope Sampling Types

Sampling Type	Job Name	Device Address
CPU	Required	N/A
IO	Name or * (wildcard)	Required
CPUIO	Required	Required

If you know the exact job name that you want to sample, such as BMVSLKV, you would type the following text on the **COMMAND** line:

MVSCOPE CPU BMVSLKV

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If you want to monitor I/O activity for all jobs on device number 3D0E, you would type the following text on the **COMMAND** line:

MVSCOPE IO * 3D0E

To see the results of the sampling, switch to the MSMONSET view by typing **MSLIST** on the **COMMAND** line and hyperlinking on the monitor set name for the monitor set that you want to view.

Starting MVScope from a Console

You can start MVScope sampling when you are not in MAINVIEW and do not have immediate access to the views. You must know the job name or address of the device that you want to monitor.

Type the following OS/390 command at a console:

F *pas*,MVSCOPE=(SAMPTYPE=*sssss*,JOBNAME=*jjjjjjj*,DEVN=*dddd*)

where

pas	Is the name of your OS/390 product address space (PAS).
sssss	Is the sampling type.
jjjjjjj	Is the job name.
dddd	Is the device address.

Note: Required elements for specific sampling types are shown in Table 11-2 on page 11-29, with the exception of I/O sampling, where the Jobname (*) keyword is not required.

If you know the exact job name that you want to sample, such as BMVSLK1, you can type the following text on the **COMMAND** line:

F PAS,MVSCOPE=(SAMPTYPE=CPU,JOBNAME=BMVSLK1)

If you want to monitor I/O activity for device number 3D0E, you can type the following text on the **COMMAND** line:

F PAS,MVSCOPE=(SAMPTYPE=IO,DEVN=3D0E)

MVScope will monitor the activity immediately, or, for CPU sampling, as soon as the job starts executing. You can check on your monitor set the next time that you are in MAINVIEW by typing **MSLIST** on the **COMMAND** line.

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Starting MVScope with MAINVIEW AutoOPERATOR

MVScope can be started automatically when predetermined alarm thresholds have been triggered by MAINVIEW Alarm Manager.

For example, your system administrator has determined that an alarm should be triggered when CPU usage by one job exceeds 80 percent for three or more intervals. In this case, your system administrator could set up MAINVIEW AutoOPERATOR rules to issue an OS/390 MODIFY command to start MVScope sampling on the job that is using the CPU resources.

Refer to the *MAINVIEW® AutoOPERATOR™ Basic Automation Guide* for information about how to create rules automatically for initiating MVScope for defined alarm events.

Starting Multiple MVScope Monitor Sets

You can create as many monitor sets as you want; however, MVScope limits the number of concurrently active monitor sets. Because MVScope uses system resources for its sampling and analyzing, the limit is intended to prevent system performance degradation.

To create multiple monitor sets, follow these steps:

Step 1 From any MAINVIEW view, type **JUDEV** on the **COMMAND** line to display the JUDEV view.

Step 2 Type the **M** line command next to five jobs that are using system resources, as shown in Figure 11-25 on page 11-32.

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Figure 11-25 Starting Multiple Samples

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =JUDEV=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====3
 C Jobname  Intvl T SrvClass    %Use    %Use  Dev Volser Type Mnt  Resp  Act. %R
 - -------- Time- - -------- ThisJob AllJobs  Num ------ ---- Sta  Time  Rate Qu
 M *MASTER* 08:31 S SYSTEM      4.17    4.17  227 PAGD27 3380 PRV  82.0  0.76  1
 M IMFCPAS  08:31 S STCNRM      4.17    5.00  308 BAB317 3390 PRV  11.4  3.83
 M CATALOG  08:31 S SYSTEM      2.92    4.58  D27 TSG306 3390 STG   5.8  7.64  0
   BMVRTR2  08:31 T TSONRM      2.08    3.75  D2F TSG310 3390 STG  30.8  1.32
 M BMVRTR2  08:31 T TSONRM      1.67    7.08  D3D ES510M 3390 PRV  43.7  1.18
   CATALOG  08:31 S SYSTEM      1.67    1.67  240 SYSP14 3380 PRV   1.8  8.26
   BMVRTR2  08:31 T TSONRM      1.25    2.92  326 TSG900 3390 PRV   7.2  4.35
   XCFAS    08:31 S SYSTEM      1.25    1.25  23E SYM030 3380 PRV   4.6  0.72
   BITYKC4  08:31 T TSONRM      1.25    2.92  326 TSG900 3390 PRV   7.2  4.35
   BMVRTR2  08:31 T TSONRM      0.83    1.25  30C BAB321 3390 PRV  20.1  0.42
   BMVRTR2  08:31 T TSONRM      0.83    1.25  D21 TSG317 3390 PRV   6.7  1.36
   BMVRTR2  08:31 T TSONRM      0.83    0.83  D2D TSG314 3390 PRV   8.9  0.47
 M BITYKC4  08:31 T TSONRM      0.83    7.08  D3D ES510M 3390 PRV  43.7  1.18
   XTSTHPAS 08:31 S STCPAS      0.83    1.25  305 BAB314 3390 PRV   9.6  1.45
   IMFCPAS  08:31 S STCNRM      0.83    1.67  D3F BAB329 3390 PRV   5.0  1.83
   BOLDSK3  08:31 T TSONRM      0.42    5.00  308 BAB317 3390 PRV  11.4  3.83
   BMVPCC4  08:31 T TSONRM      0.42    0.42  307 BAB316 3390 PRV   9.7  0.49
```

In this example, you have selected these jobs:

- *MASTER*
- IMFCPAS
- CATALOG
- BMVRTR2
- BITYKC4

MVScope initiates sampling and displays the MSMONSET view for the last selected monitor set, as shown in Figure 11-26.

Figure 11-26 MSMONSET View Showing the Last Selected Monitor Set

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                 SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                            MVScope Monitor Set
    Symptoms                                          Problem Analysis
  . Hot Program             Job BITYKC4 , Devn 0D3D   . Tasks and SRBs
    Name:  Unknown   20.0%  08:59:09 to 08:59:27      . Programs
  . Hot Instruction         5 CPU samples             . I/Os
    Addr:  Unknown   20.0%  Ready    NOV 18, YYYY     . Traces
    Pgm:   Unknown          No sampling errors        > Maps
    CSECT: Unknown
    Ofst:  Unknown          +----------------------+    Utilities
  . Hot Task                |   Place cursor on    |  > Monitored Job
    Addr:  Unknown   60.0%  |    menu item and     |  > First Monitored Dev
    Name:  Unknown          |     press ENTER      |  . Monitor Sets
  . Hot DASD Track          +----------------------+
    No samples                                        . Return ...
```

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Step 3 On the **COMMAND** line, type **MSLIST**; or, from the MSMONSET **Utilities** section, select **Monitor Sets** to switch to the MSLIST view.

Step 4 Scan MSLIST for your five sampled jobs.

Five jobs are shown at the top of MSLIST, as shown in Figure 11-27. One monitor set is ready for sampling, and the other four monitor sets are sampling or have finished sampling.

Step 5 Type the **MONitor** line command against the Ready monitor set to initiate sampling, as shown in Figure 11-27.

Figure 11-27 MSLIST View Listing Five Sampled Jobs

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
 MON BMVSLK2YYYYNOV17 09:06 Ready     CPUIO BITYKC4  /0D3D  17NOVYYYY 09:05:59
     BMVSLK2YYYYNOV17 09:06 Sampling  CPUIO BMVRTR2  /0D3D  17NOVYYYY 09:05:58
     BMVSLK2YYYYNOV17 09:06 Analyzing CPUIO CATALOG  /0D3D  17NOVYYYY 09:05:58
     BMVSLK2YYYYNOV17 09:06 Analyzed  CPUIO IMFCPAS  /0308  17NOVYYYY 09:05:57
     BMVSLK2YYYYNOV17 09:06 Analyzed  CPUIO *MASTER* /0D3D  17NOVYYYY 09:05:58
     BMVSLK2YYYYNOV17 09:06 Filed     CPUIO BMVSLKV  /0D06  17NOVYYYY  08:51:45
     BMVPCC3YYYYNOV17 09:06 Filed     CPU   RASP            17NOVYYYY  08:25:32
     Template Monset  09:06 Ready     CPU
```

Adding, Changing, and Deleting Monitor Sets

The previous section described various ways that you can start MVScope, which automatically creates a monitor set and adds it to MSLIST. This section looks at how you can manually add new monitor sets and change or delete existing monitor sets. These tasks can be performed from several views by using either line commands or primary commands, as shown in Table 11-3.

Table 11-3 Using Line or Primary Commands to Modify Monitor Sets

Type of Command	Views
Three-character line commands	MSLIST
Three-character primary commands	MSLIST (ADD command only) MSMONSET MSDIAG MSDPROF MSDCPU MSDIO

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Using Line Commands to Modify Monitor Sets

All administrative tasks that you want to perform on a monitor set can be executed from the MSLIST view by using three-letter commands, as shown in Table 11-4.

Table 11-4 Line Commands for MSLIST

Line Command	Description
ADD	defines a monitor set by using a previous definition as a template The ADD primary command can be used to define a monitor set with the MVScope default values.
CHAnge	makes changes to a monitor set definition whose status is Ready
DELete	deletes the monitor set
MONitor	starts a monitor set whose status is Ready
STOp	terminates sampling or analyzing for a monitor set whose status is Waiting, Sampling, or Analyzing

The administrative tasks that can be performed on a particular monitor set are determined by the monitor set's status. The status of a monitor set, the description, and the actions that you can perform on that monitor set by way of line commands are shown in Table 11-5.

Table 11-5 MSLIST Administrative Commands for Monitor Sets (Part 1 of 2)

Monitor Set Status	Description	Valid Line Commands
Ready	Newly created monitor set is ready to begin sampling.	ADD CHAnge MONitor DELete
Waiting	Sampling has been requested, but MVScope has not yet located the active job, or the job is not active.	ADD STOp DELete
Sampling	MVScope is sampling an active job or device.	ADD STOp DELete
Analyzing	MVScope is analyzing the completed samples.	ADD STOp DELete
Analyzed	Samples have been fully analyzed. The monitor set records are still in working storage in the PAS.	ADD DELete
Retained	Completed records are not in any historical file, but they will be kept in the PAS's working storage for five data collector intervals.	ADD DELete

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Table 11-5 MSLIST Administrative Commands for Monitor Sets (Part 2 of 2)

Monitor Set Status	Description	Valid Line Commands
Filed	Records remain in the historical file where they may be viewed in historical mode.	ADD DELete
Dropped	Historical records have been discarded or are not online. They are not retained in the PAS's working storage.	ADD DELete
Error	Sampling failed. Look at the diagnostic text in the MSMONSET or MSDIAG view before taking any action.	ADD DELete

Now, use the MSLIST view and line commands to create, change, and delete MVScope monitor sets.

Adding Monitor Sets Manually

Step 1 Display the MSLIST view by doing *one* of the following actions:

- From EZM390, select **Program and I/O Trace**.
- From the **Utilities** section on the MSMONSET view, select **Monitor Sets**.
- On the **COMMAND** line of any MAINVIEW view, type **MSLIST**.

MSLIST is displayed, showing the attributes of MVScope monitor sets, similar to Figure 11-28.

Figure 11-28 MSLIST View Showing MVScope Monitor Set Attributes

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     BMVSLK2YYYYNOV17 09:25 Analyzed  CPUIO BMVSLKV  /0D06  17NOVYYYY 09:23:45
     BMVPCC3YYYYNOV17 09:25 Ready     CPU   PCAUTH                   00:00:00
     BMVPCC3YYYYNOV17 09:25 Filed     CPU   RASP           17NOVYYYY 08:21:09
     BMVPCC3YYYYNOV17 09:25 Analyzing CPU   PCAUTH         17NOVYYYY 08:21:09
     Template Monset  09:25 Ready     CPU
```

First, add a new monitor set by using the default parameters of the Template Monset monitor set:

Step 2 Type **ADD** to the left of **Template Monset**.

The MVScope Add Monitor Set panel is displayed, as shown in Figure 11-29 on page 11-36. The MVScope Add Monitor Set panel lets you create a monitor set based on the template's default parameters.

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Figure 11-29 MVScope Add Monitor Set Panel

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE

  ------------------------ MVSCOPE ADD MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===> Template Monset
  Type of Sampling ===> CPU    (CPU CPUIO IO)

  Entities to Sample:
     Job Name  ===>
     Dev/Vol(s)===>        ===>        ===>        ===>        ===>
               ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 60       Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    10
     Max I/O Samples  ===> 100      Max CCWs per I/O ===>    25

  Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Step 3 Create a new monitor set called WEEKLY.

3.A Change the **Monitor Set** name to **WEEKLY**, and change the **Type of Sampling** to **CPU**.

3.B Type the job name ***MASTER*** and a device number or volume serial number (use PAGD27 for this example).

You can also change the sampling parameters.

Step 4 Increase the duration to **120** samples per second, and increase the maximum number of I/Os from 100 to **200**.

Note: You can copy the example because you will not activate sampling of this job.

Your screen should look like Figure 11-30 on page 11-37.

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Figure 11-30 New Monitor Set for the Job *MASTER*

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE

  ------------------------ MVSCOPE ADD MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===> WEEKLY
  Type of Sampling ===> CPU    (CPU CPUIO IO)

  Entities to Sample:
     Job Name   ===> *MASTER*
     Dev/Vol(s) ===> PAGD27 ===>        ===>        ===>        ===>
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 120      Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    10
     Max I/O Samples  ===> 100      Max CCWs per I/O ===>    25

  Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Step 5 Press **End** or **PF3** to save this monitor set.

You should see the MSLIST view, showing your new monitor set in the Ready state, as shown in Figure 11-31.

Figure 11-31 New Monitor Set for the Job *MASTER* Displayed in MSLIST

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     WEEKLY YYYYNOV18 09:27 Ready     CPU   *MASTER* PAGD27           00:00:00
     BMVSLK2YYYYNOV18 09:27 Ready     CPUIO BMDIDV   /0D06            00:00:00
     BMVSLK2YYYYNOV18 09:27 Filed     CPUIO BMVSLKV  /0D06  18NOVYYYY 09:14:45
     BMVPCC3YYYYNOV18 09:27 Ready     CPU   PCAUTH                    00:00:00
     BMVPCC3YYYYNOV18 09:27 Filed     CPU   RASP            18NOVYYYY 08:56:48
     BMVPCC3YYYYNOV18 09:27 Filed     CPU   PCAUTH          18NOVYYYY 08:56:48
     Template Monset  09:27 Ready     CPU
```

Now add a monitor set based on an existing one.

If you need to, run the Installation Verification Program again (see “MVScope Installation Verification Program” on page 11-4) so that you will have a monitor set similar to your example.

Step 6 Select a monitor set from MSLIST that is in an Analyzed or Filed state. Use the job BMVSLKV in this example.

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Step 7 Next to the selected monitor set, type **ADD**, as shown in Figure 11-32.

Figure 11-32 ADD Line Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
 ADD BMVSLK2YYYYNOV18 09:32 Analyzed  CPUIO BMVSLKV  /0D06  18NOVYYYY 09:30:05
     BMVPCC3YYYYNOV18 09:32 Ready     CPU   PCAUTH                   00:00:00
     BMVPCC3YYYYNOV18 09:32 Filed     CPU   RASP           18NOVYYYY 09:26:48
     BMVPCC3YYYYNOV18 09:32 Filed     CPU   PCAUTH         18NOVYYYY 09:26:48
     Template Monset  09:32 Ready     CPU
```

The MVScope Add Monitor Set panel is displayed, showing the parameters for the selected monitor set as shown in Figure 11-33.

Figure 11-33 MVScope Add Monitor Set Panel with Parameters for Selected Monitor Set

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE

  ------------------------ MVSCOPE ADD MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===> BMVSLK219YYYYNOV1809:32:52
  Type of Sampling ===> CPUIO  (CPU CPUIO IO)

  Entities to Sample:
     Job Name   ===> BMVSLKV
     Dev/Vol(s) ===> 0D06   ===>        ===>        ===>        ===>
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 60       Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    10
     Max I/O Samples  ===> 100      Max CCWs per I/O ===>    25

   Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Step 8 You can change the job name, type of sampling, or other parameters.

Step 9 On the **COMMAND** line, type **CANcel** to redisplay MSLIST.

Because you have already seen how to add a new monitor set, now you will learn to change a monitor set.

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Changing an Existing Monitor Set

This section shows you how to modify a monitor set for a job that has not been run yet. In this example, BMVSLKV is in the Ready state, and you want MVScope to monitor additional devices.

To do so, follow these steps:

Step 1 Next to the monitor set, type **CHA** (first three letters of CHAnge), as shown in Figure 11-34.

Figure 11-34 CHAnge Line Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
 CHA BMVSLK2YYYYNOV18 09:27 Ready     CPUIO BMVSLKV  /0D06            00:00:00
     BMVSLK2YYYYNOV18 09:27 Analyzed  CPUIO BMVSLKV  /0D06  18NOVYYYY 09:29:05
     BMVPCC3YYYYNOV18 09:27 Ready     CPU   PCAUTH                     00:00:00
     BMVPCC3YYYYNOV18 09:27 Filed     CPU   RASP            18NOVYYYY 09:16:48
     BMVPCC3YYYYNOV18 09:27 Filed     CPU   PCAUTH          18NOVYYYY 09:16:48
     Template Monset  09:27 Ready     CPU
```

The MVScope Change Monitor Set panel is displayed, as shown in Figure 11-35 on page 11-40. From this panel, you can change any of the parameters or the sampling type, and add devices.

Step 2 Make these changes to the monitor set:

2.A Add several devices in the **Dev/Vol(s)** field, such as 217, 3A01, 322, and BAB314.

Note: You must prefix device addresses with the slash character (/) to distinguish them from a volume serial number.

2.B Add a Device Range from 300 to 320.

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Figure 11-35 MVScope Change Monitor Set Panel

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE

  ------------------------ MVSCOPE CHANGE MONITOR SET ---------------------
  COMMAND ===>

  Monitor Set      ===> BMVSLK219YYYYNOV1813:509:36:34
  Type of Sampling ===> CPUIO  (CPU CPUIO IO)

  Entities to Sample:
     Job Name   ===> BMVSLKV
     Dev/Vol(s) ===> /0D06  ===> /217   ===> /3A01  ===> /322   ===> BAB314
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===> 300      to     ===> 320
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 120      Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    5
     Max I/O Samples  ===> 200      Max CCWs per I/O ===>    25

   Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

You can change the parameters of the monitor set, such as adding devices, increasing the sampling time or number of samples, and reducing the number of samples per second.

Step 3 Press **End** or **PF3** to return to MSLIST.

MVScope gives you warning messages; two of the devices added to the monitor set are unavailable, as shown in Figure 11-36. They are either offline or do not exist on your system. MVScope will still monitor the job, but the results will not contain information about the two missing devices.

Figure 11-36 MVScope Warning Messages

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                 SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
>W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==20
BBDMBM19W Device 0217 is currently unavailable
BBDMBM19W Device 3A01 is currently unavailable
```

Step 4 To clear the warning messages, press **Enter**.

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Deleting Monitor Sets

To delete a monitor set that is in any state, use the **DELete** line command in the MSLIST view.

In the example shown in Figure 11-37, you are deleting the monitor set for job PCAUTH, which was filed at 09:16:48 on 18 NOV 2000.

Figure 11-37 DELete Line Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     BMVSLK2YYYYNOV18 09:39 Ready     CPUIO BMVSLKV  /0D06            00:00:00
     BMVSLK2YYYYNOV18 09:39 Analyzed  CPUIO BMVSLKV  /0D06  18NOVYYYY 09:30:05
     BMVPCC3YYYYNOV18 09:39 Ready     CPU   PCAUTH                     00:00:00
     BMVPCC3YYYYNOV18 09:39 Filed     CPU   RASP            18NOVYYYY 09:16:48
 DEL BMVPCC3YYYYNOV18 09:39 Filed     CPU   PCAUTH          18NOVYYYY 09:16:48
     Template Monset  09:39 Ready     CPU
```

Using Primary Commands to Modify a Monitor Set

There are six primary MVScope views from which you can issue commands to perform administrative tasks. These views are

- MSLIST
- MSMONSET
- MSDIAG
- MSDPROF
- MSDCPU
- MSDIO

Note: You would normally use MSDIAG, MSDPROF, MSDCPU, and MSDIO for diagnosing errors in a monitor set that is in the Analyzed or Filed state.

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Primary Commands

MVScope primary commands perform functions similar to the MSLIST line commands, but they are different from the line commands. They bring up an ISPF dialog panel that you need to complete. They are available as three-character commands from the views indicated in Table 11-6.

Table 11-6 Primary Commands for MVScope

Primary Command	Description	Available from These Views
ADD	in MSLIST, defines a monitor set using a default template; In MSMONSET, defines a monitor set using the current monitor set as a model	MSLIST MSMONSET
CHAnge	makes changes to a monitor set definition whose status is Ready	MSMONSET MSDIAG MSDPROF MSDCPU MSDIO
DELete	deletes the monitor set	MSMONSET MSDIAG MSDPROF MSDCPU MSDIO
MONitor	starts a monitor set whose status is Ready	MSMONSET MSDIAG MSDPROF MSDCPU MSDIO
STOp	terminates sampling or analyzing for a monitor set whose status is Waiting, Sampling, or Analyzing	MSMONSET MSDIAG MSDPROF MSDCPU MSDIO

Practice the commands that you can use from MVScope primary views. You can type the first three characters of the command on the **COMMAND** line, or you can type the entire word.

Monitoring from a Primary View

From MSLIST, hyperlink to the MSMONSET view for any monitor set that is in the Ready state. Use your sample test job, BMVSLKV.

To monitor the job, follow these steps:

Step 1 Display the MSLIST view.

Step 2 Move the cursor to the monitor set name and press **Enter**.

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Step 3 When MSMONSET is displayed, type **MONitor** on the **COMMAND** line, as shown in Figure 11-38.

Figure 11-38 MONitor Primary Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===> MON                                            SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 W1=MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D=====1
                              MVScope Monitor Set
    Symptoms                                                Problem Analysis
  . Hot Program             Job BMVSLKV                   . Tasks and SRBs
    No samples              Last Update by                . Programs
  . Hot Instruction         No samples                    . I/Os
    No samples              Ready NOV 18, YYYY            . Traces
                            No sampling errors            > Maps
    CSECT:
    Ofst:                   +----------------------+      Utilities
  . Hot Task                |   Place cursor on    |    > Monitored Job
    No samples              |    menu item and     |    > First Monitored Dev
                            |     press ENTER      |    . Monitor Sets
  . Hot DASD Track          +----------------------+
    No samples                                            . Return ...
```

The monitor set's state changes to Waiting or Sampling, and MSMONSET displays more symptoms as sampling and analysis proceeds.

Step 4 Go back to MSLIST.

Job BMVSLKV is not currently active, and it is shown in the Waiting state in Figure 11-39.

Figure 11-39 BMVSLKV in Waiting State

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set      Intvl Status    Samp  Sampled  Traced Sampling  Sampling C
 --- -----------      Time- ------    Types Job      Device Date      Start
     WEEKLY YYYYNOV18 09:41 Ready     CPU   *MASTER* PAGD27           00:00:00
     BMVSLK2YYYYNOV18 09:41 Waiting   CPUIO BMVDIDV  /0D06            00:00:00
     BMVSLK2YYYYNOV18 09:41 Filed     CPUIO BMVSLKV  /0D06  18NOVYYYY 09:30:05
     BMVPCC3YYYYNOV18 09:41 Ready     CPU   PCAUTH                    00:00:00
     BMVPCC3YYYYNOV18 09:41 Filed     CPU   RASP            18NOVYYYY 09:26:48
     Template Monset  09:41 Ready     CPU
```

The monitor set is placed in the *Waiting* state until MVScope detects that the job is active.

Step 5 In MSLIST, type **ADD** on the **COMMAND** line.

The MVScope Add Monitor Set panel is displayed, as shown in Figure 11-40 on page 11-44.

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Figure 11-40 MVScope Add Monitor Set Panel Showing Sampling Parameters Defaults

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE

  ------------------------ MVSCOPE ADD MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===>
  Type of Sampling ===>

  Entities to Sample:
     Job Name   ===>
     Dev/Vol(s) ===>        ===>        ===>        ===>        ===>
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 60       Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    10
     Max I/O Samples  ===> 200      Max CCWs per I/O ===>    25

   Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Note that the only default values displayed are the Sampling Parameters.

Step 6 On the **COMMAND** line, type **CANcel** to return to MSLIST.

Step 7 When MSLIST is displayed, place the cursor on the name of a monitor set with the Analyzed or Filed state, and then press **Enter**.

Step 8 When the MSMONSET view is displayed for the monitor set that you selected, type **ADD** on the **COMMAND** line, as shown in Figure 11-41 on page 11-45.

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Figure 11-41 ADD Command

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===> ADD                                            SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS===MVMVS====D====1
                              MVScope Monitor Set
    Symptoms                                            Problem Analysis
  . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
    Name:  BBD9MAIV  89.9%  09:41:01 to 09:42:01      . Programs
  . Hot Instruction         257 CPU, 100 I/O samples  . I/Os
    Addr:  00006B4E  29.2%  Analyzed NOV 18, YYYY     . Traces
    Pgm:   BBD9MAIV         No sampling errors        > Maps
    CSECT: BBD0MAIV
    Ofst:   +0001B6         +----------------------+    Utilities
  . Hot Task                |   Place cursor on    |  > Monitored Job
    Addr:  007E39C8  89.5%  |    menu item and     |  > First Monitored Dev
    Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
  . Hot DASD Track          +----------------------+
    CCHH:  00E5000C  14.0%                            . Return ...
    Dsn:   SYS96158.T13504
```

The MVScope Add Monitor Set panel is displayed, as shown in Figure 11-42.

Figure 11-42 MVScope Add Monitor Set Panel with New Parameters

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE

  ------------------------ MVSCOPE ADD MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===> BMVSLK219YYYYNOV1809:42:43
  Type of Sampling ===> CPUIO  (CPU CPUIO IO)

  Entities to Sample:
     Job Name   ===> BMVSLKV
     Dev/Vol(s) ===> /0D06  ===> /217   ===> /3A01  ===> /322   ===> BAB314
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 120      Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    5
     Max I/O Samples  ===> 200      Max CCWs per I/O ===>    25

   Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Notice that the parameters displayed match the parameters for the job that you selected (parameters that you set in Figure 11-35 on page 11-40).

Step 9 Press **PF3** to save the new monitor set.

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Step 10 Press **PF3** and hyperlink to MSMONSET on the newly added monitor set's name to return to MSLIST.

Step 11 On the **COMMAND** line, type **CHAnge**.

The MVScope Change Monitor Set panel is displayed, as shown in Figure 11-43.

Figure 11-43 MVScope Change Monitor Set Panel

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                              SCROLL ===> CSR

  ------------------------ MVSCOPE CHANGE MONITOR SET ------------------------
  COMMAND ===>

  Monitor Set      ===> BMVSLK219YYYYNOV1809:42:55
  Type of Sampling ===> CPUIO  (CPU CPUIO IO)

  Entities to Sample:
     Job Name   ===> BMVSLKV
     Dev/Vol(s) ===> /0D06  ===> /217   ===> /3A01  ===> /322   ===> BAB314
                ===>        ===>        ===>        ===>        ===>

     Device Range(s)  from    ===>          to     ===>
                      from    ===>          to     ===>
                      from    ===>          to     ===>
  Sampling Parameters:
     Max Dur in Secs  ===> 120      Max Devs to monitor ===> 100
     Max CPU Samples  ===> 600      CPU Samples/Sec  ===>    5
     Max I/O Samples  ===> 200      Max CCWs per I/O ===>    25

   Press END to save the Monitor Set.   Enter CANcel to leave without saving
```

Do not change this monitor set now.

Step 12 Type **CANcel** on the **COMMAND** line, and then press **Enter** to return to the MSMONSET view.

Step 13 Type **DELete** on the **COMMAND** line, and then press **Enter** to delete the monitor set for BMVSLKV.

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Summary of MVScope Views

The following section provides a screenshot and brief explanation of each view. A summary of how the views are related to each other and the hyperlinks available from each view is provided in each view section. The views are grouped according to user actions, or the kind of information displayed, as shown in Table 11-7.

Note: The tables accompanying some views show some of the major hyperlinks for each MVScope view. Many of the fields in the views also hyperlink to other views. Several fields might hyperlink to the same view; however, the information displayed in the view for each hyperlink is filtered to display data relevant to that particular field. Hyperlinks might be added or deleted in future releases.

Table 11-7 Summary of MVScope Views

Description	View
Views where you can start using MVScope	EZMJOB EZMDEV MSLIST MSMONSET
Views showing instructions used by tasks	MSTASK MSTPGM MSTPGMZ
Views showing programs used, regardless of the tasks	MSPGM MSPROG
Views showing I/O samples	MSICCW MSIOZ MSIRESP MSISEEK MSITRACE
Views showing traces of resources used over the sampling period	MSRITEMZ MSRSRCZ MSRSLICE
Diagnostic views used to find out why monitoring failed	MSDCPU MSDIAG MSDIO MSDPROF
Map views that help to navigate the monitor set	MSMAP MSMDSN MSMVOL MSMTASK MSMVSTG
View that provides advisory messages about hyperlinks in MVScope views	MSXPLAIN

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Views for Starting MVScope

Use the views in this section to start MVScope.

EZMDEV and EZMDEVMS Views

EZMDEV is not an MVScope view but is included here because several MVScope hyperlinks lead to this view.

EZMDEV is a device activity menu, specific to the device that you selected. The device number and the serial number of the volume currently mounted on the device are displayed at the center of the view.

Use EZMDEV to view detailed information about the device whose I/O you traced, or to start an MVScope trace of I/Os to the device specified.

Hyperlink on **MVScope I/O Tracing** to EZMDEVMS to get a menu of MVScope options. The EZMDEVMS view enables you to trace I/Os for this specified device and to hyperlink to MSLIST. See Figure 11-44.

Figure 11-44 EZMDEVMS View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =EZMDEV===EZMDEVMS=SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                               Device Activity Menu

          Current Device ->  04E0
                  Volser ->

     This Device             + MVScope I/O Tracing =+    All Devices
   . Cache Statistics        . Begin I/O Trace      .  . Cache Overview
   . Data Sets Allocated     . List All Monitor Sets.  . Channel Utilization
   . Data Sets in Use        . Return...            .  . LCU Overview
   . Detailed Info           +----------------------+  . SMS Overview
   . Jobs Delayed by Volume                             . Tape Activity
   . Jobs Using Volume
   . Overview

     SYSPROG Services
   > I/O Subsystem
   > MVScope I/O Tracing
   > Utilities                                          . Return...
```

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EZMJOB and EZMJOBJM Views

EZMJOB is not an MVScope view but is included here because several MVScope hyperlinks lead to this view.

EZMJOB is a job activity menu, specific to the job that you selected. Options selected from this menu display data about the specified job from the current interval.

Use EZMJOB to view detailed information about the job, or to start an MVScope CPU trace of the address space specified in the view.

Hyperlink on **MVScope CPU Tracing** to EZMJOBJM to display a menu of MVScope options. The EZMJOBJM view enables you to start sampling the specified job and to hyperlink to MSLIST. See Figure 11-45.

Figure 11-45 EZMJOBJM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
CURR WIN ===> 1        ALT WIN ===>
 W1 =EZMJOB===EZMJOBJM=SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                  Job Menu
                              Timeframe - Interval

            Current Job ->  *MASTER*

    Activity                + MVScope CPU Tracing =+    Resource Usage
  . Using Resources         . Begin CPU Trace      .  . Data Sets Allocated
  . Delay Reasons           . List All Monitor Sets.  . Data Sets Used
  . Status                  . Return...            .  . Data Spaces
  . Last 10 intervals       +----------------------+  . Detail
  . Overview                                          . SRM Service Units
  . Paging                                            . Storage Used
  . Trending
  . Workflow

    SYSPROG Services
  > Actions
  > MVScope CPU Tracing
  > Performance
  > Storage                                           . Return...
```

MSLIST View

MSLIST displays a list of all MVScope monitor sets that have been created since MVScope was started. It identifies the following information, as shown in Figure 11-46:

- types of sampling
- job name
- device
- monitor set status
- date and time that the samples were taken
- number of CPU and I/O samples in the monitor set

Type **MSLIST** on the **COMMAND** line to use MSLIST to quickly review all available monitor sets.

Figure 11-46 MSLIST View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSLIST============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===20
 Cmd Monitor Set       Intvl Status   Samp  Sampled  Traced Sampling  Sampling C
 --- -----------       Time- ------   Types Job      Device Date      Start
 CHA BMVSLK2YYYYNOV18  09:27 Ready    CPUIO BMVSLKV  /0D06            00:00:00
     BMVSLK21YYYYNOV18 09:27 Analyzed CPUIO BMVSLKV  /0D06  18NOVYYYY 09:29:05
     BMVPCC3YYYYNOV18  09:27 Ready    CPU   PCAUTH                     00:00:00
     BMVPCC3YYYYNOV18  09:27 Filed    CPU   RASP            18NOVYYYY 09:16:48
     BMVPCC31YYYYNOV18 09:27 Filed    CPU   PCAUTH          18NOVYYYY 09:16:48
     Template Monset   09:27 Ready    CPU
```

Table 11-8 shows the hyperlinks from the MSLIST view.

Table 11-8 MSLIST View Hyperlinks

Hyperlink on This Field	To Reach This View
Monitor Set	MSMONSET
Status	MSDIAG
Sampled Job	EZMJOB
Traced Device	EZMDEV
Sampling Start	MSRSRCZ
CPU Ct	MSTASK
I/O Ct	MSIOZ

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MSMONSET View

MSMONSET displays an overview of an MVScope monitor set, showing high-level symptoms. It provides a menu of hyperlinks to view the detailed results of sampling, as shown in Figure 11-47.

Use MSMONSET to find the busiest program, instruction, task, and DASD track in the sampled data, and to hyperlink to more detailed views to analyze the sampled data.

Figure 11-47 MSMONSET View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSMONSET==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
     Symptoms                                                Problem Analysis
   . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
     Name:  BBD9MAIV  89.9%  11:56:04 to 11:56:06      . Programs
   . Hot Instruction         257 CPU, 100 I/O samples  . I/Os
     Addr:  00006B4E  29.2%  Analyzed NOV 16, YYYY     . Traces
     Pgm:   BBD9MAIV         No sampling errors        > Maps
     Csect: BBD0MAIV
     Ofst:   +0001B6         +----------------------+    Utilities
   . Hot Task                |   Place cursor on    |  > Monitored Job
     Addr:  007E39C8  89.5%  |    menu item and     |  > First Monitored Dev
     Name:  BBD0MACP         |     press ENTER      |  . Monitor Sets
   . Hot DASD Track          +----------------------+
     CCHH:  00E5000C  14.0%                            . Return ...
     Dsn:   SYS96158.T13504
```

Table 11-9 shows the hyperlinks from the MSMONSET view.

Table 11-9 MSMONSET View Hyperlinks

Hyperlink on This Field	To Reach This View
Hot Program	MSPGM
Hot Instruction	MSPGM
Hot Task	MSTPGM
Hot DASD Track	MSITRACE
Tasks and SRBs	MSTASK
Programs	MSPROG
I/Os	MSIOZ
Traces	MSRSRCZ
Maps	MSMAP
Monitored Job	EZMJOB
First Monitored Dev	EZMDEV
Monitor Sets	MSLIST

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Views to Show Instructions Used by Tasks

Use the views in this section to see the instructions used by tasks.

MSTASK View

MSTASK displays the active tasks, their task control block (TCB) or service request block (SRB) addresses, and how much CPU and I/O were used by each task or SRB.

Use MSTASK to determine the busiest tasks, as shown in Figure 11-48.

Figure 11-48 MSTASK View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  H1 =MSTASK============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===37
 C Task     TCB/SRB  CPU CPU              Disa- I/O  I/O% Jobname
 - ----     -------   ct shr%  0...50.100 bled%  ct  ---- --------
   (SRB)    11215338   2  50.0                             AAOHW51
   PMMAIN     7D2D90   1  25.0            100.0            AAOHW51
   CMRTMGR    790618   1  25.0            100.0            AAOHW51
   CRMAIN     76B6B0                                       AAOHW51
   AUMAIN     76BE88                                       AAOHW51
   *Ended*    76D0C0                                       AAOHW51
   CMRVIOM    76BC58                                       AAOHW51
   TLTASK     76D840                                       AAOHW51
   *Ended*    76D9D8                                       AAOHW51
   PMMAIN     76DBF8                                       AAOHW51
   XSTASK     78F708                                       AAOHW51
   QARTSK     78F8A0                                       AAOHW51
   PMMAIN     78FC68                                       AAOHW51
```

Table 11-10 shows the hyperlinks from the MSTASK view.

Table 11-10 MSTASK View Hyperlinks

Hyperlink on This Field	To Reach This View
Task	MSTPGMZ
TCB/SRB	MSTPGMZ
CPU ct	MSRITEMZ
CPU shr%	MSRITEMZ
I/O ct	MSRITEMZ
I/O%	MSRITEMZ
Jobname	EZMJOB

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MSTPGM View

MSTPGM displays the instructions and CSECTS in a program used by a specific unit of work (task or SRB).

Use MSTPGM to distinguish between the activity of one work unit and another work unit, and to see which SVCs were used, as shown in Figure 11-49.

Figure 11-49 MSTPGM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSTPGM============SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D===8
 C Name     Interval    Intvl Type      Address Length  CPU              TCB/SRB
 - ----     Date------  Time- ----      ------- ------  shr% 0...50.100
   BBM9DCS5 06MARYYYY   15:46 Program  12C39000  38080
   BBM0DC46 06MARYYYY   15:46 Csect    12C39C80   1D9C
   BBM0DC46 06MARYYYY   15:46  +000534 12C3A1B4      1   1.1              7B9E88
   BBM0DC46 06MARYYYY   15:46  +0007F4 12C3A474      1   1.1              7B9E88
   MDC22@   06MARYYYY   15:46 Csect    12C42598   13DC
   MDC22@   06MARYYYY   15:46  +000D60 12C432F8      1   1.1              7B9E88
   BBD0XC00 06MARYYYY   15:46 Csect    12C67778   2B28
   BBD0XC00 06MARYYYY   15:46  +002546 12C69CBE      1   1.1              7B9E88
```

Table 11-11 shows the hyperlinks from the MSTPGM view.

Table 11-11 MSTPGM View Hyperlinks

Hyperlink on This Field	To Reach This View
CPU shr%	MSRITEMZ
TCB/SRB	MSTPGMZ
Task	MSTPGMZ

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MSTPGMZ View

MSTPGMZ is a summary of the programs used by a specific task.

Use MSTPGMZ to identify the programs that are used most by a specific task or SRB, as shown in Figure 11-50.

Figure 11-50 MSTPGMZ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  H1 =MSTPGMZ===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==293
 C Program  Start      Length Task      TCB/SRB CPU   CPU              Related
 - -------  -----      ------ ----      -------  ct  shr% 0....50..100 SVC(s)
   IEAVELK  00FEA120     1000 (SRB)      FD1E78 119  13.2
   IXLC3SCN 0102F318      F70 (SRB)      FD1E78  34   3.8
   IEA0TI00 00FE1738     1B38 (SRB)      FD1E78  26   2.9
   IXLC3LTN 01030288      8A8 (SRB)      FD1E78  22   2.4
   IEAVESVC 00FE4000      DE8 (SRB)      FD1E78  20   2.2
   IGVVSM31 014F62E0      8D8 (SRB)      FD1E78  17   1.9
   IGVGAPVT 014E9F10      990 (SRB)      FD1E78  14   1.6
   IGVVSTOR 014F6BB8      CD8 (SRB)      FD1E78  13   1.4
   IEAVEPST 00FEC3D8     29C0 (SRB)      FD1E78  11   1.2
   Unknown  103823F2        1 (SRB)      FD1E78  11   1.2
```

Table 11-12 shows the hyperlinks from the MSTPGMZ view.

Table 11-12 MSTPGMZ View Hyperlinks

Hyperlink on This Field	To Reach This View
Program	MSTPGM
CPU ct	MSRITEMZ
CPU shr%	MSRITEMZ

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Views Showing Programs Used

Use the views in this section to see which programs were used, regardless of the task or tasks.

MSPGM View

MSPGM displays the layout of a program, showing the active CSECTs and instructions, and how much they have been used.

Use MSPGM to determine which CSECTS and instructions were used in the specified program, as shown in Figure 11-51.

Figure 11-51 MSPGM View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSPGM=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===11
 C Name     Type      Address   Length  CPU  CPU               Related  Ps Sta-
 - ----     ----      -------   ------   ct  shr% 0....50..100 SVC      Ke te
   IEAVELK  Program    FEA120     1000  124  13.8
   IEAVELK  Csect      FEA120     1000  124  13.8
   IEAVELK   +0003DC   FEA4FC        1   15   1.7                        0 SUPV
   IEAVELK   +00044C   FEA56C        1   65   7.2                        0 SUPV
   IEAVELK   +00044C   FEA56C        1   65   7.2              Stimer    0 SUPV
   IEAVELK   +00044C   FEA56C        1   65   7.2                        0 SUPV
   IEAVELK   +00044C   FEA56C        1   65   7.2                        0 SUPV
   IEAVELK   +000752   FEA872        1   16   1.8                        0 SUPV
   IEAVELK   +0009F8   FEAB18        1    3   0.3                        0 SUPV
   IEAVELK   +0009F8   FEAB18        1    3   0.3                        0 SUPV
   IEAVELK   +000B24   FEAC44        1   25   2.8                        0 SUPV
```

Table 11-13 shows the hyperlinks from the MSPGM view.

Table 11-13 MSPGM View Hyperlinks

Hyperlink on This Field	To Reach This View
Type	MSTPGM
CPU ct	MSRITEMZ
CPU shr%	MSTITEMZ

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MSPROG View

MSPROG displays a list of all of the programs used in the monitor set.

Use MSPROG to determine the busiest programs in the monitor set, as shown in Figure 11-52.

Figure 11-52 MSPROG View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  H1 =MSPROG============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==300
 C Name     Type of   Address   Length CPU   CPU                Disa-
 - ----     Area      -------   ------  ct  shr% 0.....50...100 bled%
   IEAVELK  Program    FEA120     1000 124  13.8                 13.8
   IXLC3SCN Program   102F318      F70  34   3.8                  2.1
   IEA0TI00 Program    FE1738     1B38  26   2.9
   IXLC3LTN Program   1030288      8A8  22   2.4                  0.6
   IEAVESVC Program    FE4000      DE8  20   2.2                  1.6
   IGVVSM31 Program   14F62E0      8D8  17   1.9
   IGVGAPVT Program   14E9F10      990  14   1.6
   IGVVSTOR Program   14F6BB8      CD8  13   1.4
   IEAVEPST Program    FEC3D8     29C0  11   1.2
   Unknown  Instrctn 103823F2        1  11   1.2
```

Table 11-14 shows the hyperlinks from the MSPROG view.

Table 11-14 MSPROG View Hyperlinks

Hyperlink on This Field	To Reach This View
Name	MSPGM
CPU ct	MSRITEMZ
CPU shr%	MSRITEMZ

Views Showing I/O Samples

Use the views in this section to review I/O samples.

MSICCW View

MSICCW displays the channel programs for each I/O event. Channel programs are sequences of channel command words (CCWs).

Use MSICCW to identify the types of I/O requests and to see the data transferred by each I/O, as shown in Figure 11-53 on page 11-57.

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Note: If security is enabled (in SERDEF) for I/O data, MSICCW will indicate that you are not authorized to see the I/O data. Refer to "Security Issues When Using MVScope" on page 11-2 for more information.

Figure 11-53 MSICCW View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1
=MSICCW============SYSE=====*=============DDMMMYYYY==HH:MM:SS====MVMVS====D=1085
 C Channel Command       Data  Data (EBCDIC)  Data (Hex)
 - ---------------       Bytes -------------  ----------
   ->Define Extent          16 Not authorized D596A34081A4A388969989A985844040
     Locate Record          16 Not authorized D596A34081A4A388969989A985844040
     Write Update Data (  4096 Not authorized D596A34081A4A388969989A985844040
   .-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
   <-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
   ->Define Extent          16 Not authorized D596A34081A4A388969989A985844040
     Locate Record          16 Not authorized D596A34081A4A388969989A985844040
     Read Data (MT)       4096 Not authorized D596A34081A4A388969989A985844040
     Transfer in Channel     0 Not authorized D596A34081A4A388969989A985844040
     Locate Record          16 Not authorized D596A34081A4A388969989A985844040
     Read Data (MT)       4096 Not authorized D596A34081A4A388969989A985844040
   .-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
   <-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
   ->Define Extent          16 Not authorized D596A34081A4A388969989A985844040
     Locate Record          16 Not authorized D596A34081A4A388969989A985844040
     Read Data (MT)       4096 Not authorized D596A34081A4A388969989A985844040
   .-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
   <-No-Operation            1 Not authorized D596A34081A4A388969989A985844040
```

Table 11-15 shows the hyperlinks from the MSICCW view. You must scroll to the right to see the fields listed in the table.

Table 11-15 MSICCW View Hyperlinks

Hyperlink on This Field	To Reach This View
I/O Job	EZMJOB
ASID Dec	EZMJOB
I/O Driver	MSICCW
Channel Pgm Begun	MSRSLICE
IOSB Seek CcCcHhHhRr	MSMVOL
Cyls seeked	MSISEEK
Response Time	MSIRESP
Devn	EZMDEV
Volser	EZMDEV
Data Set Name	MSMDSN

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MSIOZ View

MSIOZ is a summary of I/Os grouped by cylinders and the data sets used in those cylinders.

Use MSIOZ to identify the busiest parts of the disk, as shown in Figure 11-54.

Figure 11-54 MSIOZ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSIOZ=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===28
 C  I/O%                Data Set Name           Cyl    Cyl Dev  Volser Job(s)
 -  ---- 0.....50...100 -------------           CcCc   Dec ---  ------ ------
    18.2                PAGE.VPAGE25.LOCAL2.DAT 0520  1312 0225 PAGE25 *MASTER*
    15.2                PAGE.VPAGE25.LOCAL2.DAT 0523  1315 0225 PAGE25 *MASTER*
     7.1                PAGE.VPAGE25.LOCAL2.DAT 0522  1314 0225 PAGE25 *MASTER*
     6.1                PAGE.VPAGE25.COMMON.DAT 0003     3 0225 PAGE25 *MASTER*
     5.1                PAGE.VPAGE25.LOCAL2.DAT 0525  1317 0225 PAGE25 *MASTER*
     4.0                PAGE.VPAGE25.LOCAL2.DAT 0521  1313 0225 PAGE25 *MASTER*
     4.0                PAGE.VPAGE25.LOCAL1.DAT 009F   159 0225 PAGE25 *MASTER*
     4.0                PAGE.VPAGE25.LOCAL2.DAT 0518  1304 0225 PAGE25 *MASTER*
     3.0                PAGE.VPAGE25.LOCAL2.DAT 0524  1316 0225 PAGE25 *MASTER*
     3.0                PAGE.VPAGE25.LOCAL2.DAT 01D8   472 0225 PAGE25 *MASTER*
     2.0                PAGE.VPAGE25.PLPA.DATA  00FE   254 0225 PAGE25 *MASTER*
     2.0                PAGE.VPAGE25.LOCAL1.DAT 00AF   175 0225 PAGE25 *MASTER*
     2.0                PAGE.VPAGE25.LOCAL1.DAT 0091   145 0225 PAGE25 *MASTER*
     2.0                Not known               0000     0 0225 PAGE25 *MASTER*
     2.0                PAGE.VPAGE25.LOCAL2.DAT 0373   883 0225 PAGE25 *MASTER*
```

Table 11-16 shows the hyperlinks from the MSIOZ view. You must scroll to the right in order to see some of the fields listed in the table.

Table 11-16 MSIOZ View Hyperlinks

Hyperlink on This Field	To Reach This View
I/O%	MSITRACE
Data Set Name	MSITRACE
Cyl CcCc	MSITRACE
Cyl Dec	MSITRACE
Dev	MSITRACE
Volser	MSITRACE

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MSIRESP View

MSIRESP displays response times for each I/O event, showing the components of response time, such as connect, pending, and disconnect times.

Use MSIRESP to identify the I/O events that took the most time, as shown in Figure 11-55.

Note: "Actual Resp Time" ≠ the sum of "Channel Management Facility" timings.

Figure 11-55 MSIRESP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSIRESP===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===99
 C  Resp                 Conn  Pend  Disc  CU_Q Q  I/O Job  I/O  Data Set Name
 -  Time 0.....50...100  Time  Time  Time  Time Ln -------  Driv -------------
    70.4                  3.2   1.0  66.2        2 *MASTER* ASM  PAGE.VPAGE25.LO
    52.3                 66.6   0.3                *MASTER* ASM  PAGE.VPAGE25.LO
    51.7                  1.4   0.3  50.0        1 *MASTER* ASM  PAGE.VPAGE25.LO
    46.3                  1.3   0.4  44.7          *MASTER* ASM  PAGE.VPAGE25.LO
    36.7                  2.0   0.4  34.2          *MASTER* ASM  PAGE.VPAGE25.LO
    34.4                  1.2   0.3  32.4          *MASTER* ASM  PAGE.VPAGE25.LO
    31.9                                            *MASTER* ASM  PAGE.VPAGE25.LO
    29.8                                            *MASTER* ASM  PAGE.VPAGE25.LO
    27.5                                        1 *MASTER* ASM  PAGE.VPAGE25.CO
    25.8                  1.3   0.4  23.9        1 *MASTER* ASM  PAGE.VPAGE25.LO
```

Table 11-17 shows the hyperlinks from the MSIRESP view. You must scroll to the right in order to see some of the fields listed in the table.

Table 11-17 MSIRESP View Hyperlinks

Hyperlink on This Field	To Reach This View
Resp Time	MSICCW
ConnTime	MSICCW
Pend Time	MSICCW
Disc Time	MSICCW
CU_Q Time	MSICCW
Q Ln	MSICCW
I/O Job	MSICCW
I/O Driv	MSICCW
Data Set Name	MSICCW
Volser	MSICCW
Devn	MSICCW

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MSISEEK View

MSISEEK graphically displays the relative locations of data sets on the disk in the sequence that they were accessed by I/Os.

Use MSISEEK to identify data sets that might cause excessive device disconnect times due to large cylinder seek distances, as shown in Figure 11-56.

Figure 11-56 MSISEEK View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  H1 =MSISEEK===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===99
 C Seek Location on Disk      Disc I/O seek   Data Set Name         I/O Job
 - Cyls 0........mid.....max  Time CcCcHhHhRr -------------         -------
        *                      4.2 009F000E08 PAGE.VPAGE25.LOCAL1.D *MASTER*
        *                      0.6 009F000E08 PAGE.VPAGE25.LOCAL1.D *MASTER*
   393 ****                   18.0 022800040A PAGE.VPAGE25.LOCAL2.D *MASTER*
       ****                    0.1 022800040A PAGE.VPAGE25.LOCAL2.D *MASTER*
   377 *                      23.9 00AF000D02 PAGE.VPAGE25.LOCAL1.D *MASTER*
       *                            00AF000D02 PAGE.VPAGE25.LOCAL1.D *MASTER*
   549 *****                  20.5 02D4000708 PAGE.VPAGE25.LOCAL2.D *MASTER*
   252 ****                   17.4 01D8000507 PAGE.VPAGE25.LOCAL2.D *MASTER*
       ****                         01D8000507 PAGE.VPAGE25.LOCAL2.D *MASTER*
   472                         0.1       0000 Not known             *MASTER*
   254 **                     10.0 00FE000505 PAGE.VPAGE25.PLPA.DAT *MASTER*
       **                           00FE000505 PAGE.VPAGE25.PLPA.DAT *MASTER*
   254                                    0000 Not known             *MASTER*
  1304 ***********            13.4 0518000408 PAGE.VPAGE25.LOCAL2.D *MASTER*
       ***********             0.1 0518000605 PAGE.VPAGE25.LOCAL2.D *MASTER*
   832 ****                   20.7 01D8000503 PAGE.VPAGE25.LOCAL2.D *MASTER*
    91 ****                   21.6 0233000E0A PAGE.VPAGE25.LOCAL2.D *MASTER*
       ****                    0.1 0233000E0A PAGE.VPAGE25.LOCAL2.D *MASTER*
   384 *                      18.0 00B3000005 PAGE.VPAGE25.LOCAL1.D *MASTER*
       *                            00B3000005 PAGE.VPAGE25.LOCAL1.D *MASTER*
  1125 ***********            34.2 0518000606 PAGE.VPAGE25.LOCAL2.D *MASTER*
                                0.5 0518000606 PAGE.VPAGE25.LOCAL2.D *MASTER*
```

Table 11-18 shows the hyperlinks from the MSISEEK view.

Table 11-18 MSISEEK View Hyperlinks

Hyperlink on This Field	To Reach This View
Seek Cyls	MSICCW
Location on Disk	MSICCW
Disc Time	MSIRESP
I/O seek CcCcHhHhRr	MSICCW
Data Set Name	MSICCW
I/O Job	MSICCW

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MSITRACE View

MSITRACE displays the I/Os traced by MVScope. For each I/O, MSITRACE shows the I/O driver, the seek address, the response time, and the data set name.

Use MSITRACE to view the sequence of I/O events, as shown in Figure 11-57.

Figure 11-57 MSITRACE View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSITRACE==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===76
 C I/O Start   I/O Job  I/O  Volser Dev  Data Set Name           Resp
 - ---------   -------  Driv ------ ---  -------------           Time 0...50.100
   11:14:55.46 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  20.4
   11:14:55.48 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA   0.5
   11:14:55.51 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  22.2
   11:14:55.53 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  18.9
   11:14:55.56 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA   0.4
   11:14:56.14 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  16.0
   11:14:56.16 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA   1.3
   11:14:56.16 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  22.3
   11:14:56.19 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  23.2
   11:14:56.21 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA   0.8
   11:14:57.32 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA  36.7
   11:14:57.35 *MASTER* ASM  PAGE25 0225 PAGE.VPAGE25.LOCAL2.DA   0.9
```

Table 11-19 shows the hyperlinks from the MSITRACE view. You must scroll to the right in order to see some of the fields listed in the table.

Table 11-19 MSITRACE View Hyperlinks

Hyperlink on This Field	To Reach This View
I/O Start	MSICCW
I/O Job	MSICCW
I/O Driv	MSICCW
Volser	MSICCW
Dev	MSICCW
Data Set Name	MSICCW
Resp Time	MSIRESP
I/O Addr CcCcHhHhRr	MSICCW

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Views Showing Traces of Resources

Use the views in this section to trace the resources that were used over the sampling period.

MSRITEMZ View

MSRITEMZ, as shown in Figure 11-58, summarizes the usage of specific subsets of resources over time. Use MSRITEMZ to look for possible cause-and-effect relationships between the usage of one resource and another. Hyperlink from MSRITEMZ to a view of all resources that were used during a specific time frame.

MSRITEMZ divides the sampling time into 16 time slices, each representing about four seconds of sampling. Each time slice indicates whether the resource usage was relatively high (H), medium (M), or low (L) during those four seconds.

You can hyperlink from a time slice to MSRSLICE, which shows the eight sample buckets filled during those four seconds, as shown in Figure 11-59 on page 11-63.

Figure 11-58 MSRITEMZ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSRITEMZ==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==278
  Resource Used by  Scope of User     1st Time                                F
  -------- -------  Use      Location Slice    - - - - - - - - - - - - - - - - T
  CPUsamps *MASTER* AddrSpce A/S      11:14:52 L H L H H                      1
  ESframes *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  UsedRgnB *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  UsedHiB  *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  UsedRgnA *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  UsedHiA  *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  TCB time *MASTER* AddrSpce A/S      11:14:52 L H L L L                      1
  SRB time *MASTER* AddrSpce A/S      11:14:52 L H H L L                      1
  CSframes *MASTER* AddrSpce A/S      11:14:52 L L L L L                      1
  CPUsamps (SRB)    WorkUnit   FD1E78 11:14:52 H H H H H                      1
  CPUsamps (SRB)    WorkUnit 11215478 11:14:53 L L   L                        1
  CPUsamps (SRB)    WorkUnit  160A880 11:14:54 L   L                          1
  CPUsamps (SRB)    WorkUnit  1D61FD4 11:14:56 L                              1
  CPUsamps IEFENFWT WorkUnit   7CEE88 11:14:59   L L L                        1
  CPUsamps (SRB)    WorkUnit  15F31A4 11:14:59   L                            1
  CPUsamps (SRB)    WorkUnit  15F32A8 11:15:05   L                            1
  CPUsamps IEAVTR2S WorkUnit   7D2D90 11:15:05   L                            1
  CPUsamps (SRB)    WorkUnit  20C3D20 11:15:05   L                            1
  CPUsamps (SRB)    WorkUnit   F9E900 11:15:09   L                            1
  CPUsamps (SRB)    WorkUnit  15DF618 11:15:09     L                          1
  CPUsamps (SRB)    WorkUnit  2549DB8 11:15:10     L                          1
  CPUsamps (SRB)    WorkUnit  1C43188 11:15:10     L                          1
  CPUsamps (SRB)    WorkUnit  1D6F084 11:15:15     L                          1
```

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Table 11-20 shows the hyperlinks from the MSRITEMZ view.

Table 11-20 MSRITEMZ View Hyperlinks

Hyperlink on This Field	To Reach This View
Any Time Slice (colored stripe) with the L, M, or H character	MSRSLICE

MSRSLICE View

MSRSLICE displays all of the resources that were used during a small time slice. There are eight buckets of samples in an MVScope time slice. The duration of a time slice is usually about four seconds, so each bucket represents about 0.5 seconds of activity.

Use MSRSLICE to correlate usage of one resource (such as a program) with another resource (such as virtual storage), as shown in Figure 11-59. Scroll to the right to see all of the buckets.

Figure 11-59 MSRSLICE View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSRSLICE==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D==162
  Sample  Resource Units    User     Scope of User     1st     2nd     3rd     4
  buckets -------- -------- -------- User     Location Bucket  Bucket  Bucket  B
  025-032 CPUsamps Samples  IEAVELK  Instrctn  +00044C
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  Unknown  Instrctn 103823F2
  025-032 CPUsamps Samples  IEAVELK  Instrctn  +000752              1
  025-032 CPUsamps Samples  IGVVSM31 Instrctn  +0002F8
  025-032 CPUsamps Samples  IXLC3LTN Instrctn  +000040
  025-032 CPUsamps Samples  IEAVEPST Instrctn  +000120       1
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  IGC060   Instrctn  +00099C
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  IARVF    Instrctn  +000A2E
  025-032 CPUsamps Samples  IEAVESVC Instrctn  +000346                      1
  025-032 CPUsamps Samples  Unknown  Instrctn    F8328
  025-032 CPUsamps Samples  Unknown  Instrctn 103827DC
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn                      2
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  Unknown  Instrctn Instrctn
  025-032 CPUsamps Samples  IOSVSSCQ Instrctn  +000402                      1
  025-032 CPUsamps Samples  IEAVETRC Instrctn  +000980
  025-032 CPUsamps Samples  IGVVSTOR Instrctn  +00001A
```

There are no hyperlinks from MSRSLICE.

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MSRSRCZ View

MSRSRCZ displays a summary of the resources used and when they were used.

Use MSRSRCZ to find the times when resources were used the most. Hyperlink to views of specific resources used over time, and to views of all resources used during a specific time slice, as shown in Figure 11-60.

Figure 11-60 MSRSRCZ View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSRSRCZ===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===13
  Resource Scope of Date     1st Time                                  Final    A
  -------- Use      ----     Slice    - - - - - - - - - - - - - - - - time     B
  CPUsamps AddrSpce 19NOV200 11:14:52 M H L H H                        11:15:33 2
  CPUsamps Instrctn 19NOV200 11:14:52 L L L L L                        11:15:33 0
  CPUsamps WorkUnit 19NOV200 11:14:52 L L L L L                        11:15:33 2
  ESframes AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 5
  UsedRgnB AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 3
  UsedHiB  AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 2
  I/Osamps WorkUnit 19NOV200 11:14:54 L H                              11:15:05 3
  UsedRgnA AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 2
  UsedHiA  AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 1
  TCB time AddrSpce 19NOV200 11:14:52 L H M L L                        11:15:33 2
  TCB time WorkUnit 19NOV200 11:14:52 L H L L L                        11:15:33 7
  SRB time AddrSpce 19NOV200 11:14:52 L H H L L                        11:15:33 2
  CSframes AddrSpce 19NOV200 11:14:52 M M M M L                        11:15:33 2
```

Table 11-21 shows the hyperlinks from the MSRSRCZ view.

Table 11-21 MSRSRCZ View Hyperlinks

Hyperlink on This Field	To Reach This View
Resource	MSRITEMZ
Any Time Slice (colored stripe) with the L, M, or H character	MSRSLICE

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Diagnostic Views

Use the views in this section to find out why monitoring failed.

MSDCPU View

MSDCPU displays a high-level profile of a monitor set and high-level CPU sampling results.

Use MSDCPU to find out how many CPU samples were collected and to see high-level symptoms that were gathered for the monitored address space, as shown in Figure 11-61.

Figure 11-61 MSDCPU View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSDCPU============SYSE=======*========DDMMMYYYY==HH:MM:SS====MVMVS====D==1
                          Monitor Set Name........  BMVSLK1YYYYNOV1814:55:15
                          Sample Type(s)..........  CPUIO
                          Status..................  Filed
                          Jobname.................  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

       CPU Samples
 CPU Samples Collected...      299
 Sample Buckets Filled...      107
 Busiest Pgm Sample Count      267
 Busiest Program CPU%....     89.3
 Busiest Program......... BBD9MAIV
 Busiest Instr Sample Cnt       92
 Busiest Instruction CPU%     30.8
 Busiest Instruction.....     6B4E
 Busiest Instruction Pgm. BBD9MAIV
 Busiest Instr CSECT..... BBD0MAIV
 Busiest Instr Offset....  +0001B6
 Busiest Task Sample Cnt.      264
 Busiest Task CPU%.......     88.3
 Busiest Task............ BBD0MACP
 Busiest TCB/SRB Address.   6F21A0
```

There are no hyperlinks from MSDCPU.

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MSDIAG View

MSDIAG displays a high-level profile of a monitor set, the monitor set's status, and the status of MVScope subcomponents.

Use MSDIAG to see if any errors have occurred while processing the monitor set, as shown in Figure 11-62.

Figure 11-62 MSDIAG View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSDIAG============SYSE======*========DDMMMYYYY==HH:MM:SS=====MVMVS====D==1
   Monitor Set Aspect     Monitor Set Name........  BMVSLK1YYYYNOV1814:55:15
 . Sampling Profile       Sample Type(s)..........  CPUIO
 . CPU Samples            Status..................  Filed
 . I/O Samples            Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

    MVScope Components
 CPU Sampler Status...... Ended
 Last CPU Sampler Error..
 I/O Tracer Status....... Ended
 Last I/O Tracer Error...
 Probe Status............ Ended
 Last Probe Error........
 Request Handler Status.. Waiting
 Last Req Handler Error..
 Mapper Status........... Waiting
 Last Mapper Error.......
```

Table 11-22 shows the hyperlinks from the MSDIAG view.

Table 11-22 MSDIAG View Hyperlinks

Hyperlink on This Field	To Reach This View
Sampling Profile	MSDPROF
CPU Samples	MSDCPU
I/O Samples	MSDIO

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MSDIO View

MSDIO displays a high-level profile of a monitor set and high-level I/O tracing results.

Use MSDIO to find out how many I/O samples were collected and to see the list of devices whose I/Os were traced, as shown in Figure 11-63.

Figure 11-63 MSDIO View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSDIO=============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                          Monitor Set Name........  BMVSLK1YYYYNOV1809:55:56
                          Sample Type(s)..........  CPUIO
                          Status..................  Filed
                          Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

       I/O Samples
  I/O Samples Collected...  100
  Sample Buckets Filled...  107
  1st Device............. 5D06
  2nd Device.............
  3rd Device.............
  4th Device.............
  5th Device.............
  6th Device.............
  7th Device.............
  8th Device.............
  9th Device.............
  10th Device............
  Device Range 1  from....
                  to......
  Device Range 2  from....
                  to......
  Device Range 3  from....
                  to......
  Busiest Track I/O Count.  107
  Busiest Track (CCHH).... 7500
  Busiest Track Volser.... BAB317
  Busiest Track Data Set.. BMVMVS.LGO.ISPLLIB
```

There are no hyperlinks from MSDIO.

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MSDPROF View

MSDPROF displays a high-level profile of a monitor set, detailed sampling parameters, and an audit trail of the monitor set's state changes.

Use MSDPROF to find out the person who created the monitor set, the time that samples were collected, and the sampling parameters, as shown in Figure 11-64.

Figure 11-64 MSDPROF View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =MSDPROF===========SYSE=====*========DDMMMYYYY==HH:MM:SS=====MVMVS====D===1
                         Monitor Set Name........  BMVSLK1YYYYNOV1814:55:15
                          Sample Type(s)..........  CPUIO
                          Status..................  Filed
                         Monitored Job/Device....  Job BMVSLKV , Devn 5D06
                          Last Error..............  No sampling errors

    Sampling Profile
 Profile Defined......... 14:55:15, NOV 18, 2001
 Profile Changed......... 14:55:15, NOV 18, 2001
 Change User ID.......... BMVSLK1
 Sampling Start.......... 14:55:16, NOV 18, 2001
 Sampling End............ 14:56:16, NOV 18, 2001
 Sample Buckets Filled...   107
 Monitor Set Filed....... 14:57:30, NOV 18, 2001
 Monitor Set Dropped.....
 Monitor Set State....... Filed
 Previous State.......... Analyzed
 Prev-1 State............ Analyzing
 Prev-2 State............ Sampling
 Max Seconds to Sample...    60
 Max CPU Sampler Cycles..   600
 Max I/O Tracer Samples..   100
 Max CCWs per I/O Sample.    25
 Samples per Second......    20
 Max Devs to Monitor.....   100
```

There are no hyperlinks from MSDPROF.

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Navigational Views

Use the views in this section to help navigate the monitor sets.

MSMAP View

MSMAP provides hyperlinks to views that show the layout of the monitored items, as shown in Figure 11-65.

Figure 11-65 MSMAP View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
COMMAND  ===>                                                 SCROLL ===> CSR
CURR WIN ===> 1        ALT WIN ===>
 W1=MSMONSET=MSMAP=====SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====1
                                MVScope Monitor Set
     Symptoms                                                Problem Analysis
   . Hot Program             Job BMVSLKV , Devn 0D06   . Tasks and SRBs
     Name:  BBD9MAIV  86.0%  10:06:03 to 10:04:02      . Programs
   . Hot Instruction         285 CPU, 100 I/O samples  . I/Os
     Addr:  00006B48  31.6%  Analyzed NOV 2O, YYYY     . Traces
     Pgm:   BBD9MAIV         No sampling errors        > Maps
     CSECT: BBD0MAIV
     Ofst:   +0001B0         + Maps ================+    Utilities
   . Hot Task                . Virtual Storage      .  > Monitored Job
     Addr:  007E1988  86.0%  . Tasks Hierarchy      .  > First Monitored Dev
     Name:  BBD0MACP         . Disk Areas           .  . Monitor Sets
   . Hot DASD Track          . Data Sets            .
     CCHH:  00070000  14.0%  . Return...            .  . Return ...
     Dsn:   SYS96161.T15023  +----------------------+
```

Table 11-23 shows the hyperlinks from the MSMAP view.

Table 11-23 MSMAP View Hyperlinks

Hyperlink on This Field	To Reach This View
Virtual Storage	MSMVSTG
Tasks Hierarchy	MSMTASK
Disk Areas	MSMVOL
Data Sets	MSMDSN

MSMDSN View

MSMDSN shows the data set concatenations used by the monitored address space, giving I/O activity and providing the data set names and attributes.

Use MSMDSN to get information about library search orders, data set I/O activity, and data set attributes, as shown in Figure 11-66.

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Figure 11-66 MSMDSN View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSMDSN============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===75
 C DDname   Intvl Cn  Dev Volume I/O  I/O%   Device Data Set Name
 - -------- Time- no  --- ------  ct  ----  connect -------------
   DD1      10:46     D06 PUBBC1  90  90.0   39026 SYS96161.T150239.RA000.BMVSL
   DD2      10:46     D06 PUBBC1   9   9.0    2668 SYS96161.T150239.RA000.BMVSL
   LNKLSTxx 10:46                                  SYS1.LINKLIB
   LNKLSTxx 10:46  1                               SYS1.MIGLIB
   LNKLSTxx 10:46  2                               SYS1.CSSLIB
   LNKLSTxx 10:46  3                               SYS1.IBMUTL.SYS.LINKLIB
   LNKLSTxx 10:46  4                               SYS2.SYSD.LINKLIB
   LNKLSTxx 10:46  5                               SYS2.XDCX31.XDCLINK
   LNKLSTxx 10:46  6                               SYS2.XDCX30.XDCLINK
   LNKLSTxx 10:46  7                               SYS1.XDCX31.XDXLINK
   LNKLSTxx 10:46  8                               SYS1.IBMISP.SYS.SISPLOAD
   LNKLSTxx 10:46  9                               SYS2.BOOLEB.LINKLIB
   LNKLSTxx 10:46 10                               SYS1.CICS330.SDFHLINK
   LNKLSTxx 10:46 11                               SYS1.IBMPLI.SYS.PLILINK
   LNKLSTxx 10:46 12                               SYS1.IBMPLI.SYS.SIBMLINK
   LNKLSTxx 10:46 13                               SYS1.IBMPLI.SYS.PLICOMP
   LNKLSTxx 10:46 14                               SYS1.IBMC.PRD.SEDCLINK
```

Table 11-24 shows the hyperlinks from the MSMDSN view.

Table 11-24 MSMDSN View Hyperlinks

Hyperlink on This Field	To Reach This View
Dev	EZMDEV
Volume	EZMDEV
I/O ct	MSITRACE
I/O%	MSITRACE

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MSMTASK View

MSMTASK displays the hierarchy of work units (task control blocks, or TCBs, and service request blocks, or SRBs) in a monitored address space.

Use MSMTASK as a cross-reference for identifying task relationships, as shown in Figure 11-67.

Figure 11-67 MSMTASK View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSMTASK===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===34
 C WorkUnit Intvl Jobname  Asid Work Unit Name     CPU  CPU%           Disa- I/O
 - address  Time- -------  Hex  --------------      ct  ---- 0..50.100 bled%  ct
   007FE240 13:45 BMVSLKV  0022 IEAVAR00
   007FDE88 13:45 BMVSLKV  0022 -IEESB605
   007FD398 13:45 BMVSLKV  0022 --IEFIIC
   007E2BC0 13:45 BMVSLKV  0022 ---BBD9MAIV
   007FF1D8 13:45 BMVSLKV  0022 -IEAVTSDT
   007DFA88 13:45 BMVSLKV  0022 ----BBD0MAPG         1   0.8
   007E28C8 13:45 BMVSLKV  0022 ----BBD0MACP       111  92.5 ********   19.8
   007E23B0 13:45 BMVSLKV  0022 ----BBD0MAIO         3   2.5                100
   085964F0 13:45 BMVSLKV  0022 (SRB)                1   0.8           100.0
   00FC4600 13:45 BMVSLKV  0022 (SRB)                1   0.8
   00FC3300 13:45 BMVSLKV  0022 (SRB)                1   0.8
   00FC2F00 13:45 BMVSLKV  0022 (SRB)                1   0.8
   00FC1A00 13:45 BMVSLKV  0022 (SRB)                1   0.8
```

Table 11-25 shows the hyperlinks from the MSMTASK view. You must scroll to the right in order to see some of the fields listed in the table.

Table 11-25 MSMTASK View Hyperlinks

Hyperlink on This Field	To Reach This View
WorkUnit address	MSTPGMZ
Jobname	EZMJOB
Asid Hex	EZMJOB
Work Unit Name	MSTPGMZ
CPU ct	MSRITEMZ
CPU%	MSRITEMZ
I/O ct	MSRITEMZ
I/O%	MSRITEMZ

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MSMVOL View

MSMVOL displays the physical layout on the disk of areas referenced by the I/Os traced by MVScope. The categories of area displayed are volumes, data set extents, and tracks to which I/O has been directed.

Use MSMVOL to see a map of the referenced areas on a disk, as shown in Figure 11-68.

Figure 11-68 MSMVOL View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  H1 =MSMVOL============SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===19
 C Begin    Intvl End       TRKS Used By  Data Set Name      I/O% Dev  Volser
 - CcCcHhHh Time- CcCcHhHh  ---- -------  -------------      ---- ---  ------
   00000000 12:15 0D19000E 50310 Volume                      100. 0314 BAB325
   00000001 12:15 0000000E    14 Data Set SYS1.VTOCIX.BAB325 11.0 0314 BAB325
   00000001 12:15 00000001     1 I/O      SYS1.VTOCIX.BAB325 10.0 0314 BAB325
   00000002 12:15 00000002     1 I/O      SYS1.VTOCIX.BAB325  1.0 0314 BAB325
   00010000 12:15 0003000E    45 Data Set BAB325 VTOC         8.0 0314 BAB325
   00010000 12:15 00010000     1 I/O      BAB325 VTOC         3.0 0314 BAB325
   00010008 12:15 00010008     1 I/O      BAB325 VTOC         4.0 0314 BAB325
   00010009 12:15 00010009     1 I/O      BAB325 VTOC         1.0 0314 BAB325
   05740000 12:15 0574000E    15 Data Set BOLSDL.BOLSDL4.BBI 81.0 0314 BAB325
   05740000 12:15 05740000     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740001 12:15 05740001     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740002 12:15 05740002     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740003 12:15 05740003     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740004 12:15 05740004     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740005 12:15 05740005     1 I/O      BOLSDL.BOLSDL4.BBI 12.0 0314 BAB325
   05740006 12:15 05740006     1 I/O      BOLSDL.BOLSDL4.BBI  9.0 0314 BAB325
   00000000 12:15 0D19000E 50310 Volume                      100. 02AD TSG322
   05490000 12:15 054D000E    75 Data Set SYS2.BBPLEX01.CFRM 100. 02AD TSG322
```

Table 11-26 shows the hyperlinks from the MSMVOL view.

Table 11-26 MSMVOL View Hyperlinks

Hyperlink on This Field	To Reach This View
Data Set Name	MSMDSN
I/O%	MSRITEMZ
Dev	EZMDEV
Volser	EZMDEV

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MSMVSTG View

MSMVSTG displays the layout of virtual storage in the monitored address space.

Use MSMVSTG to get information about the locations of CSECTs and programs in virtual storage, as shown in Figure 11-69.

Figure 11-69 MSMVSTG View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >H1 =MSMVSTG===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D===19
 C Start    Intvl   Length Asid AreaName Used for  CPU  CPU%            Disa- Us
 - -----    Time-   ------ Hex  -------- --------   ct  ---- 0...50.100 bled% --
   00000000 13:45 80000000 0022 BMVSLKV  A/S                                   BM
   00000000 13:45     1000 0022 BMVSLKV  PSA                                   BM
   00001000 13:45   7FF000 0022 BMVSLKV  PVT <16M                              BM
   00001000 13:45    90000 0022 BMVSLKV  RGN <16M                              BM
   00006998 13:45      668 0022 BBD9MAIV Program   111  92.5 *********   18.3 BM
   00006998 13:45      668 0022 BBD0MAIV Csect     111  92.5 *********   17.5 BM
   00006B16 13:45        1 0022 BBD0MAIV  +00017E    2   1.7                 BM
   00006B1C 13:45        1 0022 BBD0MAIV  +000184    1   0.8                 BM
   00006B22 13:45        1 0022 BBD0MAIV  +00018A   16  13.3 *            1.7 BM
   00006B28 13:45        1 0022 BBD0MAIV  +000190   15  12.5 *            0.8 BM
   00006B2C 13:45        1 0022 BBD0MAIV  +000194    3   2.5                 BM
   00006B30 13:45        1 0022 BBD0MAIV  +000198    1   0.8                 BM
   00006B3A 13:45        1 0022 BBD0MAIV  +0001A2    1   0.8                 BM
   00006B48 13:45        1 0022 BBD0MAIV  +0001B0   27  22.5 **           5.0 BM
   00006B4E 13:45        1 0022 BBD0MAIV  +0001B6   45  37.5 ****        10.8 BM
   00800000 13:45   39C000 0022 BMVSLKV  CSA <16M                              BM
   00B9C000 13:45    98000 0022 BMVSLKV  MLPA                                   BM
```

Table 11-27 shows the hyperlinks from the MSMVSTG view. You must scroll to the right in order to see some of the fields listed in the table.

Table 11-27 MSMVSTG View Hyperlinks

Hyperlink on This Field	To Reach This View
Asid Hex	EZMJOB
Used for	EZMJOB

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Message View

There is one message view, MSXPLAIN, that is displayed automatically when there is a problem with a selected hyperlink.

MSXPLAIN View

MSXPLAIN displays text that explains an exceptional condition detected by a hyperlink. For example, if a hyperlink is blocked due to insufficient samples, MSXPLAIN tells you why, as shown in Figure 11-70.

Figure 11-70 MSXPLAIN View

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
  W1 =MSXPLAIN==========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D====5


  This Monitor Set’s records have been filed in a Historical File.
  Enter END (PF3) to set the time frame to the interval when the
  Monitor Set was filed. Then try the hyperlink again. You can resume
  using the current time frame at any time by entering a "TIME * *"
  command.
```

There are no hyperlinks from MSXPLAIN.

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Frequently Asked Questions

How many MVScope monitor sets can I run at one time?

Four monitor sets can be run at one time. If you try to start a fifth monitor set, you might receive a warning message.

How can I increase the number of monitor sets that I can run concurrently?

BMC Software does not recommend running more than four MVScope monitor sets at one time because doing so impacts system performance.

How many times can I sample the same job?

Sample a job as many times as you want; however, for each sampling, you will need a separate monitor set.

How do I start a monitor set for a job that is not running yet?

Start the monitor set in the usual way. MVScope will start sampling when the job is initiated.

My monitor set got dropped. Why? What do I do now?

The space for the monitor set was reused. If you want to prevent a monitor set from being dropped, use the DSLIST view to make the historical data set ineligible for recording. You cannot recover the monitor set record that was dropped.

The MSICCW view reports all I/O data as “Not Authorized.” What is wrong?

The system administrator has not authorized you to collect or view data transferred by traced I/Os.

How can I make MVScope sample for longer than 1 minute?

You can use the CHAnge line command in MSLIST to change sampling parameters for a job that is in the Ready state. If you want to resample a job, select that job from MSLIST by typing **ADD** next to the monitor set name. Then change the parameters to what you want, save the new monitor set, and use the MONitor line command to initiate sampling.

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How long are monitor sets in the Filed state? Why do they get dropped?

Monitor sets remain in the Filed state until their historical data sets are reused. If you want to prevent a monitor set from being dropped, use the DSLIST view to make the historical data set ineligible for recording. You cannot recover the monitor set record that was dropped.

How long are monitor sets retained in the PAS's virtual storage?

Monitor sets are retained for five intervals; during that time, you can still view them even if you have no historical data sets.

Can I run MVScope in SSI mode?

No. MVScope actions are not supported in SSI mode.

Can MVScope trace activity on any kind of device?

No. MVScope can trace activity on DASD and tape but not on a printer.

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Chapter 12 Before Calling Customer Support

This chapter discusses what you should do if you encounter specific system problems. If the suggestions in this chapter do not help you solve your problem, you will need to call Customer Support, as described on page iii.

This chapter includes the following topics:

If a View Contains Only Job or Workload Names 12-3
If You Get “Read failed for view” Messages 12-4
If Performance Degradation Occurs in ASU Mode 12-5
If SYSPROG and CSMON Entries Result in Error Messages 12-6
If Your Color Graphics Terminal Does Not Work Properly 12-7
If the ATTN Key Does Not Work 12-8
If You Get “Screen def not found” Message 12-8
If There Is No Data Available for a Screen Definition 12-9

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When you start using MAINVIEW for OS/390, you might encounter some situations that seem a bit confusing, but there is probably a reasonable explanation for the problem. To save yourself some time, check to see if your situation matches any of these situations before calling Customer Support:

If This Is Happening	Turn to
A view contains job or workload names, but all other columns are blank.	“If a View Contains Only Job or Workload Names” on page 12-3
`Read failed for view` messages appear in a window.	“If You Get “Read failed for view” Messages” on page 12-4
Performance suffers in ASU mode.	“If Performance Degradation Occurs in ASU Mode” on page 12-5
SYSPROG and CSMON commands result in error messages	“If SYSPROG and CSMON Entries Result in Error Messages” on page 12-6
Colors and reverse video do not appear on your graphics terminal.	“If Your Color Graphics Terminal Does Not Work Properly” on page 12-7
ATTN command does not end ASU mode.	“If the ATTN Key Does Not Work” on page 12-8
`Screen Def Not Found` message appears when attempting to enter a MAINVIEW product.	“If You Get “Screen def not found” Message” on page 12-8
Views do not contain data when displayed as part of a screen definition.	“If There Is No Data Available for a Screen Definition” on page 12-9

Each situation is addressed in the corresponding sections, including a suggested course of action and an explanation of why the error occurs.

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If a View Contains Only Job or Workload Names

If a view lists job and workload names but nothing else, try one of the methods described in the following table:

Action	Explanation
Press **Enter**. The data should appear for the other columns in a few seconds.	If you happen to display a view at the instant that a new interval begins, data has not had a chance to accumulate—so there is no data to display.
Display the DCSTAT view and verify that the ADDRSPCE and WORKLOAD data collectors are active. If they are not, reactivate them by using the **A** line command.	If the ADDRSPCE and WORKLOAD data collectors are deactivated at the beginning of an interval, job and workload names are the only data available for display. If you activate ADDRSPCE and WORKLOAD during the interval, data appears for the other columns but is considered invalid until the start of the next interval.

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If You Get “Read failed for view” Messages

You might get messages similar to those messages shown in Figure 12-1.

Figure 12-1 Read Failed Error Message for CPUSTRT

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =LCUINFO===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D=====
  BBMXC7039E View              CPUSTRT Not Found
```

Try one of the solutions in the following table:

Action	Explanation
Check the messages in the window to see if the view name is misspelled. If it is, type the correct view name on the **COMMAND** line. If you were executing a hyperlink, type **CUST** and change the hyperlink target to the correct view name.	MAINVIEW looks for views spelled exactly as they are entered. You might have misspelled the view name when you typed it on the **COMMAND** line. If you were trying to execute a hyperlink, the view name might have been misspelled when the hyperlink was established. You can get a list of the view names by using the VIEWS view.
Check the window information line. If it contains anything other than MVMVS, you are in another product. Change the product context back to MAINVIEW by issuing this command: **CON = MVMVS**	MAINVIEW shares a number of views with CMF MONITOR. Depending on how your site is set up, displaying one of these common views can automatically change the context to another product. For example, suppose you display the DSLIST view from MAINVIEW. Someone at your site has customized DSLIST while in CMF MONITOR, so DSLIST is interpreted as a CMF view. When the view is displayed, the window information line changes from MVMVS to CMF. Then, when you try to display a view that is unique to MAINVIEW, MAINVIEW looks for the view in CMF, cannot find it, and displays the error messages shown in Figure 12-1. Changing the context back to MVMVS solves the problem.

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If Performance Degradation Occurs in ASU Mode

If MAINVIEW for OS/390 performance seems to decline when you are in automatic screen update (ASU) mode, try the following solutions:

Action	Explanation
Minimize the number of rows in each view through the use of filters.	Every *nn* seconds (the number of seconds specified on the ASU command), MAINVIEW collects, sorts, filters, and calculates values for every row in every view. If fewer rows are present, less work is required of MAINVIEW. For example, rather than updating the entire DEVSTAT view, use the CUSTom command to enter the view customization facility and establish a filter so that only the rows containing relevant information are visible–for example, ServiceTime > 10.
Specify a value of 15 seconds or more on the ASU command.	If you give MAINVIEW more time to perform the same amount of work, the strain on performance is naturally reduced. Real-time views should not enter ASU mode with a value of less than 15 seconds, because real-time data is generally not updated more often than every 15 seconds.
Make sure that there are no unlocked views containing views that you do not want anyone to update: the VIEWS view, SCREENS view, or any view in historical mode.	ASU updates only unlocked windows. When MAINVIEW tries to update windows that are ineligible for updating, performance is degraded unnecessarily.

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If SYSPROG and CSMON Entries Result in Error Messages

If you use RESET to clear your screen, and then type SYSPROG or CSMON, your screen will look like Figure 12-2.

Figure 12-2 SYSPROG Not Found Message

```
DDMMMYYYY  HH:MM:SS -------- MAINVIEW WINDOW INTERFACE(Rv.r.mm)MVMVS------------
 COMMAND  ===>                                                SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
 >W1 =LCUINFO===========SYSE=====*========DDMMMYYYY==HH:MM:SS====MVMVS====D=====
  BBMXC7039E View          SYSPROG Not Found
```

Consult the following table:

Action	Explanation
Display any MAINVIEW view, and then retype **SYSPROG** or **CSMON**.	SYSPROG and CSMON are *actions*, rather than views. Actions belong to a single MAINVIEW product. When you clear your screen, thus removing the MAINVIEW product identifier, MAINVIEW does not know which product the action belongs to. That is why the error messages are displayed.

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If Your Color Graphics Terminal Does Not Work Properly

If you see only a subset of colors on your color terminal, try the first four solutions in the following table. If reverse video is not being displayed, try all five solutions.

Action	Explanation
Ensure that you are on a controller that supports graphics terminals.	N/A
Find a terminal that is identical to yours and see if it is working properly.	N/A
1. From the ISPF main menu, select **Option 0 - ISPF Parms**. 2. From the ISPF Parameter Options panel, select **Option 1 - TERMINAL**. 3. In the **TERMINAL TYPE** field, type **3278**. Check the valid terminal types listed for 3278 to ensure that you indeed have a graphics terminal.	To display colors or graphics, the **TERMINAL TYPE** field must contain a value of 3278, which indicates an *extended capability terminal.*
Verify that the LOGMODE for your 327*x* terminal defines the terminal as graphics-capable.	Check the IBM publication *VTAM Resource Definition Reference* for an explanation of the LOGMODE definitions that permit graphics display.
1. From within a MAINVIEW session, type **MVP** on the **COMMAND** line to display the MAINVIEW Parameter Editors menu. 2. Select **Option 2 - DISPLAY**. 3. If Y is specified in the **Show graphic?** field, change it to **N**.	When the Show graphic? field is set to Y, graphs are represented by the character that appears in the **Graphic fill** field. If you want reverse video instead of a character display, you must change Y to N.

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If the ATTN Key Does Not Work

If you have to press the ATTN key twice to exit automatic screen update (ASU) mode, you probably have a non-SNA terminal. Try pressing **Reset**, and then press the PF HELP key.

If You Get “Screen def not found” Message

If you select a product from the MAINVIEW Selection menu and get a screen similar to the one shown in Figure 12-3, MAINVIEW is probably trying to display a screen definition that does not exist.

Figure 12-3 SCREEN DEF NOT FOUND Message

```
DDMMMYYYY HH:MM:SS-MAINVIEW WINDOW INTERFACE(R.v.r.mm)MVMVS-SCREEN DEF NOT FOUND
COMMAND  ===>                                                 SCROLL ===> PAGE
 CURR WIN ===> 1        ALT WIN ===>
T1
==============================================================================
```

To verify that this is indeed the problem, follow these steps:

Step 1 On the **COMMAND** line, type **MVP** to display the MAINVIEW Parameter Editors menu.

Step 2 In the **Product** field, type **MMVS**.

Step 3 Select **Option 2 - DISPLAY**.

Step 4 Note the screen definition name that appears in the **Initial screen** field.

The problem is that none of the data sets allocated to the DD name BBSDEF contain a member by this name. (BBSDEF was established during customization. It is the DD name for your screen definition library.)

There are three ways to solve this problem.

- Create a screen definition by the same name that is shown in the **Initial screen** field.
- Make the **Initial screen** field blank. If you select this method, the MAIN view is displayed by default.

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- As a third method, you can also display a customized screen definition for each MAINVIEW product upon initialization. To do so, create a screen definition by the same name as the product that you are trying to initialize, as shown in the following table:

For This Product	Name The Screen Definition
MAINVIEW for OS/390	MVMVS
CMF MONITOR	CMF
PLEX MANAGER	PLEXMGR

Specify the screen definition name in the **Initial screen** field.

If There Is No Data Available for a Screen Definition

If one of your screen definitions contains a view that always displays the message `There is no data which satisfies your request`, even though the message does not appear when the view is displayed from the **COMMAND** line, try the following solution:

Action	Explanation
Create the screen definition again, this time carefully selecting the parameters that you want for each view.	When a screen definition is saved, the parameters currently in effect for each view are also saved. That is, assume that you display JFLOW J*, and then save that view as part of the screen definition JOBS. The next time you display JOBS, the JFLOW view will display only those jobs starting with a J. However, if there are no active jobs beginning with a J the next time you display JOBS, you will get the error message `There is no data which satisfies your request`. Likewise, if you arrived at JFLOW through a hyperlink from another view, and that hyperlink definition contained the parameter >50 for the **Workflow %** field, JFLOW will display only those jobs with a workflow value of greater than or equal to 50 percent the next time you display JOBS. If there are no jobs that meet this criteria, the error message is displayed.

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Appendix A Understanding Terminology in a View Field

This chapter discusses the standard set of terms and measurements that are used to describe the information displayed in a view. Numeric values can appear differently, depending on the number of spaces provided for display.

This chapter includes the following topics:

Displaying Numeric Values A-2
Intervals A-2
Terms and Measurements A-3

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Displaying Numeric Values

When a number is smaller than the width of a field, it fits and is displayed appropriately in the view. When a number is larger than the width of a field, asterisks (*) appear in the view rather than data. Asterisks (*) indicate that a numeric value is too large for the width of a field.

Decimal values are rounded to accommodate the width of a field. Insignificant decimal places are truncated to show as much useful data as possible.

Intervals

Interval values have different meanings depending on what kind of data you are viewing.

- If you are viewing current data:

  The PAS refreshes the current data in common storage once every 15 seconds, so a current interval value is the value recorded at the end of the last 15-second interval.

- If you are viewing data in historical mode:

  The interval value is equal to the number of minutes defined to the INTERVAL= parameter of the REPORT Extractor control statement (see the *CMF® MONITOR Batch User Guide* for more information). The value that displays is an average over the entire interval.

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Terms and Measurements

The following background information describes terms and measurements found throughout MAINVIEW for OS/390 views. The topics, which apply to fields that are displayed in a number of views, include

- “Delays” on page A-4
- “Domains” on page A-6
- “Paging” on page A-7
- “Performance Groups” on page A-10
- “Dispatching Priorities” on page A-10
- “Service Time” on page A-11
- “Active Time” on page A-12
- “Connect Time” on page A-12
- “Disconnect Time” on page A-12
- “Pend Time” on page A-13
- “IOSQ Time” on page A-13
- “Service Units” on page A-13
- “Storage” on page A-14
- “Target Multiprogramming Level (MPL)” on page A-16
- “Workflow Measure” on page A-17
- “Swapping” on page A-17
- “System Resource Manager (SRM)” on page A-20
- “Workload Monitoring” on page A-21

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Delays

Many MAINVIEW for OS/390 views contain a field called **Reason**, which explains the main cause of a delay experienced by a job or workload.

Possible reasons for delays and their explanations are listed in Table A-1.

Table A-1 Reasons for Delays

Reason	Explanation
Wait for CPU	processor busy
DASD I/O	DASD I/O queued
TAPE I/O	tape I/O queued
DASD Mount	disk mount pending
TAPE Mount	tape mount pending
Reserve	device reserve
Enqueue	enqueue wait for logical resource
Swap Page In	swap page-in wait
Local Page In	local page-in wait
Common Page In	common page-in wait
PLPA Page In	PLPA page-in wait
VIO Page In	VIO page-in wait
Real Storage	frame allocation wait
Swap From Page DS	swap page-in wait from page data set
Staging	HSM staging

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Table A-2 explains some of the types of delays in more detail.

Table A-2 Types of Delays

Delay	Explanation
CPU	If a job has been excessively delayed, check to see whether • the processor has more work than it can accommodate **Recommended Action:** If your product provides access to the CPUINFO or CPUSTAT views, check the **Overall CPU Busy %** field on either view to see whether this is the case. • other jobs are running at a higher priority **Recommended Action:** Jobs receive processor attention based on their dispatching priority. To reassign a job's dispatching priority, make the appropriate adjustments to the SRM settings in **SYS1.PARMLIB(IEAIPS*xx*)**.
Device	Device delays can be attributed to • an I/O request queued because the device was busy with a previous request • shared DASD constraints, such as I/O requests delayed because the device was reserved by another system • small blocksize or multiple extents on highly active data sets • too many active data sets on a device • a single application monopolizing a device
Reserved Devices	When a device is shared between systems, jobs that require exclusive control of the device (such as the linkage editor) issue a RESERVE macro instruction. This instruction prevents jobs that are active on other systems from accessing the device. Until a RELEASE CCW instruction is issued, I/O requests from other systems receive a `device busy` response and are queued in that system's channel subsystem as pending requests. **Recommended Action:** To suppress hardware reserves, you can buy a software product that serializes the use of resources across multiple systems.
Storage	Storage delays may be attributed to • demand page-in delays involving PLPA, common, and local page data sets • VIO page-in delays • swap page-in delays involving swap and local page data sets • real storage frame shortage
System Resource	Delays are usually caused by contention for physical resources such as the processor, I/O devices, paging, and storage. A low value indicates that the address space is being efficiently served by system resources and that the resources are not experiencing much contention.

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Domains

A domain is a collection of performance groups that you define in the IEAIPS*xx* member of SYS1.PARMLIB. A performance group is a collection of address spaces that you defined in the IEAIPS*xx* member of SYS1.PARMLIB.

Each domain behaves according to the performance characteristics that you specify in SYS1.PARMLIB(IEAIPS*xx*). By specifying the appropriate parameters, you can control

- the multiprogramming level (MPL) for specific performance groups

  Using the CNSTR parameter, you can specify the minimum and maximum number of address spaces that can be active for the domain. The SRM selects a value between these maximum and minimum values to serve as the domain's target value.

  The SRM constantly adjusts and readjusts this value as various system performance characteristics change, and it swaps address spaces in and out to maintain that target.

- the level of service for performance groups

  Using the OBJ parameter, you can set the service objectives for a domain. A service objective is the number of service units an address space within that domain's performance groups can consume before being eligible for swap-out.

- each address space's swap recommendation value

  The SRM constantly adjusts an address space's swap recommendation value based on its service unit consumption (the lower the value, the more likely the address space is to be swapped out).

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Paging

This section contains information about fields that monitor paging activities.

Page-Ins

A page-in operation involves retrieving a page from auxiliary or expanded storage to central storage for execution. Page-ins always delay a task.

In general, paging in from expanded storage is preferred over auxiliary storage for these reasons:

- Expanded storage page faults are resolved at a speed of about 75 microseconds, while auxiliary storage page fault recoveries average 20 milliseconds.
- Activities between central and expended storage are synchronous; that is, a task remains active in central storage even while its data transfer is taking place.

Page-Outs

A page-out operation involves moving multiple 4K-frames from central storage to auxiliary or expanded storage in an effort to free central storage frames for use by other address spaces.

Pages that have been paged-out are likely to be paged-in again as the result of a page fault. A page fault occurs when a program tries to refer to a page that is no longer in central storage.

Page-outs occur for reasons shown in Table A-3 on page A-8.

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Table A-3 Page-Out Occurrences

Reason	Term	Description
A page in central storage is not referred to for a long time	Page Stealing	The SRM maintains an Unreferenced Interval Count (UIC) for every central storage frame. Each second, the SRM checks each frame to see whether it has been referred to. If not, the SRM increases the UIC count for that frame by one. When the SRM needs more storage, those frames with high UIC values are paged-out so that the empty frames can be filled with pages from more active address spaces.
An address space is swapped out	Swap Trimming	Before a swap-out occurs, the SRM pares down the address space to its working set (the minimum number of pages required for the address space to be active) and pages-out any non-essential pages to auxiliary storage.
Pages in expanded storage move through central storage to their final destination of auxiliary storage	Migration Page-Out	When pages in expanded storage remain there too long, they eventually must be moved to auxiliary storage. Transition between expanded and auxiliary storage is not direct; rather, the page is first brought into central storage from expanded storage, and then paged out from central storage to auxiliary storage.

VIO Page Operations

A virtual I/O (VIO) device is actually an area of central storage that simulates the operations of a physical direct access storage device. Because VIO is in central storage, its operations are much faster than standard I/O processing.

Eventually, virtual storage pages in central storage can be paged out to auxiliary storage just as non-VIO pages are; auxiliary storage reserves slots for both VIO pages and non-VIO pages.

The auxiliary storage manager (ASM) is responsible for assigning auxiliary storage slots to these VIO pages and for controlling the movement of pages between auxiliary and central storage.

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Demand Paging

Demand paging refers to page-ins caused by page faults. A page fault occurs when a page referred to by a program in central storage is unavailable.

Recommended Action: A high-demand page rate could indicate central storage constraint. To relieve the constraint, try adjusting the RCCPTRT parameter in the IEAOPT*xx* member of SYS1.PARMLIB. By choosing the appropriate setting, you can cause the systemwide multiprogramming level (MPL) to decrease the work in the system and thus ease the burden on central storage.

By default, the RCCPTRT parameter is set so that paging rate does not affect the MPL of your system.

Page Reclaim

When the SRM earmarks a page for page-out, the page is placed in a logical queue until the auxiliary storage manager (ASM) can process the request.

If the address space refers to this page while it is still in the queue, the page-out request is dropped and the address space reclaims the page to central storage.

CSA Page Faults

The CSA page fault rate can have a big impact on subsystems that use CSA as a data area, such as IMS and VTAM.

Because common areas such as CSA and LPA are shared by all address spaces, high page-fault rates in these areas can cause widespread, erratic response times.

Recommended Action: To minimize common area paging, try some storage isolation techniques by adjusting the CWSS and CPGRT parameters in SYS1.PARMLIB(IEAIPS*xx*).

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Performance Groups

Performance groups are used to assign specific service objectives and execution priority to a group of address spaces.

You can divide a performance group further into periods. Periods assign different service objectives and execution priorities to a transaction within a performance group, based on the transaction's resource consumption.

The performance group (PGN) parameter is specified in the IEAIPS*xx* member of SYS1.PARMLIB.

Dispatching Priorities

Address spaces compete with each other for processor time based upon the dispatching priorities of their performance group. Priorities range from 1 to 255 and are specified in SYS1.PARMLIB(IEAIPS*xx*).

In general, servers, started tasks, and performance monitors should have a higher priority than application workloads.

A swapped-out address space has a dispatching priority of 255. Because of this high priority, swapped-out address spaces usually receive processing time immediately upon being swapped back in.

Note: The ROTATE option is no longer in effect after MVS XA 2.1.7. Only FIXED, MTTW, and timeslice are valid in the DP (dispatching priority) parameter in the IEAIPS*xx* member of SYS1.PARMLIB.

Service Request Block (SRB)

When the supervisor wants to execute some high-priority system tasks in a particular address space, the supervisor creates an SRB to represent the request, and then associates the SRB with the address space.

When an address space is selected for execution, any outstanding local SRBs are executed first. The address space's own work, represented by TCBs, is postponed until all SRBs are complete.

If the value in this field is high, one or more system applications or system monitors are probably scheduling many SRBs to this address space.

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Task Control Block (TCB)

For each program within an address space, the supervisor creates a TCB. A TCB is a dispatchable unit that represents a task that the address space wants to execute. These tasks are processed based on the dispatching priority of the address, and of the task itself. Each address space usually has more than one TCB associated with it.

Examples of TCBs include

- Batch Initiator TCB
- TSO Terminal Monitor Program TCB

CPU Utilization

CPU utilization percentage is the sum of task control block (TCB) time and system request block (SRB) time, divided by the elapsed time, multiplied by the number of CPUs online.

Recommended Action: To offset an excessively high utilization value, increase the number of ready users waiting for service by altering the RCCCPUT CPU threshold in the IEAOPT*xx* member of SYS1.PARMLIB. (Make sure you have enough central storage first.)

This action causes the SRM to increase or decrease the systemwide multiprogramming level (MPL).

Service Time

Service time is the sum of IOS queue time, connect time, disconnect time, and pend time. The average service time for a typical 3390 device is between 20 and 25 milliseconds (ms).

The constituent values and their target goals are

IOS queue and pend time	0ms
Disconnect (seek) time	6ms
Disconnect time (rotational delay due to set sector)	8ms
Connect time	8ms

Recommended Action: If service time is inordinately high, investigate each area to see how closely these goals are being met.

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Active Time

Active time is the sum of *connect*, *disconnect*, and *pend* times.

Connect	Is the amount of time the device is connected to a channel path and is transferring data.
Disconnect	Is the amount of time the device is disconnected from a channel path and control unit. This means that the device is either performing positioning operations (such as seek or set sector) or is waiting to be reconnected after a set sector (rotational position sensing (RPS) delay).
Pend	Is the amount of time an I/O request is waiting on the LCU queue. A request remains queued until the request's first channel command word (CCW) is accepted by the device.

Connect Time

Connect time is the sum of data transfer, connect, search, and protocol and reconnect times.

Only one device can be connected to the channel path at a time. Therefore, when one device is connected often or for a long period of time, the devices that share that channel path are disconnected and are likely to have inordinately high service times as a result.

Recommended Action: To reduce a device's connect time, try optimizing data set block sizes and the size of the device's PDS directories.

Disconnect Time

Disconnect time includes

- time waiting to be reconnected after a set sector (this is rotational position sensing [RPS] delay)
- head movement (seek) time between cylinders
- latency (search) time

Recommended Action: Because only one device can be active on the path at a time, if the disconnect time for a device is excessive, another device in the device string might be monopolizing the channel path.

Another cause might be excessive head movement. Try optimizing the relative placement of the VTOC and the data sets on the device.

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Pend Time

In general, a device's pend time should be less than 10% of the total connect time plus disconnect time. For example, a typical 3380 with a disconnect time of 14ms and a connect time of 8ms should have a pend time of about 2ms (10% of 22ms).

Excessive pend time for a device can be caused by contention for the

- channel path from other devices
- device in a shared DASD environment

Recommended Action: To reduce excessive pend time, examine the Device Utilization Percentage value, the Control Unit Busy value (3090 or ES/9000), and the activity on other systems in a shared DASD configuration.

IOSQ Time

When an I/O request is received for a device that is already busy, the IOS queues the request until the device is able to accept the request's Start Subchannel (SSCH) instruction.

If the value in the **Average Queue Time** field is high, the device might not be equipped adequately to satisfy the heavy I/O demands placed on it.

Service Units

The following service units are referred to in several views:

- CPU
- SRB
- SRM

CPU Service Units

A CPU service unit represents task control block time. The CPU service unit is the CPU model-dependent factor multiplied by the CPU (TCB) service unit. The CPU model-dependent factor varies with processor type.

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SRB Service Units

An SRB service unit is the number of SRB CPU seconds multiplied by the CPU dependent factor.

SRM Service Units

SRM service units are the sum of

- CPU coefficient multiplied by CPU service units
- SRB coefficient multiplied by SRB service units
- IOC coefficient multiplied by IOC service units
- MSO coefficient multiplied by MSO service units

SYS1.PARMLIB(IEAIPS*xx*) contains the service definition coefficients (SDC). The default values are CPU=10.0, IOC=5.0, MSO=3.0, and SRB=10.0. You should not need to change these values.

On systems prior to MVS/SP 3.1.3, MSO should be set to 0.1. On later systems, MSO should be set to 0.01 or less.

Storage

Various aspects of storage are described in this section.

Expanded Storage

Expanded storage is a hardware feature on 3090 and ES/9000 processors and is used for paging, swapping, and hiperspaces.

Instructions and I/O are not performed in expanded storage as they are in central storage.

Page faults are resolved at a speed of about 75 microseconds (usec) in expanded storage, as opposed to the 20 milliseconds (ms) required by auxiliary storage.

Activities between central and expanded storage are synchronous. This means that a task remains active in central storage even while data is being transferred in from expanded storage.

Note: Only central storage can execute instructions or perform I/O operations. Pages (4K blocks) in expanded storage are retrieved to central storage for execution.

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Unreferenced Interval Count (UIC):

UIC, a measure of central storage contention, is the number of real seconds (0 to 255) since a page frame was last referred to by the associated address space.

The SRM maintains an unreferenced interval count (UIC) for every central storage frame. Each second, the SRM checks each frame to see whether it has been referred to. If not, the SRM increases the UIC count for that frame by one.

When the SRM needs more storage, those frames with high UIC values are paged-out to auxiliary or expanded storage so that the empty frames can be used by pages from more active address spaces.

The SRM adjusts the multiprogramming level (MPL) based on the system high and low UIC values. These values are displayed in the SYSINFO view.

Fixed Storage

Fixed storage refers to those frames in central storage that cannot be paged-out to auxiliary storage.

Some storage subpools are fixed by default. Programs requesting fixed storage can specify one of these subpools on the GETMAIN macro, or use PAGEFIX to explicitly fix a range of addresses.

Fixed storage is used by programs that cannot tolerate a page fault.

Link Pack Area (LPA)

The LPA contains reentrant modules (such as TSO commands) that can be used by multiple address spaces at the same time.

When CLPA (create LPA) is specified at IPL time, the LPA modules specified in SYS1.LPALIB are loaded into the LPA page data set in auxiliary storage.

Once an application requests the modules and they are paged in from auxiliary storage, they remain in central storage for use by all other applications.

Recommended Action: To keep virtual storage constraint to a minimum, review SYS1.LPALIB periodically and remove any obsolete or duplicate load modules.

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PLPA Page Data Set

The PLPA page data set is an area of DASD reserved for pages that are paged-out from the pageable link pack area (LPA).

Recommended Action: If this value is high, examine the performance of the device on which the PLPA page data set resides.

Common Page Data Set

The common page data set is an area of DASD reserved for pages that are paged in and out of the common storage area (CSA).

Recommended Action: If this value is high, examine the performance of the device on which the common page data set resides.

VIO Page Data Set

VIO page data sets are areas of DASD reserved for pages that are paged in from virtual I/O (VIO) devices.

Recommended Action: If this value is high, examine the performance of the device on which VIO-enabled local page data sets reside.

Target Multiprogramming Level (MPL)

For each domain, your system administrator specifies in the IEAIPS*xx* member of SYS1.PARMLIB the maximum and minimum number of address spaces that should be active within that domain at any one time. The System Resource Manager (SRM) selects a value between these maximum and minimum values to serve as the domain's target MPL value, then tries to meet this target by swapping address spaces in and out.

This target value is readjusted constantly, based on the amount of work in the system as a whole.

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Workflow Measure

The workflow measure indicates how efficiently the address space is being served by system resources.

High Value

A high workflow value indicates that the address space is obtaining access to resources on request, with little impact on performance due to contention from other address spaces.

Low Value

A low workflow value indicates that the address space is not obtaining the resources that it needs to execute.

Recommended Action: Display the JDELAY view to start investigating the cause of the problem.

Swapping

These topics reflect fields having to do with swapping address spaces:

- swap paging
- auxiliary storage shortage swap
- enqueue exchange swap
- exchange swap
- real storage shortage swap
- RTO delay
- request swap
- transition swap
- unilateral swap

Swap Paging

Swap paging includes

- *unilateral swaps* that occur when the SRM discovers a domain that has more address spaces than allowed by its MPL maximum value

- *exchange swaps* that occur when an address space loses its execution privilege to another address space in its domain that has a higher execution priority

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- *enqueue exchange swaps* that occur when an address space is swapped-in to free an enqueue resource

  Enqueue exchanges typically occur in an effort to maintain domain target MPL.

In addition, swap-outs can occur when

- waits are detected (terminal input/output, detected, long)
- auxiliary or central storage is low
- address space is swapped-out by a user or system

Auxiliary Storage Shortage Swap

When the number of auxiliary storage slots is low, the SRM swaps out the address space that is acquiring auxiliary storage the fastest. When an address space is swapped out under these circumstances, it is considered delayed due to an auxiliary storage shortage.

Enqueue Exchange Swap

An enqueue exchange swap is the process of swapping out an address space that is controlling an enqueued resource so that another address space can access the resource.

For example, suppose that address space A issues an ENQ request for a resource, and then gets swapped out. Address space B then requests the same resource but is unable to use it until address space A completes its transaction. The SRM swaps in address space A so that it can finish its task and free the resource. To make room for address space A, however, the SRM first swaps out address space C. In this example, address space C is considered delayed due to an enqueue exchange swap.

Exchange Swap

Exchange swaps are used by the SRM to balance resource consumption of address spaces within a single domain.

When an active address space exceeds its allocation of resources relative to other address spaces in its domain, the SRM performs an exchange swap. The active address space is swapped out and another address space is swapped in.

When an address space is swapped out under these circumstances, it is considered delayed due to an exchange swap.

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Real Storage Shortage Swap

When the number of pageable frames is low and the number of fixed frames very high, the SRM swaps out the address space that has acquired the greatest number of fixed frames.

When an address space is swapped out under these circumstances, it is considered delayed due to a real storage shortage.

RTO Delay

The RTO parameter, specified in the **IEAIPS*xx*** member of **SYS1.PARMLIB**, determines the response time of the average first period TSO transaction.

If a TSO transaction is receiving better response time than what was specified on the RTO parameter, the ARM actually delays the TSO transaction after the command or other input has been entered at the terminal.

When a TSO address space is delayed under these circumstances, it is considered delayed due to RTO.

Request Swap

Sometimes the system requests that SRM swap out an address space for various reasons. For example, when a VARY STOR,OFFLINE command is pending, address spaces holding pages in the affected central storage area first must be paged out.

Address spaces that are swapped out under these circumstances are considered delayed due to a request swap.

Transition Swap

When the status of an address space changes from swappable to non-swappable as a result of a TRANSWAP SYSEVENT, the SRM immediately swaps-out the address space.

When it is swapped back in, the address space's pages are loaded into non-reconfigurable storage, so that they do not interfere with VARY requests to move the storage offline and online.

Address spaces that are swapped out as the result of a TRANSWAP are considered delayed due to a transition swap.

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Unilateral Swap

Unilateral swaps are used by SRM to control the multiprogramming level (MPL) of a domain.

In **SYS1.PARMLIB(IEAIPS*xx*)**, you can specify the minimum and maximum number of address spaces that can be active for each domain. The SRM selects a value between these minimum and maximum values to serve as the domain's target MPL value. The SRM constantly adjusts and readjusts this value as various system performance characteristics change, and swaps address spaces in and out to maintain that target:

- If a domain's target MPL value is exceeded when there is a fair amount of work in the system, the SRM swaps out one or more address spaces to auxiliary storage based on the address spaces' swap recommendation values.

- When the number of active address spaces falls below the target MPL value, or when the amount of work in the system decreases sufficiently, the SRM swaps in the address space back to central storage.

- When an address space is swapped out because the domain's target MPL value is exceeded, the address space is considered delayed due to unilateral swap-out.

System Resource Manager (SRM)

The System Resource Manager (SRM) attempts to balance and distribute system resources among individual address spaces based on the objectives specified in the IEAIPS*xx* and IEAOPT*xx* members of SYS1.PARMLIB.

The SRM uses these objectives, in conjunction with various system status indicators, to determine which address spaces should be swapped out and when.

MAINVIEW monitors the delays caused by the following types of SRM swaps:

- auxiliary storage shortage swaps
- request swaps
- enqueue exchange swap
- transition swap
- real storage frame shortage swaps
- exchange swap
- unilateral swap
- Response Time Option (RTO)

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Workload Monitoring

CMF MONITOR and MAINVIEW monitor the following workload definitions in order to monitor resource consumption by workload:

ALLBAT	all batch jobs
ALLTSO	all TSO jobs
ALLSTC	all started tasks
ALLWKLDS	all address spaces
PGRP*nnnn*	performance groups, where *nnnn* is the number assigned in IEAIPS*xx*
SCLS workloads	service class workloads as defined to the Workload Manager (WLM)
WLM workloads	Workload Manager workloads as defined to WLM

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Glossary

This glossary defines BMC Software terminology. Other dictionaries and glossaries can be used in conjunction with this glossary.

Since this glossary pertains to BMC Software-related products, some of the terms defined might not appear in this book.

To help you find the information you need, this glossary uses the following cross-references:

Contrast with indicates a term that has a contrary or contradictory meaning.

See indicates an entry that is a synonym or contains expanded information.

See also indicates an entry that contains related information.

action
Defined operation, such as modifying a MAINVIEW window, that is performed in response to a command. *See* object.

active window
Any MAINVIEW window in which data can be refreshed. *See* alternate window, current window, window.

administrative view
Display from which a product's management tasks are performed, such as the DSLIST view for managing historical data sets. *See* view.

ALT WIN field
Input field that allows you to specify the window identifier for an alternate window where the results of a hyperlink are displayed. *See* alternate window.

Alternate Access
See MAINVIEW Alternate Access.

alternate form
View requested through the FORM command that changes the format of a previously displayed view to show related information. *See also* form, query.

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alternate window (1) Window that is specifically selected to display the results of a hyperlink. (2) Window whose identifier is defined to the ALT WIN field. *Contrast with* current window. *See* active window, window, ALT WIN field.

analyzer (1) Online display that presents a snapshot of status and activity data and indicates problem areas. (2) Component of CMF MONITOR. *See* CMF MONITOR Analyzer.

application (1) Program that performs a specific set of tasks within a MAINVIEW product. (2) In MAINVIEW VistaPoint, combination of workloads to enable display of their transaction performance data in a single view.

application trace *See* trace.

ASCH workload Workload comprising Advanced Program-to-Program Communication (APPC) address spaces.

AutoCustomization Online facility for customizing the installation of products. AutoCustomization provides an ISPF panel interface that both presents customization steps in sequence and provides current status information about the progress of the installation.

automatic screen update
Usage mode wherein the currently displayed screen is refreshed automatically with new data at an interval you specify. Invoked by the ASU command.

batch workload Workload consisting of address spaces running batch jobs.

BBI Basic architecture that distributes work between workstations and multiple OS/390 targets for BMC Software MAINVIEW products.

BBI-SS PAS *See* BBI subsystem product address space.

BBI subsystem product address space (BBI-SS PAS)
OS/390 subsystem address space that manages communication between local and remote systems and that contains one or more of the following products:

- MAINVIEW AutoOPERATOR
- MAINVIEW for CICS
- MAINVIEW for DB2
- MAINVIEW for DBCTL
- MAINVIEW for IMS Online
- MAINVIEW for MQSeries (formerly Command MQ for S/390)
- MAINVIEW SRM
- MAINVIEW VistaPoint (for CICS, DB2, DBCTl, and IMS workloads)

BBPARM *See* parameter library.

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BBPROC *See* procedure library.

BBPROF *See* profile library.

BBSAMP *See* sample library.

BBV *See* MAINVIEW Alternate Access.

BBXS BMC Software Subsystem Services. Common set of service routines loaded into common storage and used by several BMC Software MAINVIEW products.

border Visual indication of the boundaries of a window.

bottleneck analysis Process of determining which resources have insufficient capacity to provide acceptable service levels and that therefore can cause performance problems.

CA-Disk Data management system by Computer Associates that replaced the DMS product.

CAS Coordinating address space. One of the address spaces used by the MAINVIEW windows environment architecture. The CAS supplies common services and enables communication between linked systems. Each OS/390 or z/OS image requires a separate CAS. Cross-system communication is established through the CAS using VTAM and XCF communication links.

CFMON *See* coupling facility monitoring.

chart Display format for graphical data. *See also* graph.

CICSplex User-defined set of one or more CICS systems that are controlled and managed as a single functional entity.

CMF MONITOR Comprehensive Management Facility MONITOR. Product that measures and reports on all critical system resources, such as CPU, channel, and device usage; memory, paging, and swapping activity; and workload performance.

CMF MONITOR Analyzer
Batch component of CMF MONITOR that reads the SMF user and 70 series records created by the CMF MONITOR Extractor and/or the RMF Extractor and formats them into printed system performance reports.

CMF MONITOR Extractor
Component of CMF that collects performance statistics for CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for OS/390, and RMF postprocessor. *See* CMF MONITOR Analyzer, CMF MONITOR Online, MAINVIEW for OS/390.

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CMF MONITOR Online
Component of CMF that uses the MAINVIEW window interface to present data on all address spaces, their use of various system resources, and the delays that each address space incurs while waiting for access to these resources. *See* CMF MONITOR, MAINVIEW for OS/390.

CMF Type 79 API Application programming interface, provided by CMF, that provides access to MAINVIEW SMF-type 79 records.

CMFMON Component of CMF MONITOR that simplifies online retrieval of information about system hardware and application performance and creates MAINVIEW SMF-type 79 records.

The CMFMON *online facility* can be used to view data in one or more formatted screens.

The CMFMON *write facility* can be used to write collected data as MAINVIEW SMF-type 79 records to an SMF or sequential data set.

CMRDETL MAINVIEW for CICS data set that stores detail transaction records (type 6E) and abend records (type 6D). Detail records are logged for each successful transaction. Abend records are written when an abend occurs. Both records have the same format when stored on CMRDETL.

CMRSTATS MAINVIEW for CICS data set that stores both CICS operational statistic records, at five-minute intervals, and other records, at intervals defined by parameters specified during customization (using CMRSOPT).

column Vertical component of a view or display, typically containing fields of the same type of information, that varies by the objects associated in each row.

collection interval Length of time data is collected. *See also* delta mode, total mode.

command delimiter Special character, usually a **;** (semicolon), used to stack commands typed concurrently on the COMMAND line for sequential execution.

COMMAND line Line in the control area of the display screen where primary commands can be typed. *Contrast with* line command column.

Command MQ Automation D/S
Command MQ agents, which provide local proactive monitoring for both MQSeries and MSMQ (Microsoft message queue manager). The Command MQ agents operate at the local node level where they continue to perform functions regardless of the availability of the MQM (message queue manager) network. Functionality includes automatic monitoring and restarts of channels, queue managers, queues and command servers. In cases where automated recovery is not possible, the agents transport critical alert information to a central console.

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Command MQ Automation S/390

Command MQ component, which monitors the MQM (message queue manager) networks and intercedes to perform corrective actions when problems arise. Solutions include:

- Dead-Letter Queue management
- System Queue Archival
- Service Interval Performance solutions
- Channel Availability

These solutions help ensure immediate relief to some of the most pressing MQM operations and performance problems.

Command MQ for D/S

Command MQ for D/S utilizes a true client/server architecture and employs resident agents to provide configuration, administration, performance monitoring and operations management for the MQM (message queue manager) network.

Command MQ for S/390

See MAINVIEW for MQSeries.

COMMON STORAGE MONITOR

Component of MAINVIEW for OS/390 that monitors usage and reconfigures OS/390 or z/OS common storage blocks.

composite workload

Workload made up of a WLM workload or other workloads, which are called *constituent workloads.*

constituent workload

Member of a composite workload. Constituent workloads in a composite usually belong to a single workload class, but sometimes are mixed.

contention

Occurs when there are more requests for service than there are servers available.

context

In a Plex Manager view, field that contains the name of a target or group of targets specified with the CONTEXT command. *See* scope, service point, SSI context, target context.

CONTEXT command

Specifies either a MAINVIEW product and a specific target for that product (*see* target context) or a MAINVIEW product and a name representing one or more targets (*see* SSI context) for that product.

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control statement (1) Statement that interrupts a sequence of instructions and transfers control to another part of the program. (2) Statement that names samplers and other parameters that configure the MAINVIEW components to perform specified functions. (3) In CMF MONITOR, statement in a parameter library member used to identify a sampler in the extractor or a report in the analyzer, or to describe either component's processing requirements to the operating system.

coupling facility monitoring (CFMON)
Coupling facility views that monitor the activity of your system's coupling facilities.

current data Data that reflects the system in its current state. The two types of current data are real-time data and interval data. *Contrast with* historical data. *See also* interval data, real-time data.

current window In the MAINVIEW window environment, window where the main dialog with the application takes place. The current window is used as the default window destination for commands issued on the COMMAND line when no window number is specified. *Contrast with* alternate window. *See* active window, window.

DASD (Direct Access Storage Device) (1) A device with rotating recording surfaces that provides immediate access to stored data. (2) Any device that responds to a DASD program.

DASD ADVISOR An interactive software tool that diagnoses DASD performance problems and makes recommendations to reduce overall service time. This tool measures and reports on the operational performance of IBM and IBM-compatible devices.

data collector Program that belongs to a MAINVIEW product and that collects data from various sources and stores the data in records used by views. For example, MAINVIEW for OS/390 data collectors obtain data from OS/390 or z/OS services, OS/390 or z/OS control blocks, CMF MONITOR Extractor control blocks, and other sources. *Contrast with* extractor.

delta mode (1) In MAINVIEW for DB2 analyzer displays, difference between the value sampled at the start of the current statistics interval and the value sampled by the current analyzer request. *See also* statistics interval. (2) In CMFMON, usage mode wherein certain columns of data reflect the difference in values between one sample cycle and the next. Invoked by the DELta ON command. *See also* collection interval, sample cycle, total mode.

DFSMS (Data Facility Storage Management System) Data management, backup, and HSM software from IBM for OS/390 or z/OS mainframes.

DMR *See* MAINVIEW for DB2.

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DMS (Data Management System) *See* CA-Disk.

DMS2HSM *See* MAINVIEW SRM DMS2HSM.

DSO (Data Set Optimizer) CMF MONITOR Extractor component that uses CMF MONITOR Extractor data to produce reports specifying the optimal ordering of data sets on moveable head devices.

EasyHSM *See* MAINVIEW SRM EasyHSM.

EasyPOOL *See* MAINVIEW SRM EasyPOOL.

EasySMS *See* MAINVIEW SRM EasySMS.

element (1) Data component of a data collector record, shown in a view as a field. (2) Internal value of a field in a view, used in product functions.

element help Online help for a field in a view. The preferred term is *field help.*

Enterprise Storage Automation
See MAINVIEW SRM Enterprise Storage Automation.

event A message issued by Enterprise Storage Automation. User-defined storage occurrences generate events in the form of messages. These events provide an early warning system for storage problems and are routed to user-specified destinations for central viewing and management.

Event Collector Component for MAINVIEW for IMS Online, MAINVIEW for IMS Offline, and MAINVIEW for DBCTL that collects data about events in the IMS environment. This data is required for Workload Monitor and optional for Workload Analyzer (except for the workload trace service). This data also is recorded as transaction records (X‘FA’) and program records (X‘F9’) on the IMS system log for later use by the MAINVIEW for IMS Offline components: Performance Reporter and Transaction Accountant.

expand Predefined link from one display to a related display. *See also* hyperlink.

extractor Program that collects data from various sources and keeps the data control blocks to be written as records. Extractors obtain data from services, control blocks, and other sources. *Contrast with* data collector.

extractor interval *See* collection interval.

fast path Predefined link between one screen and another. To use the fast path, place the cursor on a single value in a field and press **Enter**. The resulting screen displays more detailed information about the selected value. *See also* hyperlink.

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field Group of character positions within a screen or report used to type or display specific information.

field help Online help describing the purpose or contents of a field on a screen. To display field help, place the cursor anywhere in a field and press **PF1** (HELP). In some products, field help is accessible from the screen help that is displayed when you press **PF1**.

filter Selection criteria used to limit the number of rows displayed in a view. Data that does not meet the selection criteria is not displayed. A filter is composed of an element, an operator, and an operand (a number or character string). Filters can be implemented in view customization, through the PARm/QPARm commands, or through the Where/QWhere commands. Filters are established against elements of data.

fire The term used to indicate that an event has triggered an action. In MAINVIEW AutoOPERATOR, when a rule selection criteria matches an incoming event and *fires*, the user-specified automation actions are performed. This process is also called *handling* the event.

fixed field Field that remains stationary at the left margin of a screen that is scrolled either right or left.

FOCAL POINT MAINVIEW product that displays a summary of key performance indicators across systems, sites, and applications from a single terminal.

form One of two constituent parts of a view; the other is query. A form defines how the data is presented; a query identifies the data required for the view. *See also* query, view.

full-screen mode Display of a MAINVIEW product application or service on the entire screen. There is no window information line. *Contrast with* windows mode.

global command Any MAINVIEW window interface command that can affect all windows in the window area of a MAINVIEW display.

graph Graphical display of data that you select from a MAINVIEW window environment view. *See also* chart.

hilevel For MAINVIEW products, high-level data set qualifier required by a site's naming conventions.

historical data (1) Data that reflects the system as it existed at the end of a past recording interval or the duration of several intervals. (2) Any data stored in the historical database and retrieved using the TIME command. *Contrast with* current data, interval data and real-time data.

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historical database Collection of performance data written at the end of each installation-defined recording interval and containing up to 100 VSAM clusters. Data is extracted from the historical database with the TIME command. *See* historical data.

historical data set In MAINVIEW products that display historical data, VSAM cluster file in which data is recorded at regular intervals.

HSM (Hierarchical Storage Management) Automatic movement of files from hard disk to slower, less-expensive storage media. The typical hierarchy is from magnetic disk to optical disk to tape.

hyperlink (1) Preset field in a view or an EXPAND line on a display that permits you to

- access cursor-sensitive help
- issue commands
- link to another view or display

The transfer can be either within a single product or to a related display/view in a different BMC Software product. Generally, hyperlinked fields are highlighted. (2) Cursor-activated short path from a topic or term in online help to related information. *See also* fast path.

Image log Collection of screen-display records. Image logs can be created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Image log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Image log stops when both data sets are filled and the first data set is not processed by the archive program.

The TS Image log is a single data set that wraps around when full.

IMSPlex System Manager (IPSM)
MVIMS Online and MVDBC service that provides Single System Image views of resources and bottlenecks for applications across one or more IMS regions and systems.

interval data Cumulative data collected during a collection interval. Intervals usually last from 15 to 30 minutes depending on how the recording interval is specified during product customization. *Contrast with* historical data.

Note: If change is made to the workloads, a new interval will be started.

See also current data and real-time data.

InTune Product for improving application program performance. It monitors the program and provides information used to reduce bottlenecks and delays.

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IRUF IMS Resource Utilization File (IRUF). IRUFs can be either detail (one event, one record) or summarized (more than one event, one record). A detail IRUF is created by processing the IMS system log through a program called IMFLEDIT. A summarized IRUF is created by processing one or more detail IRUFs, one or more summarized IRUFs, or a combination of both, through a sort program and the TASCOSTR program.

job activity view Report about address space consumption of resources. *See* view.

journal Special-purpose data set that stores the chronological records of operator and system actions.

Journal log Collection of messages. Journal logs are created for both the BBI-SS PAS and the BBI terminal session (TS).

The BBI-SS PAS Journal log consists of two data sets that are used alternately: as one fills up, the other is used. Logging to the BBI-SS PAS Journal log stops when both data sets are filled and the first data set is not being processed by the archive program.

The TS Journal log is a single data set that wraps around when full.

line command Command that you type in the line command column in a view or display. Line commands initiate actions that apply to the data displayed in that particular row.

line command column
Command input column on the left side of a view or display. *Contrast with* COMMAND line.

Log Edit In the MAINVIEW for IMS Offline program named IMFLEDIT, function that extracts transaction (X‘FA’) and program (X‘F9’) records from the IMS system log. IMFLEDIT also extracts certain records that were recorded on the system log by IMS. IMFLEDIT then formats the records into a file called the IMS Resource Utilization File (IRUF).

MAINVIEW BMC Software integrated systems management architecture.

MAINVIEW Alarm Manager (MV ALARM)
In conjunction with other MAINVIEW products, notifies you when an exception occurs. MAINVIEW Alarm Manager is capable of monitoring multiple systems simultaneously, which means that MAINVIEW Alarm Manager installed on one system keeps track of your entire sysplex. You can then display a single view that shows exceptions for all MAINVIEW performance monitors within your OS/390 or z/OS enterprise.

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MAINVIEW Alternate Access
Enables MAINVIEW products to be used without TSO by providing access through EXCP and VTAM interfaces.

MAINVIEW Application Program Interface (MVAPI)
A CLIST- or REXX-based, callable interface that allows MAINVIEW AutoOPERATOR EXECs to access MAINVIEW monitor product view data.

MAINVIEW AutoOPERATOR
Product that uses tools, techniques, and facilities to automate routine operator tasks and provide online performance monitoring, and that achieves high availability through error minimization, improved productivity, and problem prediction and prevention.

MAINVIEW control area
In the MAINVIEW window environment, first three lines at the top of the view containing the window information line and the COMMAND, SCROLL, CURR WIN, and ALT WIN lines. The control area cannot be customized and is part of the information display. *Contrast with* MAINVIEW display area, MAINVIEW window area.

MAINVIEW Desktop Version of the MAINVIEW window interface designed to run on OS/2 and Windows workstations.

MAINVIEW display area
See MAINVIEW window area.

MAINVIEW Explorer Product that provides access to MAINVIEW products from a Web browser running under Windows. MAINVIEW Explorer replaces MAINVIEW Desktop.

MAINVIEW for CICS Product (formerly MV MANAGER for CICS) that provides real-time application performance analysis and monitoring for CICS system management.

MAINVIEW for DB2 Product (formerly MV MANAGER for DB2) that provides real-time and historical application performance analysis and monitoring for DB2 subsystem management.

MAINVIEW for DBCTL (MVDBC)
Product that provides real-time application performance analysis and monitoring for DBCTL management.

MAINVIEW for IMS (MVIMS) Offline
Product with a Performance Reporter component that organizes data and prints reports used to analyze IMS performance and a Transaction Accountant component that produces cost accounting and user charge-back records and reports.

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MAINVIEW for IMS (MVIMS) Online
Product that provides real-time application performance analysis and monitoring for IMS management.

MAINVIEW for IP Product that monitors OS/390 and z/OS mission-critical application performance as it relates to TCP/IP stack usage. Collected data includes availability, connections, response times, routers, service levels, storage, traffic, Web cache, and so on.

MAINVIEW for Linux–Servers
Product that allows you to monitor the performance of your Linux systems from the MAINVIEW windows interface.

MAINVIEW for MQSeries (formerly known as Command MQ for S/390)
Delivers comprehensive capabilities for configuration, administration, performance monitoring and operations management for an entire MQM (message queue manager) network.

MAINVIEW for OS/390
System management application (formerly known as MAINVIEW for MVS prior to version 2.5). Built upon the MAINVIEW window environment architecture, it uses the window interface to provide access to system performance data and other functions necessary in the overall management of an enterprise.

MAINVIEW for UNIX System Services
System management application that allows you to monitor the performance of the Unix System Services from a MAINVIEW window interface.

MAINVIEW for VTAM
Product that displays application performance data by application, transaction ID, and LU name. This collected data includes connections, response time statistics, application availability, and application throughput.

MAINVIEW for WebSphere Application Server (formerly known as MAINVIEW for WebSphere)
Product that provides extensive monitoring for the IBM WebSphere Application Server for z/OS and OS/390 environment.

MAINVIEW Selection Menu
ISPF selection panel that provides access to all MAINVIEW windows-mode and full-screen mode products.

MAINVIEW SRM *See* MAINVIEW Storage Resource Manager (SRM).

MAINVIEW SRM DMS2HSM
Product that facilitates the conversion of CA-Disk, formerly known as DMS, to HSM.

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MAINVIEW SRM EasyHSM

Product that provides online monitoring and reporting to help storage managers use DFHSM efficiently.

MAINVIEW SRM EasyPOOL

Product that provides control over data set allocation and enforcement of allocation and naming standards. EasyPOOL functions operate at the operating system level to intercept normal job processing, thus providing services without any JCL changes.

MAINVIEW SRM EasySMS

Product that provides tools that aid in the conversion to DFSMS and provides enhancement to the DFSMS environment after implementation. EasySMS consists of the EasyACS functions, the SMSACSTE function, and the Monitoring and Positioning Facility.

MAINVIEW SRM Enterprise Storage Automation

Product that delivers powerful event generation and storage automation technology across the storage enterprise. Used in conjunction with MAINVIEW AutoOPERATOR, automated solutions to perform pool, volume, application, or data set-level manipulation can be created and used in response to any condition or invoked to perform ad hoc requests.

MAINVIEW SRM SG-Auto

Product that provides early warning notification of storage anomalies and automated responses to those anomalies based on conditions in the storage subsystem.

MAINVIEW SRM SG-Control

Product that provides real-time monitoring, budgeting, and control of DASD space utilization.

MAINVIEW SRM StopX37/II

Product that provides enhancements to OS/390 or z/OS space management, reducing the incidence of space-related processing problems. The StopX37/II functions operate at the system level to intercept abend conditions or standards violations, thus providing services without any JCL changes.

MAINVIEW SRM StorageGUARD

Product that monitors and reports on DASD consumption and provides historical views to help control current and future DASD usage.

MAINVIEW Storage Resource Manager (SRM)

Suite of products that assist in all phases of OS/390 or z/OS storage management. MAINVIEW SRM consists of products that perform automation, reporting, trend analysis, and error correction for storage management.

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MAINVIEW SYSPROG Services
See SYSPROG services.

MAINVIEW VistaPoint
Product that provides enterprise-wide views of performance. Application and workload views are available for CICS, DB2, DBCTL, IMS, OS/390, or z/OS. Data is summarized at the level of detail needed; for example, views can be for a single target, an OS/390 or z/OS image, or an entire enterprise.

MAINVIEW window area
Portion of the information display that is not the control area and in which views are displayed and windows opened. It includes all but the first three lines of the information display. *Contrast with* MAINVIEW control area.

monitor
Online service that measures resources or workloads at user-defined intervals and issues warnings when user-defined thresholds are exceeded.

Multi-Level Automation (MLA)
The user-defined, multiple step process in Enterprise Storage Automation that implements solutions in a tiered approach, where solutions are invoked one after another until the condition is resolved.

MVALARM
See MAINVIEW Alarm Manager.

MVAPI
See MAINVIEW Application Program Interface.

MVCICS
See MAINVIEW for CICS.

MVDB2
See MAINVIEW for DB2.

MVDBC
See MAINVIEW for DBCTL.

MVIMS
See MAINVIEW for IMS.

MVIP
See MAINVIEW for IP.

MVLNX
See MAINVIEW for Linux–Servers.

MVMQ
See MAINVIEW for MQSeries.

MVMVS
See MAINVIEW for OS/390.

MVScope
MAINVIEW for OS/390 application that traces both CPU usage down to the CSECT level and I/O usage down to the channel program level.

MVSRM
See MAINVIEW Storage Resource Manager (SRM).

MVSRMHSM
See MAINVIEW SRM EasyHSM.

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MVSRMSGC *See* MAINVIEW SRM SG-Control.

MVSRMSGD *See* MAINVIEW SRM StorageGUARD.

MVSRMSGP *See* MAINVIEW SRM StorageGUARD.

MVUSS *See* MAINVIEW for UNIX System Services.

MVVP *See* MAINVIEW VistaPoint.

MVVTAM *See* MAINVIEW for VTAM.

MVWEB *See* MAINVIEW for WebSphere Application Server.

nested help Multiple layers of help pop-up windows. Each successive layer is accessed by clicking a hyperlink from the previous layer.

object Anything you can manipulate as a single unit. MAINVIEW objects can be any of the following: product, secondary window, view, row, column, or field.

You can issue an action against an object by issuing a line command in the line command column to the left of the object. *See* action.

OMVS workload Workload consisting of OS/390 OpenEdition address spaces.

online help Help information that is accessible online.

OS/390 and z/OS Installer
BMC Software common installation system for mainframe products.

OS/390 product address space (PAS)
Address space containing OS/390 or z/OS data collectors, including the CMF MONITOR Extractor. Used by MAINVIEW for OS/390, MAINVIEW for UNIX System Services, and CMF MONITOR products. *See* PAS.

parameter library Data set consisting of members that contain parameters for specific MAINVIEW products or a support component There can be several versions:

- the distributed parameter library, called BBPARM
- a site-specific parameter library or libraries

These can be

- a library created by AutoCustomization, called UBBPARM
- a library created manually, with a unique name

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PAS
Product address space. Used by the MAINVIEW products. Contains data collectors and other product functions. *See also* OS/390 product address space (PAS) *and* BBI subsystem product address space (BBI-SS PAS).

performance group workload
Collection of address spaces defined to OS/390 or z/OS. If you are running OS/390 or z/OS with WLM in compatibility mode, MAINVIEW for OS/390 creates a performance group workload instead of a service class.

PERFORMANCE MANAGER
MAINVIEW for CICS online service for monitoring and managing current performance of CICS regions.

Performance Reporter (MVIMS)
MVIMS Offline component that organizes data and prints reports that can be used to analyze IMS performance.

Performance Reporter
Product component that generates offline batch reports. The following products can generate these reports:

- MAINVIEW for DB2
- MAINVIEW for CICS

Plex Manager
Product through which cross-system communication, MAINVIEW security, and an SSI context are established and controlled. Plex Manager is shipped with MAINVIEW window environment products as part of the coordinating address space (CAS) and is accessible as a menu option from the MAINVIEW Selection Menu.

pop-up display
Full-screen panel that displays additional information about a selected event in a detail trace.

pop-up window
Window containing help information that, when active, overlays part of the window area. A pop-up window is displayed when you issue the HELP command while working in windows-mode.

PRGP workload
In MVS/SP 5.0 or earlier, or in compatibility mode in MVS/SP 5.1 or later, composite of service classes. MAINVIEW for OS/390 creates a performance group workload for each performance group defined in the current IEAIPS*xx* member.

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procedure library Data set consisting of members that contain executable procedures used by MAINVIEW AutoOPERATOR. These procedures are execute command lists (EXECs) that automate site functions. There can be several versions:

- the distributed parameter library, called BBPROC
- a site-specific parameter library or libraries

These can be

- a library created by AutoCustomization, called UBBPROC
- a library created manually, with a unique name

The site-created EXECs can be either user-written or customized MAINVIEW AutoOPERATOR-supplied EXECs from BBPROC.

product address space
See PAS.

profile library Data set consisting of members that contain profile information and cycle refresh definitions for a terminal session connected to a BBI-SS PAS. Other members are dynamically created by MAINVIEW applications. There can be several versions:

- the distributed profile library, called BBPROF
- a site-specific profile library or libraries

These can be

- a library created by AutoCustomization, called SBBPROF
- a library created manually, with a unique name

The site library is a common profile shared by all site users. The terminal session CLIST creates a user profile automatically if one does not exist; it is called userid.BBPROF, where userid is your logon ID. User profile libraries allow each user to specify unique PF keys, CYCLE commands, target system defaults, a Primary Option Menu, and a unique set of application profiles.

query One of two constituent parts of a view; the other is form. A query defines the data for a view; a form defines the display format. *See also* form, view.

real-time data Performance data as it exists at the moment of inquiry. Real-time data is recorded during the smallest unit of time for data collection. *Contrast with* historical data. *See also* current data and interval data.

Resource Analyzer Online real-time displays used to analyze IMS resources and determine which are affected by specific workload problems.

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Resource Monitor Online data collection services used to monitor IMS resources and issue warnings when defined utilization thresholds are exceeded.

row (1) Horizontal component of a view or display comprising all the fields pertaining to a single device, address space, user, and so on. (2) Horizontal component of a DB2 table consisting of a sequence of values, one for each column of the table.

RxD2 Product that provides access to DB2 from REXX. It provides tools to query the DB2 catalog, issue dynamic SQL, test DB2 applications, analyze EXPLAIN data, generate DDL or DB2 utility JCL, edit DB2 table spaces, perform security administration, and much more.

sample cycle Time between data samples.

For the CMF MONITOR Extractor, this is the time specified in the extractor control statements (usually 1 to 5 seconds).

For real-time data, the cycle is not fixed. Data is sampled each time you press **Enter**.

sample library Data set consisting of members each of which contains one of the following items:

- sample JCL that can be edited to perform specific functions
- macro that is referenced in the assembly of user-written services
- sample user exit routine

There can be several versions:

- the distributed sample library, called BBSAMP
- a site-specific sample library or libraries

These can be

- a library created by AutoCustomization, called UBBSAMP
- a library created manually, with a unique name

sampler Program that monitors a specific aspect of system performance. Includes utilization thresholds used by the Exception Monitor. The CMF MONITOR Extractor contains samplers.

SBBPROF *See* profile library.

scope Subset of an SSI context. The scope could be all the data for the context or a subset of data within the context. It is user- or site-defined. *See* SSI context, target.

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screen definition Configuration of one or more views that have been stored with the SAVEScr command and assigned a unique name. A screen includes the layout of the windows and the view, context, system, and product active in each window.

selection view In MAINVIEW products, view displaying a list of available views.

service class workload
Collection of address spaces defined to OS/390 or z/OS. If you are running Workload Manager (WLM) in goal mode, MAINVIEW for OS/390 creates a service class workload for each service class that you define through WLM definition dialogs.

If you are running MVS 4.3 or earlier, or MVS/SP 5.1 or later with WLM in compatibility mode, OS/390 creates a performance group workload instead of a service class. *See* performance group workload.

service objective Workload performance goal, specified in terms of response time for TSO workloads or turnaround time for batch workloads. Performance group workloads can be measured by either objective. Composite workload service objectives consist of user-defined weighting factors assigned to each constituent workload. For compatibility mode, neither OS/390 nor z/OS provides any way to measure service.

service point Specification, to MAINVIEW, of the services required to enable a specific product. Services can be actions, selectors, or views. Each target (for example, CICS, DB2, or IMS) has its own service point.

The PLEX view lists all the defined service points known to the CAS to which the terminal session is connected.

service request block (SRB)
Control block that represents a routine to be dispatched. SRB mode routines generally perform work for the operating system at a high priority. An SRB is similar to a task control block (TCB) in that it identifies a unit of work to the system. *See also* task control block.

service select code Code entered to invoke analyzers, monitors, and general services. This code is also the name of the individual service.

session Total period of time an address space has been active. A session begins when monitoring can be performed. If the product address space (PAS) starts after the job, the session starts with the PAS.

SG-Auto *See* MAINVIEW SRM SG-Auto.

SG-Control *See* MAINVIEW SRM SG-Control.

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single system image (SSI)
Feature of the MAINVIEW window environment architecture where you can view and perform actions on multiple OS/390 or z/OS systems as though they were a single system. The rows of a single tabular view can contain rows from different OS/390 or z/OS images.

Skeleton Tailoring Facility
A facility in MAINVIEW AutoOPERATOR that allows skeleton JCL to be used during job submission. Skeleton JCL can contain variables within the JCL statements to be substituted with data values at job submission time. Directive statements can be used in the skeleton JCL to cause the repetition of a set of skeleton statements. This facility functions similar to the TSO skeleton tailoring facility**.**

SRB *See* service request block.

SSI *See* single system image.

SSI context Name created to represent one or more targets for a given product. *See* context, target.

started task workload
Address spaces running jobs that were initiated programmatically.

statistics interval For MAINVIEW for DB2, cumulative count within a predefined interval (30-minute default set by the DB2STATS parameter in the distributed BBPARM member BBIISP00) for an analyzer service DELTA or RATE display. Specifying the DELTA parameter displays the current value as the difference between the value sampled by the current analyzer request and the value sampled at the start of the current interval. Specifying the RATE parameter displays the current value by minute (DELTA divided by the number of elapsed minutes).

stem variables A REXX facility, supported in MAINVIEW AutoOPERATOR REXX EXECs and the Skeleton Tailoring Facility, where variable names end with a period followed by a number, such as &POOL.1. This configuration allows each variable to actually represent a table or array of data, with the zero variable containing the number of entries in the array. For example, &POOL.0 = 5 would indicate variables &POOL.1 through &POOL.5 exist.

StopX37/II *See* MAINVIEW SRM StopX37/II.

StorageGUARD *See* MAINVIEW SRM StorageGUARD.

summary view View created from a tabular view using the Summarize option in view customization. A summary view compresses several rows of data into a single row based on the summarize criteria.

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SYSPROG services Component of MAINVIEW for OS/390. Over 100 services that detect, diagnose, and correct OS/390 or z/OS system problems as they occur. Accessible from the OS/390 Performance and Control Main Menu. Note that this component is also available as a stand-alone product MAINVIEW SYSPROG Services.

system resource *See* object.

target Entity monitored by one or more MAINVIEW products, such as an OS/390 or z/OS image, an IMS or DB2 subsystem, a CICS region, or related workloads across systems. *See* context, scope, SSI context.

target context Single target/product combination. *See* context.

TASCOSTR MAINVIEW for IMS Offline program that summarizes detail and summary IMS Resource Utilization Files (IRUFs) to be used as input to the offline components.

task control block (TCB)
Address space-specific control block that represents a unit of work that is dispatched in the address space in which it was created. *See also* service request block.

TCB *See* task control block.

terminal session (TS)
Single point of control for MAINVIEW products, allowing data manipulation and data display and providing other terminal user services for MAINVIEW products. The terminal session runs in a user address space (either a TSO address space or a stand-alone address space for EXCP/VTAM access).

TDIR *See* trace log directory.

threshold Specified value used to determine whether the data in a field meets specific criteria.

TLDS *See* trace log data set.

total mode Usage mode in CMFMON wherein certain columns of data reflect the cumulative value between collection intervals. Invoked by the DELta OFF command. *See also* collection interval, delta mode.

trace (1) Record of a series of events chronologically listed as they occur. (2) Online data collection and display services that track transaction activity through DB2, IMS, or CICS.

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trace log data set (TLDS)
Single or multiple external VSAM data sets containing summary or detail trace data for later viewing or printing. The trace log(s) can be defined as needed or dynamically allocated by the BBI-SS PAS. Each trace request is assigned its own trace log data set(s).

trace log directory (TDIR)
VSAM linear data set containing one entry for each trace log data set. Each entry indicates the date and time of data set creation, the current status of the data set, the trace target, and other related information.

transaction Specific set of input data that initiates a predefined process or job.

Transaction Accountant
MVIMS Offline component that produces cost accounting and user charge-back records and reports.

TS *See* terminal session.

TSO workload Workload that consists of address spaces running TSO sessions.

UAS *See* user address space.

UBBPARM *See* parameter library.

UBBPROC *See* procedure library.

UBBSAMP *See* sample library.

user address space
Runs a MAINVIEW terminal session (TS) in TSO, VTAM, or EXCP mode.

User BBPROF *See* profile library.

view Formatted data within a MAINVIEW window, acquired from a product as a result of a view command or action. A view consists of two parts: query and form. *See also* form, job activity view, query.

view definition Meaning of data that appears online, including source of data, selection criteria for data field inclusion and placement, data format, summarization, context, product, view name, hyperlink fields, and threshold conditions.

view command Name of a view that you type on the COMMAND line to display that view.

view command stack
Internal stack of up to 10 queries. For each command, the stack contains the filter parameters, sort order, context, product, and time frame that accompany the view.

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view help Online help describing the purpose of a view. To display view help, place the cursor on the view name on the window information line and press **PF1** (HELP).

window Area of the MAINVIEW screen in which views and resources are presented. A window has visible boundaries and can be smaller than or equal in size to the MAINVIEW window area. *See* active window, alternate window, current window, MAINVIEW window area.

window information line Top border of a window. Shows the window identifier, the name of the view displayed in the window, the system, the scope, the product reflected by the window, and the tomfooleries for which the data in the window is relevant. *See also* window status field.

window number Sequential number assigned by MAINVIEW to each window when it is opened. The window number is the second character in the window status field. *See also* window status field.

window status One-character letter in the window status field that indicates when a window is ready to receive commands, is busy processing commands, is not to be updated, or contains no data. It also indicates when an error has occurred in a window. The window status is the first character in the window status field. *See also* window information line, window status field.

window status field Field on the window information line that shows the current status and assigned number of the window. *See also* window number, window status.

windows mode Display of one or more MAINVIEW product views on a screen that can be divided into a maximum of 20 windows. A window information line defines the top border of each window. *Contrast with* full-screen mode.

WLM workload In goal mode in MVS/SP 5.1 and later, a composite of service classes. MAINVIEW for OS/390 creates a workload for each WLM workload defined in the active service policy.

workflow Measure of system activity that indicates how efficiently system resources are serving the jobs in a workload.

workload (1) Systematic grouping of units of work (for example, address spaces, CICS transactions, IMS transactions) according to classification criteria established by a system administrator. (2) In OS/390 or z/OS, a group of service classes within a service definition.

workload activity view Tracks workload activity as the workload accesses system resources. A workload activity view measures workload activity in terms of resource consumption and how well the workload activity meets its service objectives.

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Workload Analyzer Online data collection and display services used to analyze IMS workloads and determine problem causes.

workload definition Workload created through the WKLIST view. Contains a unique name, a description, an initial status, a current status, and selection criteria by which address spaces are selected for inclusion in the workload. *See* Workload Definition Facility.

Workload Definition Facility
In MAINVIEW for OS/390, WKLIST view and its associated dialogs through which workloads are defined and service objectives set.

workload delay view
Tracks workload performance as the workload accesses system resources. A workload delay view measures any delay a workload experiences as it contends for those resources.

Workload Monitor Online data collection services used to monitor IMS workloads and issue warnings when defined thresholds are exceeded.

workload objectives
Performance goals for a workload, defined in WKLIST. Objectives can include measures of performance such as response times and batch turnaround times.

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