

# **MAINVIEW for Linux<sup>®</sup> – Servers User Guide**

**Version 1.3**

**November 21, 2003**



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- order or download product documentation
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- find worldwide BMC Software support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

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



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# About This Book

MAINVIEW<sup>®</sup> for Linux – Servers monitors and manages Linux systems.

## How This Book Is Organized

This book is organized as follows:

Chapter	Description
Chapter 1, "Introduction"	introduces the features and functions of MAINVIEW for Linux – Servers This chapter also provides information on the MAINVIEW window interface and product navigation.
Chapter 2, "Navigating in MAINVIEW for Linux – Servers"	explains how to access MAINVIEW for Linux – Servers, MAINVIEW Explorer and the MAINVIEW for Linux – Servers Easy Menu and Sub-menus
Chapter 3, "Using Views"	explains MAINVIEW for Linux – Servers views that are displayed on the MAINVIEW console
Chapter 5, "Displaying Historical Data"	explains historical data sets
Chapter 4, "Using Rules and Images"	explains monitor rules and images and how to use them
Chapter 6, "MAINVIEW Alarm Manager"	describes the sample alarms that are shipped with MAINVIEW for Linux – Servers
Appendix A, "BMC Software's VM Monitor Reader Messages"	describes the messages that are provided with BMC Software's Monitor ReaderS

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## 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 Linux – Servers generates are available in a z/OS data set that is downloaded during installation. For each message, the data set includes an explanation and suggests a user response. *Using MAINVIEW* describes how to get help for messages. However, BMC Software’s Monitor Reader messages are described in Appendix A, “BMC Software’s VM Monitor Reader Messages” of this book.

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

Category	Document	Description
installation documents	<i>OS/390 and z/OS Installer Guide and MAINVIEW Installation Requirements Guide</i> (formerly the <i>Product Installation and Maintenance Guide</i> )	provides information about product distribution, installation methods, installation requirements, creating product libraries with CPO or SMP, applying SMP maintenance, tape formats, FMIDs, and SYSMODs
core documents	<i>Using MAINVIEW</i>	provides information about working with MAINVIEW products in windows mode and full-screen mode
	<i>MAINVIEW Administration Guide</i>	provides information about MAINVIEW operations, targets, single-system image contexts, MAINVIEW Alarm Manager, data sets, view customization, and diagnostic facilities
	<i>MAINVIEW Alarm Manager User Guide</i>	explains how to create and install alarm definitions that indicate when exceptions occur
	<i>MAINVIEW Common Customization Guide</i>	provides instructions for customizing the MAINVIEW environment for your products
	<i>MAINVIEW for Linux – Servers Customization Guide</i>	provides instructions for customizing MAINVIEW for Linux – Servers
	<i>MAINVIEW Quick Reference</i>	introduces the MAINVIEW family of products and lists the commands used to manage the MAINVIEW windows environment

Category	Document	Description
SAF security for MAINVIEW products	<i>Implementing Security for MAINVIEW Products</i>	explains basic MAINVIEW security, enhanced security, and MAINVIEW Alternate Access security
supplemental documents	release notes, flashes, technical bulletins	provide updated information about MAINVIEW for Linux – Servers

## Online and Printed Books

The books that accompany BMC Software products are available in online format and printed format. If you are a Windows, Unix, or Linux 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

MAINVIEW for Linux – Servers includes online Help. In the MAINVIEW for Linux – Servers ISPF interface, you can access Help by pressing **F1** 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). The latest versions of the release notes and other notices are available on the Web at <http://www.bmc.com/support.html>.

## Conventions

This book uses the following conventions:

Item	Example
information that you are instructed to type	Type <b>SEARCH DB</b> in the designated field. Type <b>search db</b> in the designated field.
specific (standard) keyboard key names	Press <b>Enter</b> .
field names, text on a panel	Type <b>the appropriate entry</b> in the <b>Command</b> field.
directories, file names, Web addresses	The BMC Software home page is at <b>www.bmc.com</b> .
nonspecific key names, option names	Use the HELP function key.  KEEPDICTIONARY option
Linux commands, command options	Use the <b>rpm -i file_name.rpm</b> to install a program.

Item	Example
code examples, syntax statements, system messages, screen text	<code>//STEPLIB DD</code> The table <i>table_name</i> is not available.
emphasized words, new terms, variables	The instructions that you give to the software are called <i>commands</i> .  In this message, the variable <i>file_name</i> represents the file that caused the error.

This book uses the following types of special text:

**Note:** Notes contain important information that you should consider.

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

## Syntax Statements

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

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

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

Item	Example
Items in italic type represent variables that you must replace with a name or value. Use an underscore for variables with more than one word.	<code>dtsbackup control_directory</code>
Brackets indicate a group of options. You can choose at least one of the items in the group, but none of them is required. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option.	<code>[table_name, column_name, field]</code>  <code>[-full, -incremental, -level]</code>
Linux options are indicated with a hyphen.	
Braces enclose a list of required items. You must enter at least one of the items. Do not type the braces when you enter the item.	<code>{DBD_name   table_name}</code>  <code>{-a   -c}</code>

---

Item	Example
A vertical bar means that you can choose only one of the listed items. In the example, you would choose either <i>commit</i> or <i>cancel</i> .	{commit   cancel}  {-commit   -cancel}
An ellipsis indicates that you can repeat the previous item or items as many times as necessary.	<i>column_name</i> . . .

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# Summary of Changes

This section summarizes changes to the functionality of the product, listing the changes by product version and release date. The summary includes enhancements to the product and any major changes to the documentation.

## Version 1.3

November 21, 2003

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This book contains the following changes for MAINVIEW for Linux – Servers version 1.3.

- MAINVIEW for Linux – Servers no longer requires RTM by IBM. MAINVIEW for Linux – Servers now supports all of the following VM monitors and monitor readers:
  - BMC Software’s VM Monitor Reader (packaged with this version of MAINVIEW for Linux – Servers)
  - ESAMON or zMON by Velocity Software
  - FCON/ESA by IBM
  - Performance Toolkit by IBM
  - RTM by IBM
- New filesystem and process actions
- New Syslog view
- Appendix added to describe BMC Software’s VM Monitor Reader messages



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# Chapter 1 Introduction

MAINVIEW for Linux – Servers is a system management application that provides services and functions to help you monitor and control your Linux servers. Built on the BMC Software MAINVIEW architecture, MAINVIEW for Linux – Servers uses a traditional MAINVIEW interface to provide access to Linux and z/VM data. For more information on the MAINVIEW architecture, how to navigate in MAINVIEW, and how to customize MAINVIEW views, see *Using MAINVIEW*.

This chapter discusses the following topics:

Overview . . . . .	1-2
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Linux Data Server . . . . .	1-2
VM Data Server . . . . .	1-3
MAINVIEW for Linux – Servers PAS . . . . .	1-3
Data Collector . . . . .	1-3
Features and Functions . . . . .	1-4
Data Collectors and Data Servers . . . . .	1-4
Heartbeat Data . . . . .	1-5
Real-Time Data . . . . .	1-5
Historical Data . . . . .	1-6



## VM Data Server

A VM data server resides on the z/VM system where your Linux systems are running. The VM data server obtains data from a real-time performance monitor or BMC Software's VM Monitor Reader and sends the data to the MAINVIEW for Linux – Servers PAS through the communication server.

## VM Monitor or Monitor Reader

MAINVIEW for Linux – Servers requires one of the following real-time performance monitors or BMC Software's Monitor Reader to be installed on the z/VM system where your Linux systems are running:

- BMC Software's VM Monitor Reader
- ESAMON and zMON by Velocity Software
- FCON/ESA by IBM
- Performance Toolkit by IBM
- RTM by IBM

BMC Software's VM Monitor Reader is packaged with this version MAINVIEW for Linux – Servers. This VM monitor reader runs its own virtual machine (VMMASVR).

## MAINVIEW for Linux – Servers PAS

MAINVIEW for Linux – Servers PAS runs as a z/OS subsystem. MAINVIEW for Linux – Servers PAS stores heartbeat data that is provided by monitored Linux systems and z/VM systems. For more information on heartbeat data, see "Heartbeat Data" on page 1-5. The PAS requests data from the monitored Linux and z/VM systems as views are displayed.

## Data Collector

A PATROL for Performance data collector resides on each monitored Linux image. Each data collector gathers data from the monitored Linux image and provides the data to the data server, which sends the data to the MAINVIEW for Linux – Servers PAS through the communication server.

## Features and Functions

MAINVIEW for Linux – Servers provides monitoring and management of Linux for zSeries and S/390 systems as well as Linux for x86 systems.

MAINVIEW for Linux – Servers has the following features and functions:

- displays Linux and z/VM performance and availability information in real-time and interval time (historical data) frames
- provides historical data which allows you to perform trend analysis on the historical performance of your Linux and z/VM systems
- provides over 90 different views providing Linux and z/VM performance, availability, usage, and configuration information
- integrates views from the MAINVIEW console of zSeries and S/390 subsystems and Linux applications
- monitors system and process resource usage
- alerts support personnel of exception conditions through alarm management
- discovers Linux and z/VM systems automatically
- provides the ability to view network statistics
- lets you customize the environment to provide logical or performance-scaled division of Linux systems
- provides a choice of user interfaces (3270 MAINVIEW or the browser-based MAINVIEW Explorer)

## Data Collectors and Data Servers

Data servers and data collectors are programs that are used by MAINVIEW for Linux – Servers to collect data and store data from various sources to be displayed by views. Specifically, the MAINVIEW for Linux – Servers data collectors obtain data from Linux systems and automatically makes the information available to be selected and monitored from the MAINVIEW console.

MAINVIEW for Linux – Servers collects and displays heartbeat data and requested data. Data that is collected by the data collector running on the monitored Linux system is always collected in background mode. For efficiency and response time purposes, heartbeat data is stored in the PAS. Since the SYLOVRZR view displays heartbeat data, the response time when viewing the SYLOVRZR view should be faster than the response time of other real-time views. When you are viewing other real-time views, the request is sent to the data server that is running on the monitored Linux system. The data server then returns the last sampled value. At this time, demand sampling will start and continue until the view is deactivated and the demand mode sampling duration has expired. The data collector continues sampling data in background sampling mode. This design lets data be collected at lower sampling intervals (low system overhead) when a view is not active. However, data is collected more often when a specific real-time view is activated.

**Note:** Real-time views (other than SYLOVRZR) require more system resources than interval views. Normal monitoring should be performed using the interval views. Real-time views should only be used for diagnosing an immediate problem or on a limited basis.

## Heartbeat Data

Heartbeat interval is used for a quick understanding of how your monitored Linux images are running—a “snapshot” of your key system statistics. The Data Server on each monitored Linux image obtains the heartbeat data and sends it to the MAINVIEW for Linux – Servers PAS. Key system statistics are collected automatically at specified intervals.

The heartbeat data is specified by using Monitor Rule parameters. To change these parameters, see “Using Rules and Images” on page 4-1. Heartbeat data is available on the SYLOVRZR view. For more information about the SYLOVRZR view, see Chapter 3, “Using Views.”

## Real-Time Data

Real-time data is data that you request MAINVIEW for Linux – Servers to retrieve and display. There are two modes for real-time data, Background Sampling mode and Demand Sampling mode.

MAINVIEW for Linux – Servers is always collecting data in Background Sampling mode. When you invoke a real-time, Demand Sampling begins automatically. Real-time data is not limited to key system statistics (as heartbeat data is) and can be as new as 10 seconds; however, real-time data is more costly in CPU overhead and network traffic.

The sampling intervals are specified for the Demand Sampling mode and the Background Sampling mode using the Monitor Rules parameters. To change the sampling intervals, see “Rule Parameters” on page 4-3.

## Historical Data

MAINVIEW for Linux – Servers 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 data or interval data, stores information about your operating environment at the end of each historical data 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. The default interval is set to 15 minutes. This value is located in BBPARM(MMLTIR00). You can use this information to determine whether current behavior is an anomaly or part of a trend.

At the end of every Background Sampling interval, the data server obtains the data sample from the data collector (either one of the supported VM performance monitors or BMC Software’s Monitor Reader for z/VM data or PATROL for Performance data collector for Linux data) and sends it to the PAS. The Background Sampling Interval is set through Monitor Rules and the default is one minute. To change the sampling intervals, see Table 4-2 on page 4-3.

For information about using historical data, see Chapter 5, “Displaying Historical Data,” *Using MAINVIEW*, or type **HELP TIME** on any MAINVIEW COMMAND line. *Using MAINVIEW* describes how to use the TIME Command in detail.

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# Chapter 2 Navigating in MAINVIEW for Linux – Servers

This chapter discusses the following topics:

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# Accessing MAINVIEW for Linux – Servers

MAINVIEW for Linux – Servers can be accessed from the MAINVIEW Selection Menu (Figure 2-1).

**Figure 2-1 MAINVIEW Selection Menu**

```

----- MAINVIEW Selection Menu -----
OPTION  ==>                                DATE   -- YYYY/MM/DD
                                           TIME   -- 16:45:41
                                           USERID -- BMVDID3
                                           MODE   -- ISPF 4.8

  O    Parameters and Options
  E    Alerts and Alarms
  P    PLEX Management (PLEXMGR)
  U    Utilities, Tools, and Messages

Solutions for:
  A    Automated Operations
  C    CICS
  D    DB2
  I    IMS
  L    Linux
  N    Network Management
  S    Storage Management
  T    Application Management and Performance Tuning
  W    WebSphere and MQSeries
  Z    OS/390, z/OS, and USS

Enter X to Terminate

                                Copyright BMC Software, Inc. 2001
    
```

To access MAINVIEW for Linux – Servers, Type **L** on the COMMAND line to select **Linux**, and press **Enter**.

The Linux Solutions panel (Figure 2-2 on page 2-3) is displayed.

**Figure 2-2 Linux Solutions Panel**

```
----- Linux Solutions -----
OPTION ==>
Management
  1 MVLNX      MAINVIEW for Linux
Operations
  E ALERTS    Alert Management
General Services
  M MESSAGES  Messages and Codes
  P PARS      Parameters and Options
DATE -- YYYY/MM/DD
TIME -- 12:03
USERID -- BOLKXB
MODE -- ISPF 4.8M
```

To access MAINVIEW for Linux – Servers, Type **1** on the COMMAND line, and press **Enter**.

Session Control Parameters panel (Figure 2-3 on page 2-4) is displayed.

**Figure 2-3 Session Control Parameters Panel**

```
BMC Software      ----- SESSION CONTROL PARAMETERS -----  
COMMAND ==>  
  
Subsystem ID     ==> BBCS (Coordinating Address Space subsystem ID)  
  
XDM mode        ==> NO      (Execute session in diagnostic mode, Yes/No)  
  
Press ENTER to confirm use of session parameters entered above.
```

Type the default subsystem ID **BBCS** for the coordinating address space (CAS), and press **Enter**.

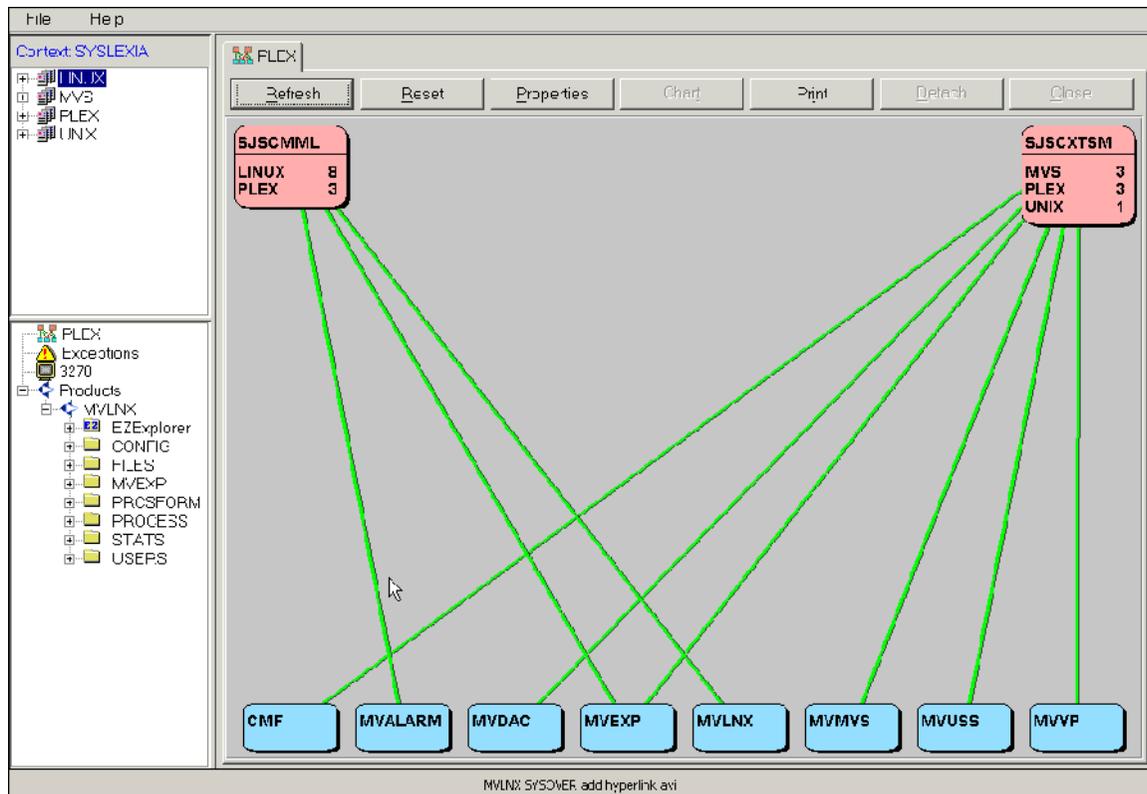
**Note:** Use the default subsystem ID, unless you have changed the subsystem ID.

The EZLNK Menu (Figure 2-5 on page 2-8) is displayed.

# MAINVIEW Explorer

When MAINVIEW Explorer is installed on your system, you can access MAINVIEW for Linux – Servers through a web browser as shown in Figure 2-4. Refer to *Using MAINVIEW* for information about using MAINVIEW Explorer to access MAINVIEW products.

Figure 2-4 MAINVIEW Explorer



## Displaying Real-time and Historical Data in Views and Easy Menus

There are two sets of views; one set for monitoring and managing Linux and z/VM systems in real-time (Time Frame - Real-time) and another set for viewing Linux and z/VM system historical data (Time Frame - Interval) for trend analysis. Real-time views are invoked by default when the product is initially accessed. Interval views (for viewing historical data) can be invoked either from the EZLENV easy menu or by typing **EZLNXI** at the COMMAND line.

Most of the real-time view names end with the letter **R**. The exceptions to this naming convention are the following:

- PSLTREE
- FSLSPACE
- EZLENV
- EZLNX

PSLTREE and FSLSPACE are real-time-only views. EZLENV easy menu is an example of a view which pertains to neither real-time nor interval time frames; therefore, it has no special name suffix. EZLNX is a real-time easy menu, which has an alias of EZLNXR.

The following two types of interval views exist:

- summary interval views
- interval views

As you navigate through the interval time frame easy menus, the hyperlinks take you to summarized views. Summarized view names end with the letter **Z**. Data in these views are summarized over multiple intervals, if you have selected multiple intervals using the **TIME** command. This means that the numerical values in one row of the view represents an average of those fields for all the intervals specified by the **TIME** command.

If you hyperlink on the key field of one of the summarized rows, you will be taken to a interval view which expands the summarized row and displays one row for each selected interval. This view has the same name as the summary view without the Z suffix. For example, the interval summary view name for Linux system resource usage is SYLUSEZ. If you hyperlink on one of the rows in this view, the row will be expanded and the data will be displayed in view SYLUSE with one row for each selected interval.

If you do not issue the **TIME** command while using interval views, data queries are retrieved from the Interval Recorder current interval buffers. If an interval switch has just occurred and no data has yet arrived from a data server, there will not be any interval (historical) data available for viewing. You can either wait for a period of time equal to the Background Sampling Interval (see Chapter 4, “Using Rules and Images”), then press **Enter** or issue the **TIME** command to select a different time frame or more intervals than the current one. For example, **TIME \* \* 2I** selects the latest two intervals (if MMLTIR00 member INTVAL=15, this would be equal to the last 15-30 minutes depending on how many samples have arrived from the data server).

The views described in Chapter 2, “Navigating in MAINVIEW for Linux – Servers” and Chapter 3, “Using Views” are real-time views. The interval views are not in this book, but you can access them by replacing the **R** suffix of the real-time view names with a **Z** suffix. These view names are listed in all of the tables in Chapter 3, “Using Views” (beginning with Table 3-1 on page 3-2). One simple way to access all of the interval views is by accessing the EZLNXI easy menu.

## Using Easy Menus

MAINVIEW for Linux – Servers detects performance problems or potential problems of Linux systems. MAINVIEW easy menus let you access any MAINVIEW for Linux – Servers view easily without knowing the view name. When you access a view, you can obtain more detailed information regarding Linux systems.

### Using the MAINVIEW for Linux – Servers Easy Menu

The MVLNX easy menu (EZLNX) lets you navigate to various parts of MAINVIEW for Linux – Servers based on a general area that you want to monitor rather than on a specific view. The selections on this menu let you access information quickly. The easy menus have symbols to the left of the hyperlinks to indicate certain actions. Table 2-1 describes symbols that are used in the MVLNX easy menus.

**Table 2-1 MVLNX Easy Menu Symbols**

Symbol	Description
>	takes you to another easy menu (sub-menu)
.	takes you directly to a view that displays data

Figure 2-5 on page 2-8 shows the MVLNX easy menu (EZLNX).

**Figure 2-5 MVLNX Easy Menu**

```

MVLNX Easy Menu
Time frame - Realtime
-----+
| Place cursor on |
| menu item and  |
| press ENTER    |
|-----+
Activity
> System
> Processes
> Filesystems
> Users
> Configuration
. Network statistics
. Disk Statistics
. Syslog

> VM System

Utilities
> Alarm Management
> Environment Settings
. Image Status
. VM System Status

> Linux Monitor Fast Menu
> Linux Monitor MAIN View

. Add/Edit Monitor Rules

. Return...
```

Options on this menu are grouped into two categories: Activity and Utilities. Activity options display submenus that give you an overview of some aspect of your system's performance. From these overview submenus, you can display information about a particular element by hyperlinking to a menu specific to the element. Utilities options display submenus from which you can access other MAINVIEW products or perform customization of the operating environment.

## Using MAINVIEW for Linux – Servers Sub-menus

MAINVIEW for Linux – Servers sub-menus provide easy access to views, based on the type of information that you want to monitor. Hyperlink to a sub-menu by completing one of the following steps:

- place your cursor on the sub-menu you want to view and press **Enter**
- type the name of the easy menu on the COMMAND line (for example, EZLCONF)

## System

From the MVLNX easy menu, hyperlink on the **System** option to view the System Easy Menu (EZLSYSR). The System Easy Menu (Figure 2-6) lets you access views regarding key performance areas of your system.

**Figure 2-6 System Easy Menu**

```

System Easy Menu
Time frame - Realtime
IPC Information
. Resource Usage +-----+
. CPU | Place cursor on | . Shared Memory Info
. Swapping | menu item and | . Shared Memory Stats
. Tables | press ENTER | . Msg Queue Information
+-----+ . Msg Queue Statistics
. Semaphore Information
. Semaphore Statistics

. Return...

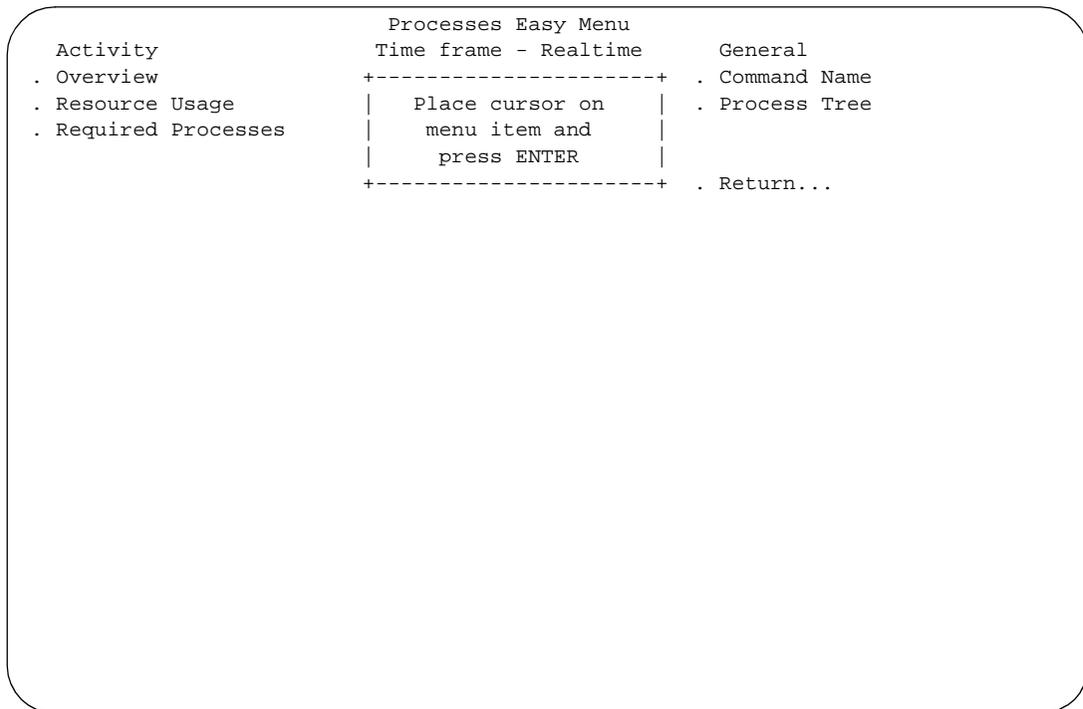
```

From the System Easy Menu, you can hyperlink to overall kernel activity and Inter-Process Communication (IPC) information.

## Processes

Hyperlink on the **Process** option from the MVLNX easy menu to access the Processes Easy Menu (EZLPRCSR). The Processes Easy Menu (Figure 2-7) lets you access views that contain data regarding process activity.

**Figure 2-7 Processes Easy Menu**



The Processes Easy Menu is divided into activity information and general information. Activity options lead you to information about specific process activity, including resource usage. General options provide more general information about a process, including parent/child relationships of processes and parameters.

## File Systems

The File System Easy Menu, EZLFSYSR, (Figure 2-8) contains hyperlinks to detailed information about mounted file systems.

**Figure 2-8 File Systems Easy Menu**

```

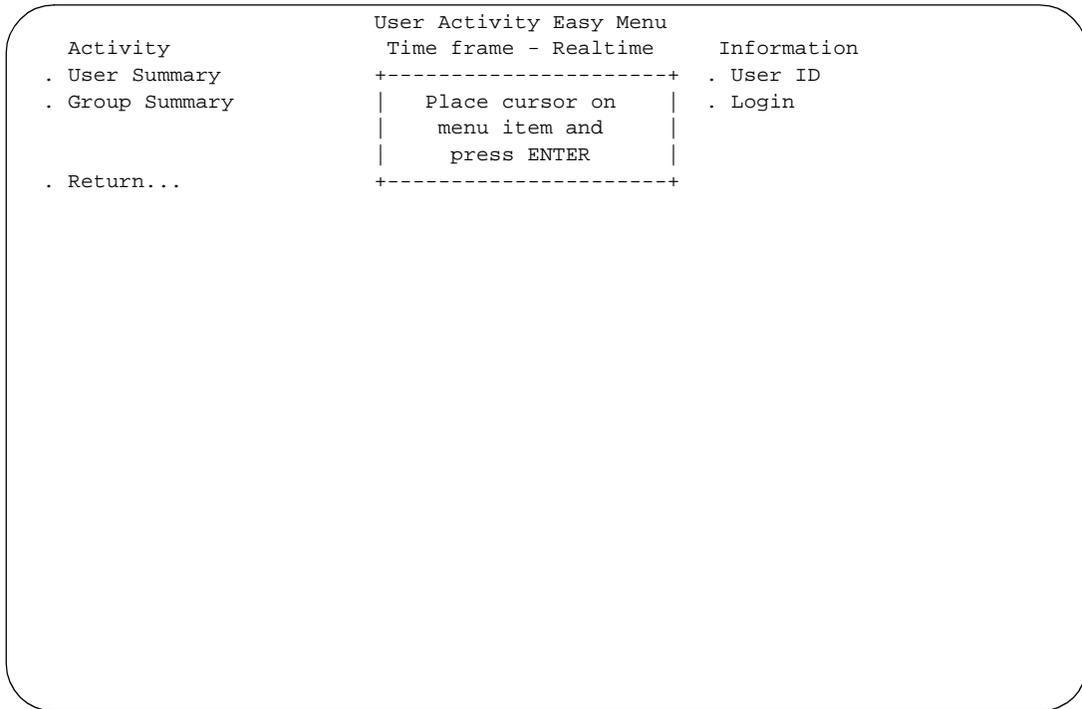
Filesystems Easy Menu
Time frame - Realtime
-----+
| Place cursor on |
| menu item and  |
| press ENTER    |
-----+
. All Filesystems
. All Mounted Filesys
. Directory Listing
. Biggest Files
. Open Files
. Return...
```

EZLFSYSR allows you to access information regarding mounted file systems. Data about all file systems includes mount information and directory listings.

## Users

The User Activity easy menu, EZLUSRSR, (Figure 2-9) contains hyperlinks to detailed information regarding individual users, groups, and users that are logged in to a monitored Linux system.

**Figure 2-9**      **User Activity Easy Menu**



## Configuration

The Configuration Easy Menu, EZLCONFR, (Figure 2-10) contains hyperlinks to configuration views that show system information and system tuning parameters.

**Figure 2-10 Configuration Easy Menu**

```

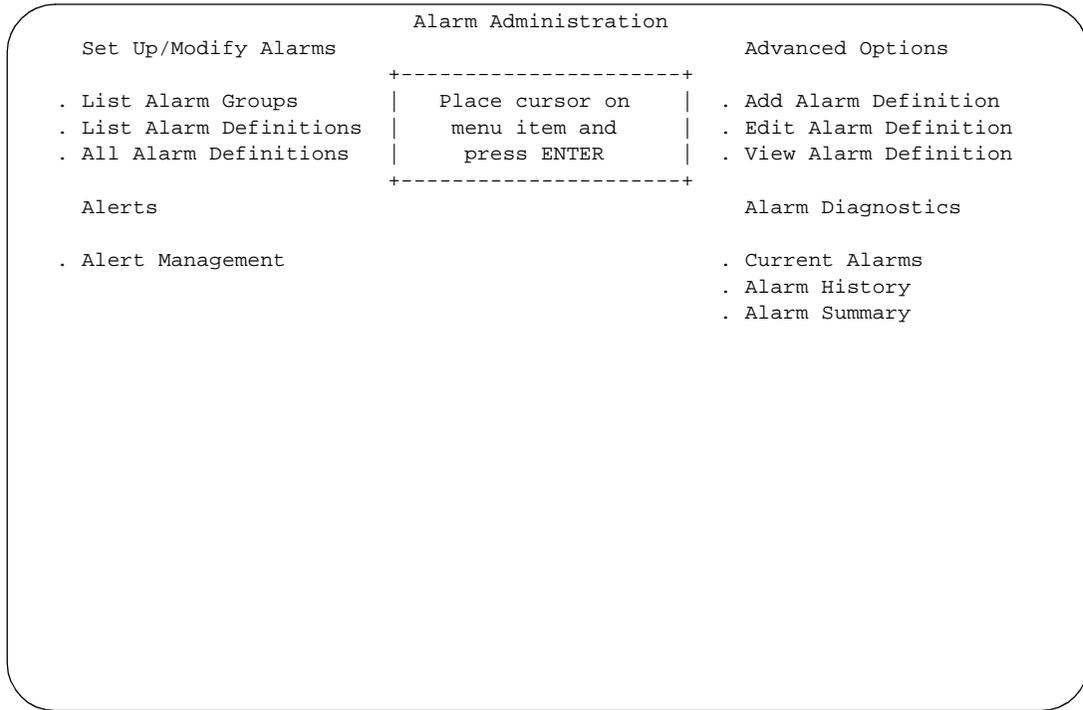
Configuration Easy Menu
Time frame - Realtime
-----+
Information
. System
. Network Interfaces
. Disks
. Disk Controllers
. Partitions
-----+
| Place cursor on |
| menu item and  |
| press ENTER   |
-----+
System Parameters
. General Kernel
. File System
. Virtual Memory
> Network
. Return...

```

## Alarm Management

MAINVIEW Alarm Manager contains a series of views, beginning with the MVALARM Easy Menu, MVALARM, (Figure 2-11).

**Figure 2-11 MVALARM Easy Menu**



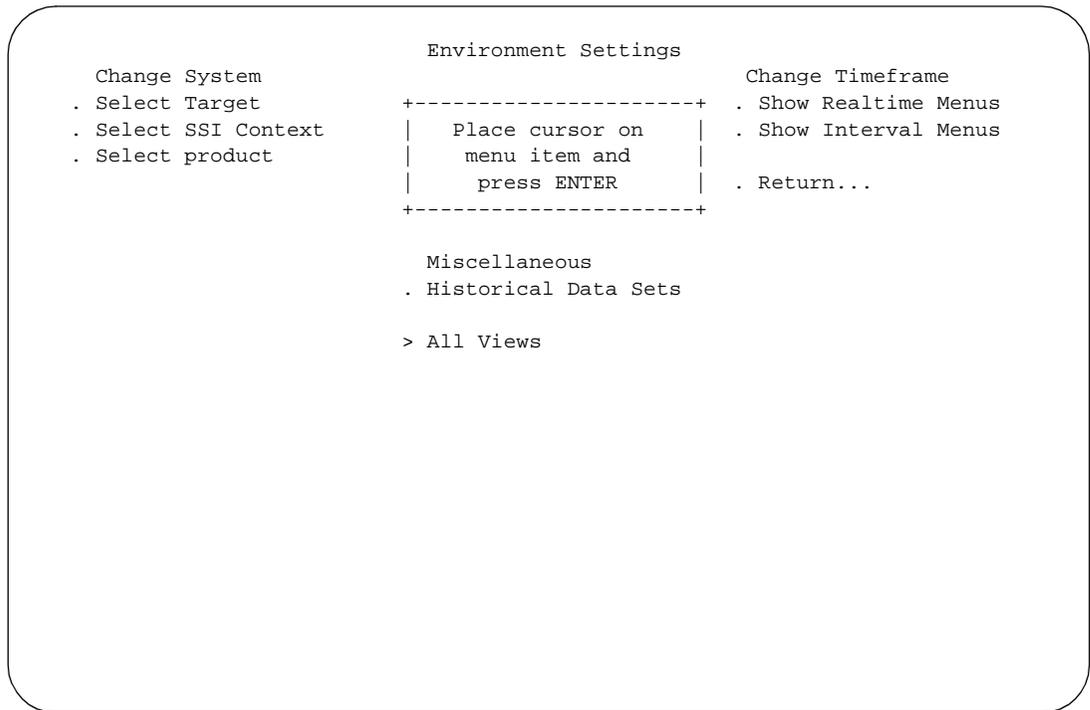
Hyperlink to other views from the MVALARM Easy Menu to display alarms or to edit or view alarm definitions. When you add or edit an alarm definition, you can customize alarm messages, threshold levels, monitoring frequency, and the action that is taken when an alarm occurs.

For more information about MAINVIEW Alarm Manager, see Chapter 6, “MAINVIEW Alarm Manager.”

## Environment Settings

MAINVIEW for Linux – Servers also provides the Environment Settings easy menu to access your environmental settings, EZLENV (Figure 2-12).

**Figure 2-12 Environment Settings Easy Menu**



EZLENV lets you change your target, Single System Image (SSI) context, real-time/interval mode, and product. For more information about SSI context, see *Using MAINVIEW*.

## z/VM System

The z/VM System Easy Menu, EZLVSYSR, (Figure 2-13) provides access to views that display detailed information about z/VM system performance.

**Figure 2-13 Virtual Machine Systems Easy Menu**

```
VM Easy Menu
Time frame - Realtime      I/O
. CPU                      +-----+ . Devices
. Resource Usage          | Place cursor on | . Paging/Spooling
. Storage                  | menu item and  | . Minidisks
. Priv Ops                 | press ENTER    |
                           +-----+ . Return...

. VM System Status

Virtual Machines
. All Virtual Machines
. Linux Virtual Machines
. MP Virtual Machines
```

## Using the Image Easy Menu

The Image Easy Menu, EZLIMAGR (Figure 2-14), provides easy access to detailed views for the selected image.

**Note:** The *image* refers to the Linux system for which the data is being displayed. This value is automatically derived from the first 60 characters of the monitored host name.

**Figure 2-14** EZLIMAGR View (Image Easy Menu)

```

Image Easy Menu
Time frame - Realtime
Current Image ->      JMWLINUX
Host Name    ->      jmwlinux

Activity          +-----+ Configuration
. System          | Place cursor on | . System
. CPU             | menu item and   | . Network Interfaces
. Swap           | press ENTER    | . Disks
. Kernel Tables  +-----+ . Disk Controllers
. Network                                     . Partitions
. Disk
. Syslog          Information                System Parameters
. Processes Overview . Mounted File Systems . General Kernel
. Process Resource Usage . Directory Listing . File System
. Required Processes . List of Biggest Files . Virtual Memory
. Process Tree      . User Ids                > Network
. Process Cmd/Path . Logins                    > Linux Monitor Easy Menu
. Users                                                     > Linux Monitor Fast Menu
. Groups          . Shared Memory
. Shared Memory   . Msg Queues
. Msg Queues     . Semaphores
. Semaphores     . Return...

```

## Using the Linux Monitor Fast Menu

The Linux Monitor Fast Menu, EZLFASTR (Figure 2-15), provides easy access to all MAINVIEW for Linux – Servers views.

**Figure 2-15 Linux Monitor Fast Menu**

```

Linux Monitor Fast Menu
Systems
. Resource Usage
. CPU
. Swap
. Kernel Tables
. Configurations
. Syslog

Processes
. Overview
. Command Path/Parms
. Process Tree
. Resource Usage
. Required Processes
File Systems
. Mounted File Systems
. Directory Listing
. List of Biggest Files
. List of Open Files
Users
. Overview
. Group Overview
. UID information
. Login information

Time frame - Realtime
+-----+
| Place cursor on |
| menu item and  |
| press ENTER    |
+-----+

Devices
. Disk Statistics
. Disk Configuration
. DiskCtlr Configuration
. Partition Information

Network
. Statistics
. Intfc Configuration

VM
> VM System

IPC Information
. Shared Memory Info
. Shared Memory Stats
. Msg Queue Info
. Msg Queue Stats
. Semaphore Info
. Semaphore Stats

System Parameters
. General Kernel
. File System
. Virtual Memory
> Network

Utilities
. Image Status
. VM System Status
. Add/Change Monitor Rule
> Environment Settings
> Linux Monitor Easy Menu

. Return...

```

---

---

## Chapter 3 Using Views

This chapter provides information on how to view data in MAINVIEW for Linux – Servers views. For more detailed information about the MAINVIEW architecture and interface, see *Using MAINVIEW*. The views described in this chapter are real-time views. This chapter discusses the following topics:

Overview . . . . .	3-2
Viewing System Information . . . . .	3-2
All Monitored Linux Images . . . . .	3-4
Heartbeat Data . . . . .	3-5
System Resource Information . . . . .	3-5
Viewing Process Activity . . . . .	3-6
List of Running Processes . . . . .	3-6
Full Command Names . . . . .	3-8
Parent/Child Relationship of Current Processes . . . . .	3-9
Required Processes. . . . .	3-10
Monitoring File Systems. . . . .	3-11
Monitoring File Systems . . . . .	3-11
File System Information for a Specific Linux System. . . . .	3-12
Full File System Name. . . . .	3-14
Detailed File Listing. . . . .	3-14
Using User and Group Views . . . . .	3-16
Process Statistics by Group Name . . . . .	3-16
Process Statistics by User Name . . . . .	3-17
Viewing Configuration Information . . . . .	3-18
File System Configuration Information . . . . .	3-21
System Configuration Information. . . . .	3-22
Displaying Network Statistics . . . . .	3-23
Displaying Disk Statistics. . . . .	3-24
Viewing z/VM System Data . . . . .	3-25
z/VM User Resource Information . . . . .	3-27
z/VM System Overview Information. . . . .	3-28
Exiting from MAINVIEW for Linux – Servers . . . . .	3-29

## Overview

MAINVIEW for Linux – Servers provides system information and statistics for your Linux systems. The interval views are not in this chapter, but you can access the interval views by replacing the **R** suffix of the real-time view names with a **Z** suffix from the Interval Easy Menu (EZLNXI).

## Viewing System Information

MAINVIEW for Linux – Servers monitors CPU usage, kernel information, and related activities of your Linux systems. Table 3-1 lists the system information views.

**Table 3-1 System Views (Part 1 of 2)**

View	Description
SYLCPUR	displays processor usage for each monitored Linux image Use the SYLCPU/SYLCPUR view to display CPU load information.
SYLCPUER	displays processor statistics summarized over all processor engines
SYLHOSTR	displays the full host name for a system
SYLMSQIR	displays resource usage and limits of the monitored Linux system message queuing component
SYLMSQSR	displays the message queue statistics and information for each Inter-Process Communication (IPC) message queue that is allocated on the monitored Linux system
SYLOVERR	displays information about each Linux system being monitored by the PAS Data for this view comes from heartbeat data. For more information, see “Heartbeat Data” on page 3-5. Use the SYLOVER /SYLOVERR view to quickly obtain status information about all monitored Linux system images connected to the PAS that own the current context.
SYLOVRZR	displays information about each Linux system being monitored by the PAS This view is summarized by image name.
SYLSEMIR	displays resource usage limits of the semaphore subsystem This view includes the following information: <ul style="list-style-type: none"> <li>• maximum number of semaphores and undo structures</li> <li>• maximum number of IDs</li> <li>• maximum semaphores per ID</li> </ul>

**Table 3-1 System Views (Part 2 of 2)**

<b>View</b>	<b>Description</b>
SYLSEMSR	displays semaphore array information This view includes the following information: <ul style="list-style-type: none"> <li>• semaphore set ID</li> <li>• creator and owner</li> <li>• current number of semaphores</li> <li>• permissions</li> <li>• access times</li> </ul>
SYLSHMIR	displays the shared memory information This view includes the following information: <ul style="list-style-type: none"> <li>• total amount of shared memory used (in kilobytes)</li> <li>• minimum segment size (in bytes)</li> <li>• maximum number of segments per process</li> </ul>
SYLSHMSR	displays the shared memory statistics
SYLSWAPR	displays the system metrics and swap load to manage system performance This view shows the following information: <ul style="list-style-type: none"> <li>• total swap space and usage,</li> <li>• pages scanned</li> <li>• paging rates</li> <li>• paging reads</li> <li>• paging writes</li> <li>• faults</li> <li>• context switches</li> </ul>
SYLTBLSR	displays table size and the amount of the table currently being used for the following kernel tables: <ul style="list-style-type: none"> <li>• process table (processes currently running)</li> <li>• I-Node table (unique file identifiers)</li> <li>• file table (open file instances)</li> </ul>
SYLUSER	displays system resource information This view shows the following information: <ul style="list-style-type: none"> <li>• CPU usage</li> <li>• run queue</li> <li>• memory usage and totals</li> <li>• I/O rates</li> <li>• kernel table</li> <li>• swapping</li> <li>• load averages (1-, 5- and 15- minute intervals)</li> </ul>

This section details some basic functions that you can perform, useful information, and sample views from a few frequently used system views. The following views are detailed in this section:

- SYLOVRZR
- SYLUSER

## All Monitored Linux Images

The SYLOVRZR view (Figure 3-1) provides the following information for each Linux system that is being monitored by the active PAS:

- host name of each Linux system image
- status (inactive or running)
- CPU usage (percentage)
- memory usage (percentage)
- swap space usage (percentage)

**Figure 3-1 SYLOVRZR View**

CMD Image	VMSystem	Status	%CPU	%Mem
-----			0.....50...100	0.....50...100
SUSE	SYSLBMC	Inactive		
VALGRIND	N/A	Inactive		
CHEROKEE	N/A	Inactive		
LNK5RH	SYSLBMC	Inactive		
LWDLINUX	SYSCBMC	Inactive		
LNK16SUS	SYSLBMC	Inactive		
LNK5SUS	SYSLBMC	Inactive		
LUGGAGE	N/A	Running	5.20	83.98
SUSE3	N/A	Running	1.07	67.00
JMWLINUX	SYSLBMC	Running	0.95	96.00
OCTARINE	N/A	Running	0.57	98.00
RINCEWIN	N/A	Running	0.42	92.00

From the SYLOVRZR view, you can perform five actions for a managed Linux system. These actions are described in Table 3-2.

**Table 3-2 SYLOVRZR Actions (Part 1 of 2)**

Action	Description
CNS	cancels a previous shutdown request (shutdown -c)
DEL	deletes an inactive image This action removes the inactive image from image file so it will not be displayed on the SYLOVRZR view.
HLT	halts a Linux system (shutdown -h now)
RBT	reboot a Linux system (shutdown -r)

**Table 3-2 SYLOVRZR Actions (Part 2 of 2)**

Action	Description
STA	starts a Linux system
WRN	send a warning message to all processes (shutdown -k)

## Heartbeat Data

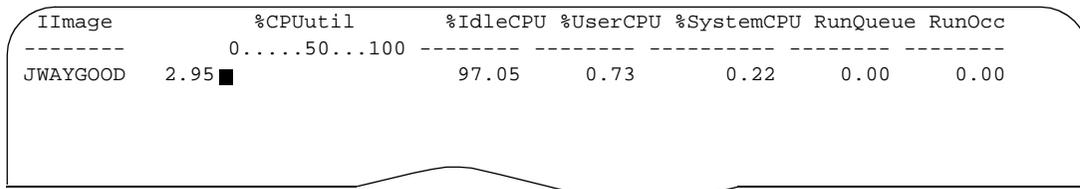
Data for the SYLOVRZR view comes from heartbeat data that is sent every heartbeat interval from each Linux system to the PAS. For more information about heartbeat data, see “Heartbeat Data” on page 1-5.

You can use the SYLOVRZR view to quickly obtain status information about all the Linux system images being monitored that are connected to the PAS owning the current context.

## System Resource Information

The System Resource Usage (SYLUSER) view (Figure 3-2 on page 3-6), displays system resource information. The SYLUSER view includes the following information:

- monitored Linux image name
- CPU usage (percentage)
- average number of processes that are waiting for CPU service (per second)
- average number of times that the run queue is updated during the measurement interval (per second)
- average number of processes that are ready to run (for 1-, 5-, and 15-minute intervals)
- number of processes running during the measurement interval
- total amount of physical memory that is in use during the measurement interval

**Figure 3-2 SYLUSER View**

## Viewing Process Activity

MAINVIEW for Linux – Servers monitors your Linux systems processes and related activities. Table 3-3 lists the processes activity views.

**Table 3-3 Process Activity Views**

View	Description
PSLCMNDR	displays the commands that are issued for the processes
PSLCPRMR	displays commands and parameters for a specific process
PSLINFOR	displays detailed overview of a process
PSLOVERR	displays a list of all processes that are running
PSLTREE	displays relationships between parent and child processes in the system The PSLTREE view uses a combination of the sequence number and level number to show the order and depth of the branches of the tree, following any process to the last child process.
PSLUSER	displays the resources that are used by each process
PELSTATR	displays the processes that are required to be running but are not

This section details some basic functions you can perform, useful information, and sample views from a few frequently used process views. The following views are detailed in this section:

- PSLOVERR
- PSLTREE
- PELSTATR

## List of Running Processes

The PSLOVERR view (Figure 3-3 on page 3-8) displays a list of all running processes. The PSLOVERR view shows the following information:

- process identification number
- process name
- the system on which a process is running
- elapsed process time
- CPU resources that were used for each process during the last sampling interval
- total physical resident memory
- I/O rate
- process state
- total virtual memory size
- CPU time that a process consumed executing programs and library functions during the last sampling interval
- CPU time that a process consumed by the kernel in system calls and administrative overhead during the last sampling interval
- average CPU usage over the life of the process
- parent process ID
- number of open files that the process had open during the last sampling interval
- name of the real userid
- userid of the logged on user that initiated the process
- name of the userid that is being checked for access privileges (effective userid)
- userid that is being checked for access privileges (effective userid)
- name of the userid of the previous effective userid at the time of the last SETUID() command
- userid of the previous effective userid at the time of the last SETUID() command
- primary group ID of the logged in user

**Figure 3-3 PSLOVERR View**

CMD	PID	Process Name	Image	Elapsed ProcTime	%CPU 0...50...100	ResSize (KB)
	1103	mmldsrv	JWAYGOOD	215:54:5	1.60	6052
	25739	bgscollect	JWAYGOOD	07:58:49	0.70	2408
	3	ksoftirqd_CPU0	JWAYGOOD	215:55:4	0.00	0
	5	bdflush	JWAYGOOD	215:55:4	0.00	0
	6	kupdated	JWAYGOOD	215:55:4	0.00	0
	7	mdrecoveryd	JWAYGOOD	215:55:3	0.00	0
	12	khubd	JWAYGOOD	215:55:2	0.00	0
	512	in.identd	JWAYGOOD	215:55:1	0.00	32
	327	snmpd	JWAYGOOD	215:55:1	0.00	692
	338	sshd	JWAYGOOD	215:55:1	0.00	40
	354	syslogd	JWAYGOOD	215:55:1	0.00	252
	360	klogd	JWAYGOOD	215:55:1	0.00	188
	471	atd	JWAYGOOD	215:55:1	0.00	120
	510	in.identd	JWAYGOOD	215:55:1	0.00	32
	958	nscd	JWAYGOOD	215:55:0	0.00	388
	1327	bash	JWAYGOOD	215:49:5	0.00	672
	513	in.identd	JWAYGOOD	215:55:1	0.00	32
	679	nmbd	JWAYGOOD	215:55:0	0.00	492
	683	smbd	JWAYGOOD	215:55:0	0.00	544
	697	smpppd	JWAYGOOD	215:55:0	0.00	220
	766	automount	JWAYGOOD	215:55:0	0.00	84
	806	lpd	JWAYGOOD	215:55:0	0.00	24
	891	kdm	JWAYGOOD	215:55:0	0.00	4
	903	cron	JWAYGOOD	215:55:0	0.00	152

You can perform the actions described in Table 3-4 to a specific process or processes.

**Table 3-4 PSLOVERR Actions**

Action	Descriptions
F	display the files open for a process
KIL	kill a process
RENice	change the priority of a process

## Full Command Names

The Process Name field in the PSLOVERR view (shown in Figure 3-3) shows a limited number of bytes of the process name. To view the full process name, select the **Process Name** field. By hyperlinking on the **Process Name** field, you can display the full command and parameters.

## Parent/Child Relationship of Current Processes

The PSLTREE view (Figure 3-4) displays the relationship between parent and child processes in the system. The PSLTREE view uses a combination of the sequence number and level number to show the order and depth of the branches of the tree, following any process to the last child process. The PSLTREE view shows the following information:

- unique process ID
- process name of the command that it is executing
- process ID of the current process' parents
- number of processes that have the same parent (sibling count)
- number of processes that this process created (child count)
- name of the real user to which the process belongs
- number of generations between the current process and the original process

**Figure 3-4 PSLTREE View**

ProcessId	Image	Cmd Name	Parent ProcessID	TreeLevel	Sibling Count	Child Count	Real User
-----	-----	-----	-----	1.....10	Count	Count	Use
3848	JMWLINUX	mmldsrv	483		3	0	roo
448	JMWLINUX	nscd	441		5	0	roo
443	JMWLINUX	nscd	441		5	0	roo
425	JMWLINUX	rpciod	424		1	0	roo
3849	JMWLINUX	mmldsrv	483		3	0	roo
197	JMWLINUX	ypbind	195		2	0	roo
196	JMWLINUX	ypbind	195		2	0	roo
444	JMWLINUX	nscd	441		5	0	roo
3847	JMWLINUX	mmldsrv	483		3	0	roo
449	JMWLINUX	nscd	441		5	0	roo
442	JMWLINUX	nscd	441		5	0	roo
3846	JMWLINUX	bgscollect	463		2	0	roo
441	JMWLINUX	nscd	440		1	5	roo
424	JMWLINUX	lockd	420		1	1	roo
195	JMWLINUX	ypbind	194		1	2	roo
483	JMWLINUX	mmldsrv	463		2	3	roo

## Required Processes

The PELSTATR view (Figure 3-5) displays the a list of Linux processes that are required to be running, but are not currently running. You must specify these required processes before this view will display any pertinent data.

**Figure 3-5 PELSTATR View**

Command Name	Image	Status	Start Time	End Time
asdf	JMWLINUX	Inactive	00:00	10:00
init	JMWLINUX	NotSched	00:00	10:00
syslogd	JMWLINUX	Active	00:00	23:59
xyz	JMWLINUX	Missing	00:00	23:59

## Specifying Required Processes

Before you can view the missing required processes in the PELSTATR view, you must identify the required process in BBPARM(MMLTSRP0).

**Figure 3-6 BBPARM(MMLTSRP0)**

```

***** Top of Data *****
-CAUTION- Profile changed to NUMBER OFF (from NUMBER ON STD).
Data does not have valid standard numbers.
-Warning- The UNDO command is not available until you change
your edit profile using the command RECOVERY ON.
Required Process control card member MMLTSRP0
=====

```

NOTE: Copy this member to your highlevel.UBBPARM before modification.

Processes listed in this member, plus their execution statuses, can be monitored on view PELSTATR.

CNAME= Specifies the first 32 characters of the command name. This should be specified as it appears in the PSLOVERR view, and is case sensitive.

TIME= specifies the timeframe in which the required process should be executing. Format of the TIME= parameter is "TIME=<from>-<thru>", where both <from> and <thru> are expressed as 24-hour hhmm values. See examples, below.

When required processes are checked, the current local time on the Linux system is compared against this time range.

SYS= Optionally specifies the Linux image's system name on which the attempt to locate the specified process will be made. If SYS= i not specified, the current Linux image is assumed.

PNAME= (optional) Specifies the entire 1024 byte command and parm field as a quoted string. If present, the entire command and parm field must match, not just the CNAME portion. The quoted string can be up to 1024 characters long, and may need to be continued on subsequent lines. The quoted string is continued by placing a comma immediately after the last quote in each line that needs to be continued. The Command and parms field is entered as displayed on hyperlinking on the Command field in PSLOVERR.

A comma can be placed after any parameter so the line can be continued.

Control card examples:

```
CNAME=ftpd TIME=0000-2359 SYS=LNX1PRD
CNAME=ftpd TIME=0000-2359
CNAME=inetd TIME=0000-2359
CNAME=inetd TIME=0000-2359
CNAME=inetd TIME=0000-2359
```

Examples using the ID/PNAME field:

```
CNAME=inetd TIME=0000-2359 pname="/usr/sbin/inetd /etc/inetd.conf"
CNAME=inetd TIME=0000-2359 pname="/usr",
"/sbin/inetd /etc/inetd.conf"
CNAME=inetd TIME=0000-2359 pname="/usr/sbin/inetd ",
"/etc/inetd.conf"
```

NOTE:  
====

Once this BBIPARM member has been modified, certain actions must be taken before the changes will become effective:

Before the changed BBIPARM member will be used by a PELSTATR view in MVLNX, the view must be invoked by typing "PELSTATR" on the primary command line and pressing the ENTER key. Just refreshing a PELSTATR view that had already been invoked by pressing the ENTER key (or using the ASU feature) will cause the version of the BBIPARM member that existed at the time the view was invoked to continue to be used.

Any alarms set using the PELSTATR view, must be disabled and enabled before any changes to this BBIPARM take effect.

## Monitoring File Systems

To help you monitor statistics for your file systems, such as storage allocation and i-node usage, MAINVIEW for Linux – Servers offers the file systems views. Table 3-5 lists the file systems views.

**Table 3-5 File Systems Views**

View	Description
FSLDIRNM	displays the full directory name for a file The full directory name can be up to 1024 bytes.
FSLFLNM	displays the full file name or directory for a file The full file name can be up to 1024 bytes.
FSLINFOR	displays a mounted file system This view includes the following information: <ul style="list-style-type: none"> <li>• mount point directory</li> <li>• type of file system</li> <li>• amount of space in the file system that is used</li> <li>• mount parameters</li> </ul>
FSLMNTR	displays mounted file systems usage and space usage statistics Use the FSLMNT view to monitor mounted file systems during a specified interval.
FSLMNTPTR	displays the full mount point for a file system
FSLSPACE	displays a detailed directory listing for a directory or a detailed file listing for a file
FSLBIG	lists the largest 50 files of the file system sorted by size This view is useful to identify file space usage problems.
FSLFOPN	displays the open files in a directory. These files have been opened by a process.
FLLIST	browse file contents
FLLISTH	browse file contents (hexidecimal format)

This section details some basic functions you can perform, useful information, and sample views from a few frequently used file system views. The following views are detailed in this section:

- FSLMNTR
- FSLSPACE

## File System Information for a Specific Linux System

Figure 3-7 shows the FSLMNTR view. The FSLMNTR view lets you view file system information about a specific Linux image. The view provides the following file system information:

- path name of the directory where the file system is mounted
- type of file system
- amount of the file system that is being used (percentage)

- total file system capacity (in kilobytes)
- free file system space (in kilobytes)
- used file system space (in kilobytes)
- amount of the file system that is being used by users excluding root (percentage)
- amount of the file system that is available to users, excluding root (in kilobytes)
- amount of the file system that is available to users for allocation (in kilobytes)
- size of the file system allocation unit (in blocks and kilobytes)
- total number of file system allocation units (in blocks)
- number of free file system allocation units (in blocks)
- number of i-nodes in use (percentage)
- total number of i-nodes
- number of free i-nodes
- number of i-nodes in use

**Figure 3-7 FSLMNTR View**

C	FileSysName (Mount Point)	Image	FSType	%Utilization
				0.....50...100
	/	JWAYGOOD	ext2	78
	/windows/E	JWAYGOOD	vfat	64
	/usr	JWAYGOOD	ext2	51
	/boot	JWAYGOOD	ext2	15

## Full File System Name

The Mounted File System Name field displays a portion of the full file system name. You can display the full name of the mounted file system by hyperlinking on the Mounted File System Name field.

## Detailed File Listing

The FSLSPACE view shows detailed directory information.

To display the FSLSPACE view, from the FSLMNTR view type **S** to the left of the File System Name that you want to view and press **Enter**.

The FSLSPACE view provides the following information:

- file or directory name
- type of file or directory
- unique serial number (or i-node) of the file or directory
- number of directories that point to the file or directory
- size of the file or directory (in bytes)
- size of the file (in blocks)
- user ID of the owner of the file (UID)
- group ID of the owner of the file (GID)
- file permissions
- time and date of the last modification to the file
- time and date of the last modification to the file attributes
- directory that contains the directory or file

**Figure 3-8 FSLSPACE View**

C	File or Dir Name	Type	File Ser Number	Number	Links	Size (bytes)	Size (blocks)	Block Size	Owner UserID	G
-	-----									
.		DIR	1	6		16384	1	32768	0	
..		DIR	1	5		4096	1	4096	0	
BackupData		DIR	125	2		32768	1	32768	0	
BackupJMW		DIR	118	2		32768	1	32768	0	
BackupMML		DIR	133	2		32768	1	32768	0	
BackupSrc		DIR	130	2		32768	1	32768	0	
Image.113		NORM	261	1		987.6Mi	31601	32768	0	
50.exe		NORM	260	1		1375956	42	32768	0	

From the FSLSPACE view, you can perform actions for a Linux file or directory. These actions are described in Table 3-6.

**Table 3-6 FSLSPACE Actions**

Action	Description
CM	change the permissions of a file
CO	change the ownership of a file
CP	copy a file
H	display the FLLISTH view to browse the files contents in hexadecimal format
MV	move or rename a file
O	show open files in a directory
RM	remove a file
S	(directory) drill-down to subdirectory (file) display the FLLIST view to show the first 100 KB contents of a file
T	display the FLLIST view to show the last 100 KB contents of a file

## Using User and Group Views

User and group views provide a series of views that summarize process data by a user or a group. Table 3-7 lists user and group views.

**Table 3-7 User and Group Views**

View	Description
GRLOVRZR	displays all the processes that are running on a selected image, summarized by real group name
USLINFOR	displays the user ID name and user ID (number) for each user with a process running on the monitored system This view shows the group ID name and group ID (number) for each user.
USLLOGNR	displays all users who are logged-on to a monitored Linux system
USLOVRZR	displays all processes that are running on a selected image, summarized by real user name

This section details some basic functions that you can perform, useful information, and sample views from a few frequently used user and group views. The following views are described in this section:

- GRLOVRZR
- USLOVRZR

## Process Statistics by Group Name

You can use GRLOVRZR to view resource usage for all users that are part of a group based on the processes that are running on their behalf. You can select a group name to see a list of processes running under that group name.

**Figure 3-9 GRLOVRZR View**

Real	#Processes	Image	Elapsed	%CPU	ResSize	I/O	R
Group Name	-----	-----	ProcTime	0.....50...100	(KB)	----	
root	68	JWAYGOOD	216:12:0	0.01	741		0

## Process Statistics by User Name

You can use USLOVRZR to view resource usage for users based on the processes that are running on each users' behalf. You can select a user name to see a list of processes running under that user name.

**Figure 3-10** USLOVERZ View

Real User Name	#Processes -----	Image -----	Elapsed ProcTime	%CPU 0.....50...100	ResSize (KB)	I/O R ----
root	46	JWAYGOOD	216:14:5	0.07	511	0
wwwrun	1	JWAYGOOD	216:14:0	0.00	1784	0
jwaygood	17	JWAYGOOD	216:13:3	0.00	1488	0
nobody	4	JWAYGOOD	216:14:2	0.00	32	0

# Viewing Configuration Information

The configuration views let you view configuration information. Table 3-8 lists these configuration views.

**Table 3-8 Configuration Views (Part 1 of 3)**

View	Description
CFLCOLLR	displays configuration information about the data collector and data server that are running on each Linux system This view is can be used to determine release levels of the product's components and data server initialization parameter settings.
CFLDCTRL	displays disk controllers attached to the system, and displays configuration information about each one The configuration information includes: <ul style="list-style-type: none"> <li>• controller name</li> <li>• controller type</li> <li>• parent name</li> </ul>
CFLDISKR	displays disk devices that are attached to the monitored Linux system, and displays the configuration information about each device This view includes the following information: <ul style="list-style-type: none"> <li>• disk model</li> <li>• disk type</li> <li>• disk size (in megabytes)</li> </ul>
CFLFSYSR	display kernel parameters that relate to the file system in the /proc/sys/fs directory of the monitored Linux system
CFLFLICM4R	displays values of system parameters that relate to the ICMP protocol in the /proc/sys/net/ipv4 directory of the monitored Linux system
CFLIFC4R	displays values of the system parameters contained in the /proc/sys/net/ipv4/conf directory of the monitored Linux image for each network interface In this view, <b>All</b> in the <b>Network Interface</b> field indicates that values in the other fields apply to all of the network interfaces. <b>Default</b> in the <b>Network Interface</b> field indicates that values in the other fields contain default values for all interfaces.
CFLIFC4AR	displays values of system parameters in the /proc/sys/net/ipv4/conf directory of the monitored Linux image for each network interface
CFLIPF4R	displays system parameters in the monitored Linux system's /proc/sys/net/ipv4 directory These parameters relate to IP protocol packet fragmentation.
CFLIP4R	displays general system parameter values in the /proc/sys/vm directory of the monitored Linux system These parameters relate to the kernel's management of virtual memory.

**Table 3-8 Configuration Views (Part 2 of 3)**

<b>View</b>	<b>Description</b>
CFLIP4AR	displays general system parameter values in the /proc/sys/vm directory of the monitored Linux system These parameters relate to the kernel's management of virtual memory.
CFLKERNLR	displays general system parameter values in the /proc/sys/kernel directory of the monitored Linux system
CFLNETCR	displays system parameter values in the /proc/sys/net/core directory of the monitored Linux system These parameters relate to the kernel's management of core network resources.
CFLNIFCR	displays network interfaces that are attached to the monitored Linux system and configuration information about each network interface This view displays the following information: <ul style="list-style-type: none"> <li>• monitored Linux system</li> <li>• interface name</li> <li>• interface type</li> <li>• parent name of the interface</li> </ul>
CFLNN4R	displays system parameter values in the /proc/sys/net/ipv4/neigh directory of the monitored Linux system In the <b>Network Interface</b> field, <b>Default</b> indicates default values for all network interfaces.
CFLPARTR	displays configured disk partitions on the monitored Linux system, and displays information about each disk partition This view displays the following disk partition information: <ul style="list-style-type: none"> <li>• partition name</li> <li>• monitored Linux image name</li> <li>• disk name</li> <li>• partition size (in blocks)</li> <li>• offset cylinder number from the beginning of the disk</li> </ul>
CFLPASR	displays configuration information about the active PAS that is monitoring the current context This view lets you determine release levels of the MAINVIEW for Linux – Servers components and PAS initialization parameter settings.
CFLRT4R	displays system parameter values in the /proc/sys/net/ipv4 directory of the monitored Linux image that are related to IP network routing
CFLSYSR	displays configuration of the system, including information about the processor, memory, time zone, and IP address
CFLTCP4R	displays system parameter values in the /proc/sys/net/ipv4 directory of the monitored Linux image that relate to the TCP protocol

**Table 3-8 Configuration Views (Part 3 of 3)**

<b>View</b>	<b>Description</b>
CFLVMEMR	displays system parameter values in the <code>/proc/sys/vm</code> directory of the monitored Linux image These parameters relate to the kernel management of virtual memory.
CONFIG	displays all of the parameter views You can select and delete the views that are listed on the CONFIG view.

This section details some basic functions you can perform, useful information, and sample views from a few frequently used configuration views. The following views are detailed in this section:

- CFLFSYSR
- CFLSYSR

## File System Configuration Information

The File System - System Parameters (CFLFSYSR) view (Figure 3-11), displays the system parameters in the `/proc/sys/fs` directory. The parameters displayed in the CFLFSYSR view relate to how the kernel manages the files in use by processes of the monitored Linux system.

**Figure 3-11** CFLFSYSR View

```
I Image      nr_dentry nr_unused age_limit want_pages nr_alloc nr_free dquot-max
-----
JWAYGOOD    163408   148573     45         0         0         0         0
```

## System Configuration Information

The System Configuration (CFLSYSR) view (Figure 3-12), displays the configuration of the monitored Linux systems. The CFLSYSR view lets you view configuration information, such as memory and processor configurations.

**Figure 3-12** CFLSYSR View

Image	Processor	Processor	Processor	Processor	CPUclock	Numbe
-----	Model	Vendor	ClockRate	Width	Ticks/Sec	Proce
JWAYGOOD	Pentium III	GenuineIntel	448	32	100	

# Displaying Network Statistics

The Network Statistics (NTLSTATR) view (Figure 3-13), displays network statistics for the monitored Linux system. The following statistics are displayed in the NTLSTATR view:

- network protocol or network interface name
- monitored Linux image name
- inbound transmission rate (packets per second and bytes per second)
- outbound transmission rate (packets per second and bytes per second)
- error rate (errors per second)
- average collision rate (per second)

**Figure 3-13 NTLSTATR View**

Protocol	Image	InBound (pkts/sec)	OutBound (pkts/sec)	InBound (bytes/sec)	OutBound (bytes/sec)	Errs/Sec	Colls
eth0	JWAYGOOD	3.82	1.88	301.05	2698.07	0.00	
lo	JWAYGOOD	0.00	0.00	0.00	0.00	0.00	
sit0	JWAYGOOD	0.00	0.00	0.00	0.00	0.00	
ICMPSTAT	JWAYGOOD	0.00	0.00	.....N/A	.....N/A	0.00	
IPSTAT	JWAYGOOD	2.58	1.88	.....N/A	.....N/A	0.00	
TCPSTAT	JWAYGOOD	1.47	1.88	.....N/A	.....N/A	0.00	
UDPSTAT	JWAYGOOD	0.72	0.00	.....N/A	.....N/A	0.00	

## Displaying Disk Statistics

The Device Statistics (DVLSTATR) view (Figure 3-14), displays the statistics for devices that are attached to the monitored Linux system. The following statistics are displayed in the DVLSTATR view:

- disk name
- monitored Linux image
- operations per second (average transfer rate)
- average queue lengths
- response time (seconds per operation)
- input/output rate (pages per second and kilobytes per second)
- blocks read per second
- blocks written per second
- paging device indication (indicates if a disk is a paging device)
- page size (in bytes)
- block size (in bytes)
- major device number
- minor device number

**Figure 3-14 DVLSTATR View**

DiskName	Image	XferRate	%Active	AvgQuLen	RespTime	I/
		(ops/sec)	0.....50...100	(secs/op) (page		
sda	JWAYGOOD	0.42	0.00	0.00	0.00	
sdb	JWAYGOOD	0.00	0.00	0.00	0.00	
sdc	JWAYGOOD	0.03	0.00	0.00	0.00	
hda	JWAYGOOD	0.00	0.00	0.00	0.00	

By hyperlinking on the **DiskName** field, you can display the VMLDEVR view that shows real-time VM device statistics.

# Displaying Syslog

The Syslog (FLLIST) view (Figure 3-15), displays the last 100 KB of the syslog file (/var/messages):

**Figure 3-15 FLLIST View**

```

**** *****
1 x -- MARK --
2 Oct 24 06:59:00 jmwlinux /USR/SBIN/CRON.23315.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
3 Oct 24 07:25:49 jmwlinux -- MARK --
4 Oct 24 07:45:49 jmwlinux -- MARK --
5 Oct 24 07:59:00 jmwlinux /USR/SBIN/CRON.23429.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
6 Oct 24 08:25:49 jmwlinux -- MARK --
7 Oct 24 08:45:49 jmwlinux -- MARK --
8 Oct 24 08:59:00 jmwlinux /USR/SBIN/CRON.23547.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
9 Oct 24 09:25:49 jmwlinux -- MARK --
10 Oct 24 09:45:49 jmwlinux -- MARK --
11 Oct 24 09:59:00 jmwlinux /USR/SBIN/CRON.23663.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
12 Oct 24 10:25:49 jmwlinux -- MARK --
13 Oct 24 10:45:49 jmwlinux -- MARK --
14 Oct 24 10:59:00 jmwlinux /USR/SBIN/CRON.23779.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
15 Oct 24 11:25:49 jmwlinux -- MARK --
16 Oct 24 11:45:49 jmwlinux -- MARK --
17 Oct 24 11:59:00 jmwlinux /USR/SBIN/CRON.23893.: (root) CMD ( rm -f /var/
. spool/cron/lastrun/cron.hourly)
18 Oct 24 12:25:49 jmwlinux -- MARK --
19 Oct 24 12:45:49 jmwlinux -- MARK --

```

# Viewing z/VM System Data

The z/VM System views let you view the performance of your z/VM systems. Table 3-9 lists these z/VM system views.

**Table 3-9 Virtual Machine Views (Part 1 of 2)**

View	Description
VMLSYSR	displays general z/VM system performance data
VMLCPUR	displays z/VM CPU statistics The statistics are presented based on a logical point of view. They take into account the actual time allotted to the CPU.
VMLPRVR	displays privileged operations information
VMLSTRR	displays z/VM storage statistics

**Table 3-9 Virtual Machine Views (Part 2 of 2)**

<b>View</b>	<b>Description</b>
VMLOVRZR	displays the status, matched rule, and host name of each z/VM system image being monitored by the PAS, which owns the current context  Data for this view comes from heartbeat data which is sent every heartbeat interval from each z/VM system to the PAS. No requests for data are transmitted over the network when this view is invoked or refreshed.  Use the VMLOVRZR view to quickly obtain status information about all the z/VM systems being monitored.
VMLDEVR	displays z/VM device statistics
VMLCPOR	displays z/VM paging and spooling statistics
VMLUSRR	displays z/VM user information
VMLLUSRR	displays z/VM user information for Linux virtual machines
VMLMPUR	displays z/VM virtual MP user resource usage
VMLVDEVR	displays z/VM minidisk information and statistics

## z/VM User Resource Information

The z/VM User Resource Usage (VMLUSRR) view (Figure 3-16), displays z/VM user information and statistics.

**Figure 3-16 VMLUSRR View**

CMD	VMUserid	VMSysSystem	%CPU	%Sup	%Emul	NonSpool	DASDpgrt	Proj
-----			0.....50...100	-----	-----	IO/sec	Pgs/sec	(pa
LNX5SUS	SYSLBMC		2.42	0.06	2.37	8.0	0.0	9
LNX12SUS	SYSLBMC		2.38	0.09	2.29	4.1	0.0	13
LNXBSUS	SYSLBMC		1.60	0.08	1.52	2.4	0.0	3
LNX5RH	SYSLBMC		1.39	0.07	1.32	2.1	0.0	
LNX10RH	SYSLBMC		1.35	0.07	1.28	2.3	0.0	
LNX1RH	SYSLBMC		1.35	0.08	1.27	2.4	0.0	2
LNX3RH	SYSLBMC		1.32	0.07	1.25	2.0	0.0	1
LNX8RH	SYSLBMC		1.32	0.07	1.25	1.4	0.0	2
LNX7RH	SYSLBMC		1.32	0.07	1.25	1.5	0.0	1
MMLVSRV4	SYSLBMC		1.08	0.02	1.06	0.0	0.0	
SUSE	SYSLBMC		0.94	0.09	0.85	5.7	0.0	2
LNXGSUS	SYSLBMC		0.87	0.13	0.74	19.5	0.0	5

From the VMLUSRR view, you can perform two actions to a virtual machine. These actions are described in Table 3-10.

**Table 3-10 VMLUSRR Actions**

Action	Description
FRC	log off the virtual machine
SHR	change the priority of computing resources for the virtual machine

## z/VM System Overview Information

Use the VMLOVRZR (Figure 3-17) view to quickly obtain status information about all the z/VM systems being monitored.

**Figure 3-17 VMLOVRZR View**

VMSystem	Status	%CPU	%Storage	#Linux	#Users
-----	-----	0.....50...100	0.....50...100	-----	-----
SYSCBMC	Running	83.00 ██████████	77.0 ██████████	1	128
SYSLBMC	Inactive	0.00	0.00	0	0

### Heartbeat Data

Data for the VMLOVRZR view comes from heartbeat data that is sent every heartbeat interval from each z/VM system to the PAS. For more information about heartbeat data, see “Heartbeat Data” on page 1-5.

You can use the VMLOVRZR view to quickly obtain status information about all the z/VM systems being monitored.

## Exiting from MAINVIEW for Linux – Servers

When you are finished working with MAINVIEW for Linux – Servers, return to the MAINVIEW Selection Menu by typing one of the following commands on the COMMAND line:

- Quit [DISConnect]
- RETURN



---

# Chapter 4 Using Rules and Images

MAINVIEW for Linux – Servers monitor rules lets you customize the environment that you are monitoring.

This chapter discusses the following topics:

Overview . . . . .	4-2
Rule Parameters . . . . .	4-3
Wildcard Characters . . . . .	4-6
Editing an Existing Rule . . . . .	4-7
Adding a New Rule . . . . .	4-8
Deleting an Existing Rule . . . . .	4-9
Viewing Detailed Rule Information . . . . .	4-10
Viewing Errors . . . . .	4-11

## Overview

Monitor rules determine how the data is collected from a monitored Linux or z/VM system. You can add, delete, and change rules. MAINVIEW for Linux – Servers searches the rules when the PAS discovers a Linux system to be monitored.

When MAINVIEW for Linux – Servers is monitoring a Linux system, the monitored system is called an image. These monitored Linux system names can be many characters. MAINVIEW for Linux – Servers requires an image name that is up to eight characters in length. Unique image names let you identify remote Linux systems quickly.

You can add, edit, and delete rules using the ADLRULER view (Figure 4-1).

**Figure 4-1 ADLRULER View**

CMD	Image	Monitor	HeartBeat	Reply	Backgrnd	Demand	Min	Demand	VM	Rdev	His		
---	Pattern	(Y/N)	Interval	TimeOut	Samp	Int	Samp	Int	Mode	Dur	Min	I/O	Sta
	\$DEFAULT	Yes	60	20	60	10	300	100	00:				
	JACTST	Yes	60	20	60	10	300	10	00:				
	JMWD2TL	Yes	60	20	60	10	300	8	00:				
	JMWLINUX	Yes	60	20	60	10	300	100	00:				
	JWAYGOOD	Yes	60	60	60	10	300	8	00:				
	LNK5SUS	Yes	60	20	60	10	300	100	00:				
	LWDLINUX	Yes	55	45	55	15	300	100	00:				
	SUSE	Yes	60	20	60	10	300	0	00:				
	SYSCBMC	Yes	60	20	60	10	300	100	00:				
	SYSLBMC	Yes	60	20	60	10	300	100	00:				

Table 4-1 on page 4-3 describes the monitor rules that apply to the Linux systems, where the names start with the characters *JMW* (as shown in Figure 4-1).

**Table 4-1 Description of Monitor Rule Example**

Field	Value	Description
Image Pattern	JMW*	indicates that all of the Linux systems having image names beginning with the characters JMW will be monitored according to the parameter values in this rule
Monitor	Yes	indicates these Linux systems are to be monitored
Heartbeat Interval	60	indicates the heartbeat interval is set to 60 seconds
Reply TimeOut	30	indicates the reply time-out is 30 seconds
Backgrnd Samp Int	60	indicates the background sampling interval is set to 60 seconds
Demand Samp Int	10	indicates the demand sampling interval is set to 10 seconds
Min Demand Mode Dur	150	indicates a 150 second minimum demand mode duration
History Start	06:00:00	indicates the time of day to start collecting historical data on the managed systems

## Rule Parameters

You are able to set rule parameters in the ADLRULER and ADLRULDR views. These parameters are described in Table 4-2.

**Table 4-2 Rule Parameters (Part 1 of 4)**

Parameter	Value	Default	Description
Image Pattern	8-character string	N/A	specifies the rule The Image Pattern field is used by the product to apply monitoring parameters to monitored systems. This field accepts wildcard characters. For more information, see "Wildcard Characters" on page 4-6.
Monitor	YES NO	Yes	specifies whether you want to monitor systems identified by the Image Pattern field For example, if the Image Pattern equals TEST* and Monitor equals No, all systems with MAINVIEW image names that begin with the string TEST are not monitored.

**Table 4-2 Rule Parameters (Part 2 of 4)**

Parameter	Value	Default	Description
Heartbeat Interval	0 30–3600	60	specifies how often, in seconds, the monitored system should send its heartbeat status and data to the PAS The value 0 disables sending heartbeat data.
Reply Timeout	1–300	20	specifies the amount of time, in seconds, the PAS should wait for a reply from the monitored system for a data request If time-outs occur in views when you request large amounts of data, you may want to increase this value.
Background Sampling Interval	0 30–3600	60	specifies the interval length, in seconds, of background sampling This value specifies the maximum age of data that can be retrieved. Background mode sampling ensures that data is always available when requested. The value of 0 is allowed only if the Heartbeat Interval is 0; otherwise, the Background Sampling Interval must range from 30 to 3600. Lower values increase overhead on the Linux system because sampling occurs more frequently than higher values.
Demand Sampling Interval	10–3600	10	specifies the interval length, in seconds, of demand sampling This value specifies the maximum age of data that can be retrieved when the system is being actively monitored (demand mode) or when requests for data are issued during the Minimum Demand Mode Duration. Demand Sampling ensures that data is up to date when it is requested. Lower values increase overhead on the Linux system because sampling occurs more frequently.
Minimum Demand Mode Duration	10–1800 (must be greater than or equal to 2× Demand Sampling Interval)	300	specifies the minimum amount of time, in seconds, that demand sampling stays active Higher values increase overhead on the Linux system because demand sampling remains active longer than with lower values.
VM Real Device Minimum I/O Requests		100	specifies the minimum number of I/O requests that have been issued by a z/VM system to a real device during a CP Monitor sampling interval (typically one minute)

**Table 4-2 Rule Parameters (Part 3 of 4)**

<b>Parameter</b>	<b>Value</b>	<b>Default</b>	<b>Description</b>
History Start	00.00.00– 23.59.00	00.00.00	specifies the time of day to start collecting historical data
History End	00.59.00– 23.59.59	23.59.59	specifies the time of day to stop collecting historical data
VM History	YES NO	YES	indicates whether or not you want to collect z/VM system historical data for systems identified by the Image Pattern field
Configuration History	YES NO	YES	indicates whether or not you want to collect configuration-related historical data for systems identified by the Image Pattern field
File System History	YES NO	YES	indicates whether or not you want to collect file system-related historical data for systems identified by the Image Pattern field
Kernel History	YES NO	YES	indicates whether or not you want to collect kernel-related historical data for systems identified by the Image Pattern field
IPC History	YES NO	YES	indicates whether or not you want to collect IPC-related historical data for systems identified by the Image Pattern field
Device History	YES NO	YES	indicates whether or not you want to collect device-related historical data for systems identified by the Image Pattern field
Network History	YES NO	YES	indicates whether or not you want to collect network-related historical data for systems identified by the Image Pattern field
Process History	YES NO	YES	indicates whether or not you want to collect process-related historical data for systems identified by the Image Pattern field

**Table 4-2 Rule Parameters (Part 4 of 4)**

Parameter	Value	Default	Description
User History	YES NO	YES	indicates whether or not you want to collect user-related historical data for systems identified by the Image Pattern field
Virtual Device History	YES NO	NO	indicates whether or not you want to collect virtual device history for Linux systems identified by the Image Pattern field, which run on z/VM  <b>Note:</b> Be careful when specifying Yes for this field, because it is possible that there are many virtual devices for each Linux image identified by the Image Pattern field. Normally, this field should be No.

## Wildcard Characters

MAINVIEW for Linux – Servers lets you use wildcard characters in the Image Pattern field to identify a group of similarly named Linux systems. The Image Pattern field specifies the Linux images to which the monitor rule applies. The wildcard characters let you specify one or several images per rule. Table 4-3 lists wildcard characters that are accepted by MAINVIEW for Linux – Servers.

**Table 4-3 Wildcard Characters**

Character	Description
*	represents an unlimited number of characters in a string For example, J*Y could represent <i>JAY, JABY, JABCDEFGHIY</i> .
?	represents one character in a string For example, J?Y could represent <i>JAY, JBY, JCY</i> .

## Switching Modes

The default mode for the ADLRULER view is Browse mode. Browse mode does not let you make any changes to the rules. Before you add a new rule, edit an existing rule, or delete an existing rule, you must switch from Browse mode to Edit mode.

To switch to Edit mode, complete the following steps:

- Step 1** From the ADLRULER view (Figure 4-1 on page 4-2), type **EDIT** on the COMMAND line to switch to Edit mode.
- Step 2** Press **Enter**.
- Step 3** 00 EDIT MOD (Figure 4-2) is displayed in the window information line. You are now in Edit mode.

**Figure 4-2 EDIT Mode**

```
>W1 =ADLRULER=====JMWLINUX=*===== (00 EDIT          )=====MVLNX====D====5
CMD Image      Monitor HeartBeat   Reply Backgrnd   Demand Min Demand History Hi
--- Pattern   (Y/N)      Interval TimeOut Samp Int Samp Int   Mode Dur Start  En
$DEFAULT Yes          60      20      60      10      300 00:00:00 23
JMW* Yes          60      30      60      10      150 06:00:00 18
```

## Editing an Existing Rule

To edit an existing rule, complete the following steps:

- Step 1** From the ADLRULER view (Figure 4-1 on page 4-2), verify that you are in Edit mode (see “Switching Modes” on page 4-6).
- Step 2** Change the desired parameters in the rules that you want to modify.
- Step 3** Choose one of the following options:
- To save the changes to the rule and continue creating new rules or making changes to existing rules, type **SAVE** on the COMMAND line and press **Enter**.
  - To save the changes to the rules and return to the previous view, press **F3**.
  - To return to the Browse mode. To cancel the changes, type **CANCEL** on the COMMAND line and press **Enter**.

**Note:** You are not able to edit the Image Pattern field (to which you are applying the rule). To change the Image Pattern field, delete the existing rule (see “Deleting an Existing Rule” on page 4-9), and add a new rule with the desired image patterns (see “Adding a New Rule” on page 4-8).

**Note:** The \$DEFAULT rule cannot be edited or deleted.

## Adding a New Rule

Adding rules lets you apply specific monitoring behavior to groups of images or to a particular image. For example, if you did not want to monitor your test servers at all, you could set up a rule to exclude collecting the test server statistics. However, if you had a group of similarly named images that you wanted to monitor more closely than your other images, you could set your heartbeat interval lower than the default.

To add a new rule, complete the following steps:

- Step 1** From the ADLRULER view (Figure 4-1 on page 4-2), verify that you are in Edit mode (see “Switching Modes” on page 4-6).
- Step 2** Type **A** in the Line Command field next to an existing rule.
- Step 3** Type the name of the image pattern of the new rule in the Image Pattern field.
- Tip:** You can use wildcard characters to monitor several similarly-named Linux images. For more information about wildcard characters, see “Wildcard Characters” on page 4-6.
- Step 4** Press **Enter**.
- Step 5** Change the parameters according to how you want the new rule to monitor the images you specified in Step 3.
- Step 6** Choose one of the following options:
- To save the new rule that you just created and to continue creating new rules or making changes to existing rules, type **SAVE** on the **COMMAND** line and press **Enter**.
  - To save the new rule and return to the previous view, press **F3**.
  - To cancel saving the new rule, type **CANCEL** on the **COMMAND** line and press **Enter**.

## Deleting an Existing Rule

To delete an existing rule, complete the following steps:

- Step 1** From the ADLRULER view (shown in Figure 4-1 on page 4-2), verify that you are in Edit mode (see “Switching Modes” on page 4-6).
- Step 2** Type **DEL** in the Line Command field next to the rule you want to delete.
- Step 3** Press **Enter**. This will delete the existing rule.
- Step 4** Choose one of the following options:
- To delete the rule and continue creating new rules or making changes to existing rules, type **SAVE** on the COMMAND line and press **Enter**.
  - To delete the rule(s) and return to the previous view, press **F3**.
  - To cancel and avoid permanently deleting the rule(s), type **CANCEL** on the COMMAND line and press **Enter**.

**Note:** The \$DEFAULT rule cannot be edited or deleted.

## Viewing Detailed Rule Information

You can view detailed information on a specific rule by selecting the Image Pattern field from the ADLRULER view. By typing ADLRULDR on the COMMAND line from any view, you can display the detailed view (ADLRULDR) for the default rule, shown in Figure 4-3.

You can also view detailed rule information for a specific image pattern by typing ADLRULDR *image pattern* on the COMMAND line.

**Figure 4-3** ADLRULDR View

```
Image Pattern..... $DEFAULT
Monitor(Y/N)..... Yes

Heartbeat Interval..... 60
Reply Timeout..... 20
Background-mode Sampling Interval
Demand-mode Sampling Interval.... 10
Minimum Demand-mode Duration..... 300
VM Rdev Min I/O..... 100
History Start..... 00:00:00
History End..... 23:59:59
VM Hist..... Yes
Config Hist..... Yes
FileSys Hist..... Yes
Kernel Hist..... Yes
IPC Hist..... Yes
Device Hist..... Yes
Network Hist..... Yes
```

# Viewing Errors

If you are adding a new rule, editing an existing rule, or deleting an existing rule from the ADLRULER view, and you encounter an error (Figure 4-4), complete the following steps to view the reason for the error:

**Step 1** Place the cursor on the **ERR** and press **Enter**.

**Figure 4-4 ADLRULER View Error**

?*	Yes	60	10	60	10	300
ERR JAY*	Yes	60	10	60	10	300
JMW*	Yes	60	20	60	10	300
K*	Yes	60	20	60	10	300

**Step 2** The description of the error is displayed. An example of an error description is shown in Figure 4-5.

**Figure 4-5 ADLRULER View Error Description**

```
BBMXCB36I Action IRREHBIN completed with return code: 8
-Related:BBMXCB35I For: IRRETARG = JAY*
-Related:BBMXCB37I At: 12:41:11 on DDMMYYYY
--Related:MMLI2008I 01 invalid; must be 0, or between 30 and 3600
```

**Step 3** To clear the error, press **Enter** *twice*.



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# Chapter 5    Displaying Historical Data

This chapter provides information about the historical data feature. Historical data lets you look at system data as it existed an hour ago, yesterday, last week, last month, or last year.

**Note:** For instructions on how to generate historical performance reports, see *Using MAINVIEW*.

This chapter contains the following sections:

Overview . . . . .	5-2
Data Availability . . . . .	5-2
Linux Data Servers and VM Data Servers . . . . .	5-2
MAINVIEW for Linux – Servers Product Address Space (PAS) . . .	5-3
MAINVIEW Display . . . . .	5-3
TIME Command . . . . .	5-4

## Overview

Historical data lets you recreate the operating environment as it existed during a previous time frame so that you can compare the current performance with a previous performance. This comparison lets you determine whether your system is working normally or whether there is a problem.

Historical data consists of your data from a specified recent interval and its preceding intervals. Using the `TIME` command, you can specify intervals from any time frame for which data exists on your system. You can also use certain fields to determine when the data was collected and to hyperlink to a particular time frame.

## Data Availability

When you need historical data, you must ensure that the data is available in one of the historical data sets that has been allocated.

To determine whether data has been recorded to historical data sets, and to view a list of allocated historical data sets, type `DSL` on the `COMMAND` line. The `DSL` view is displayed.

Each of the following components are used to collect and display history data:

- Linux data servers
- VM data servers
- MAINVIEW for Linux – Servers Product Address Space (PAS)
- MAINVIEW Display

## Linux Data Servers and VM Data Servers

The Background Sampling Mode Interval controls how often the data server requests the collection software for data samples. The Background Sampling Mode Interval (default= 1 minute) is set in the Monitor Rules. For more information on the Background Sampling Mode Interval and Monitor Rules, see Chapter 4, “Using Rules and Images.”

## MAINVIEW for Linux – Servers Product Address Space (PAS)

The PAS receives the incoming data samples from the Linux and VM data servers and summarizes the data samples with the records in the current interval data record buffers.

Numeric data is averaged using the number of samples received for the current interval.

The PAS Interval Recorder has its own interval which is specified in the BBPARM member MMLTIR00, using the keyword INTVAL=. For more information on how to specify this interval, see the *MAINVIEW for Linux – Servers Customization Guide*. At the end of every interval, Interval Recorder writes the current interval record data buffers to one of the VSAM history data sets. These history data sets were allocated during the PAS customization. For more information on the history data sets allocation, see the *MAINVIEW for Linux – Servers Customization Guide*.

The INTVAL= value determines when data is written to the history data set, which controls the granularity of the data. Smaller values for Background Mode Sampling Interval and the INTVAL= value increase collection overhead, but yield more accurate data. Higher values smooth out the peaks and valleys of the data samples, but it decreases the collection overhead.

## MAINVIEW Display

Historical data views have the following two fields at the end of every row:

- **Last Sample Time** field
- **Last Sample Date** field

These fields are specific to MAINVIEW for Linux – Servers (see “Linux Data Servers and VM Data Servers” on page 5-2). The date and time values are local to the Linux or z/VM system where the data server is running. It is provided so that you can accurately determine when the data was sampled, because the Linux or z/VM system could be in a time zone different from the PAS or there could be some network delay of the sample data flowing to the PAS.

If the INCLUDE DATE and INCLUDE TIME commands have been issued, MAINVIEW also displays the following fields:

- **PAS Interval Date** field
- **PAS Interval Time** field

These fields specify when the Interval Recorder interval ended in the PAS. This date and time are local to the system where the PAS is running.

## TIME Command

You can use the TIME command to specify the intervals of historical data that you want to display. The TIME command lets you display data as it existed at the end of one interval. To see data that spans a greater time frame, use the TIME duration parameter with the date and time parameters.

For detailed information about using the TIME command, the syntax of the command, and examples of different uses of the TIME command, see *Using MAINVIEW*.

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# Chapter 6    **MAINVIEW Alarm Manager**

MAINVIEW Alarm Manager works with MAINVIEW for Linux – Servers, and other MAINVIEW products, to provide alarms. These alarms display messages that can alert you when specified thresholds are exceeded. |

MAINVIEW Alarm Manager is capable of monitoring multiple systems simultaneously. This means that MAINVIEW Alarm Manager installed on one system keeps track of your entire enterprise.

This chapter discusses the following topics:

MAINVIEW for Linux – Servers Sample Alarms . . . . .	6-2
Alarm Definitions . . . . .	6-2
More Information . . . . .	6-3

# MAINVIEW for Linux – Servers Sample Alarms

MAINVIEW for Linux – Servers contains a number of sample alarms that you can customize to meet your specific monitoring needs. Table 6-1 lists MAINVIEW for Linux – Servers sample alarms.

**Table 6-1** MAINVIEW for Linux – Servers Sample Alarms

Alarm	Description
AVGCPU	current number of processes has exceeded a specified percentage of the maximum allowable CPU space on the system
AVGSWP	swap space usage has exceeded a specified percentage
FILTBL	kernel file table usage has exceeded a specified percentage
FSYSIN	file system I-Node usage has exceed a specified percentage of the maximum allowable I-Node space
FILSYSUT	file system space usage is greater than a specified amount
INOTBL	Kernel I-node table has exceeded a specified percentage
PRCCPU	a process has exceeded a specified percentage of CPU usage
PRCTBLE	Kernel Process table usage has exceeded a specified percentage
REQDPRCS	a required process or processes are not running <sup>a</sup>
AVGVMCPU	overall z/VM system usage has exceeded a specified threshold
AVGVMXST	z/VM expanded storage utilization has exceeded a specified threshold
AVGCPUVM	an individual virtual machine has exceeded a specified percentage of CPU space
AVGPGWVM	an individual virtual machine waiting for paging operations to complete has exceeded a specified percentage
AVGPGRVM	an individual virtual machine is performing more paging operations per second than a specified percentage

<sup>a</sup> These required processes must be identified in BBPARAM(MMLTSRP0) prior to using this alarm.

## Alarm Definitions

Alarm definitions consist of the following parameters:

- threshold and filter criteria
- view, product, and context for which the criteria are established
- message IDs and message text
- monitoring frequency and time periods

- hyperlinks to views, extended help or AutoOPERATOR commands

**Note:** Sample alarm definitions are shipped with **CONTEXT=SAMPCTXT**. For the samples to work on your system, change **CONTEXT=VALUE**, where **VALUE** is variable for a value that is valid at your site.

Alarm definitions are stored in a parameter library member that is read by MAINVIEW Alarm Manager at MVALARM PAS initialization.

Threshold conditions are defined as one of the following priority levels:

- Informational
- Warning
- Minor
- Major
- Critical

## More Information

For more information about MAINVIEW Alarm Manager, see the *MAINVIEW Alarm Manager User Guide*.



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# Appendix A BMC Software's VM Monitor Reader Messages

This chapter provides information about the messages that are issued by BMC Software's VM Monitor Reader.

This chapter contains the following sections:

Interpreting Messages . . . . .	A-1
Message Format . . . . .	A-2
Message Identifiers . . . . .	A-2
Message Levels . . . . .	A-3
Description Format . . . . .	A-3
Contacting BMC Software Customer Support . . . . .	A-3
BMC Software's VM Monitor Reader Messages . . . . .	A-5

## Interpreting Messages

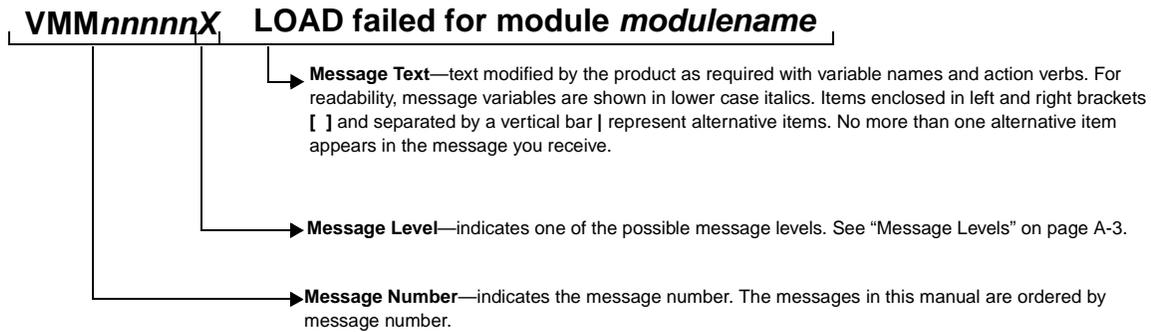
This section provides general information about the messages that are issued by BMC Software's VM Monitor Reader. This section describes the following items:

- parts of a message
- description format
- message levels
- information that you should have available when contacting BMC Software Customer Support

# Message Format

Figure 1-1 describes the parts of a message.

**Figure 1-1** Parts of a Message



Message text that is italicized and in lowercase characters (*example*) indicates variable text that will be determined when the message is issued.

Message text that is enclosed in left and right brackets and is separated by vertical lines ([ON | OFF]) indicates actual values, one of which will be included at that point in the message.

## Message Identifiers

All VM Monitor Reader messages consist of a message identifier and message text of the following format:

**VMMnnnnnX Message Text**

Table 1-1 describes the message identifiers.

**Table 1-1** Message Identifiers

Field	Description
VMM	The prefix identifies the owner of the message. VMM is for the BMC Software VM Monitor Reader.
nnnnn	This two-digit to five-digit number identifies the message.
X	This identifier is the severity code. The severity code indicates the amount of action required by the user and the nature of the message. For an explanation of the severity codes, see Table 1-2.

## Message Levels

A severity code indicates the nature of the message and the amount of action that is required by the user. Table 1-2 describes the levels of message severity.

**Table 1-2 Message Severity Codes**

Code	Description
E (error)	The function that you requested was not completed, because an error occurred.
I (information)	Information only. No action is required.
S (severe)	A severe error occurred.
W (warning)	The system is still operating and no immediate action is required. When time is available, further investigation may be needed.

## Description Format

The following information is provided for each message:

- *Explanation* explains why the product issued the message.
- *System Action* explains the product action as a result of encountering the situation.
- *User Response* explains the action that you should perform in this situation.

The text that is associated with each message is a short phrase or sentence describing a condition that has occurred or that requests a user response. For example:

```
VMMRCL9400E Invalid field request in input parameters.
```

## Contacting BMC Software Customer Support

Some message descriptions instruct you to contact your BMC Software customer support representative. The customer support representative can help you resolve the problem quickly if you can answer the following questions before calling:

- What kind of problem do you have?

- Can you repeat the problem or preceding conditions?
- Do you have supporting dumps or other diagnostic information?
- What has changed in your environment:
  - Have you recently installed a new product on your system?
  - Have you recently modified an application program?
  - Have you recently installed a BMC Software product or product maintenance tape?

# BMC Software's VM Monitor Reader Messages

BMC Software's VM Monitor Reader messages are displayed on the VMMAVMSR console. The message information includes an explanation of the message, the system action, and the suggested user response. Some of the messages will appear in the **VMMLOG** *yyyymmdd* file on the LOG minidisk. See the VMMAVMSR config file or the BMCINSTL Configuration screen for BMC Software's VM Monitor Reader.

## **VMMRCL9400E**      **Invalid field request in input parameters.**

*Explanation:*      For GETREC, you can only request either all whole records or all specific fields. This indicates there is a record request mixed with a field request.

*System Action:*    The request is rejected.

*User Response:*    Request only whole records or specific fields.

## **VMMRCL9401E**      **Error building VMMACM control block.**

*Explanation:*      An internal error has occurred in the Server Client program building the VMMACM control block. Message VMMRCL9402E identifies the nature of the error.

*System Action:*    The Server Client program terminates.

*User Response:*    Report this message and message VMMRCL9402E to BMC Software support personnel.

## **VMMRCL9402E**      **Error\_text**

*Explanation:*      The Server Client program has encountered an error described by error\_text building the VMMACM control block. This message is accompanied by VMMRCL9401E.

*System Action:*    The Server Client program terminates.

*User Response:*    None.

## **VMMRCL9403E**      **File: fn ft fm not found.**

*Explanation:*      The VMMVMCL FILE function could not locate the file fn ft fm on an accessed minidisk.

*System Action:*    The VMMVMCL FILE command terminates.

*User Response:*    Ensure that the file fn ft fm is available on an accessed minidisk or that it is not misspelled and re-issue the VMMVMCL FILE command.

**VMMRCL9404E**

**Error reading file: fn ft fm.**

*Explanation:* The VMMVMCL FILE function could not read the file fn ft fm with EXECIO.

*System Action:* The VMMVMCL FILE command terminates.

*User Response:* Ensure that the file fn ft fm is available on an accessed minidisk and does not contain errors, then re-issue the VMMVMCL FILE command.

**VMMRCL9405E**

**Rule command syntax error on line: lineno of fn ft fm.**

*Explanation:* The file fn ft fm contains a syntax error in the rule command located on line lineno.

*System Action:* The VMMRULE FILE command terminates.

*User Response:* Edit fn ft fm to correct the syntax error and re-issue the VMMRULE FILE command.

**VMMRCL9406I**

**Connection to server established.**

*Explanation:* The Server Client program has established an interactive session with the Server named server.

*System Action:* None.

*User Response:* None.

**VMMRCL9407I**

**VMMVMCL Interactive Mode entered.**

*Explanation:* The Server Client program has established an interactive

*System Action:* None.

*User Response:* You may now enter interactive Rules Server commands.

**VMMRCL9408I**

**Enter a valid command.**

*Explanation:* The interactive mode of the Client program is prompting you to input a Server command.

*System Action:* None.

*User Response:* Enter an interactive Server command or enter QUIT to terminate the interactive session.

**VMMRCL9409E****Command syntax error, command ignored.**

*Explanation:* The interactive Server command contained a syntax error.

*System Action:* The command is ignored.

*User Response:* Correct the syntax error and issue the interactive command again.

**VMMRCL9410I****VMMVMCL Interactive Mode ended.**

*Explanation:* The Server Client program has terminated the interactive session with the Server.

*System Action:* None.

*User Response:* None.

**VMMRCL9411E****Unable to connect to server.**

*Explanation:* The Client program was unable to establish an APPC/VM connection to the Server APPC resource server.

*System Action:* The VMMVMCL command terminates.

*User Response:* Attempt the command again. If the problem persists, notify your system support personnel.

**VMMRCL9412E****Unable to set APPC Conversation Security.**

*Explanation:* The Client program was unable to set APPC conversation security using XCSCST.

*System Action:* The VMMVMCL command terminates.

*User Response:* Attempt the command again. If the problem persists, notify your system support personnel.

**VMMRCL9413E****Unable to set APPC Conversation Type.**

*Explanation:* The Client program was unable to set APPC conversation type using CMSCT.

*System Action:* The VMMVMCL command terminates.

*User Response:* Attempt the command again. If the problem persists, notify your system support personnel.

**VMMRCL9414E      Unable to set APPC Send Type.**

*Explanation:*      The Client program was unable to set APPC send type using CMSST.

*System Action:*    The VMMVMCL command terminates.

*User Response:*    Attempt the command again. If the problem persists, notify your system support personnel.

**VMMRCL9415E      Unable to send request to server.**

*Explanation:*      The Client program was unable send the command to server using CMSEND.

*System Action:*    The VMMVMCL command terminates.

*User Response:*    Attempt the command again. If the problem persists, notify your system support personnel.

**VMMRCL9416I      Request cancelled by server.**

*Explanation:*      The command has been cancelled by server.

*System Action:*    The VMMVMCL command terminates.

*User Response:*    Re-issue the VMMVMCL command again. If the problem persists, notify your system support personnel to determine why the Server is cancelling the request.

**VMMRCL9417E      CPIC Error on function, return code is rc.**

*Explanation:*      The Client program has encountered an error executing the CPIC function. The return code is rc.

*System Action:*    The VMMVMCL command terminates.

*User Response:*    Re-issue the VMMVMCL command again. If the problem persists, notify your system support personnel to determine why the Server is cancelling the request.

**VMMRCL9418I      Function completed successfully.**

*Explanation:*      The Client command you entered, function, has completed successfully.

*System Action:*    None.

*User Response:*    None.

**VMMRCL9419E****Function completed unsuccessfully, return code is rc.**

*Explanation:* The Client command you entered, function, has completed unsuccessfully. The return code is rc.

*System Action:* The function is not performed.

*User Response:* This message is always accompanied by another messages explaining the nature of the error. Examine the accompanying message for an explanation of the error.

**VMMRCL9420E****Invalid record id monitor-record-id**

*Explanation:* The Client program, VMMVMCL, is processing the GETREC request and has encountered an invalid record id on the command line.

*System Action:* The request is rejected.

*User Response:* Re-issue the command with a valid monitor record id.

**VMMRCL9421I****Processing keyword userid vdev fn ft compress\_action**

*Explanation:* The Client program, VMMVMCL, is processing the request identified by keyword userid vdev fn ft compress\_action.

*System Action:* The request is sent to the Server for processing.

*User Response:* None.

**VMMRCL9422E****Error writing file: fn ft fm, return code is rc.**

*Explanation:* The VMMVMCL command encountered an error writing results to the file fn ft fm. The return code is rc.

*System Action:* The VMMVMCL command terminates. The file fn ft fm may contain partial information.

*User Response:* The return code rc is for EXECIO DISKW. Use HELP EXECIO to determine the cause of the error.

**VMMRCL9423E****Message Repository and/or DLCS file(s) unavailable.**

*Explanation:* The files which are necessary for the Client program are not available on an accessed minidisk. These files are VMMUME TXTnnnnn, VMMUPA TXTnnnnn, and VMMUSY TXTnnnnn.

*System Action:* Client program terminates.

*User Response:* Notify your system support personnel of the problem.

**VMMRCL9424I Internal logic error.**

*Explanation:* An internal error has occurred in the Client program.

*System Action:* The Client program terminates.

*User Response:* Notify BMC Support personnel of the problem.

**VMMRCL9425E Multiple record request is invalid.**

*Explanation:* The GETREC parsing routine has detected an error. The input parameters must be a single record request or field format request. This indicates there is more than one record request.

*System Action:* The GETREC request is rejected.

*User Response:* Correct the parameters and re-submit.

**VMMRCL9426I VMMVMCL FILE command terminated.**

*Explanation:* The Client program FILE function has terminated due to an error. The error is reported in message VMMRCL9405E.

*System Action:* The Client program terminates.

*User Response:* Examine the error reported in message VMMRCL9405E.

**VMMRCL9427W Unable to resolve message from the Server.**

*Explanation:* The Server has requested that the Client program display a message which is not available in the message repository.

*System Action:* The Client program terminates.

*User Response:* Report the problem to BMC Support personnel.

**VMMRCL9428I VM MonData Server has been reassigned to altservr.**

*Explanation:* The SERVER option on the VMMVMCL command specified an alternate VM MonData Server, altservr. The VMMVMCL command will direct the request to this userid.

*System Action:* The command is directed to altservr.

*User Response:* None.

**VMMRCL9429I      Your authorization level is authlvl.**

*Explanation:*      The AUTH option was specified on the VMMVMCL command. This message indicates your authorization level to the Server.

*System Action:*    The request is rejected.

*User Response:*    None.

**VMMRCL9430E      Server encountered error processing GETREC recid**

*Explanation:*      The server encountered an error processing a GETREC request for record id recid. This indicates an internal error was encountered by the server.

*System Action:*    The request is rejected. The server log will show more detail.

*System Action:*    Notify your system support personnel of the problem.

**VMMRCL9431E      Unknown field recordid.fieldname**

*Explanation:*      A field name has been specified in a GETREC request in the format recordname.fieldname. The field name is not valid for this record type.

*System Action:*    The request is rejected.

*User Response:*    Ensure the record name and field names are correct in the request and resubmit.

**VMMRCL9432E      Incorrect record ID recid1.fieldname expecting recid2**

*Explanation:*      When requesting multiple fields all the fields must come from the same record. The message indicates that the record ID in recid1.fieldname is not the same as the record id specified in a previous field.

*System Action:*    The request is rejected.

*User Response:*    Ensure the record name and field names are correct in the request and resubmit.

**VMMSRV9500E      Duplicate GRANT authlevel userid configuration statement ignored.**

*Explanation:*      The userid identified by userid has been specified more than once in a GRANT statement(s) for authorization level authlevel.

*System Action:*    The duplicate specification is ignored. Server initialization continues.

*User Response:*    None required. To avoid this message, edit the Server configuration file and delete the duplicate specification.

**VMMSRV9503E Invalid value for time interval on SAVE RULES statement. Reset to 24 HOURS.**

*Explanation:* The SAVE RULES statement in the rules server configuration file contains an invalid time interval value. The value has been reset to 24 HOURS.

*System Action:* The rules server continues initialization and the SAVE RULES event has been scheduled for a 24 hour interval.

*User Response:* Edit the rules server configuration file and correct the error on the SAVE RULES statement. Terminate and restart the rules server to process the new statement.

**VMMSRV9504I VM MonData Server Administrators:**

*Explanation:* The server lists on the console all userids identified as administrators by the GRANT ADMINISTRATOR statement(s) in the server configuration file. This message precedes message VMMSRV9541I which lists the actual userid(s).

*System Action:* Normal operation continues.

*User Response:* None.

**VMMSRV9506I VM MonData Server Operators:**

*Explanation:* The server lists on the console all userids identified as operators by the GRANT OPERATOR statement(s) in the server configuration file. This message precedes message VMMSRV9541I which lists the actual userid(s).

*System Action:* Normal operation continues.

*User Response:* None.

**VMMSRV9507W LOG SWITCH event not scheduled due to errors.**

*Explanation:* The Server encountered an internal failure attempting to schedule the LOG SWITCH event. Another message accompanies this message explaining the nature of the error.

*System Action:* Normal processing continues, however, the LOG SWITCH event is not scheduled to occur. Logging of server messages may not occur reliably.

*User Response:* Terminate the Server and restart it to establish the LOG SWITCH event. If the problem persists, contact BMC Support personnel.

**VMMSRV9509E Invalid port number &1 on TCPIP statement**

*Explanation:* The VM MonData Server configuration file VMMAVMSR CONFIG, has a TCPIP statement with an invalid port number.

*System Action:* The VM MonData Server terminates.

*User Response:* Correct the port number on the TCPIP statement in file VMMAVMSR CONFIG. Valid port numbers range from 1 to 65535. Be sure to choose an unused port number or the VM MonData Server will fail to initialize.

**BMCVMMSRV9513E Unrecognized server command.**

*Explanation:* An unrecognized command has been entered on the server console.

*System Action:* Normal processing continues, the command is ignored.

*User Response:* Correct the command and enter it again.

**VMMSRV9514E No IDENTIFY SERVER statement for userid.**

*Explanation:* The server configuration file does not contain an IDENTIFY SERVER statement for userid.

*System Action:* Server initialization fails.

*User Response:* Edit the server configuration file and include the server userid on the IDENTIFY SERVERS statement. Restart the server.

**VMMSRV9516E VM MonData Server termination cancelled by pending HALT - intervention required.**

*Explanation:* The server attempted to terminate but could not due to a pending HALT. The HALT must be removed before termination can be performed.

*System Action:* VM MonData Server termination is not performed. The server remains active.

*User Response:* Determine the HALT that is in effect by issuing the rules server console command LIST HALTS. Determine the cause for the HALT and if appropriate, remove it by issuing the RESUME console command. Once the HALT is removed, server termination may be attempted again.

**VMMSRV9521E Invalid Conversation identifier "id". RC=rc.**

*Explanation:* The Server attempted to close a conversation identified by id, but the conversation has never existed.

*System Action:* Normal operation continues.

*User Response:* Contact BMC Support personnel.

**VMMSRV9522E      Conversation "id" has already terminated. RC=rc.**

*Explanation:*      The Server attempted to close a conversation identified by id, but the conversation no longer exists.

*System Action:*    Normal operation continues.

*User Response:*    None. If this message is issued repeatedly, contact BMC Support personnel.

**VMMSRV9523I      VM MonData Server is terminating.**

*Explanation:*      The VM MonData Server has initiated the termination process.

*Explanation:*      VM MonData Server termination begins.

*System Action:*    None.

**VMMSRV9526E      Duplicate Conversation. ID=id RC=rc.**

*Explanation:*      The Server detected that a new client attempted to connect with a conversation id which is already in use. The conversation number is id, the return code is rc.

*System Action:*    The new conversation is not accepted. Normal operation continues.

*User Response:*    None. If the problem persists, contact BMC Support personnel.

**VMMSRV9527I      Session nnnnnnnn started as uuuuuuuu.**

*Explanation:*      The Server has started a new session number nnnnnnnn with client userid uuuuuuuu.

*Explanation:*      Session number nnnnnnnn is accepted.

*System Action:*    None.

**VMMSRV9529I      RECEIVE failure, invalid receive buffer:**

*Explanation:*      An internal error has occurred in the Server program. A client has transmitted a request in an invalid format. The nature of the error or the actual control block is displayed immediately following this message.

*System Action:*    The client conversation on which the invalid request was sent is severed. Normal processing continues.

*User Response:*    None. If the problem persists, notify BMC Support personnel.

**VMMSRV9534I****Session nnnnnnnn ended by uuuuuuuu.**

*Explanation:* The Server session number nnnnnnnn was terminated by the client userid uuuuuuuu.

*System Action:* Session number nnnnnnnn is terminated.

*User Response:* None.

**VMMSRV9537I****Response**

*Explanation:* The response to a server console command is displayed in the message. The response is related to the command entered.

*System Action:* None.

*User Response:* None.

**VMMSRV9541I****Userid**

*Explanation:* The userid with ADMINISTRATOR or OPERATOR authority is listed in the message. This message follows message VMMSRV9504I or VMMSRV9506I.

*System Action:* None.

*User Response:* None.

**VMMSRV9542I****LOG minidisk space manager disabled.**

*Explanation:* The Server LOG minidisk manager has been disabled. The LOG minidisk manager may be enabled by entering a KEEP nn LOG FILES statement in the server configuration file.

*System Action:* The Server will not attempt to perform space management on the LOG minidisk.

*User Response:* If LOG minidisk space management is desired, edit the Server configuration file and add a KEEP nn LOG FILES statement with the desired number of log files to be retained on the server LOG minidisk. Terminate and restart the Server virtual machine.

**VMMSRV9555E****Invalid syntax in VMMAVMSR CONFIG: statement**

*Explanation:* The server has detected an invalid statement in the server configuration file, VMMAVMSR CONFIG A. The invalid statement is displayed in the message.

*System Action:* Normal operation continues, the invalid statement will be ignored.

*User Response:* Edit the VMMAVMSR CONFIG file to correct the statement in error, then terminate and restart the server.

**VMMSRV9556I Invalid configuration statement has been ignored.**

*Explanation:* This message accompanies message VMMSRV9555E. The statement identified in message VMMSRV9555E has been ignored.

*System Action:* None.

*User Response:* See message VMMSRV9555E.

**VMMSRV9557E Logic error processing file: VMMAVMSR CONFIG.**

*Explanation:* An internal error has occurred in the server during configuration processing.

*System Action:* The server terminates.

*User Response:* Examine any other messages at the time of this message to determine if you can correct the problem. If not, contact BMC Support personnel.

**VMMSRV9561W User userid attempted privileged command cmd.**

*Explanation:* The server received a request from userid to perform cmd, but the user does not have the proper authorization level.

*System Action:* The requested command is not performed.

*User Response:* If the user should be allowed to perform cmd, you must add userid to the GRANT ADMINISTRATOR or GRANT OPERATOR statement(s) in the server configuration file and restart the server.

**VMMSRV9564E Function failed, no data found to satisfy the request.**

*Explanation:* The requested function failed because there was no data found to satisfy the request.

*System Action:* None.

*User Response:* None.

**VMMSRV9565I VM CP Monitor Data Reader (VMMavmsr) has initialized.**

*Explanation:* The VM MonData Server userid, VMMavmsr, has successfully initialized the CP Monitor Data Reader.

*System Action:* The VM MonData Server is ready for work.

*User Response:* None.

**MMSRV9566I VM Monitor Data Reader (vmmavmsr) being terminated by source.**

*Explanation:* The VM MonData Server userid, vmmavmsr, is being terminated from source.

*System Action:* The VM MonData Server begins termination processing.

*User Response:* None.

**VMMSRV9569E I/O error on file: VMMAVMSR CONFIG A, return code is rc.**

*Explanation:* The server encountered an I/O error processing the configuration file from the A-disk.

*System Action:* The server terminates.

*User Response:* Examine A-disk and the VMMAVMSR CONFIG file to ensure there are no problems and restart the server.

**VMMSRV9570I No configuration file available, terminating the VM MonData Server.**

*Explanation:* The server could not find the VMMAVMSR CONFIG file on the A-disk.

*System Action:* The server terminates.

*User Response:* Ensure that the VMMAVMSR CONFIG file is present on the server A-disk and restart the server.

**VMMSRV9571E RECEIVE occurred for unknown/invalid session. session id = nnnnnnnn.**

*Explanation:* The server received a request from a client for whom the session number is unknown.

*System Action:* The rules server attempts to sever the session nnnnnnnn.

*User Response:* None.Iftheproblempersists,contactBMCSupportpersonnel.

**VMMSRV9572I LOG disk space management completed.**

*Explanation:* The server has completed performing LOG disk space managed.

*System Action:* None.

*User Response:* None.

**VMMSRV9574I      Recovering from failed exitname exit.**

*Explanation:*      The server encountered an internal storage management error during exitname exit processing. The failure is related to a client request.

*System Action:*    The server attempts to recover from a virtual storage shortage by dropping all unnecessary storage and cancelling the current client request.

*User Response:*    None.

**VMMSRV9575I      Recovering from general failure.**

*Explanation:*      The server encountered an internal storage management error during an internal process or schedule event.

*System Action:*    The server attempts to recover from a virtual storage shortage by dropping all unnecessary storage and cancelling the current console command, internal process, or scheduled event.

*User Response:*    None.

**VMMSRV9576I      Recovery completed.**

*Explanation:*      The server has successfully recovered from the failure reported by message VMMSRV9574I or VMMSRV9575I.

*System Action:*    Normal operation continues, but the client request, internal process, or schedule event active at the time of the failure did not complete successfully.

*User Response:*    None.

**VMMSRV9577I      LOG disk space management in progress.**

*Explanation:*      The server has initiated the LOG disk space management process. This process runs nightly to ensure that LOG minidisk space is maintained as specified on the KEEP nn LOG FILES statement in the server configuration file.

*System Action:*    The server attempts to discard any old log files on the LOG minidisk which are older than the number of days specified in the KEEP nn LOG FILES statement of the server configuration file.

*User Response:*    None.

**VMMSRV9578I      No LOG files found on LOG disk.**

*Explanation:*      During LOG disk space management, there were no LOG files found on the LOG disk.

*System Action:*    None.

*User Response:*    None.

**VMMSRV9579I****Discarded LOG file: fn ft, return code is rc.**

*Explanation:* LOG disk space management has discarded the log file fn ft on the LOG minidisk. The return code is rc.

*System Action:* None.

*User Response:* None.

**VMMSRV9580E****Send failed with RC=rc.**

*Explanation:* The server attempted to send a response to a client, but the send failed with return code rc.

*System Action:* The client conversation is severed.

*User Response:* None.

**VMMSRV9584E****Error writing to VMMAVMSR LOG, return code is rc.**

*Explanation:* The VM MonData Server encountered an error trying to OPEN or WRITE to the current log file on the LOG minidisk. The return code is rc.

*System Action:* The server immediately switches all message traffic to the virtual console. The server will attempt to begin a new log file at the beginning of the next day (12:00:01 AM).

*User Response:* Determine if the LOG minidisk is available to the server or if the LOG minidisk is full. If the minidisk is full, re-evaluate the setting of the KEEP nn LOG FILES statement in the configuration file to decrease the amount of LOG data kept, or manually clear some minidisk space.

**VMMSRV9585E****You are not authorized for function for userid.**

*Explanation:* You are not authorized to perform a VMMAVMSR function command For the user userid.

*System Action:* The request is ignored.

*User Response:* None.

**VMMSRV9586E****You are not authorized for function.**

*Explanation:* You are not authorized to perform a VMMAVMSR function command.

*System Action:* The request is ignored.

*User Response:* None.

**VMMSRV9587S**

**No response to internal client request.**

*Explanation:* The server failed to respond to an internal request while operating in recovery mode.

*System Action:* The server terminates.

*User Response:* Report the problem to BMC Support personnel.

**VMMSRV9589E**

**Rescheduling of next LOG SWITCH event failed for time\_value time\_units.**

*Explanation:* The Server encountered an internal failure attempting to schedule the next LOG SWITCH event. The attempted time is time\_value time\_units and is expressed either as a number of MINUTES or HOURS or as a time of day (AM/PM).

*System Action:* Normal processing continues, however, the LOG SWITCH event will no longer occur.

*User Response:* Terminate the Server and restart it to re-establish normal LOG SWITCH events. If the problem persists, contact BMC Support personnel.

**VMMSRV9590E**

**Ensure that the 191 minidisk is ACCESsed as 'A' in R/W mode and restart the server.**

*Explanation:* This message is preceded by VMMSRV9591E. The server needs the 191 minidisk (CONFIG) accessed as A in R/W mode.

*System Action:* The server terminates.

*User Response:* Ensure that the 191 minidisk is accessed a A and is R/W. Restart the server.

**VMMSRV9591E**

**The 191 minidisk is not available in write mode as filemode 'A'.**

*Explanation:* The server needs the 191 minidisk (CONFIG) accessed as A in R/W mode.

*System Action:* The server terminates.

*User Response:* Ensure that the 191 minidisk is accessed a A and is R/W. Restart the server.

**VMMSRV9592E**

**No filemodes available to ACCESS the diskname minidisk.**

*Explanation:* The server is attempting to ACCESS the diskname minidisk, but there are no unused filemodes available.

*System Action:* The server terminates.

*User Response:* RELEASE unnecessary filemodes and restart the server.

**VMMSRV9593I****Release some unnecessary minidisks and restart the server.**

*Explanation:* This message is preceded by VMMSRV9592E. The server needs an available filemode to ACCESS a server minidisk.

*System Action:* The server terminates.

*User Response:* RELEASE unnecessary filemodes and restart the server.

**VMMSRV9594E****ACCESS failure on diskname minidisk, return code is rc.**

*Explanation:* An ACCESS failed for the diskname minidisk. The return code is rc.

*System Action:* The server terminates.

*User Response:* Determine the cause of the ACCESS error and correct it before restarting the server.

**VMMSRV9595E****The diskname minidisk is not available R/W.**

*Explanation:* The diskname minidisk is not available as a R/W minidisk to the server.

*System Action:* The server terminates.

*User Response:* Ensure that the minidisk identified by diskname is available to the server R/W and restart the server.

**VMMSRV9596I****Ensure that the diskname(vdev) minidisk is available R/W and restart the server.**

*Explanation:* This message is preceded by VMMSRV9595E. The server needs the diskname minidisk available in R/W mode.

*System Action:* The server terminates.

*User Response:* Ensure that the minidisk identified by diskname and vdev is available to the server R/W.

**VMMSRV9597E****Invalid SET statement in file: VMMAVMSR CONFIG, SET keyword value.**

*Explanation:* The Server has detected an invalid SET statement in the configuration file, VMMAVMSR CONFIG. The invalid statement is displayed in the message.

*System Action:* The invalid statement is ignored.

*User Response:* Edit the VMMAVMSR CONFIG file to correct the invalid statement before restarting the server.

- VMMSRV9598E**      **Invalid ACCESS statement in file: VMMAVMSR CONFIG, ACCESS vdevdiskname.**
- Explanation:*      The Server has detected an invalid ACCESS statement in the configuration file, VMMAVMSR CONFIG. The invalid statement is displayed in the message.
- System Action:*      The invalid statement is ignored.
- User Response:*      Edit the VMMAVMSR CONFIG file to correct the invalid statement before restarting the server.
- 
- VMMSRV9599I**      **LOG minidisk space manager will keep up to nn log files.**
- Explanation:*      The Server has initialized the LOG minidisk space management process to keep nn log files as specified on the KEEP nn LOG FILES statement in the configuration file.
- System Action:*      None.
- User Response:*      None.
- 
- VMMSRV9900E**      **Server name is missing.**
- Explanation:*      The server program was invoked without a server name parameter.
- System Action:*      The server program terminates. record.
- User Response:*      Reissue the server program command with a parameter of the APPC/VM resource name for the server.
- 
- VMMSRV9901I**      **Server has terminated.**
- Explanation:*      The server program for server has terminated.
- System Action:*      None.
- User Response:*      None.
- 
- VMMSRV9902S**      **EXIT exitname is undefined. Execution cannot continue.**
- Explanation:*      The server program was directed to execute an EXIT called exitname, but no such exit handler exists.
- System Action:*      The server program terminates abnormally.
- User Response:*      Report the problem to BMC Support personnel.

**VMMSRV9903W****Server termination cancelled - intervention required.**

*Explanation:* The server program for server was in termination processing but a HALT exists on a process required for termination. Manual intervention is required to perform termination.

*System Action:* The server program stops termination processing and returns to normal operation.

*User Response:* Determine which process is halted by examining other messages accompanying this message or by issuing the server console command LIST HALTS. Remove any pending halts using the RESUME HALTS command before attempting termination again.

**VMMSRV9904I****Initializing the APPC/VM environment for server.**

*Explanation:* The server program is initializing the APPC/VM environment for server.

*System Action:* The APPC/VM environment initialization begins.

*User Response:* None.

**VMMSRV9905I****APPC/VM initialization complete.**

*Explanation:* The server program has successfully initialized the APPC/VM environment.

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9906E****APPC/VM environment START failed, return code is rc.**

*Explanation:* The server program encountered an error in APPC/VM initialization, the return code is rc.

*System Action:* The server program terminates.

*User Response:* Examine any other messages accompanying this message and if possible, correct the problem and restart the server program. Contact BMC Support for assistance.

**VMMSRV9907I****Server ready for work.**

*Explanation:* The server is completely initialized and ready for client requests, console commands, and communications with the File System Interface.

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9908E Server Common Structure ABEND. Return Code is rc.**

*Explanation:* The server control program has failed with a return code of rc.

*System Action:* The server program terminates abnormally.

*User Response:* Report the problem to BMC Support personnel.

**VMMSRV9909I Connect to tcpip-virtual-machine and listening on port port-number.**

*Explanation:* The server program has successfully established a TCP/IP interface through the TCP/IP stack running on tcpip-virtual-machine and is listening for socket connections on port port-number.

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9910I Loaded segment monitor-saved-segment-name and connected to MONITOR.**

*Explanation:* The server program has successfully loaded the CP Monitor saved segment monitor-saved-segment-name and connected to the MONITOR system service using IUCV.

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9911I LOGCLOSE for logname failed, return code is rc.**

*Explanation:* The server program attempted to close a log called logname but the LOGCLOSE process failed. The return code is rc.

*System Action:* Normal processing continues, but a logging of server activity to the LOG minidisk may be discontinued.

*User Response:* Attempt to determine the cause of the failure from other messages. If the problem cannot be correct, report the problem to BMC Support personnel.

**VMMSRV9912E Monitor DCSS SEGMENT LOAD failed, return code is rc.**

*Explanation:* The server program encountered an error trying to issue SEGMENT LOAD for the Monitor DCSS (MONDCSS). rc is the return code from the CMS SEGMENT LOAD macro.

*System Action:* The server program terminates.

*User Response:* Try increasing or decreasing the virtual machine storage size and restart the server program. Contact BMC Support for assistance.

**VMMSRV9913I****LOGOPEN failed, is not a valid Log handle.**

*Explanation:* The server program attempted to open a log with a Log handle of which is invalid.

*System Action:* Normal processing continues.

*User Response:* A logic error exists within the server program. Report this problem to BMC Support personnel.

**VMMSRV9914S****Server invoked shell service: service which is unknown.**

*Explanation:* The server program attempted to invoke a service called service which is not known to the server.

*System Action:* Normal processing continues.

*User Response:* A logic error exists within the server program. Report this problem to BMC Support personnel.

**VMMSRV9915I****Service call has been ignored.**

*Explanation:* The service call for service described in message VMMSRV9914S has been ignored.

*System Action:* Normal processing continues.

*User Response:* A logic error exists within the server program. Report this problem to BMC Support personnel.

**VMMSRV9916E****NUCXLOAD failed for APPC/VM module VMMSCS, return code is rc.**

*Explanation:* The server program attempted to load the VMMSCS module using NUCXLOAD and failed. The return code from NUCXLOAD is rc.

*System Action:* The server program terminates.

*User Response:* Determine the cause of the problem by examining the return code from NUCXLOAD.

**VMMSRV9917I****APPC/VM event is unknown and has been ignored.**

*Explanation:* The server control program reported an event called event which is unknown to the server program. The event is ignored.

*System Action:* Normal processing continues.

*User Response:* A logic error may exist in the server control program. Report the problem to BMC Support personnel.

**VMMSRV9918E**

**APPC/VM RECEIVE failed on path, return code is rc.**

*Explanation:* The server program attempted to receive data from a client on path path, but the RECEIVE failed with a return code of rc.

*System Action:* The client on path is severed. Normal processing continues.

*User Response:* If the problem persists, contact BMC Support personnel.

**VMMSRV9919S**

**Internal error at location in Server Shell - cancelling current transaction.**

*Explanation:* The server program exhausted virtual storage or encountered a logic error at location.

*System Action:* The server cancels the current transaction that caused the error and attempts to recover virtual storage associated with the transaction. If recovery is successful, normal processing continues.

*User Response:* If the problem persists, contact BMC Support personnel.

**VMMSRV9920I**

**HALT IMMEDIATE command ignored. Enter QUIT to end server.**

*Explanation:* An HI command was issued from the server console. The HI command is blocked.

*System Action:* The server ignores the HI command.

*User Response:* If server termination is desired, enter the QUIT command from the server console.

**VMMSRV9921E**

**Unable to locate Message Repository file.**

*Explanation:* The message repository file, VMMUME TXTnnnnn, is not available on an accessed minidisk.

*System Action:* The server program terminates.

*User Response:* Notify your system support personnel of the problem.

**VMMSRV9922I**

**Return code from SET LANG command is: rc.**

*Explanation:* The server program received a return code of rc from the SET LANG command.

*System Action:* The server program terminates.

*User Response:* Notify your system support personnel of the problem.

**VMMSRV9923E LOGOPEN for logname failed, log file is already open.**

*Explanation:* The server program attempted to open a log, called logname, but the file is already open.

*System Action:* The LOGOPEN request is ignored.

*User Response:* None.

**VMMSRV9924E LOGWRITE to logname failed, log file is not open.**

*Explanation:* The server program attempted to write to a log, called logname, but the file is not open.

*System Action:* The LOGWRITE request is ignored. Log data may be lost.

*User Response:* Notify BMC Support personnel of the problem.

**VMMSRV9925E LOGWRITE to logname failed, return code is rc.**

*Explanation:* The server program attempted to write to a log, called logname, but the LOGWRITE failed with return code rc.

*System Action:* Normal processing continues. Log data may be lost.

*User Response:* Notify BMC Support personnel of the problem.

**VMMSRV9926E Monitor event processor reported error code XXXXXXXX.**

*Explanation:* The monitor data reader has encountered an error. The error code is set to a value (for example NOSTORCM) to indicate the nature of the error.

*System Action:* Monitor data processing is failing. Attempts to access monitor data will not retrieve any new data until this problem is resolved.

*User Response:* Notify BMC Support personnel of the problem.

**VMMSRV9927W Queued SEND failure on APPC/VM path: path. RC=rc.**

*Explanation:* The server program attempted perform SEND to a client on path path, but the SEND failed with return code rc.

*System Action:* The client on path is severed and any queued data to send is purged. Normal processing continues.

*User Response:* None.

**VMMSRV9928I Invalid value for parameter start parameter has been ignored.**

*Explanation:* The server program was invoked with a start parameter of parameter, but the value specified was invalid.

*System Action:* The invalid value for the start parameter is ignored.

*User Response:* Correct the start parameter before starting the server program again.

**VMMSRV9929I Server resource function is disabled by start parameter.**

*Explanation:* The server program was invoked with a start parameter which disabled the function for resource.

*System Action:* The process described by resource function is not active.

*User Response:* None.

**VMMSRV9930S CMS Pipelines is unavailable. PIPE command return code is rc**

*Explanation:* The server program was unable to access CMS Pipelines.

*System Action:* The server program terminates.

*User Response:* Ensure that the CMS command PIPE is available to the server on an accessed minidisk and restart the server.

**VMMSRV9931I Lost LOG record: record.**

*Explanation:* The server program was unable to record the LOG record due to a prior failure. The record is displayed in this message.

*System Action:* Normal processing continues.

*User Response:* Examine other messages to determine the cause of the problem.

**VMMSRV9932E Data may be lost for Server Log logname.**

*Explanation:* The server program encountered a failure with log processing described in another message. Data for the log logname may be lost.

*System Action:* Normal processing continues.

*User Response:* Examine other messages to determine the cause of the problem.

**VMMSRV9933I****Log buffering has been turned off due to errors.**

*Explanation:* The server program has disabled the LOG BUFFERING process because of a prior error. Another message describes the error.

*System Action:* Normal processing continues. Server performance may be degraded due to no buffering of log records.

*User Response:* Examine other messages to determine the cause of the problem.

**VMMSRV9934E****Product version incompatibility error.**

*Explanation:* The server program attempted to extract the version of VM CP Monitor Data Reader but the function failed.

*System Action:* The server program terminates.

*User Response:* Report the problem to BMC Support personnel.

**VMMSRV9935I****VM CP Monitor Data Reader**

*Explanation:* The server program is running from libraries distributed with version of VM CP Monitor Data Reader

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9936E****LOGOPEN failed, invalid buffer setting.**

*Explanation:* The server program attempted to open a log file but the buffer parameter was invalid.

*System Action:* Normal processing continues, the LOGOPEN fails.

*User Response:* Report the logic error to BMC Support personnel.

**VMMSRV9937E****FINIS failed for fn ft fm, return code is rc.**

*Explanation:* The server program attempted to perform a FINIS on fn ft fm and the return code was rc.

*System Action:* Normal processing continues.

*User Response:* Report the logic error to BMC Support personnel.

**VMMSRV9940E VM CP Monitor Data Reader is not licensed for this CPU.**

*Explanation:* The server program determined that the product is not licensed to run on this processor.

*System Action:* The server program terminates.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9941I VM CP Monitor Data Reader Trial Mode expires in nn days.**

*Explanation:* The server program determined that the product is running in Trial Mode. This means that it has a temporary license to run on this processor.

*System Action:* The server program continues initialization. In nn days, the server program will terminate.

*User Response:* None.

**VMMSRV9942E VM CP Monitor Data Reader Trial period has expired.**

*Explanation:* The server program determined that the product was running in Trial Mode. This means that it had a temporary license to run on this processor. The temporary license has expired.

*System Action:* The server program terminates.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9943E Severe error in product authorization logic.**

*Explanation:* The server program encountered a severe error determining the licensing of the product.

*System Action:* The server program terminates.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9943E Severe error in product authorization logic.**

*Explanation:* The server program encountered a severe error determining the licensing of the product.

*System Action:* The server program terminates.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9945I****Unable to perform storage usage management.**

*Explanation:* The server program received an error return code from the CMS STORMAP command. The server disables internal storage management.

*System Action:* Normal operation continues, however, if a storage shortage occurs, the server may not be able to recover.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9946E****SCS PROCREQ code retcd processing GETREC recid**

*Explanation:* The server program received an error return code (retcd) from a PROCREQ call to SCS attempting to process a GETREC request for record id recid.

*System Action:* The request is rejected. Normal processing continues.

*User Response:* Contact BMC Support for assistance.

**VMMSRV9947E****Server storage cushion manager called with invalid request: request - ignored.**

*Explanation:* The server program invoked the storage manager process with an invalid request, request. The request will be ignored.

*System Action:* Normal operation continues. The request is ignored.

*User Response:* A logic problem exists in the server. Report the problem to BMC support personnel.

**VMMSRV9948W****Server storage cushion manager GET of nnnn bytes for block x of y failed.**

*Explanation:* The server program invoked the storage manager process with a GET request for nnnn bytes for block x of y. The request failed due to a lack of virtual storage.

*System Action:* Normal operation continues. The storage manager may not have enough free storage to recover from a storage related failure.

*User Response:* If no run-time errors have been described in other server messages, consider increasing the virtual machine storage size of the server virtual machine.

**VMMSRV9949S      Server storage cushion manager FREE of nnnn bytes for block x of y failed. Storage exhausted.**

*Explanation:*      The server program invoked the storage manager process with a FREE request for nnnn bytes for block x of y. The request failed due to a lack of virtual storage.

*System Action:*    Normal operation continues, however, nnnn bytes of virtual storage have been lost and may not be recovered. The server may not have enough free storage to continue operation much longer.

*User Response:*    If no run-time errors have been described in other server messages, consider increasing the virtual machine storage size of the server virtual machine.

**VMMSRV9950I      Event event\_name is starting at time.**

*Explanation:*      The server program has started the event\_name process at the time shown. This event was scheduled internally or by a statement in the server configuration file.

*System Action:*    Event event\_name begins processing.

*User Response:*    None.

**VMMSRV9951I      Event event\_name completed at time.**

*Explanation:*      The server program has completed the event\_name process at the time shown. This event was scheduled internally or by a statement in the server configuration file.

*System Action:*    Event event\_name processing is completed.

*User Response:*    None.

**VMMSRV9952E      Unknown TIMER expired. Timer Id=id.**

*Explanation:*      The server control program detected a timer expiration for an unknown event. The timer is ignored.

*System Action:*    Normal processing continues.

*User Response:*    Report the problem to BMC Support personnel.

**VMMSRV9970I      Server opened LOG file.**

*Explanation:*      The server program opened the log file at the time and date shown on the record in the log file.

*System Action:*    Normal processing continues.

*User Response:*    None.

**VMMSRV9970I Server closed LOG file.**

*Explanation:* The server program closed the log file at the time and date shown on the record in the log file.

*System Action:* Normal processing continues.

*User Response:* None.

**VMMSRV9972W Monitor DCSS Sample Area too small; some records lost.**

*Explanation:* The monitor data reader has detected that sample monitor records are available, but the data is incomplete because there was not enough space in the sample area of the DCSS to contain all the records. Any records which could not be written to the DCSS are lost.

*System Action:* Monitor data processing continues. Some sample monitor records are not available.

*User Response:* Increase the size of the sample area in the Monitor DCSS and restart the Monitor Data Reader server.

**VMMSRV9973W Monitor DCSS Event Partition too small; some records lost.**

*Explanation:* The monitor data reader has detected that event configuration records are available, but the data is incomplete because there was not enough space in the event partition of the DCSS to contain all the records. Any records which could not be written to the DCSS are lost.

*System Action:* Monitor data processing continues. Some event configuration records are not available.

*User Response:* Increase the size of the event partition in the Monitor DCSS and restart the Monitor Data Reader server.

**VMMSRV9998S Failure recovering from internal error, terminating server.**

*Explanation:* The server program failed to recover from the internal error reported in message VMMSRV9919S. The server will terminate.

*System Action:* The server program terminates.

*User Response:* Report the problem to BMC Support personnel.

**VMMSRV9999T**

**Unrecoverable error during termination - server terminated without cleanup.**

*Explanation:* The server program encountered an unrecoverable internal error attempting to perform orderly termination following message VMMSRV9998T. The server will terminate immediately.

*System Action:* The server program terminates without performing normal orderly termination.

*User Response:* Report the problem to BMC Support personnel.

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**ARBITRATION. ANY DISPUTE BETWEEN YOU AND BMC ARISING OUT OF THIS AGREEMENT OR THE BREACH OR ALLEGED BREACH, SHALL BE DETERMINED BY BINDING ARBITRATION CONDUCTED IN ENGLISH. IF THE DISPUTE IS INITIATED IN THE AMERICAS REGION, THE ARBITRATION SHALL BE HELD IN NEW YORK, U.S.A., UNDER THE CURRENT COMMERCIAL OR INTERNATIONAL, AS APPLICABLE, RULES OF THE AMERICAN ARBITRATION ASSOCIATION. IF THE DISPUTE IS INITIATED IN A COUNTRY IN THE ASIA PACIFIC REGION, THE ARBITRATION SHALL BE HELD IN SINGAPORE, SINGAPORE UNDER THE CURRENT UNCITRAL ARBITRATION RULES. IF THE DISPUTE IS INITIATED IN A COUNTRY OUTSIDE OF THE AMERICAS REGION OR ASIA PACIFIC REGION, THE ARBITRATION SHALL BE HELD IN AMSTERDAM, NETHERLANDS UNDER THE CURRENT UNCITRAL ARBITRATION RULES. THE COSTS OF THE ARBITRATION SHALL BE BORNE EQUALLY PENDING THE ARBITRATOR'S AWARD. THE AWARD RENDERED SHALL BE FINAL AND BINDING UPON THE PARTIES AND SHALL NOT BE SUBJECT TO APPEAL TO ANY COURT, AND MAY BE ENFORCED IN ANY COURT OF COMPETENT JURISDICTION. NOTHING IN THIS AGREEMENT SHALL BE DEEMED AS PREVENTING EITHER PARTY FROM SEEKING INJUNCTIVE RELIEF FROM ANY COURT HAVING JURISDICTION OVER THE PARTIES AND THE SUBJECT MATTER OF THE DISPUTE AS NECESSARY TO PROTECT EITHER PARTY'S CONFIDENTIAL INFORMATION, OWNERSHIP, OR ANY OTHER**

**PROPRIETARY RIGHTS. ALL ARBITRATION PROCEEDINGS SHALL BE CONDUCTED IN CONFIDENCE, AND THE PARTY PREVAILING IN ARBITRATION SHALL BE ENTITLED TO RECOVER ITS REASONABLE ATTORNEYS' FEES AND NECESSARY COSTS INCURRED RELATED THERETO FROM THE OTHER PARTY.**

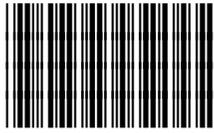
**U.S. GOVERNMENT RESTRICTED RIGHTS.** The Software under this Agreement is "commercial computer software" as that term is described in 48 C.F.R. 252.227-7014(a)(1). If acquired by or on behalf of a civilian agency, the U.S. Government acquires this commercial computer software and/or commercial computer software documentation subject to the terms of this Agreement as specified in 48 C.F.R. 12.212 (Computer Software) and 12.211 (Technical Data) of the Federal Acquisition Regulations ("**FAR**") and its successors. If acquired by or on behalf of any agency within the Department of Defense ("**DOD**"), the U.S. Government acquires this commercial computer software and/or commercial computer software documentation subject to the terms of this Agreement as specified in 48 C.F.R. 227.7202 of the DOD FAR Supplement and its successors.

**MISCELLANEOUS TERMS.** You agree to pay BMC all amounts owed no later than 30 days from the date of the applicable invoice, unless otherwise provided on the order for the License to the Products. You will pay, or reimburse BMC, for taxes of any kind, including sales, use, duty, tariffs, customs, withholding, property, value-added (VAT), and other similar federal, state or local taxes (other than taxes based on BMC's net income) imposed in connection with the Product and/or the Support. This Agreement constitutes the entire agreement between You and BMC and supersedes any prior or contemporaneous negotiations or agreements, whether oral, written or displayed electronically, concerning the Product and related subject matter. No modification or waiver of any provision hereof will be effective unless made in a writing signed by both BMC and You. You may not assign or transfer this Agreement or a License to a third party without BMC's prior written consent. Should any provision of this Agreement be invalid or unenforceable, the remainder of the provisions will remain in effect. The parties have agreed that this Agreement and the documents related thereto be drawn up in the English language. Les parties exigent que la présente convention ainsi que les documents qui s'y rattachent soient rédigés en anglais.

SW EULA Int 030102



# Notes



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