

User Service Guide

HP Integrity rx4640 Server



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About This Document

This document provides information and instructions on servicing and troubleshooting the HP Integrity rx4640 server.

Document updates may be issued between editions to correct errors or document product changes. To ensure that you receive the updated or new editions, you should subscribe to the appropriate product support service. See your HP sales representative for details.

The latest version of this document can be found on the HP website at:

<http://www.docs.hp.com>

Intended Audience

This document is intended to provide technical product and support information for authorized service providers, system administrators, and HP support personnel.

This document is not a tutorial.

New and Changed Information in This Edition

This guide has been updated as follows:

- iLO 2 MP LAN Port link/activity LED display
- Removing and replacing a processor, deleted caution regarding dip switch information
- Removing an I/O board, dip switch information
- Added replacement battery part number

Publishing History

The publishing history below identifies the edition dates of this manual. Updates are made to this publication on an unscheduled, *as needed*, basis. The updates will consist of a complete replacement manual and pertinent on-line documentation.

Table 1 Publishing History Details

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
A6961-96013-ed2	HP-UX, Windows®, Linux®, OpenVMS®	rx4640	November 2008
A6961-96013	HP-UX, Windows, Linux, OpenVMS	rx4640	August 2006

Document Organization

This guide is divided into the following chapters.

Chapter 1	Introduction Use this chapter to learn about the features and specifications of the HP Integrity rx4640 server.
Chapter 2	Controls, Ports, and LEDs Use this chapter to learn about the locations of the external controls, ports, and LEDs on the server.
Chapter 3	Powering Off and Powering On the Server Use this chapter to learn about powering the server off and on.
Chapter 4	Removing and Replacing Components Use this chapter to learn how to remove and replace the field replaceable components (FRUs) on the server.
Chapter 5	Troubleshooting Use this chapter to learn about troubleshooting problems you may encounter with the server.
Appendix A	Parts Information Use this appendix to learn the location and part numbers of the server components.
Appendix B	Operating System Boot and Shutdown Use this appendix to learn about booting and shutting down the operating system on the server.
Appendix C	Utilities Use this appendix for information regarding the utilities available for the server.
Appendix D	Console Setup and Connection Use this appendix to learn about the process for setting up a console session and connecting to the server.

Typographic Conventions

This document uses the following conventions.

WARNING A warning lists requirements that you must meet to avoid personal injury.

CAUTION A caution provides information required to avoid losing data or avoid losing system functionality.

NOTE A note highlights useful information such as restrictions, recommendations, or important details about HP product features.

<i>Book Title</i>	The title of a book. On the web and on the Instant Information CD, it may be a hot link to the book itself.
KeyCap	The name of a keyboard key or graphical interface item (such as buttons, tabs, and menu items). Note that Return and Enter both refer to the same key.
<i>Emphasis</i>	Text that is emphasized.
Bold	Text that is strongly emphasized.
Bold	The defined use of an important word or phrase.
ComputerOut	Text displayed by the computer.
UserInput	Commands and other text that you type.

Command	A command name or qualified command phrase.
Option	An available option.
Screen Output	Example of computer screen output.
[]	The contents are optional in formats and command descriptions. If the contents are a list separated by , you must select one of the items.
{ }	The contents are required in formats and command descriptions. If the contents are a list separated by , you must select one of the items.
...	The preceding element may be repeated an arbitrary number of times.
	Separates items in a list of choices.

HP-UX Release Name and Release Identifier

Each HP-UX 11i release has an associated release name and release identifier. The *uname* (1) command with the -r option returns the release identifier. This table shows the releases available for HP-UX 11i.

Table 2 HP-UX 11i Releases

Release Identifier	Release Name	Supported Processor Architecture
B.11.11	HP-UX 11i v1	PA-RISC
B.11.20	HP-UX 11i v1.5	Intel® Itanium®
B.11.22	HP-UX 11i v1.6	Intel Itanium
B.11.23	HP-UX 11i v2.0	Intel Itanium

Related Documents

You can find other information on HP server hardware management, Microsoft® Windows®, and diagnostic support tools in the following publications.

Website for HP Technical Documentation:

<http://docs.hp.com>

Server Hardware Information:

<http://docs.hp.com/hpux/hw/>

Windows Operating System Information

You can find information about administration of the Microsoft Windows operating system at the following websites, among others:

- http://docs.hp.com/windows_nt/
- <http://www.microsoft.com/technet/>

Diagnostics and Event Monitoring: Hardware Support Tools

Complete information about HP's hardware support tools, including online and offline diagnostics and event monitoring tools, is at the <http://docs.hp.com/hpux/diag/> website. This site has manuals, tutorials, FAQs, and other reference material.

Website for HP Technical Support:

<http://us-support2.external.hp.com/>

Books about HP-UX Published by Prentice Hall

The <http://www.hp.com/hpbooks/> website lists the HP books that Prentice Hall currently publishes, such as HP-UX books including:

- *HP-UX 11i System Administration Handbook*
http://www.hp.com/hpbooks/prentice/ptr_0130600814.html
- *HP-UX Virtual Partitions*
http://www.hp.com/hpbooks/prentice/ptr_0130352128.html

HP Books are available worldwide through bookstores, online booksellers, and office and computer stores.

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Include the document title, manufacturing part number, and any comment, error found, or suggestion for improvement you have concerning this document.

1 Introduction

The HP Integrity rx4640 server is a 4-processor/8-core IPF rack-mount server based on the Itanium2 processor family architecture. The supported operating systems include HP-UX, Windows, Linux, and OpenVMS. The server accommodates up to 32 DIMMs and internal peripherals; including two hard disk drives, and a DVD. Its high availability features include hot-swap fans and 200-240 VAC power supplies, hot-plug disk drives, and hot-plug PCI-X cards.

This chapter addresses the following topics:

- “Server Overview” on page 20.
- “Server Dimensions and Weight” on page 21.
- “Server Components” on page 22.
- “Supported Operating Systems” on page 24.

Server Overview

The HP Integrity rx4640 server is a 4U high Electronics Industry Association (EIA) enclosure, which mounts in any standard 19" EIA rack. All external cabling enters and exits from the rear of the enclosure. With the server installed in the rack, service access is enhanced by the use of chassis slides. It has bays to accommodate 1 + 1 redundant, hot-swappable power supplies, accessible from the rear of the enclosure. There are two low-profile hot swappable hard disk drives accessible from the front, as well as a slim-line optical drive for a CD-R, CD-RW, DVD-R or DVD+RW. There are N + 1 redundant, hot-swappable server fans, all clearly identified and easily accessible. Server status indication, a power switch, server locator switch and LED are located in the front within the control panel access door on the bezel. There is also a server locator switch and LED located on the front and back of the server for easy identification in the rack. See the *HP Integrity rx4640 Site Preparation Guide* for more detailed server specifications and requirements. Figure 1-1, Figure 1-2, and Figure 1-3 show the top, front, and rear views of the server.

Figure 1-1 **HP Integrity rx4640 Server with Front Bezel**

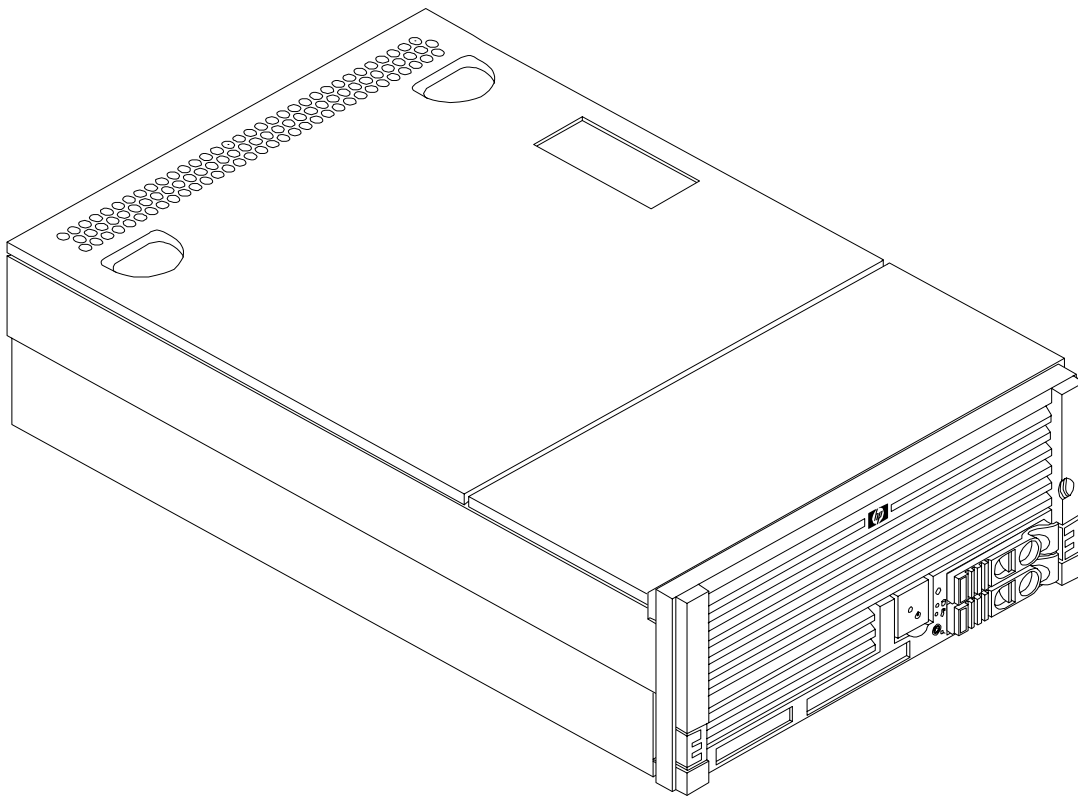


Figure 1-2 HP Integrity rx4640 Server (front view with bezel removed)

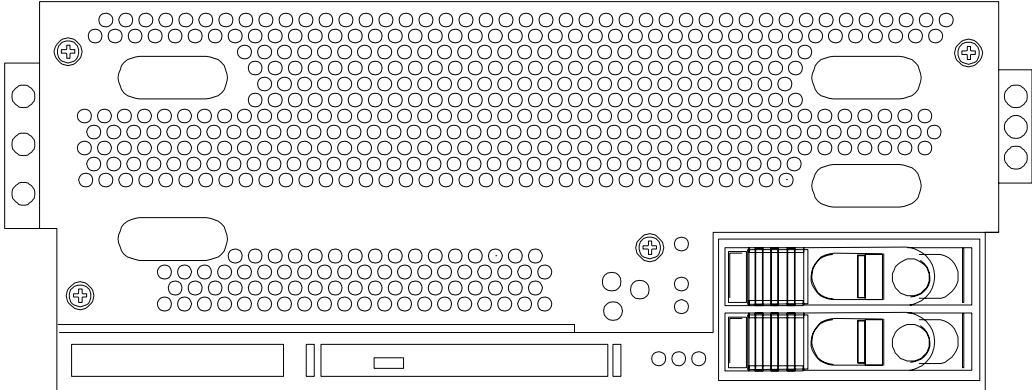
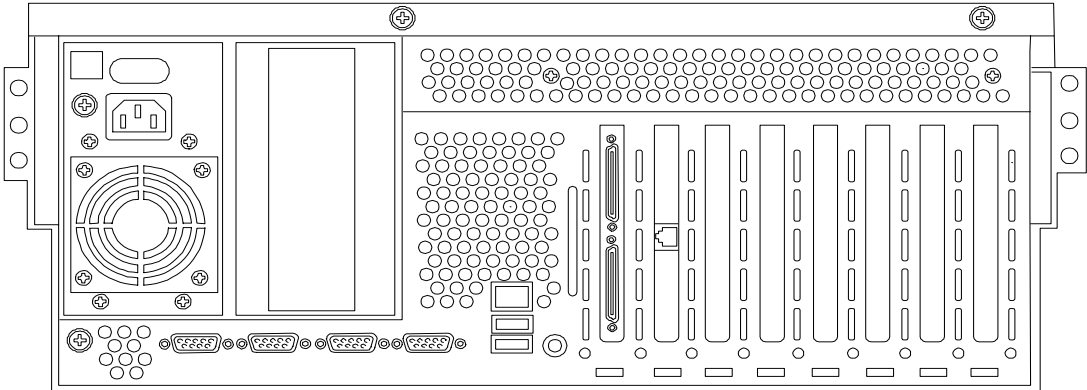


Figure 1-3 HP Integrity rx4640 Server (rear view)



Server Dimensions and Weight

Table 1-1 shows the dimensions and weight of the HP Integrity rx4640 server.

Table 1-1 Server Dimensions

Dimensions	Value
Height	17.46 cm (6.87 in.)
Width	44 cm (17.32 in.)
Depth	(63.8 cm (25.1 in.)
Weight	Unloaded - 40 kg (95 lb) Fully loaded - 100 kg (220 lb)

Server Components

The following components comprise the HP Integrity rx4640 server.

Processors

The following processors are available for the rx4640 server:

- 1.6 GHz / 18 MB cache
- 1.6 GHz / 24 MB cache

These processors are dual core processors. The processor configuration options are 1-processor/2-core (1p/2c), 2p/4c, 3p/6c, or 4p/8c.

Memory

- 16 DIMM slots on standard memory extender board
- 32 DIMM slots on optional memory extender board
- Minimum memory size of 1 GB (four 256 MB DIMMs in
- Maximum memory size of 128 GB (4 GB DIMMs on 32-slot memory extender board)
- 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB standard 184 pins 2.5V DDR 200, CL2, registered, ECC
- 200 MHz memory bus frequency, 400 MTransfers/s data, 12.8 GB/s peak data bandwidth
- DIMMs loaded by quads enable interleaved mode and chip spare

PCI Riser

- Two dedicated PCI slots (LAN and SCSI)
- Four hot-plug PCI-X 66 MHz, 64-bit, 3.3V, 25W slots with shared busses and I/O. Slots 3 and 4 share a PCI-X bus and slots 5 and 6 share a PCI-X bus
- Two hot-plug PCI-X 133 MHz 64-bit 3.3V 25W slots

Internal Core I/O

- Dual channel SCSI U320 interface, two internal 68-pin connectors, two 68-pin external connectors
- The SCSI backplane is configured as either one or two channels
- One internal IDE connector for a slim-line optical device (CD and DVD)
- No floppy connector

External Core I/O

- Three external DB-9 ports (MP local, auxiliary, remote)
- Two external USB 2.0 ports
- Two SCSI Ultra320 68-pin connectors

- Two 10/100/1000Base-T ethernet LAN port
- One 10/100 integrated Lights Out Management Processor (iLO MP) LAN port
- One VGA port

Power Supply Unit

- 1200 W output power
- Redundant and hot-swap power supplies

Motherboard Manageability

- Baseboard Management Controller (BMC)
- Temperature monitoring and fans regulation by BMC
- Includes diagnostic panel LED display that shows server health
- Hardware diagnostics by BMC displayed by diagnostic panel LED
- IPMI protocol for communication between BMC/server/MP card
- Locator front/rear LEDs
- Field replacement units monitoring by BMC

Enhanced Server Manageability Using Management Processor

- LAN, telnet, and SSH console
- Web GUI
- Serial port for local console
- Serial port for modem console
- Duplication of console screen content across all consoles

Hard Disk Drives

- Two low-profile, hot-pluggable Ultra320 SCSI disk bays
- Disk options:
 - 36 GB 15K RPM SCSI disk
 - 73 GB 15K RPM SCSI disk
 - 146 GB, 10K RPM SCSI disk
 - 300 GB, 10K RPM SCSI disk
- Minimum server configuration includes one hard disk drive

Supported Operating Systems

The following operating systems are supported on the entry-class HP Integrity servers:

- **HP-UX 11i Version 2 (B.11.23)**
- **HP OpenVMS I64**
- **Microsoft® Windows® Server 2003**
- **Red Hat Enterprise Linux 4**
- **SuSE Linux Enterprise Server 10**

For more operating system information, see Appendix B, “Booting the Operating System,” on page 141.

2 Controls, Ports, and LEDs

This chapter describes the controls, ports, and LEDs found on the front panel, rear panel, and internal locations of the HP Integrity rx4640 server.

This chapter addresses the following topics:

- “Front Panel Controls, Ports, and LEDs” on page 26.
- “Rear Panel Controls, Ports, and LEDs” on page 28.
- “Internal Controls, Ports, and LEDs” on page 31.

Front Panel Controls, Ports, and LEDs

The front panel of the HP Integrity rx4640 server provides the controls and indicators commonly used for operation. Figure 2-1, Figure 2-2, and Figure 2-3 show the controls, ports, and LEDs on the front panel and control panel.

Figure 2-1 Front View with Bezel

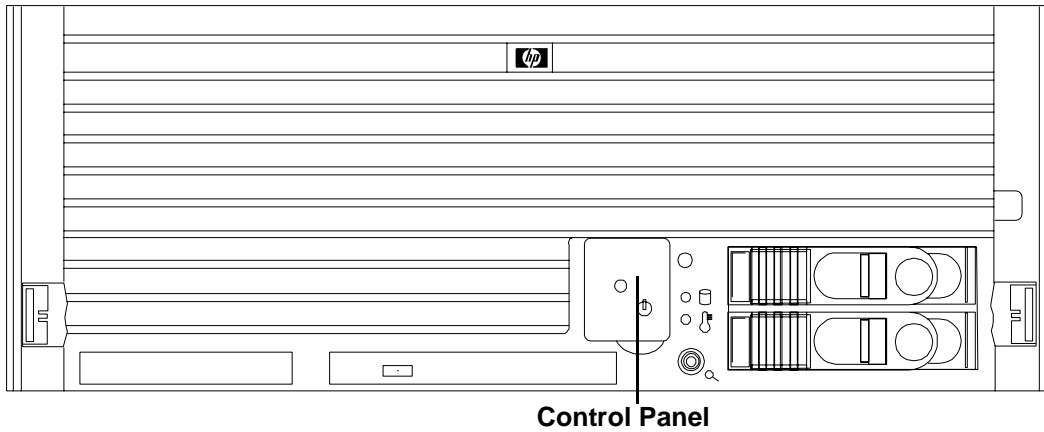


Figure 2-2 Accessing the Control Panel

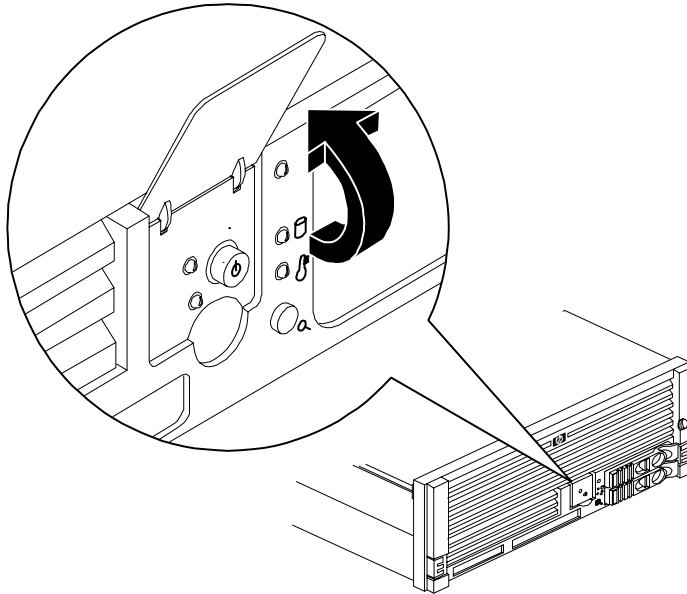
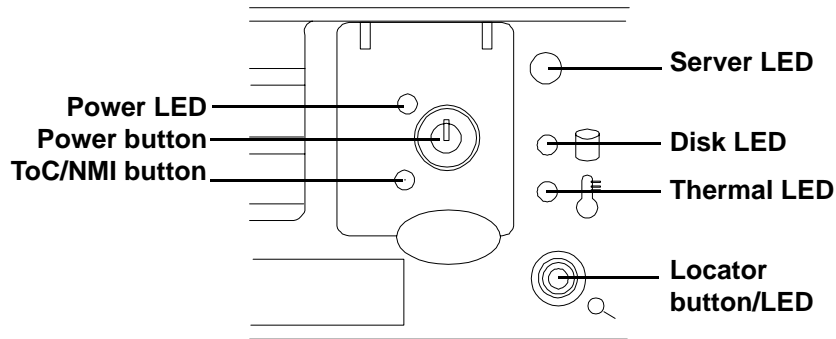


Figure 2-3 Control Panel LEDs



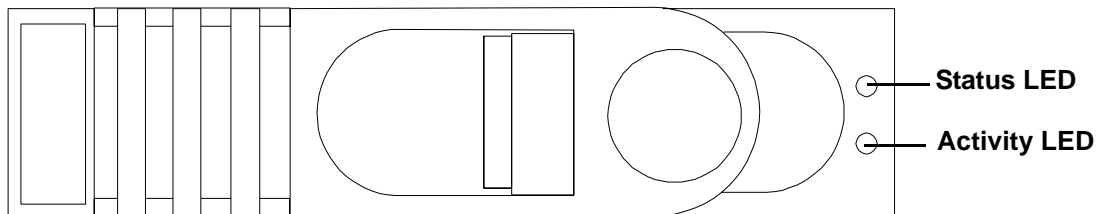
NOTE For troubleshooting information regarding control panel LEDs, see “Front Control Panel LED Indicators” on page 117.

Hard Disk Drive LED Indicators

The hot-swap disk drives have two LEDs per drive, as described below. Figure 2-4 shows the hard disk drive LEDs.

- Status LED - The drive status LED displays green when disk power is on, and is off when disk power is off.
- Activity LED - The drive activity LED is green and indicates disk drive activity. This LED is controlled by the disk drive directly and turns on when a drive is accessed.

Figure 2-4 Hard Disk Drive LED Indicators

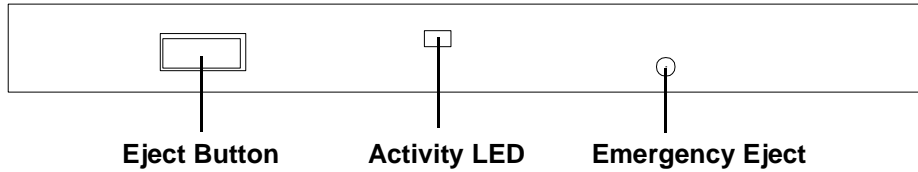


NOTE For troubleshooting information regarding the hard disk drive LEDs, see “Hard Disk Drive LED Indicators” on page 118.

DVD/DVD-R/DVD-RW Drives

The HP server is delivered with one DVD drive (DVD-R and DVD-RW optional). Each of these devices has one activity LED. Figure 2-5 shows the location of the DVD LEDs.

Figure 2-5 DVD-ROM Drive



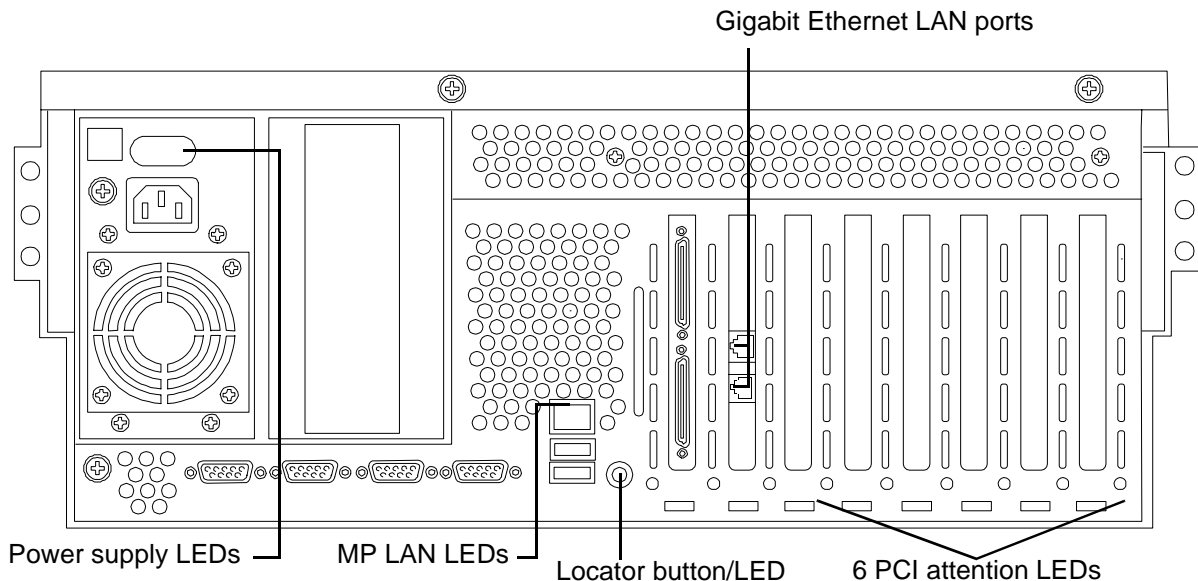
NOTE For troubleshooting information regarding the DVD LEDs, see “DVD/DVD-R/DVD-RW Drive LED Indicators” on page 118.

Rear Panel Controls, Ports, and LEDs

The HP server rear panel includes communication ports, I/O ports, ac power connectors, two power supply bays, attention LED indicators for the hot-plug PCI boards, and the locator LED/button. Figure 2-6 shows the LEDs located on the rear panel of the HP server. They include the:

- Power supplies
- MP LAN
- 2 port Gigabit ethernet card LAN
- PCI slots 3-8

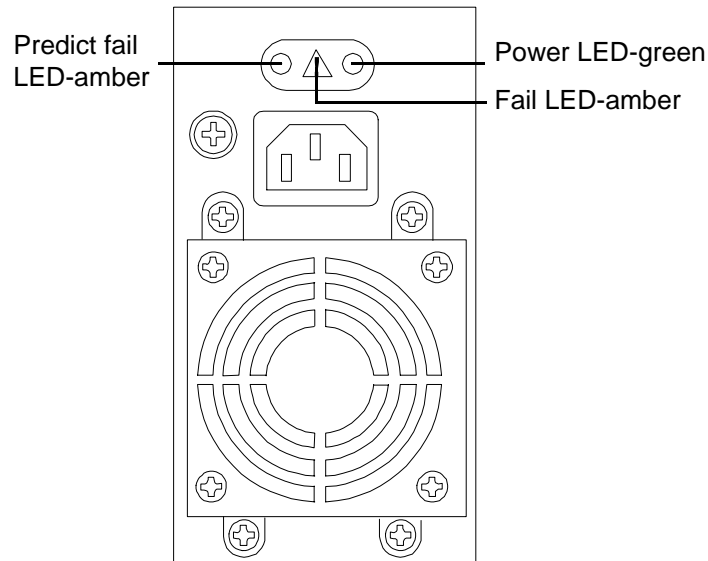
Figure 2-6 Rack Mount and Pedestal Rear View



Power Supply Status LEDs

Each 200-240 VAC power supply unit has three status LEDs located on the power supply accessible from the rear panel. Consolidated status of all power supplies is reported by the front control panel by the power status LED. Figure 2-7 shows the location of the power supply status LEDs on the rear of the enclosure.

Figure 2-7 Power Supply Status LEDs



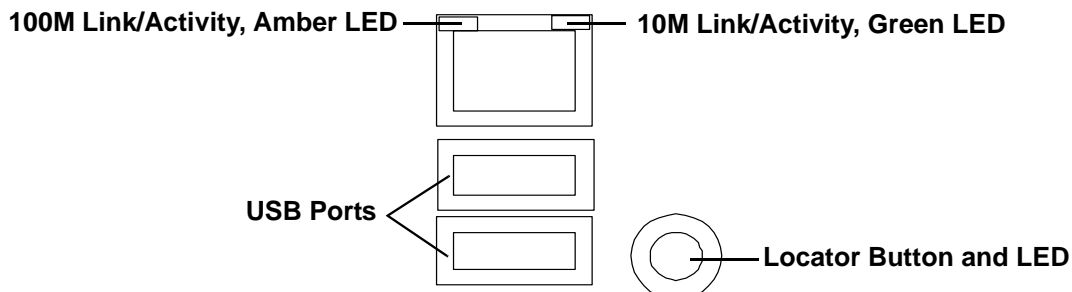
NOTE For troubleshooting information regarding the power supply status LEDs, see “Power Supply Status LED Indicators” on page 123.

Management Processor LAN LEDs

The internal Management Processor (MP) LAN uses an RJ-45 type connector. This connector has two LEDs (LAN link and LAN activity) that signal status and activity. Figure 2-8 shows the MP LAN LEDs and USB ports on the rear panel of the server.

NOTE Two versions of the iLO MP card exist for this server. Depending on which version of the card is installed in the server, the iLO MP LAN port LEDs display differently. For more information, see “iLO MP LAN Port Link/Activity LED Display” on page 123.

Figure 2-8 MP LAN LEDs



NOTE For troubleshooting information regarding the iLO MP LAN LEDs, see “iLO MP LAN Port Link/Activity LED Display” on page 123.

Locator LED and Button

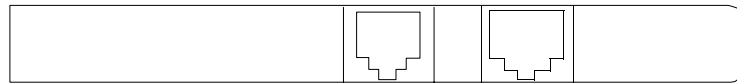
An LED and button is provided on the rear panel of the server. Another single blue LED and button is on the front control panel that enables/disables the locator function. See Figure 2-8 for the location of the locator button.

Gigabit Ethernet Card LAN Ports (Core I/O)

The 2-Port core I/O Gigabit ethernet card uses two RJ-45 LAN connectors. These connectors have no LEDs. Figure 2-9 shows the two core I/O LAN ports.

Figure 2-9 Core I/O LAN Port LEDs

RJ-45 Connectors



Internal Controls, Ports, and LEDs

The HP Integrity rx4640 server contains internal controls, switches, and LEDs inside the server. This includes a diagnostic LED panel located under the top panel; and reset buttons, switches, and LEDs located on the I/O baseboard.

QuickFind Diagnostic Panel

The QuickFind diagnostic panel has 58 single color LEDs and one multi-color LED for temperature. The LEDs are normally off. The appropriate LED is turned on when an error is detected or a replacement part is required. You can access the QuickFind diagnostic panel by removing the top cover. See “Removing the Top Cover” on page 43. Figure 2-10 shows the QuickFind diagnostic panel LEDs.

Figure 2-10 QuickFind Diagnostic Panel

Refer to Reference Label for Additional Information				
	0	1	2	3
Processor	○	○	○	○
Subsystem	○	○	○	○
I/O VRM	○	○	○	○
CPU VRM	○	○	○	○
Fan	○	○	○	○
	A	B	C	D
Memory Bank 0	○	○	○	○
Memory Bank 1	○	○	○	○
Memory Bank 2	○	○	○	○
Memory Bank 3	○	○	○	○
Memory Bank 4	○	○	○	○
Memory Bank 5	○	○	○	○
Memory Bank 6	○	○	○	○
Memory Bank 7	○	○	○	○
Power Supply	○			
Memory Config Error	○			
Processor Config Error	○			
Missing Component	○			
System Temperature	○			
Check Event Log	○			

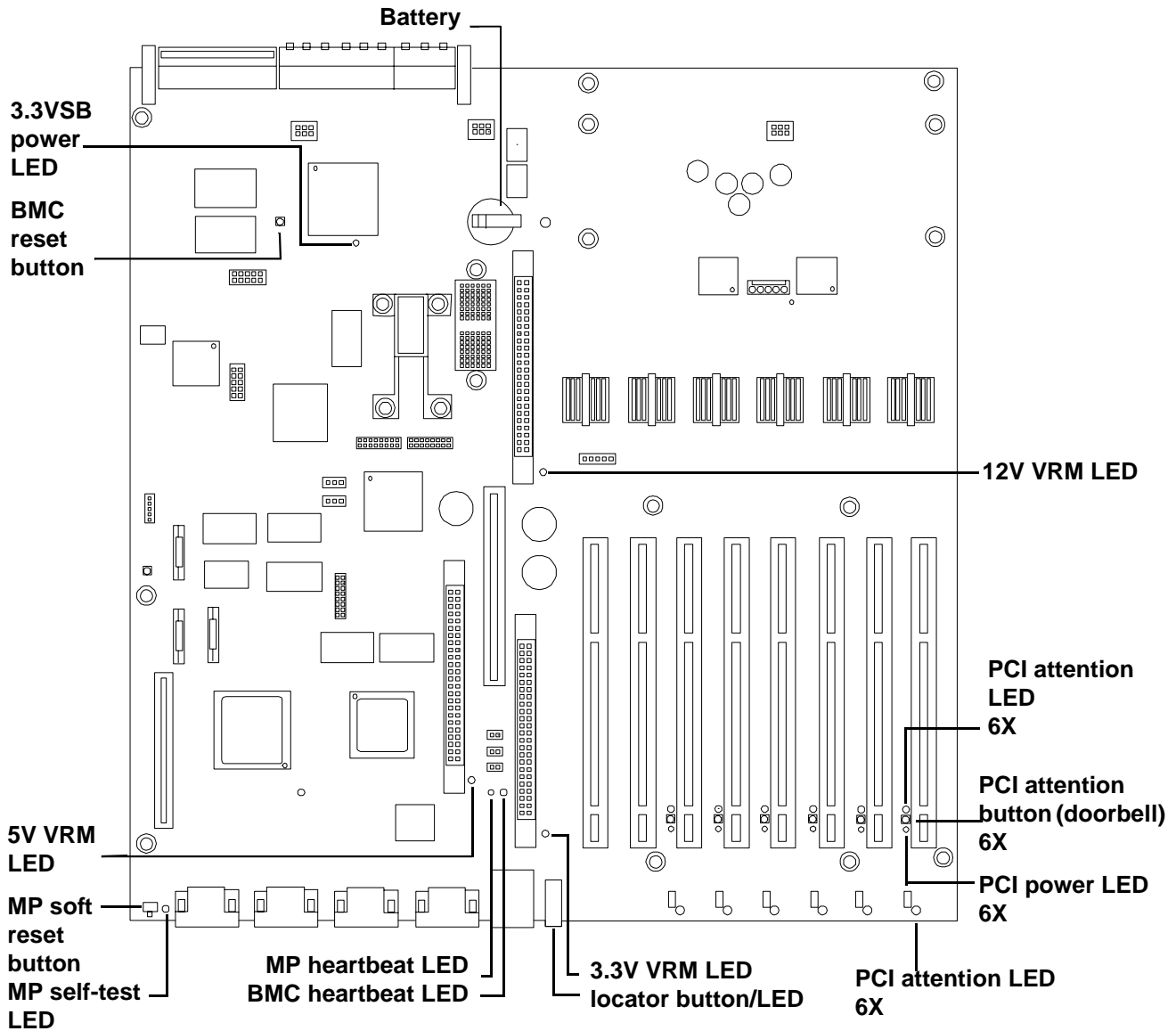
○ Marks unused LED positions covered by the label

NOTE For a complete description of QuickFind diagnostic LED states, see “QuickFind Diagnostic Panel LED Indicators” on page 119.

I/O Baseboard LED Indicators

There are various LEDs, sensors, reset, and attention buttons located on the HP Integrity rx4640 server I/O baseboard. They are shown in Figure 2-11.

Figure 2-11 I/O Baseboard LEDs, Buttons, and Sensors



NOTE For a complete description of the baseboard LEDs, see “I/O Baseboard LED Indicators” on page 121.

3 Powering Off and Powering On the Server

This chapter provides information and procedures for powering off and powering on the server.

This chapter addresses the following topics:

- “Power States” on page 34.
- “Powering Off the Server” on page 34.
- “Powering On the Server” on page 35.

Power States

The server has three power states:

- Standby power
- Full power
- Off

Plug the power cord into the appropriate receptacle on the rear of the chassis to achieve the standby power state; the front panel power button is not turned on. Full power occurs when the power cord is plugged into the appropriate receptacle, and either the power is activated through the iLO MP PC command, or the power button is activated. In the off state, the power cords are not plugged in. Table 3-1 lists the server power states.

Table 3-1 Power States

Power States	Power Cable Plugged Into Receptacle?	Power Activated through the iLO MP PC Command; or Front Panel Power Button Activated?	AC Voltage Applied	DC Voltage Applied
Standby power	Yes	No	Yes	No
Full power	Yes	Yes	Yes	Yes
Off	No	No	No	No

NOTE If the power restore feature is set to **Always On** through the iLO MP PR command, the server automatically powers on to the full power state.

Powering Off the Server

Power off the server using the following methods if the server is in either the standby or full power state:

- iLO MP PC command
- Power button

Powering Off the Server Using the iLO MP

To power off the server through the iLO MP, follow these steps:

- Step 1.** Gracefully shut down the operating system. See Appendix B, “Booting the Operating System,” on page 141, or your operating system documentation for more information.
- Step 2.** Initiate a console session, and access the **iLO MP Main Menu**.
- Step 3.** Enter **CM** to access the **Command Menu**.

Step 4. Enter **PC** to use the remote power control command.

Step 5. Enter **OFF** to power off the server, and enter **YES** when prompted to confirm the action.

IMPORTANT The main dc voltage is now removed from the server; however, ac voltage for standby power is still present in the server.

Step 6. Unplug all power cables from the receptacles on the rear panel of the server.

Powering Off the Server Manually

Manually power off the server through the power button by following these steps:

Step 1. Gracefully shut down the operating system. See Appendix B, “Booting the Operating System,” on page 141, or your operating system documentation for more information.

Step 2. Press the power button to power off the server.

IMPORTANT The main dc voltage is now removed from the server; however, ac voltage for standby power is still present in the server.

Step 3. Unplug all power cables from the receptacles on the rear panel of the server.

Powering On the Server

Power on the server to full power using the following methods if the server is in the standby power state:

- iLO MP **PC** command
- Power button

Powering On the Server Using the iLO MP

NOTE If the power restore feature is set to **Always On** through the iLO MP **PR** command, the server may automatically power on to the full power state.

To power on the server through the iLO MP, follow these steps:

Step 1. Plug all power cables into the receptacles on the rear panel of the server.

Step 2. Initiate a console session, and access the iLO MP Main Menu.

Step 3. Enter **CM** to enable command mode.

Step 4. Enter **PC** to use the remote power control command.

Step 5. Enter **ON** to power on the server, and enter **YES** when prompted to confirm the action.

Step 6. Start the operating system. See Appendix B, “Booting the Operating System,” on page 141, or your operating system documentation for more information.

Powering On the Server Manually

NOTE If the power restore feature is set to **Always On** through the iLO MP PR command, the server may automatically power on to the full power state.

To manually power on the server, follow these steps:

Step 1. Plug all power cables into the receptacles on the rear panel of the server.

Step 2. Press the power button to start the server.

Step 3. Start the operating system. See Appendix B, “Booting the Operating System,” on page 141, or your operating system documentation for more information.

4 Removing and Replacing Components

This chapter describes the procedure for removing and replacing the different components in the HP Integrity rx4640 server.

This chapter addresses the following topics:

- “Safety Information” on page 38
- “Service Tools Required” on page 38
- “Accessing a Rack Mounted Server” on page 38
- “Accessing a Pedestal Mounted Server” on page 40
- “Removing and Replacing the Front Bezel” on page 41
- “Removing and Replacing the Front and Top Covers” on page 42
- “Removing and Replacing the Memory Extender Board” on page 44
- “Removing and Replacing Server Memory DIMMs” on page 46
- “Removing and Replacing the Processor Extender Board” on page 52
- “Removing and Replacing a Processor” on page 55
- “Removing and Replacing Hot-Swap Chassis Fans” on page 63
- “Removing and Replacing the I/O Baseboard” on page 66
- “Removing and Replacing Hot-Plug PCI-X Cards” on page 71
- “Removing and Replacing OLX Dividers” on page 81
- “Removing and Replacing Core I/O Cards” on page 85
- “Removing and Replacing the Server Battery” on page 89
- “Removing and Replacing Hard Disk Drives” on page 90
- “Removing and Replacing the SCSI Backplane Board” on page 93
- “Removing and Replacing the Midplane Riser Board” on page 95
- “Removing and Replacing the Power Supplies” on page 98
- “Removing and Replacing the Power Distribution Board” on page 100
- “Removing and Replacing the DVD Drive” on page 102
- “Removing and Replacing the DVD I/O Board” on page 104
- “Removing and Replacing the Display Board” on page 107
- “Removing and Replacing the QuickFind Diagnostic Board” on page 109

Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the HP server:

- Use an antistatic wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155).
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

WARNING **Hazardous voltages are present inside the HP server. Always remove ac power from the server and associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.**

Service Tools Required

Service of this product may require one or more of the following tools:

- Electrically conductive field service kit (P/N 9300-1155)
- 1/4 inch flat blade screwdriver
- ACX-15 torx screwdriver
- ACX-25 torx screwdriver

Accessing a Rack Mounted Server

The HP Integrity rx4640 server is designed to be rack mounted. The following procedure explains how to gain access to your HP Integrity rx4640 server that is mounted in an approved rack. For rack installation instructions, review the document titled *Installation Guide, Mid-Weight Slide Kit, 5065-7291*. This document can be accessed at: <http://www.hp.com/racksolutions>.

WARNING **Ensure that all anti-tip features (front and rear anti-tip feet installed; adequate ballast properly placed; and so on) are employed prior to extending the server.**

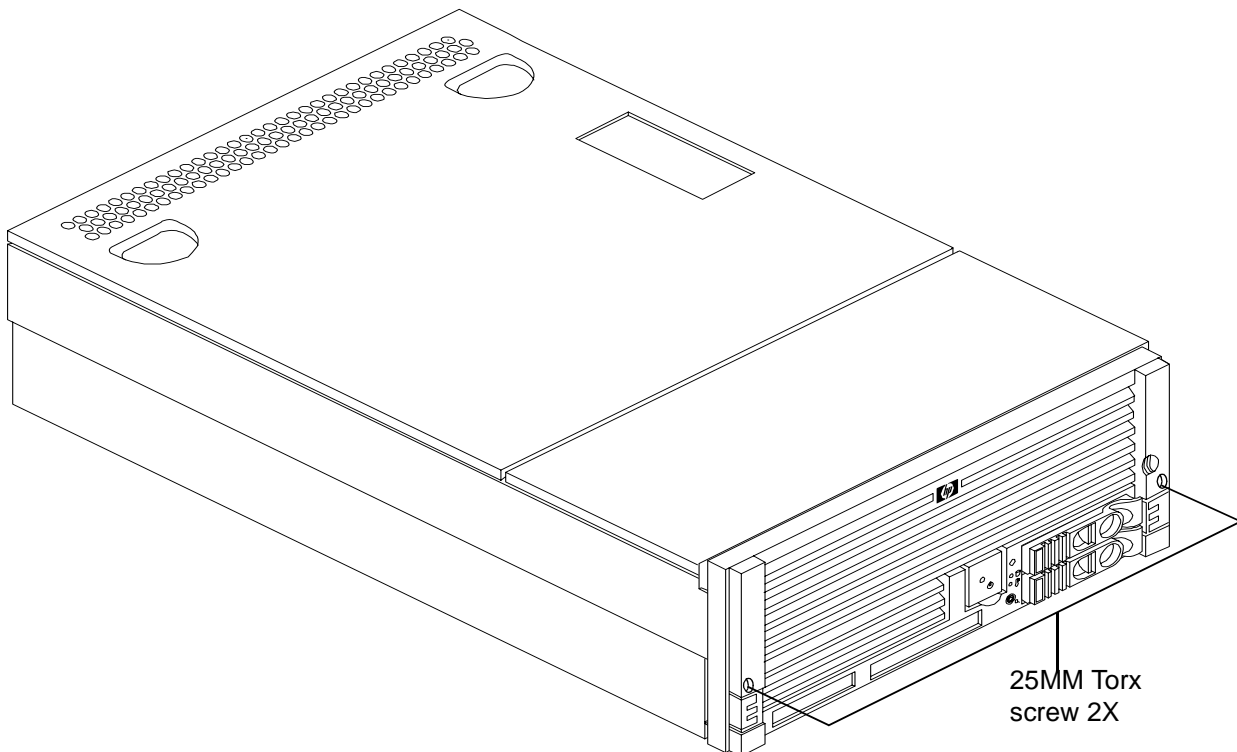
Extending the Server from the Rack

NOTE Ensure that there is enough area (Approximately 1.5 meters [4.5 ft.]) to fully extend the server out the front and work on it.

To extend the server from the rack, follow these steps:

- Step 1.** Remove the T-25 screws that fasten the server to the rack. See Figure 4-1, “Accessing 25MM Torx Screws.”
- Step 2.** Flip out the two pull handles at either end of the front bezel and slowly pull the unit forward by the handles. The server is fully extended when the rail clips are locked in place. When fully extended, the front and top covers are fully accessible.

Figure 4-1 Accessing 25MM Torx Screws



Inserting the Server into the Rack

To insert the server into the rack, follow these steps:

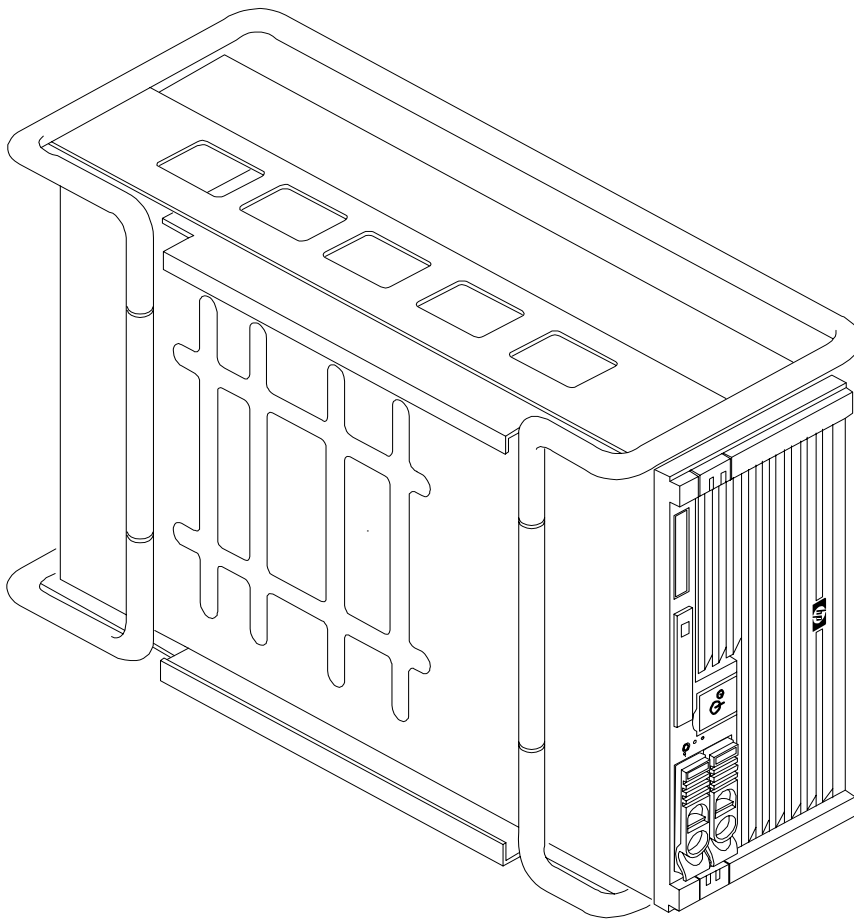
- Step 1.** Press the rail clips on either side of the server inward and push the server into the rack until it stops.
- Step 2.** Replace the T-25 screws that fasten the server to the rack.

Accessing a Pedestal Mounted Server

The HP Integrity rx4640 server is also designed to be pedestal mounted. You do not need to remove the pedestal from the HP server to gain access to internal components. The front bezel, front cover, and top cover may be removed with the pedestal attached to the HP server.

WARNING Ensure that the HP server is properly grounded when performing remove-and-replace procedures. Use an antistatic wrist strap and grounding mat similar to those found in the HP Electrically Conductive Field Service Kit.

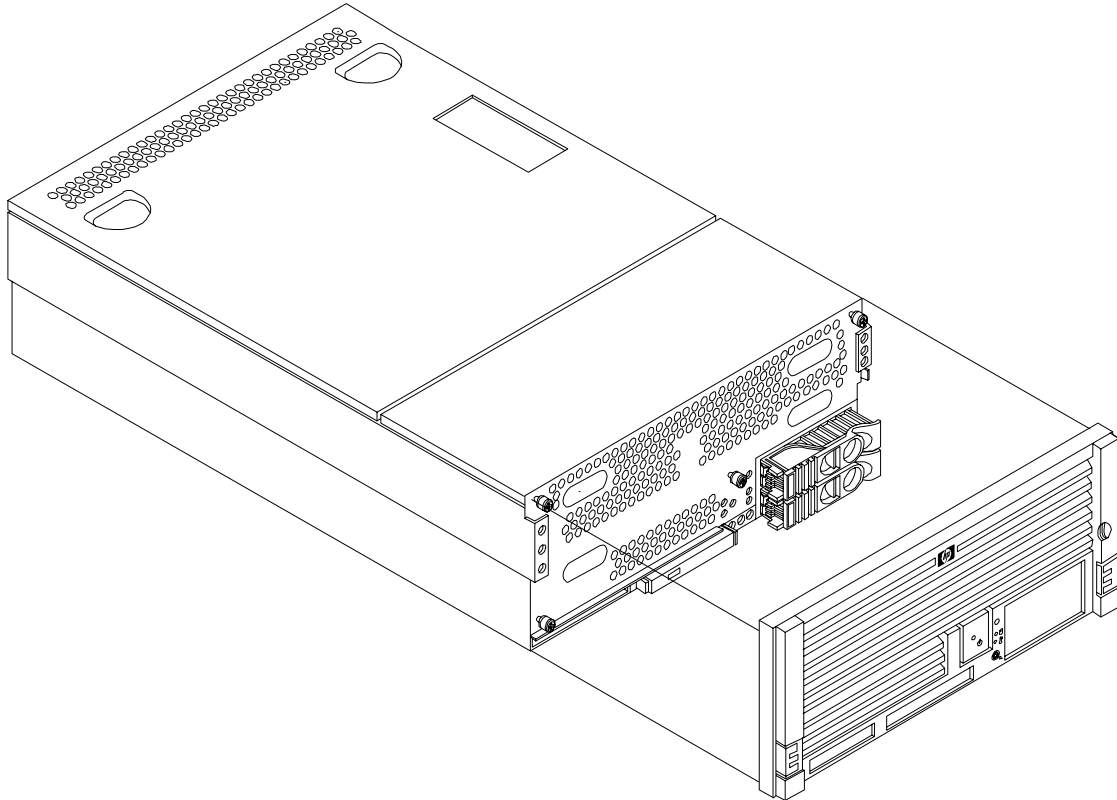
Figure 4-2 Pedestal Mounted HP Integrity rx4640 Server



Removing and Replacing the Front Bezel

The server does not have to be turned off to remove the front bezel. Figure 4-3 shows how to remove the front bezel.

Figure 4-3 Removing and Replacing the Front Bezel



Removing the Front Bezel

To remove the front bezel, perform the following step:

Step 1. Grasp the front bezel at the outer edges and pull straight out.

Replacing the Front Bezel

To replace the front bezel, perform the following step:

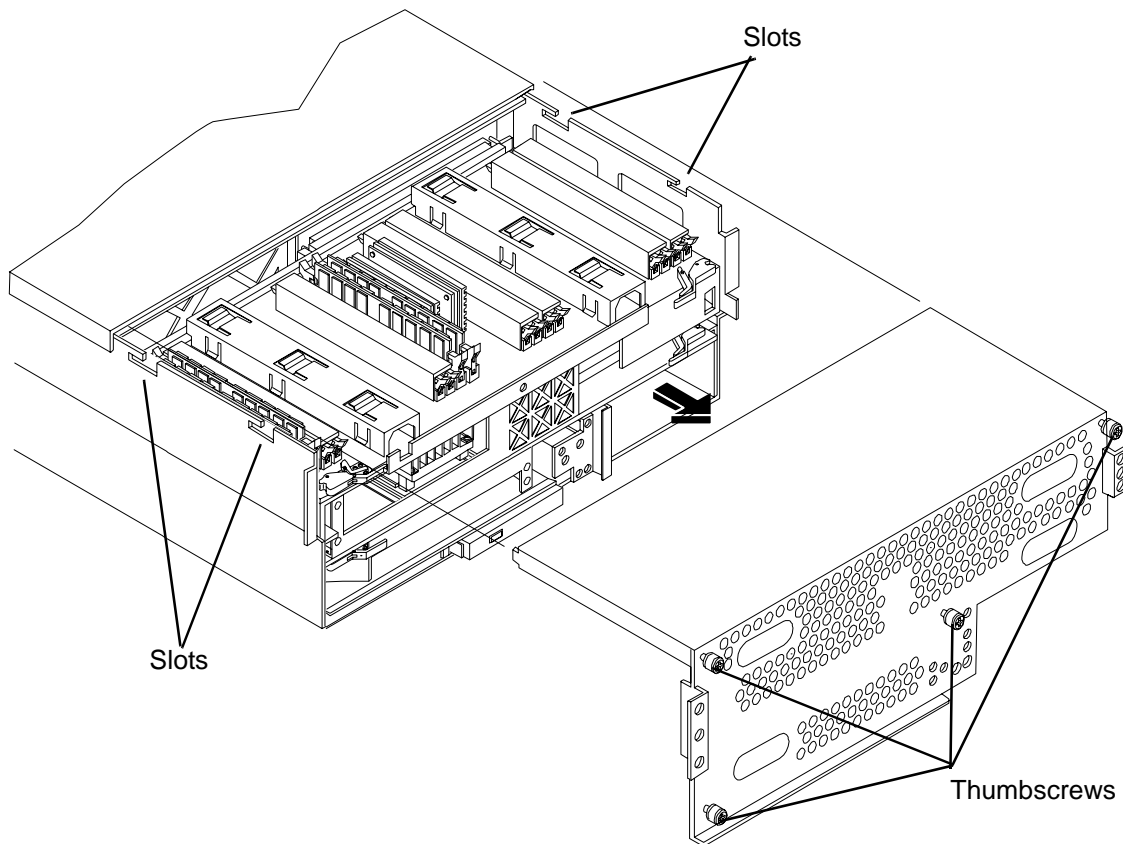
Step 1. Push the front bezel straight into the chassis until it snaps into place.

Removing and Replacing the Front and Top Covers

The following procedures detail how to remove and replace the front and top covers of the HP Integrity rx4640 server. Figure 4-4 shows how to remove the front cover.

NOTE When the front or top cover is removed the chassis fan units increase to high speed to assist cooling. When the top cover is replaced at the end of the operation, the chassis fans return to normal speed.

Figure 4-4 Removing and Replacing the Front Cover



Removing the Front Cover

To remove the front cover, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Using a torx T15 driver, loosen the four captive thumbscrews that hold the front cover in place.
- Step 4.** Raise the cover slightly, and pull the cover toward the front of the server to free the tabs from the slots in the chassis.

Replacing the Front Cover

To replace the front cover, follow these steps:

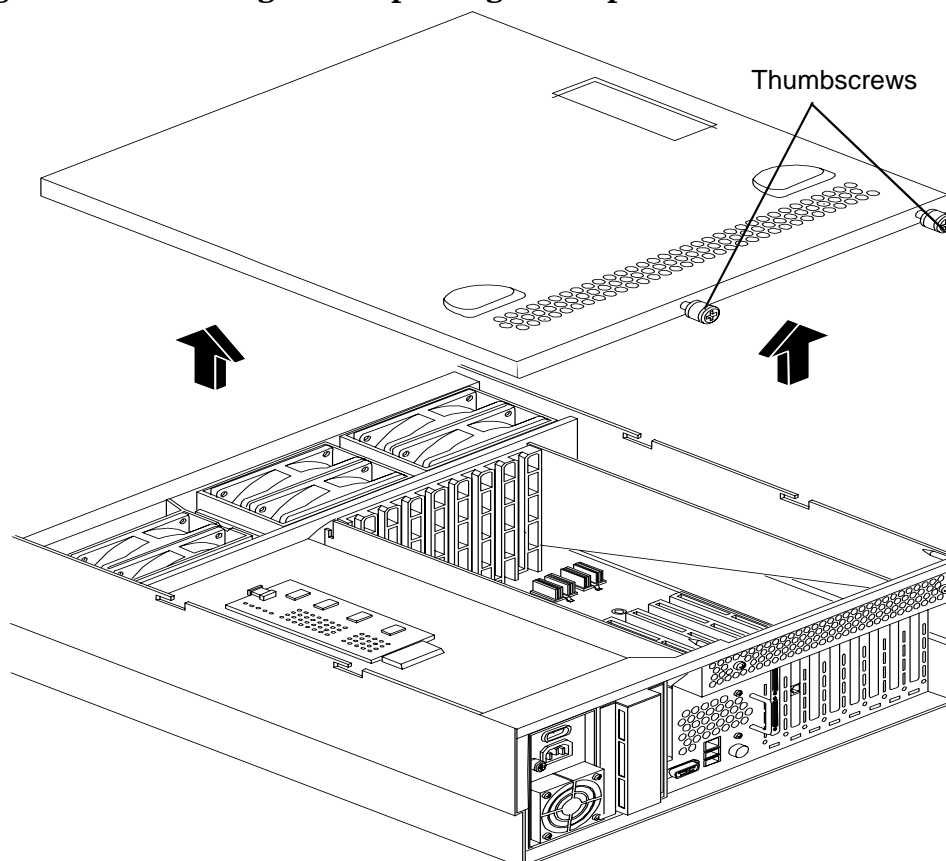
- Step 1.** Align the tabs at the rear of the front cover with the corresponding slots in the chassis and fully seat the tabs into the slots. Figure 4-4 shows how to install the front cover.
- Step 2.** Tighten the four thumbscrews securely.
- Step 3.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 4.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing the Top Cover

To remove the top cover, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.

Figure 4-5 Removing and Replacing the Top Cover



- Step 2.** Loosen the two captive thumbscrews that hold the top cover in place.
- Step 3.** Pull the cover toward the rear of the server to free the tabs from the slots in the chassis and lift it straight up.

Replacing the Top Cover

To replace the top cover, follow these steps:

- Step 1.** Align the tabs at the rear of the top cover with the corresponding slots in the chassis, fully seat the tabs into the slots, and push forward until it seats.
- Step 2.** Using a torx T15 driver, tighten the two thumbscrews securely.
- Step 3.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing the Memory Extender Board

The memory extender board is located directly under the front cover of the chassis. The standard memory extender board can hold up to 16 DIMMs. The high capacity memory extender board can hold up to 32 DIMMs.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing a memory extender board.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the Memory Extender Board

To remove a memory extender board, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.

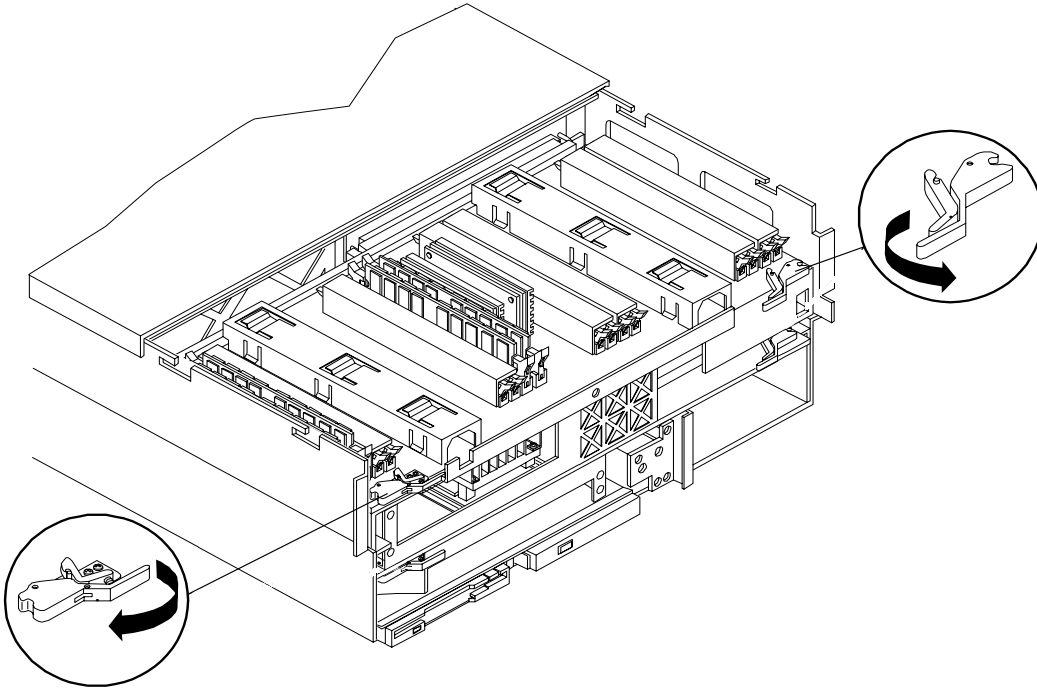
NOTE If desired, the memory extender board may be removed without removing the HP server from the rack.

- Step 2.** Remove the front bezel from the chassis. See “Removing the Front Bezel” on page 41.

- Step 3.** Remove the front cover from the chassis. See “Removing the Front Cover” on page 42.

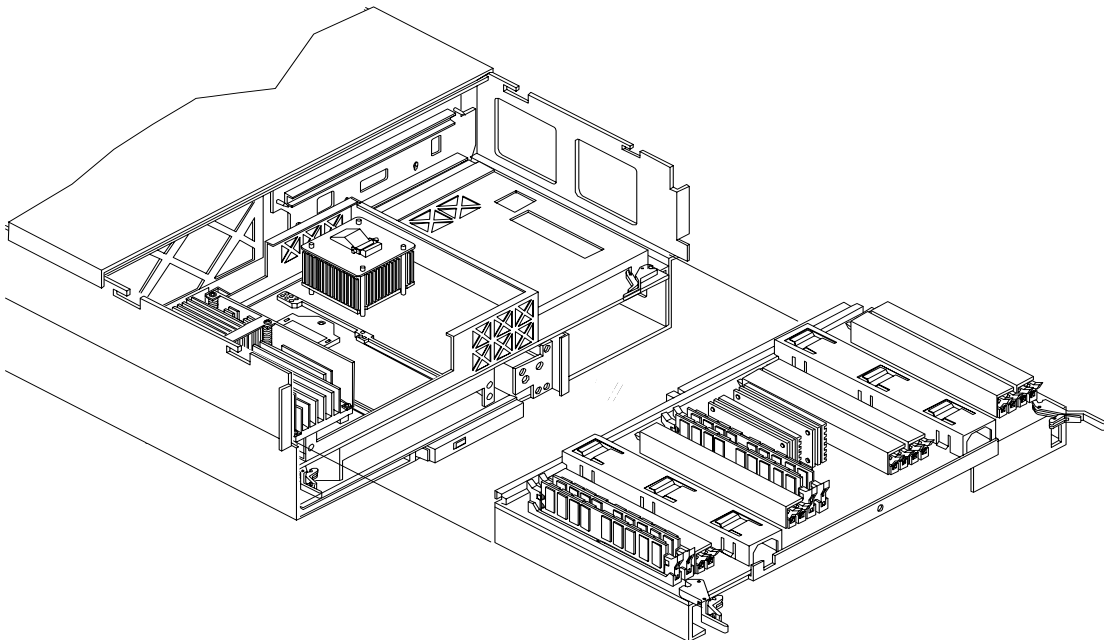
- Step 4.** Press each latch on the two extraction levers located on each side of the memory extender board. Figure 4-6 shows how to unlatch the memory extender board.

Figure 4-6 Opening the Memory Extender Board Latches



- Step 5.** Pull on the extraction levers to unplug the memory extender board from the socket located on the midplane riser board and remove the memory extender board from the chassis. Figure 4-7 shows how to remove the memory extender board from the server.

Figure 4-7 Removing and Replacing the Memory Extender Board



Replacing the Memory Extender Board

To replace the memory extender board, follow these steps:

- Step 1.** Ensure the extraction levers are positioned in the outward, unlocked position. Figure 4-7 shows how to install the memory extender board.
- Step 2.** Align the memory extender board with the front and rear chassis guide slots.
- Step 3.** Slide the memory extender board in until it begins to seat in the socket located on the midplane board.
- Step 4.** Push the extraction levers inward to the locked position in order to plug in the memory extender board into the midplane riser board.
- Step 5.** Replace the front cover. See “Replacing the Front Cover” on page 43.
- Step 6.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 7.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing Server Memory DIMMs

Use these procedures to remove and replace server memory DIMMs. server memory DIMMs are located on the memory extender board.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing server memory DIMMs. Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.**

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing Server Memory DIMMs

To remove server memory, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.

NOTE If desired, the processor extender board may be removed without removing the HP server from the rack.

- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the memory extender board. See “Removing the Memory Extender Board” on page 44.
- Step 5.** Identify the DIMM to be removed and push the appropriate extraction levers found on either side of the DIMM slot outward to the open position. The DIMM ejects from the slot.
- Step 6.** Remove the DIMM from the socket.

Installing Memory DIMMs

Your HP Integrity rx4640 comes with a 16 DIMM memory extender board that is minimally configured with 1GB of memory (four 256 Mb DIMMs loaded in quad 0 [slots 0A, 0B, 0C, and 0D]). See Figure 4-9 for the slot locations on the 16 DIMM memory extender board.

An optional 32 DIMM memory extender board is available to replace the 16 DIMM memory extender board and must also be minimally configured with 1 GB in quad 0. See Figure 4-10 for the slot locations on the 32 DIMM memory extender board.

You may insert additional DIMMs into both 16 and 32 DIMM boards. When adding DIMMs, you must use a minimum of four like sized DIMMs in the next available quad. DIMMs must be loaded in quads with qualified modules. Memory is protected by data ECC, and the hardware implementation supports chip-spare.

Supported DIMM Sizes

Supported DIMM sizes are 256 MB, 512 MB, 1 GB, 2 GB, or 4 GB. Dissimilar DIMM sizes may be used across the entire extender board but all four DIMMs in each quad must match. For cooling purposes, DIMM fillers must be used in some unused slots.

DIMM Slot Fillers

Both the 16 and 32 DIMM extender boards have DIMM slot filler boards placed over all unfilled DIMM slots. As you fill DIMM quads with additional memory you must remove the DIMM slot fillers covering the affected slots. All remaining DIMM fillers in unused slots must remain in place to maximize internal cooling. See Table 4-2 and Table 4-4 for slot filler requirements for the 16 and 32 DIMM memory extender boards.

NOTE One DIMM filler board covers two adjacent DIMM slots. As a general rule, only remove DIMM slot fillers as you add memory and the correct configuration will always remain.

Installing DIMMs

To install DIMMs, follow these steps:

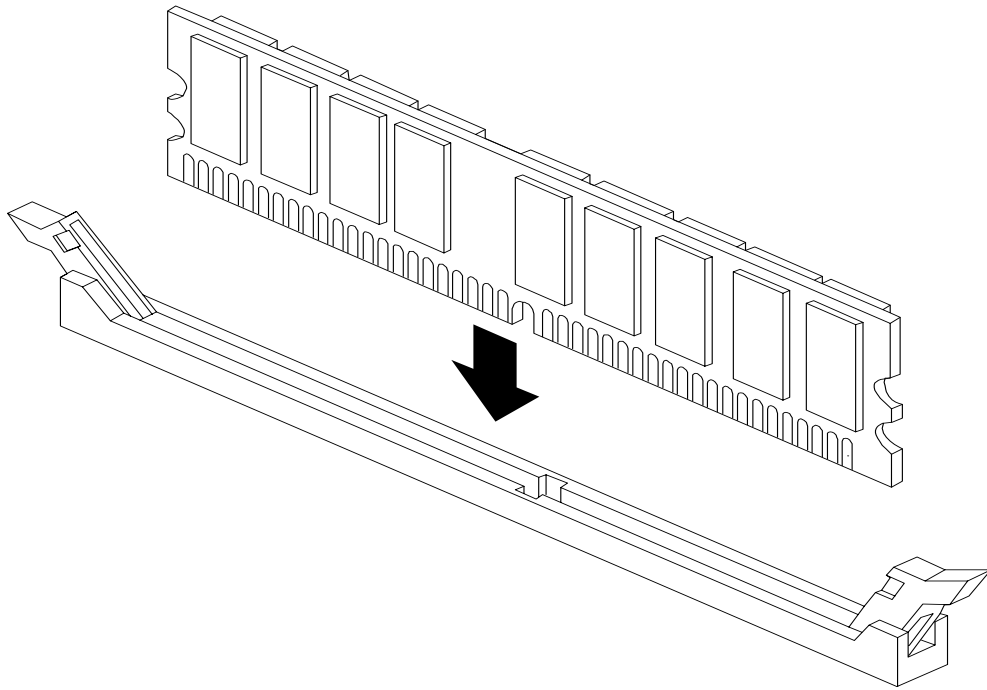
- Step 1.** Align the DIMM with the socket located on the memory extender board.
- Step 2.** Gently and evenly push on each side of the DIMM until it seats in the socket. Ensure that the extraction levers are in the closed position. Repeat as needed until all additional DIMMs are installed.
- Step 3.** Replace the memory extender board. See “Replacing the Memory Extender Board” on page 46.

Step 4. Replace the front cover. See “Replacing the Front Cover” on page 43.

Step 5. Replace the front bezel. See “Replacing the Front Bezel” on page 41.

Step 6. If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Figure 4-8 **Inserting DIMM into Extender Board Slot**



16 DIMM Memory Extender Board Layout

The following details the slot locations, quads, and slot filler requirements on the 16 DIMM memory extender board.

Figure 4-9 shows the slot locations on the 16 DIMM extender board.

Figure 4-9 16 DIMM Extender Board Slot IDs

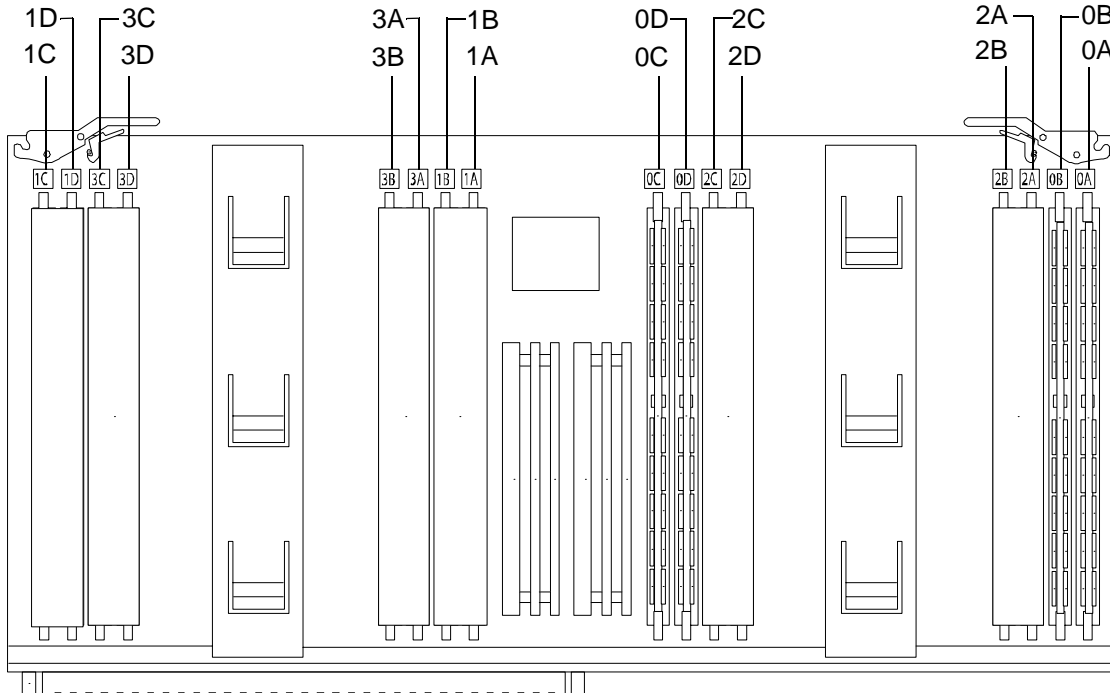


Table 4-1 details the quads on the 16 DIMM memory extender board.

Table 4-1 Quads on the 16 DIMM Memory Extender Board

Quad	Slots
Quad 0	Slots 0A, 0B, 0C, 0D
Quad 1	Slots 1A, 1B, 1C, 1D
Quad 2	Slots 2A, 2B, 2C, 2D
Quad 3	Slots 3A, 3B, 3C, 3D

Table 4-2 details the slot filler requirements when installing DIMMs on the 16 DIMM memory extender board.

Table 4-2 DIMM Filler Requirements for 16 DIMM Extender Board

16 DIMM Extender Board	
DIMMs Loaded	Fillers Required ^a
4 DIMMs in quad 0	6 fillers total: 2 fillers in quads 1, 2, and 3 (all quads filled)
8 DIMMs in quads 0 and 1	4 fillers total: 2 fillers in quads 2 and 3 (all quads filled)
12 DIMMs in quads 0, 1, and 2	2 fillers total: 2 fillers in quad 3 (all quads filled)
16 DIMMs in quads 0, 1, 2, and 3	No fillers required

a. One DIMM filler board covers two adjacent DIMM slots.

32 DIMM Memory Extender Board Layout

The following details the slot locations, quads, and slot filler requirements on the optional 32 DIMM memory extender board.

Figure 4-10 shows the slot locations on the optional 32 DIMM extender board.

Figure 4-10 32 DIMM Extender Board Slot IDs

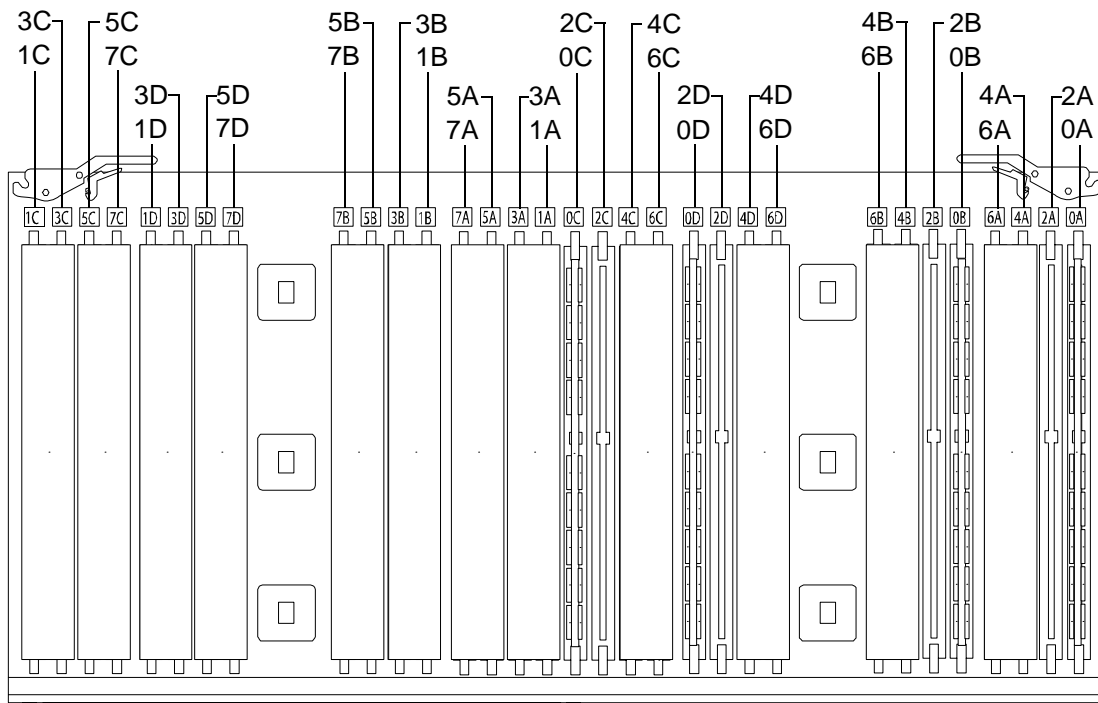


Table 4-3 details the quads on the 32 DIMM memory extender board.

Table 4-3 Quads on the Optional 32 DIMM Memory Extender Board

Quad	Slots
Quad 0	Slots 0A, 0B, 0C, 0D
Quad 1	Slots 1A, 1B, 1C, 1D
Quad 2	Slots 2A, 2B, 2C, 2D
Quad 3	Slots 3A, 3B, 3C, 3D
Quad 4	Slots 4A, 4B, 4C, 4D
Quad 5	Slots 5A, 5B, 5C, 5D
Quad 6	Slots 6A, 6B, 6C, 6D
Quad 7	Slots 7A, 7B, 7C, 7D

Table 4-4 details the slot filler requirements when installing DIMMs on the optional 23 DIMM memory extender board.

Table 4-4 DIMM Filler Requirements for 32 DIMM Extender Board

32 DIMM Extender Board	
DIMMs Loaded	Fillers required ^a
4 DIMMs in quad 0	12 fillers total: 2 fillers in quads 1, 3, 4, 5, 6, and 7 (quad 2 remains unfilled)
8 DIMMs in quads 0 and 1	8 fillers total: 2 fillers in quads 4, 5, 6, and 7 (quads 2 and 3 remain unfilled)
12 DIMMs in quads 0, 1, and 2	8 fillers total: 2 fillers in quads 4, 5, 6, and 7 (quad 3 remains unfilled)
16 DIMMs in quads 0, 1, 2, and 3	8 fillers total: 2 fillers in quads 4, 5, 6, and 7 (all quads filled)
20 DIMMs in quads 0, 1, 2, 3, and 4	4 fillers total: 2 fillers in quads 5, 7 quad 6 remains unfilled
24 DIMMs in quads 0, 1, 2, 3, 4, and 5	No fillers required
28 DIMMs in quads 0, 1, 2, 3, 4, 5, and 6	No fillers required
32 DIMMs in quads 0, 1, 2, 3, 4, 5, 6, and 7	No fillers required

a. One DIMM filler board covers two DIMM adjacent slots.

Removing and Replacing the Processor Extender Board

The processor extender board is located directly under the memory extender board. The processor extender board can hold between one and four processors.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the processor extender board.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure will result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the Processor Extender Board

To remove the processor extender board, follow these steps:

Step 1. If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.

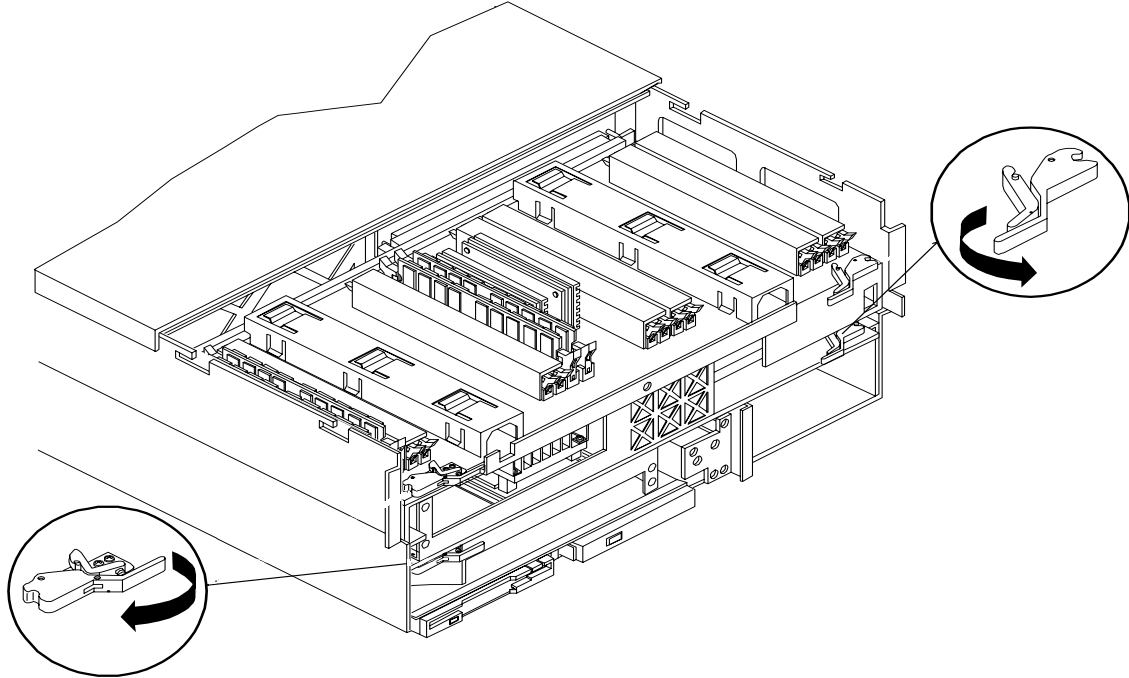
NOTE If desired, the processor extender board may be removed without removing the HP server from the rack.

Step 2. Remove the front bezel. See “Removing the Front Bezel” on page 41.

Step 3. Remove the front cover. See “Removing the Front Cover” on page 42.

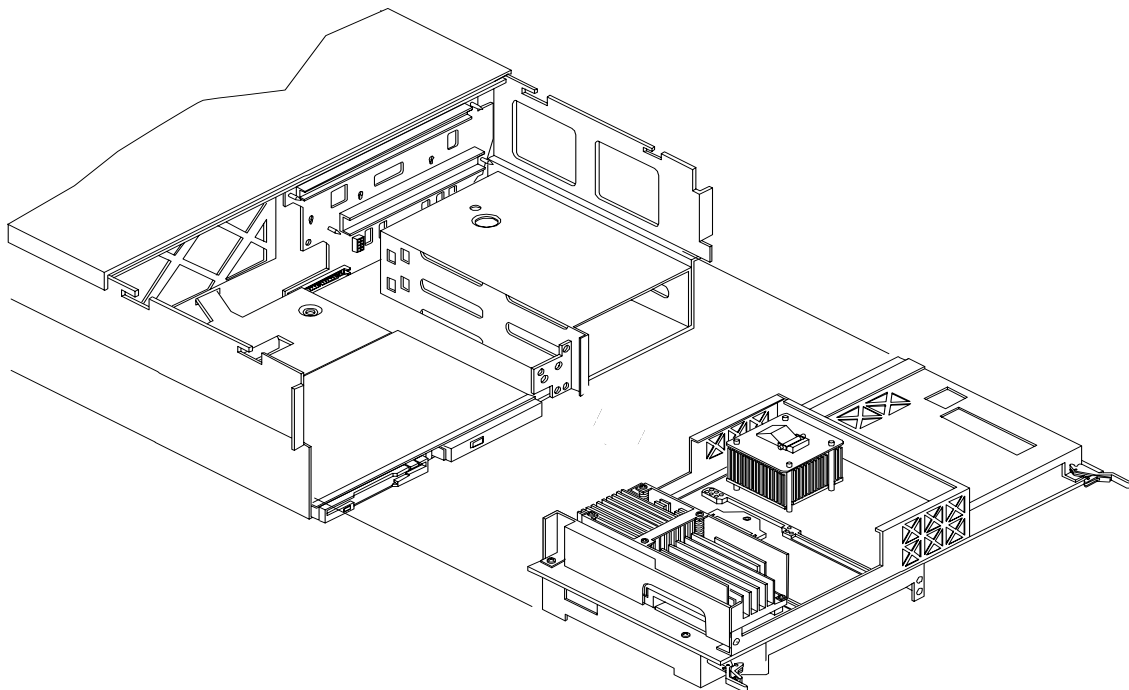
- Step 4.** Press the latch on the extraction levers located on each side of the processor extender board. Figure 4-11 shows how to open the processor extender board latches.

Figure 4-11 Opening the Processor Extender Board Latches



- Step 5.** Pull out on the extraction levers to unplug the processor extender board from the socket located on the midplane riser board. Figure 4-12 shows how to remove the extender board from the server.

Figure 4-12 Removing and Replacing the Processor Extender Board



Replacing the Processor Extender Board

To replace the processor extender board, follow these steps:

- Step 1.** Ensure the extraction levers are positioned in the outward, unlocked position.
- Step 2.** Align the processor extender board with the front and rear card guides.
- Step 3.** Slide the processor extender board down until it begins to seat in the socket located on the midplane riser board.
- Step 4.** Push the extraction levers inward to the locked position in order to fully seat the processor extender board into the socket on the midplane riser board.
- Step 5.** Replace the front cover. See “Replacing the Front Cover” on page 43.
- Step 6.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 7.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing a Processor

Use the following procedures to remove and replace a processor on the processor extender board. Processors are located on the top and bottom surfaces of the processor extender board.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing a processor.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

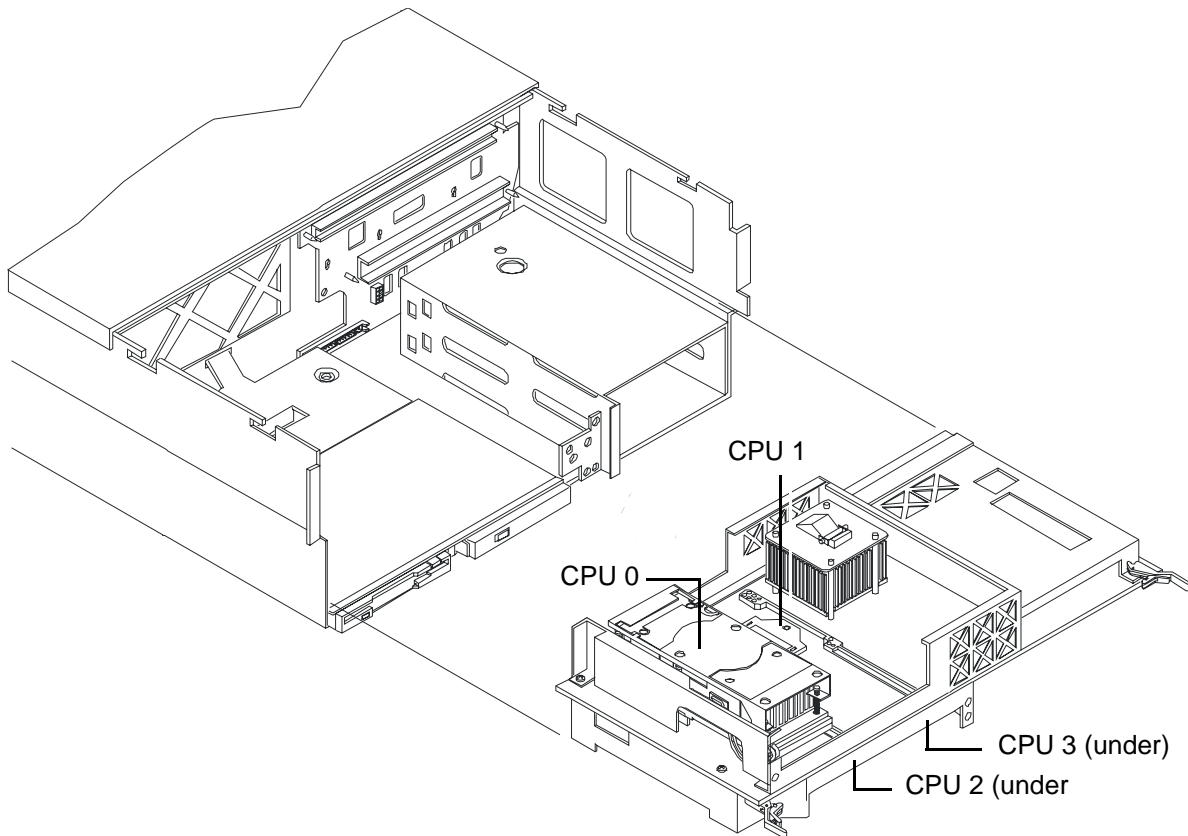
Processor Load Order

Processor modules are housed on the processor extender board located under the top cover in the top service bay. The processor extender board can hold between one and four processor modules. CPU 0 and CPU 1 are located on the top of the processor extender board and CPU 2 and CPU 3 are located on the bottom. Processors must be installed in a specific order as detailed in Table 4-5. Figure 4-13 shows the processor slot locations on the processor extender board.

Table 4-5 Processor Load Order

Processor Modules	Socket
First	CPU 0
Second	CPU 1
Third	CPU 2
Fourth	CPU 3

Figure 4-13 Processor Slot Locations on the Processor Extender Board



Removing a Processor

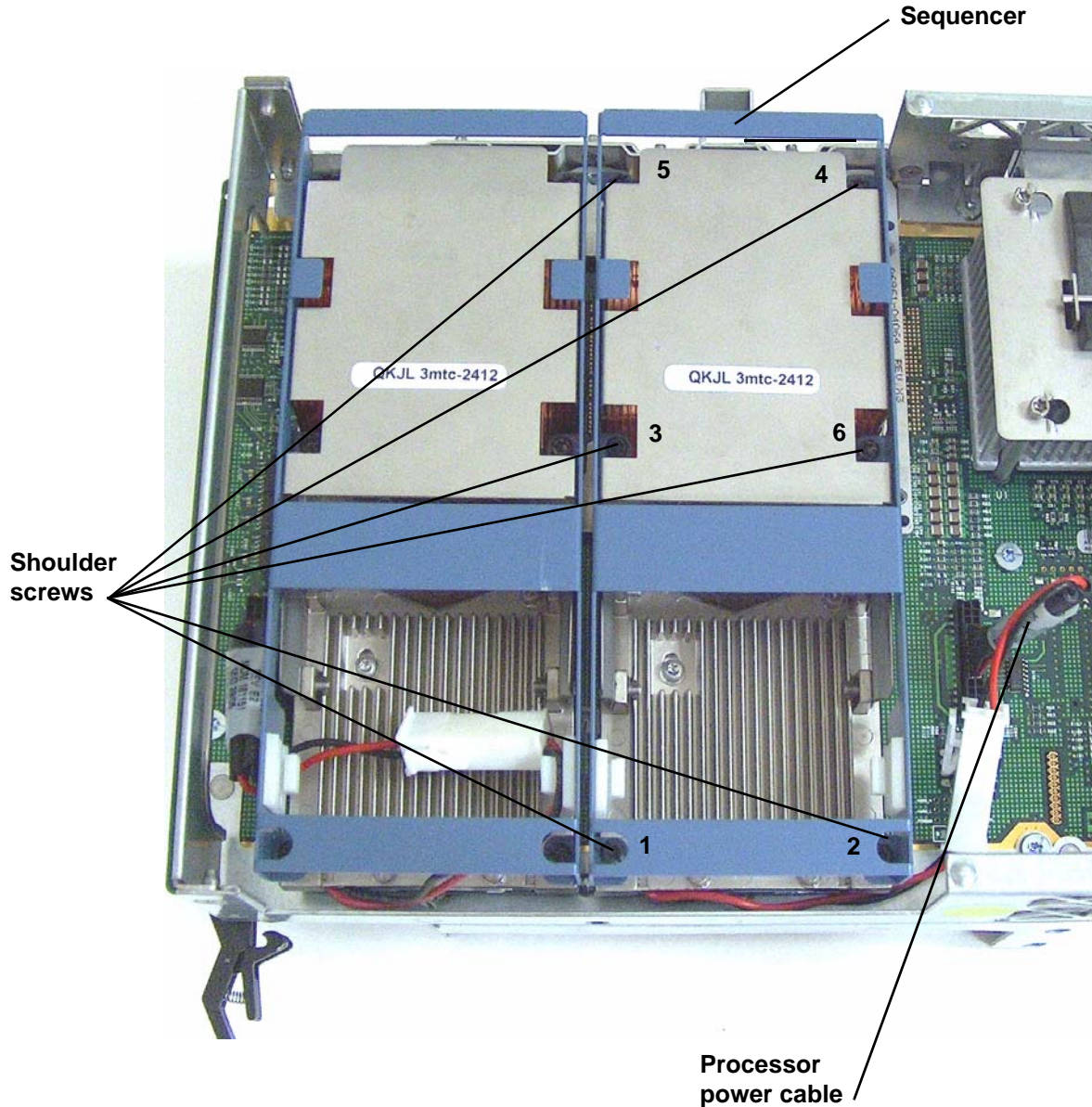
To remove a processor on the processor extender board, follow these steps:

NOTE The processor being removed in this procedure is CPU 1. This procedure applies to all the processors on the processor extender board.

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the processor extender board. See “Removing the Processor Extender Board” on page 52.

Step 5. Using a torx T15 driver, loosen the six captive T15 shoulder screws that attach the sequencer frame on the heatsink in the order specified in Figure 4-14 until the sequencer frame is free.

Figure 4-14 Removing the Processor Sequencer

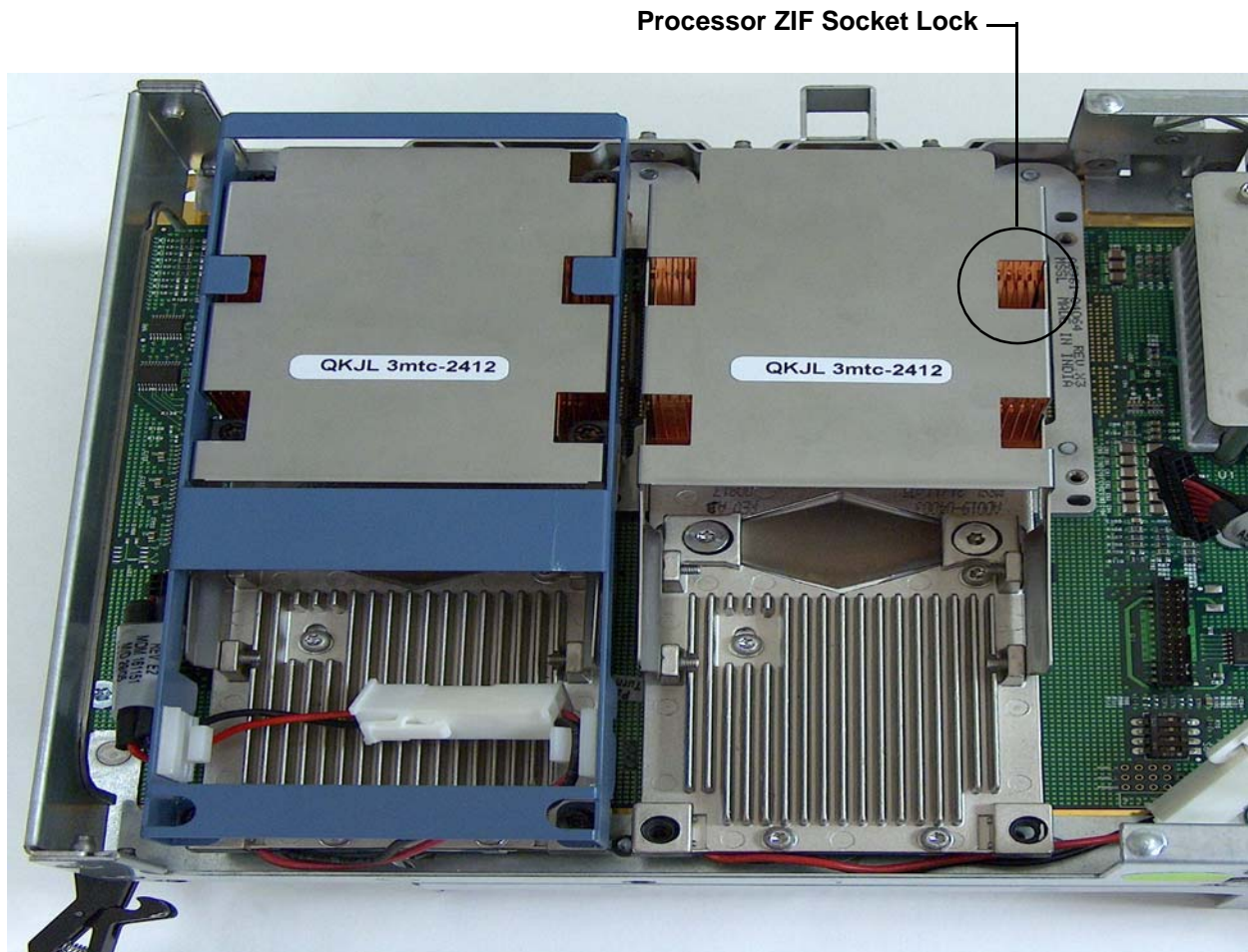


Step 6. Remove the sequencer frame from the heatsink.

Step 7. Unplug the processor power cable from its socket on the extender board.

Step 8. Unlock the processor from the processor extender board by inserting the 2 mm hex end of the processor installation tool through the processor into the ZIF socket lock and turning it 180 degrees counterclockwise. Figure 4-15 shows the location of the ZIF socket lock.

Figure 4-15 Unlocking the Processor from the Processor Extender Board



Step 9. Carefully remove the processor from the processor extender board, and place in an antistatic bag.

Replacing a Processor

To install a processor on the extender board, perform the following steps. If you have already removed the processor extender board from the server, proceed to step 6.

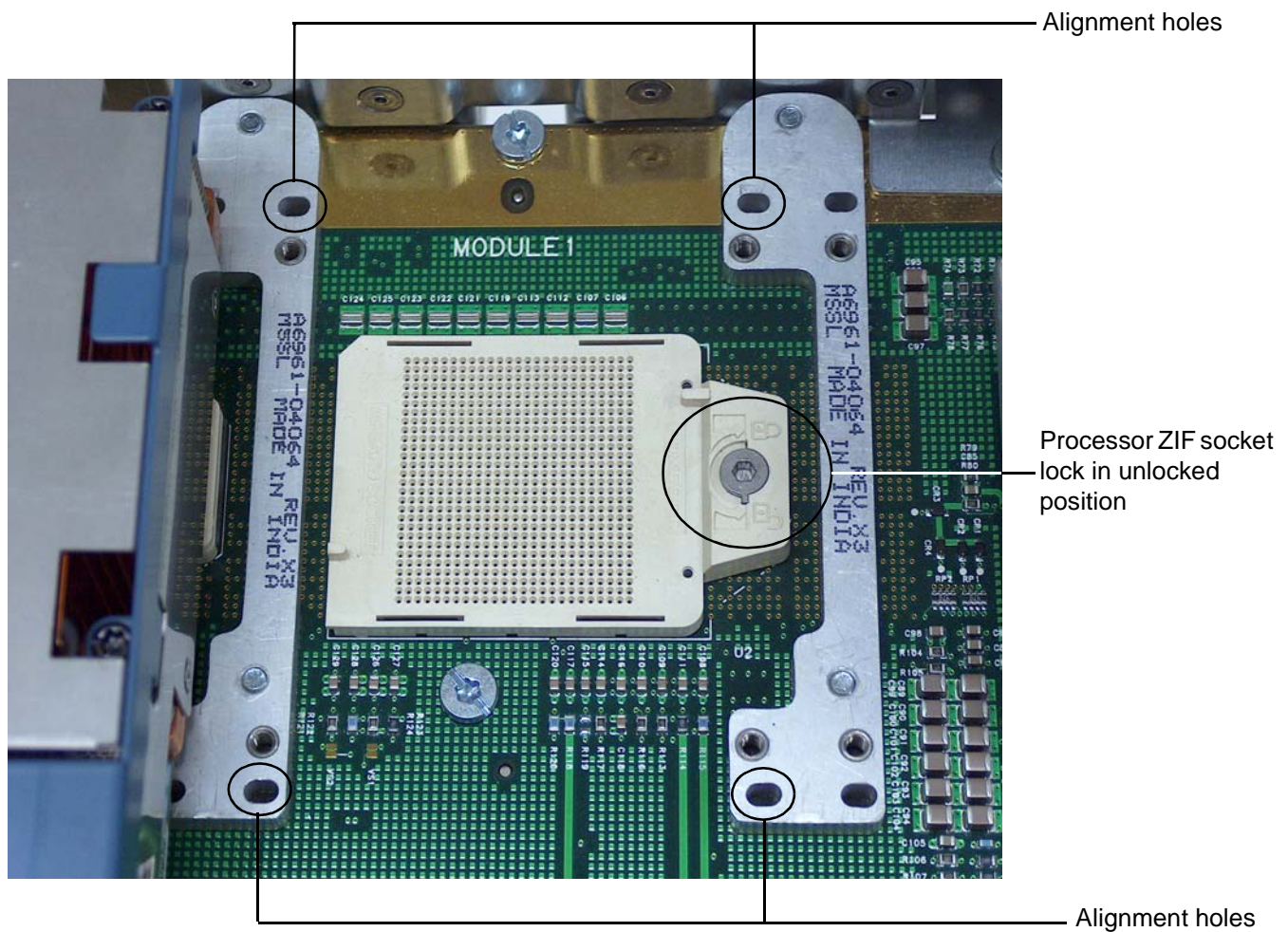
CAUTION Ensure that the cache size is identical for all processors. Failure to observe this caution will result in server failure.

Ensure that all processors are rated for use at the same speed. Failure to observe this caution will result in performance degradation.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Accessing a Rack Mounted Server” on page 38.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the processor extender board. See “Removing the Processor Extender Board” on page 52.
- Step 5.** Using an antistatic wrist strap place the extender board on a grounding mat (Electrically Conductive Field Service Grounding Kit-HP 9300-1155).
- Step 6.** Ensure the cam on the processor socket lock is in the unlocked, counterclockwise position. Figure 4-16 shows the CPU 1 ZIF socket in the unlocked position.

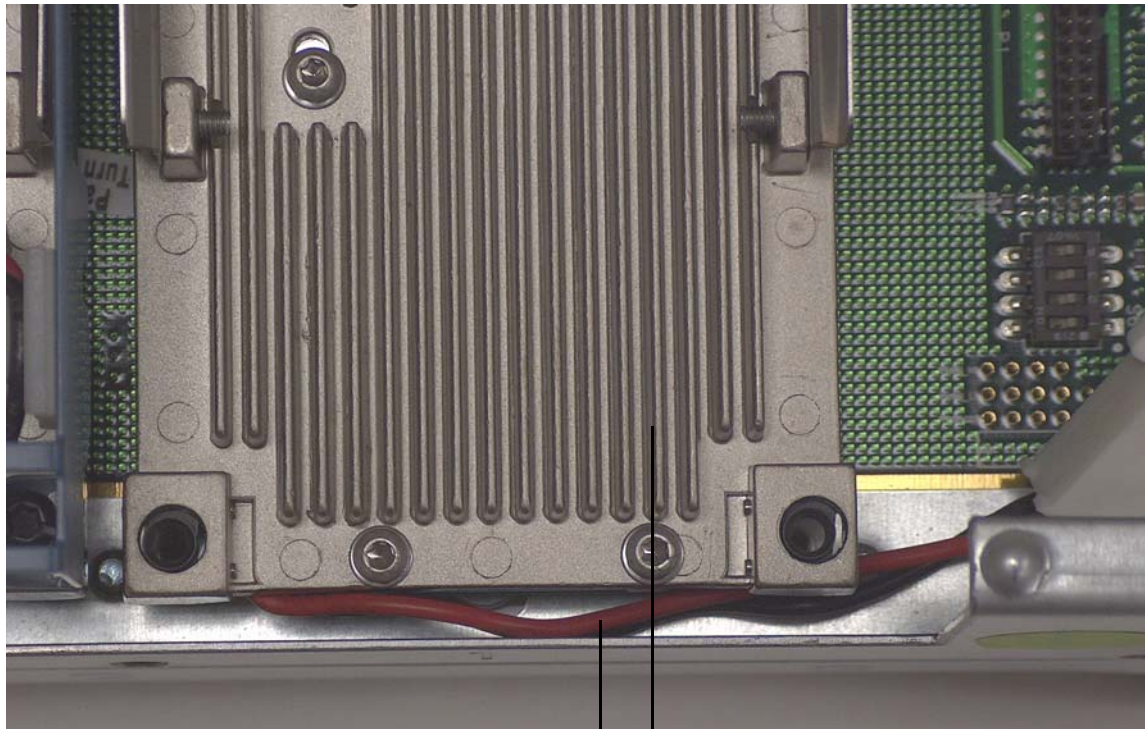
Figure 4-16 CPU 1 Socket Unlocked



- Step 7.** Carefully lower the processor, without the sequencer clamp, onto the processor socket. Align the pins on the bottom of the heatsink to the slots in the retention frame on the extender board. Figure 4-16 shows the alignment holes on the processor extender board.

Step 8. Make sure the processor power cable is not pinched underneath the processor before locking the processor onto the processor extender board. Figure 4-17 shows the correct placement of the processor power cable.

Figure 4-17 Processor Cable Routed Correctly



Correct routing of CPU 1 power cable — CPU 1

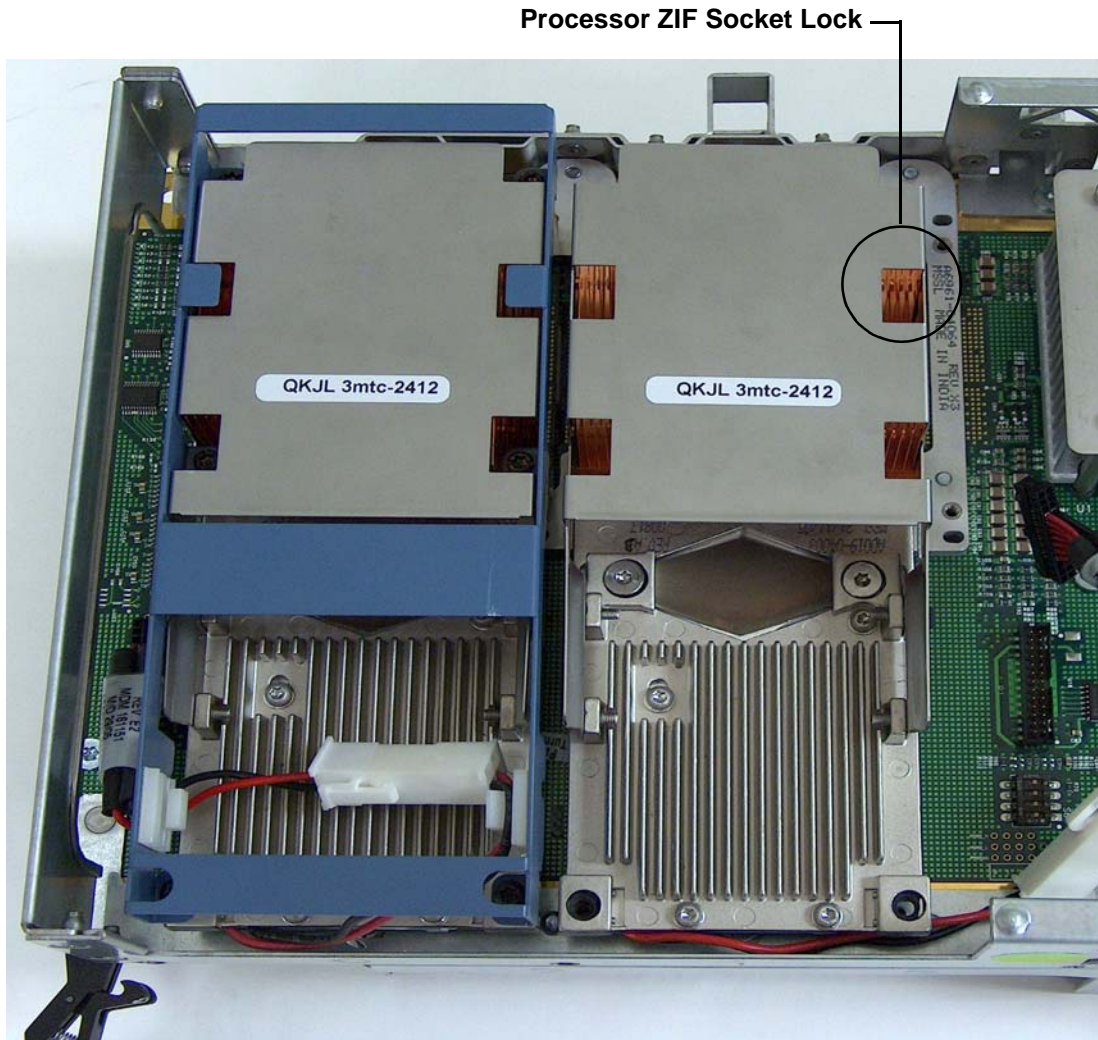
CAUTION Test the alignment of the assembly to the socket by gently moving the assembly back and forth with the palm of your hand—you should feel little or no sideplay. However, because the assembly is not yet tightened, it may tilt slightly towards the center of the extender board—this is acceptable.

CAUTION Before locking the processor assembly into its socket, ensure that the power cable is not pinched between the heatsink and sheet metal frame of the extender board. See Figure 4-17 for the correct placement of the processor power cable.

Step 9. Insert the 2 mm hex end of the processor installation tool through the processor into the ZIF socket lock. Rotate the socket 180 degrees clockwise to lock the processor to the processor extender board.

CAUTION When rotating the locking cam, hold the palm of your hand on top of the assembly and exert light pressure. This ensures that the assembly stays flush and level to the socket while it is being tightened.

Figure 4-18 Locking the Processor to the Processor Extender Board



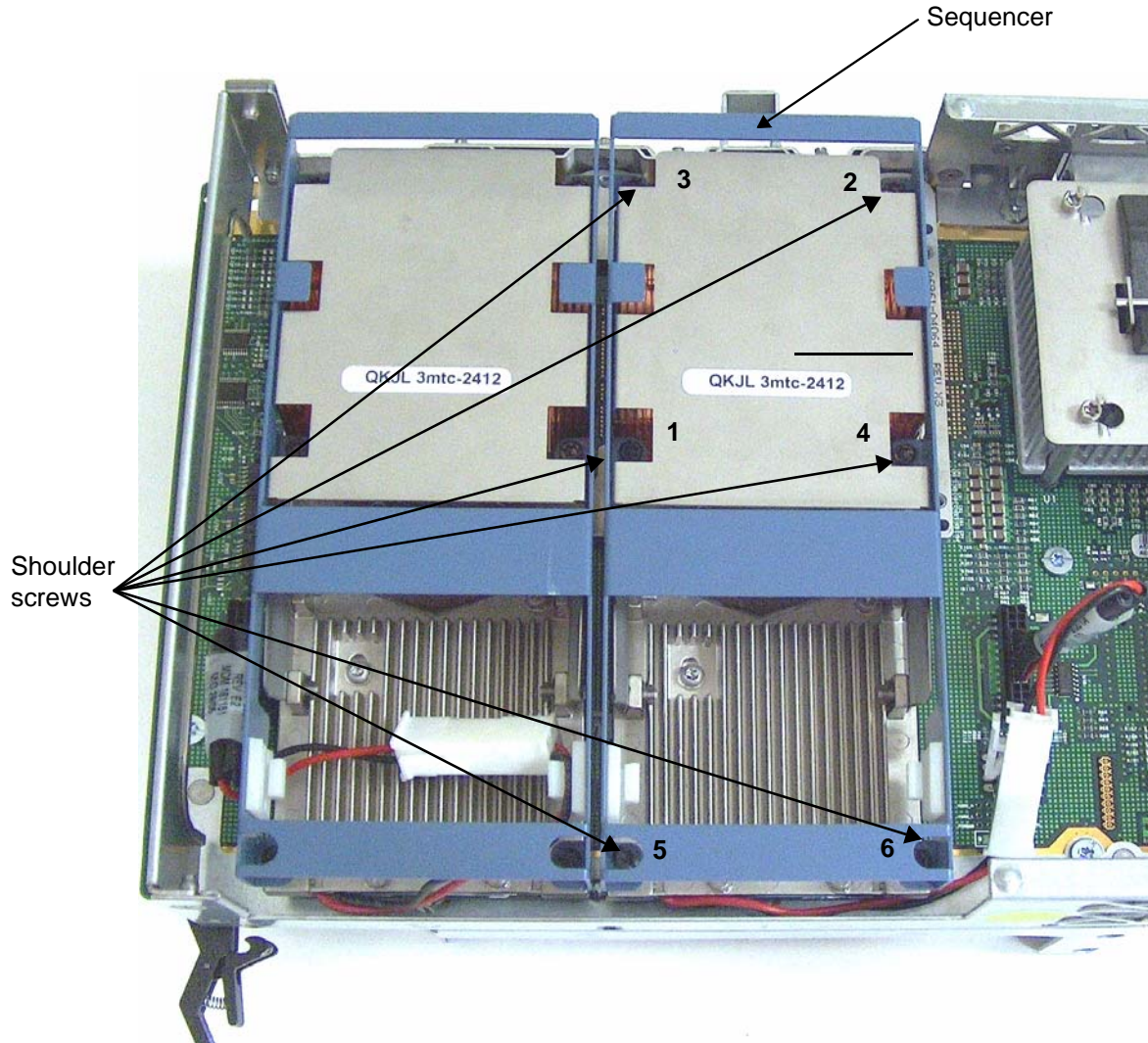
Step 10. Plug in the processor cable to its socket on the extender board.

Step 11. Place the sequencer frame over the processor.

Step 12. Using the ACX-15 torx screwdriver, tighten the six shoulder screws until they just bottom out. Follow the tightening sequence shown in Figure 4-19.

CAUTION Do not overtighten the six shoulder screws—they may shear off if overtightened. Stop tightening the shoulder screws when you feel them just bottom out.

Figure 4-19 Installing Sequencer on Extender Board



Removing and Replacing Hot-Swap Chassis Fans

There are three hot-swap chassis fan units in the HP server. Fan units 0, 1, and 2 are in the center of the chassis, spanning the full chassis width. Fan units 0 and 1 are interchangeable and are in the left and center positions. Fan unit 2 is smaller and only fits into the right-most position (behind the power supply).

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

CAUTION When the server is running, the top cover must be replaced within two minutes to prevent components from overheating. If the top metal cover is not replaced within five minutes, the server automatically shuts down.

NOTE A hot-swap device does not require interaction with the operating system before the device is removed from or installed into the server.

The ac power to the server does not have to be off to remove or replace a hot-swap chassis fan.

Removing a Hot-Swap Chassis Fan Unit

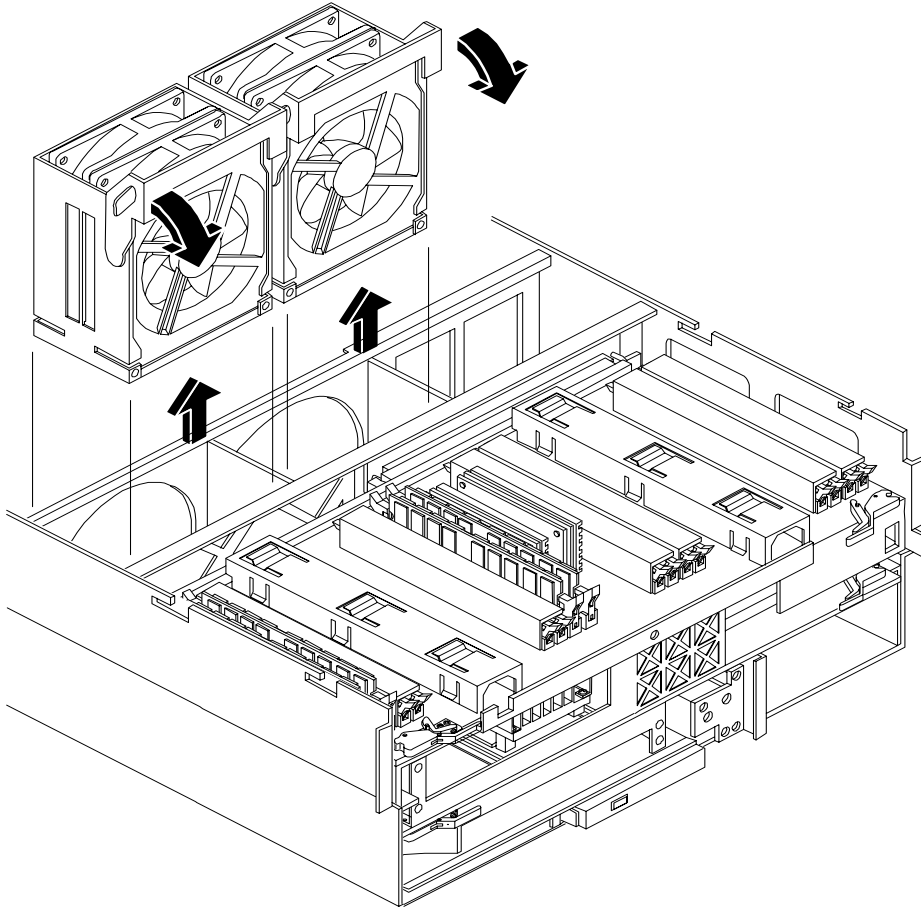
To remove a hot-swap chassis fan unit, follow these steps:

Step 1. If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.

Step 2. Remove the top cover. See “Removing the Top Cover” on page 43.

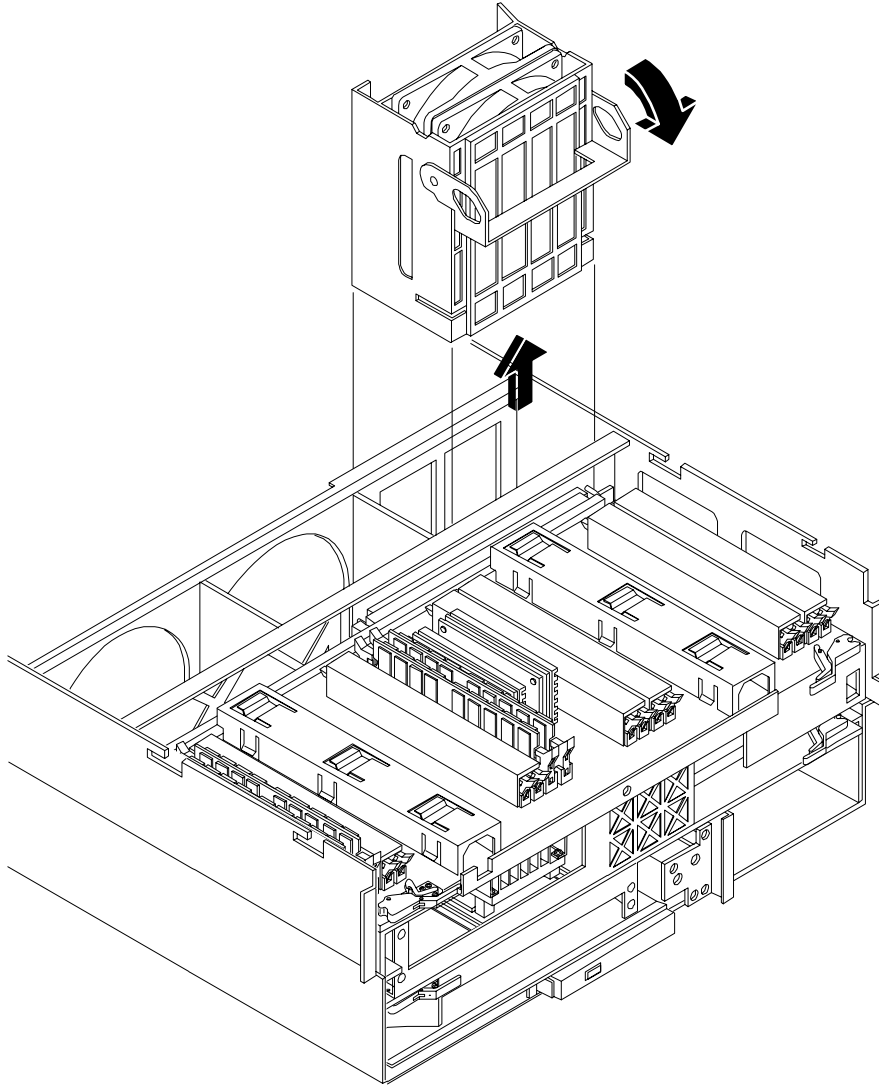
Step 3. Grasp the fan unit locking handle, tilt it up, and pull out the fan from the chassis.

Figure 4-20 Removing and Replacing the Chassis Fans 0 and 1



NOTE When one fan unit is removed from the server, the remaining fan units operate at full speed for two minutes. After two minutes the server goes into soft-shutdown mode.

Figure 4-21 Removing and Replacing the Chassis Fan 2



Replacing a Hot-Swap Chassis Fan Unit

To replace a hot-swap chassis fan unit, follow these steps:

- Step 1.** Orient the fan units by aligning the appropriate icon on the fan unit handle to the identical icon on the chassis wall. Fan units 0 and 1 have “triangle” icons and fan unit 2 has a “square” icon.
- Step 2.** Push the fan unit firmly into the housing and close the handle until flush to the top of the chassis—the fan unit plugs into the power outlet on the I/O baseboard.

CAUTION If the fan unit handle does not close completely, it is misaligned. Remove the fan unit and check that the alignment icons are oriented correctly.

- Step 3.** Check the QuickFind diagnostic board LED indicating the replaced fan unit.
- When the fan is functioning normally, the LED is off.
 - When the fan fails, the LED is lit.
- Step 4.** Replace the top cover. “Replacing the Top Cover” on page 44.
- Step 5.** If rack mounted, slide the HP server into the rack until it stops. “Inserting the Server into the Rack” on page 39.

Removing and Replacing the I/O Baseboard

These procedures detail how to remove the I/O baseboard from the server. The I/O baseboard is removed from the rear of the server.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the I/O baseboard assembly.**

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure results in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the I/O Baseboard

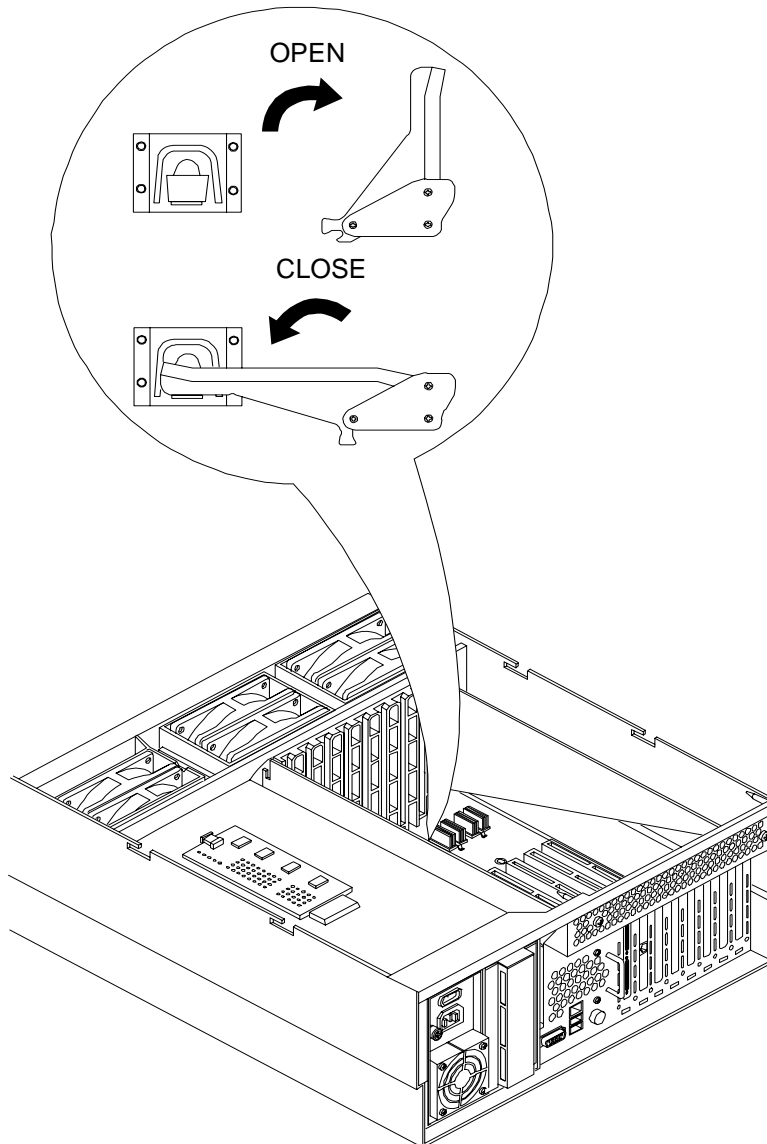
To remove the I/O baseboard, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 3.** Remove the three chassis fan units. See “Removing a Hot-Swap Chassis Fan Unit” on page 63.
- Step 4.** Unplug all external cabling attached to ports at the rear of the I/O baseboard.
- Step 5.** Unplug the SCSI cables attached to the HBA board in PCI slot 1.

CAUTION When unplugging the SCSI cables, note the labeling on the SCSI A and SCSI B channel cables. When plugging in these cables, you must match each cable with its appropriate socket on the SCSI HBA. If the cables are mismatched your server may not reboot. Both cables and sockets are clearly marked with the correct channel.

Step 6. Lift up on the locking lever attached to the side of the Power Supply cage to unplug the I/O baseboard from the socket on the midplane riser board. Figure 4-22 shows the locking lever.

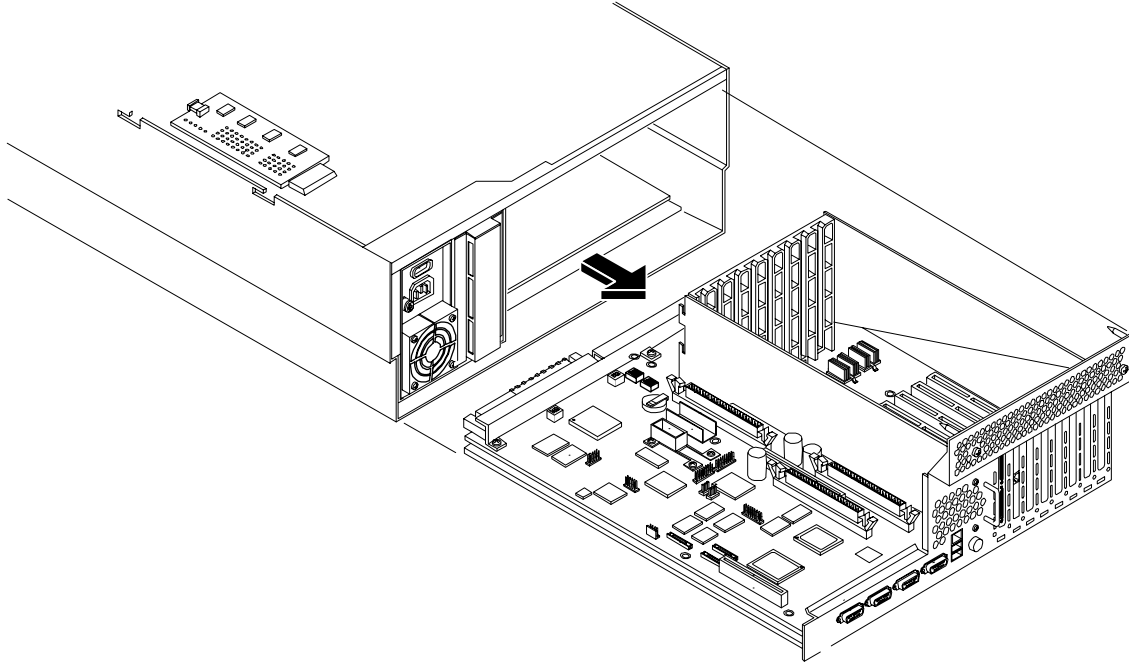
Figure 4-22 I/O Baseboard Locking Lever



Step 7. Grasp the handle on the rear of the server and slide the I/O baseboard assembly all the way to the rear until removed from chassis. Figure 4-23 shows how to remove the I/O baseboard.

NOTE The I/O baseboard assembly is large, so be careful when lifting it out of the server.

Figure 4-23 Removing the I/O Baseboard



Replacing the I/O Baseboard

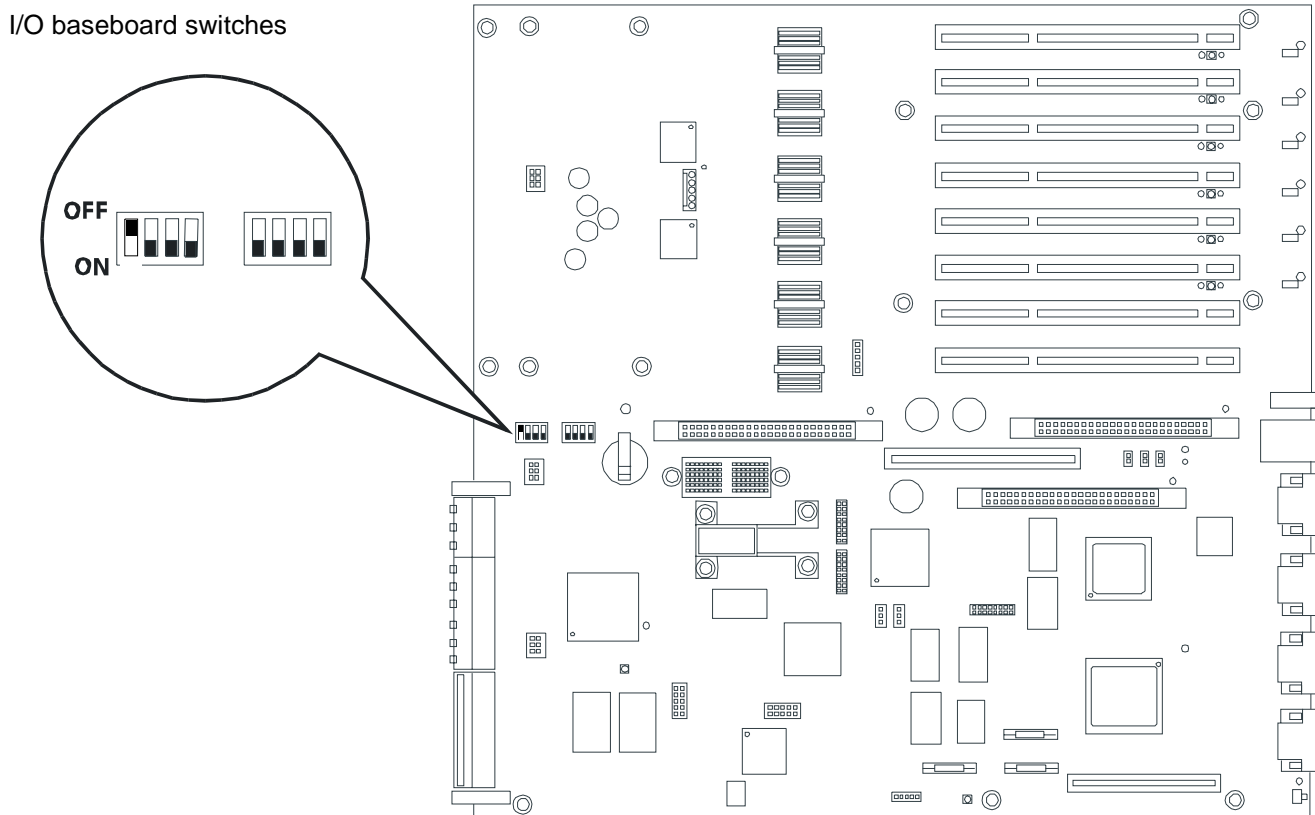
To replace the I/O baseboard, follow these steps:

Step 1. Depending on the type of processor you have installed, set the I/O baseboard dip switch SW1503 (position 4) (Figure 4-24) as follows:

- Itanium 2 processor - Off

- MX2 dual-core processor - On

Figure 4-24 I/O Baseboard Dip Switches



NOTE The I/O baseboard is large, so use care when sliding it into the server chassis.

Step 2. Align the I/O baseboard assembly rails with the chassis slots and slide the assembly into the chassis until it stops against the midplane riser board socket.

CAUTION Ensure the I/O baseboard locking lever is in the “up” position or the I/O baseboard hangs up before engaging the midplane riser board socket.

Step 3. With the I/O baseboard flush against the midplane riser board socket, push down firmly on the locking lever until the I/O baseboard plugs all the way into the midplane riser board socket.

Step 4. Replace the three chassis fan units. “Replacing a Hot-Swap Chassis Fan Unit” on page 65.

Step 5. Plug in all external cabling the rear ports of the I/O baseboard.

CAUTION When plugging the SCSI cables, note the labeling on the SCSI A and SCSI B channel cables. You must match each cable with its appropriate socket on the SCSI HBA. If the cables are mismatched your server may not reboot. Both cables and sockets are clearly marked with the correct channel.

Step 6. Plug in the internal SCSI cable(s) to the HBA board in PCI slot 1.

Step 7. Replace the top cover. See “Replacing the Top Cover” on page 44

Step 8. If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Step 9. Power up and boot to EFI.

Step 10. Respond **YES** to prompts regarding copying information onto the new I/O baseboard.

Step 11. Enter SERVICE mode.

```
Shell> sysmode service
Current System Mode: ADMIN

You are now in SERVICE mode.
```

Step 12. Use the 'sysset' command to enter the product data:

```
Shell> sysset prodname "server rx4640"
```

Step 13. Use the **sysset** command to verify all values are set:

```
Shell> sysset
System Information:
Manufacturer: hp
Product Name: server rx4640
Product Number: A6961A
Secondary Product Number is Identical
Serial number: SGH43442VB
Secondary Serial Number is Identical
UUID: 3C33C58E-2E5A-11D8-A33B-4188C0AEFAE2 (Valid)
Secondary UUID is Identical
Product ID: 0x305
```

Step 14. Use the EFI `date` and `time` commands to set the correct local date and time.

Step 15. Boot the server and resume normal operation.

Removing and Replacing Hot-Plug PCI-X Cards

The HP Integrity rx4640 server supports PCI-X hot-plug technology and offers six PCI-X, hot-plug capable slots.

CAUTION There are restrictions on the number of PCI-X cards that can be installed in the rx4640 server at any given time, depending on the cards being used.

Maximum quantity for any I/O configuration using 337972-B21, AB287A, or A9890A cards:

- Three 337972-B21 cards maximum plus three unpopulated slots
- Two AB287A cards maximum plus four unpopulated slots
- Three A9890A cards maximum plus three unpopulated slots

Failure to observe this caution will result in server degradation, or server failure.

PCI-X Specifications

PCI-X technology enables the following hot-plug operations. For procedures with step-by-step instructions describing how to add, replace, delete, and locate PCI-X cards see “Hot-Plug Operation Procedures” on page 77.

- **Online Addition (OL-A)**

You can install new PCI-X expansion cards in previously empty slots without powering down the server.

- **Online Replacement (OL-R)**

You can replace a previously occupied slot with a new PCI-X expansion card by suspending the driver. This operation combines removing an active card and replacing it with an equivalent capability card. The existing driver for the old card must be compatible with the new card.

CAUTION A special OL-R requirement for HP-UX 11i v2 is that the card to be inserted (replaced) must be exactly the same as the removed card. This is also known as like-for-like replacement.

NOTE Windows Server 2003 Enterprise Edition does not support OL-R. Instead, you can do a combination of an OL-D operation followed by an OL-A operation. This is the equivalent of an OL-R operation.

- **Online Deletion (OL-D)**

You can remove an existing PCI-X expansion card. This operation is different from OL-R because there are no restrictions placed on the type of replacement card that you can use. In this operation, the drivers are also completely removed from the slot.

NOTE HP-UX 11i v2 does not support OL-D. It does support OL-R.

- **PCI-X Slot Locate (Locate)**

To easily locate the PCI-X slot at which you wish to perform a hot-plug operation, you can command the attention LEDs, on the OLX divider and the I/O baseboard, to blink and act as visual cues to the active slot location. This operation is always initiated through a software or web interface and is optional to the operating system on your HP server.

Operating System Support for Hot-Plug PCI-X Operations

The capability of each operating system to support hot-plug PCI-X operations is different. The following explanation details the capabilities of each operating system.

NOTE Open VMS does not support hot-plug PCI-X operations.

- **HP-UX 11i v2**

HP-UX 11i v2 supports only OL-A, OL-R, and Locate hot-plug PCI-X operations.

In OL-R, it is a requirement that the card to be inserted (replaced) be exactly the same as the card being removed. During this OL-R operation, HP-UX 11i v2 suspends the device driver and re-enables it upon completion of the OL-R operation.

In HP-UX 11i v2, the Locate function is only available through the command line or web interface.

- **Windows Server 2003 Enterprise Edition**

Windows Server 2003 Enterprise Edition supports only OL-A and OL-D hot-plug PCI-X operations.

In OL-D, Windows Server 2003 Enterprise Edition will delete the device object, after the card's successful removal from the slot. You do not have to re-install drivers for the deleted device on subsequent insertions or reboots

To perform a card replacement hot-plug PCI-X operation in Windows Server 2003, you must first perform an OL-D operation followed by an OL-A operation.

- **Linux Red Hat Advanced Server 2.1**

At this time Linux RHEL4 U3 does not support hot-plug PCI-X technology.

Table 4-6 shows hot-plug operations that are available in HP-UX 11i v2, Windows Server 2003 Enterprise Edition, and Linux Red Hat Advanced Server 2.1 operating systems.

Table 4-6 Hot-Plug Operation and OS Compatibility

Hot-Plug Operation	HP-UX 11i v2	Windows Server 2003 Enterprise Edition	Linux Red Hat Enterprise Advanced Server 4 Update 3
OL-A	Yes	Yes	No
OL-R	Yes. HP-UX 11i v2 demands like-for-like replacement. A like-for-like card means that the new card is exactly the same as the card being replaced.	No. But, you can perform a combination of OL-D and OL-A to replace a card.	No
OL-D	Not supported by HP-UX 11i v2.	Yes	No

Table 4-6 Hot-Plug Operation and OS Compatibility (Continued)

Hot-Plug Operation	HP-UX 11i v2	Windows Server 2003 Enterprise Edition	Linux Red Hat Enterprise Advanced Server 4 Update 3
Locate	Yes. Only supported through the command line interface or the web interface.	No	No

PCI-X Hardware and Software Interfaces

Table 4-7 shows what hot-plug hardware and software interfaces are available on HP-UX 11i v2, Windows Server 2003 Enterprise Edition, and Linux Red Hat Advanced Server 2.1 operating systems.

Table 4-7 Hot-Plug Hardware and Software Interfaces and OS Availability

Hot-Plug PCI-X Interface	HP-UX 11i v2	Windows Server 2003 Enterprise Edition	Linux Red Hat Enterprise Advanced Server 4 Update 3
Hardware interface comprised of: —Attention Button —Manual Retention Latch —Power LED —Attention LED —PCI-X card lock	Yes	Yes	No
Graphical User Interface	Yes	Yes. You can use the Safely Remove Hardware icon in the tool tray or device manager to remove a device (OL-D). OL-A is only possible through the hardware interface.	No
Command Line Interface (CLI)	Yes -olrad command. Read <i>Interface Card OL* Support for HP-UX Servers and Workstations, olrad Command Line Interface</i> at http://docs.hp.com .	No	No

Table 4-7 Hot-Plug Hardware and Software Interfaces and OS Availability

Hot-Plug PCI-X Interface	HP-UX 11i v2	Windows Server 2003 Enterprise Edition	Linux Red Hat Enterprise Advanced Server 4 Update 3
Web Interface	Yes- pdweb command. Read <i>Interface Card OL* Support for HP-UX Servers and Workstations</i> , <i>pdweb-Peripheral Device tool Web Interface</i> , at http://docs.hp.com .	No	No

PCI-X Slot Locations and Configurations

PCI-X slots are numbered from 1 through 8 in your HP server. Figure 4-25 shows the slot locations on the I/O baseboard.

The following describes configuration requirements for slots 1 through 8 (see Table 4-8 for configuration requirements):

- PCI slots 1 and 2 are dedicated for use by the core I/O cards—SCSI HBA card in slot 1 and Gigabit Ethernet LAN card in slot 2. Slots 1 and 2 **are not** hot-plug capable. Additional PCI-X expansion cards **may not** be placed in slots 1 or 2.
- Slots 3 and 4 share a PCI-X bus, and slots 5 and 6 share a PCI-X bus. The maximum capability of each slot sharing a PCI-X bus is PCI-X 66 MHz. If a PCI-X 133 MHz card is placed in a slot sharing a bus, the maximum capability the PCI-X 133 MHz card can run at is PCI-X 66 MHz. If different modes (PCI vs. PCI-X) or slower speeds (33 MHz) are used, then the slot automatically downgrades to accept the change.

Shared slots have card compatibility restrictions. If one of the shared slots is occupied then the card being added to the second slot is limited by the configuration of the occupied slot. If the new card has a slower capability than the current bus configuration, it will be rejected. If the new card has a faster capability than the current bus configuration, it will only run at the bus mode and frequency of the current bus configuration (slower).

1. If you have a 66 MHz card in slot 3, and you hot-plug insert a 33 Mhz card into slot 4, then the operation will not succeed. The new 33 MHz card will not initialize and the slot will power down because you cannot change bus speed during hot-plug operations.

NOTE If the server is rebooted in the new configuration, then both cards re-initialize to run at 33 MHz. This is because the server firmware can only change the bus capability from 66 MHz down to 33 MHz.

2. If you have a 33 MHz card in slot 3, and you hot-plug insert a 66 Mhz card into slot 4, it will work but the new card will run at 33 MHz. This also applies to slots 5 and 6, as they are shared (both use a common bus).
3. If your unit is powered down and you insert a 33 MHz card into slot 4 (that shares a 66 MHz card in slot 3), then both cards will run at 33 MHz when the unit is powered up. This also applies to slots 5 and 6, as they are shared (both use a common bus).

- Slots 7 and 8 are single slots, they do not share a PCI-X bus. The maximum capability of each slot is PCI-X 133 MHz. Only slots 7 and 8 allow 133 Mhz, PCI-X cards to run at full speed. These two slots are not limited by bus mode frequency related incompatibilities.

Table 4-8 PCI-X Card vs. Slot Frequency/Bus Mode Compatibility for Shared Slots^a

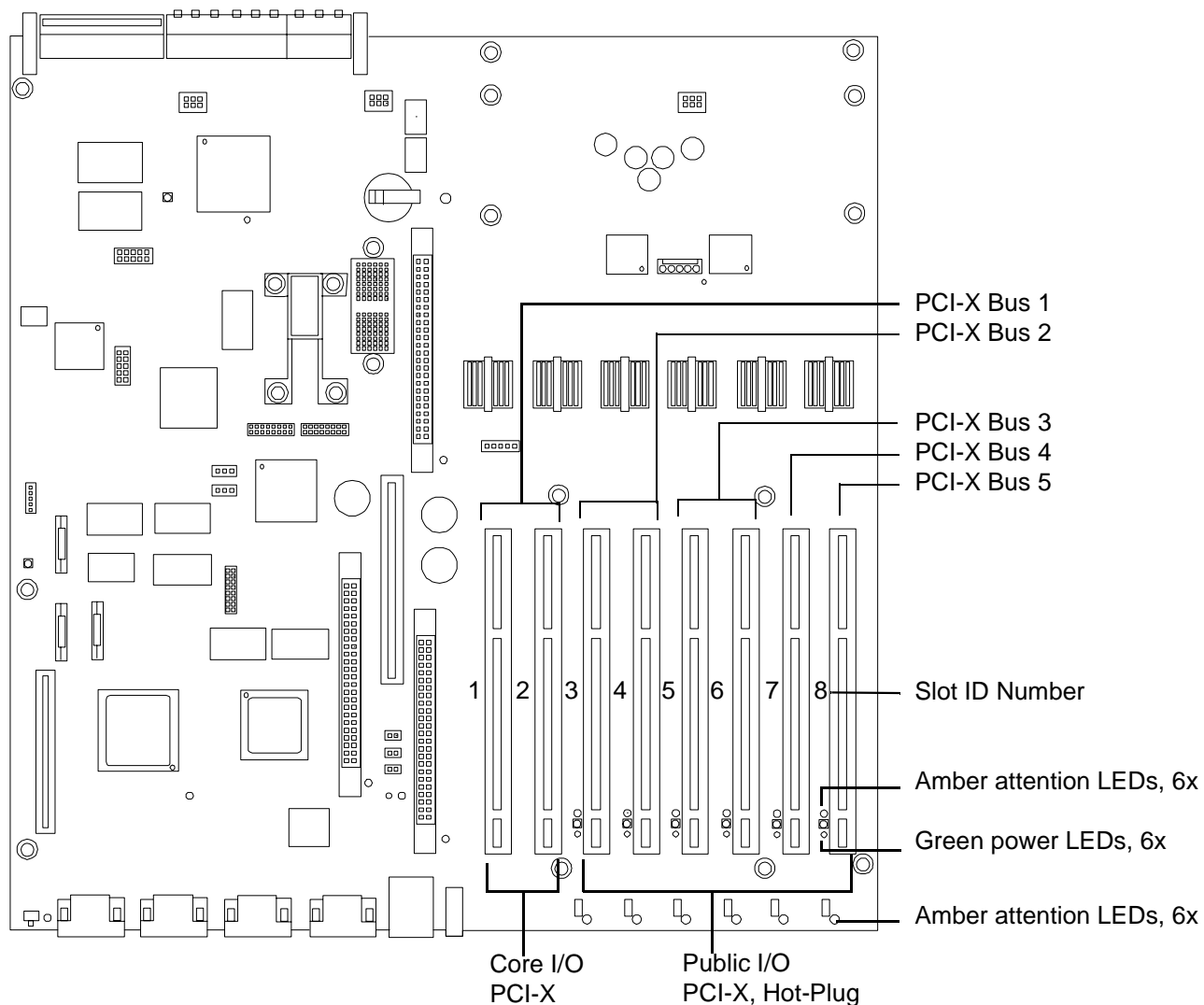
Current PCI Bus Mode and Frequency for the Shared Slot	Cards to be installed			
	PCI 33	PCI 66	PCI-X 66	PCI-X 133
PCI 33 MHz	Compatible ^b	Compatible (note b) New card running at PCI 33	Compatible (note b) New card running at PCI 33	Compatible (note b) New card running at PCI 33
PCI 66 MHz	Incompatible-Frequency ^c	Compatible (note b)	Compatible (note b) New card running at PCI 66	Compatible (note b) New card running at PCI 66
PCI-X 66 MHz	Incompatible-Frequency (note c)	Incompatible-Bus ^d	Compatible (note b)	Compatible (note b) New card running at PCI-X 66
PCI-X 133 MHz^e	Incompatible-Frequency (note c)	Incompatible-Frequency (note c)	Compatible (note b) New card	Compatible (note b) New card running at PCI-X 66

- The conditions described in this table apply only to shared slots (slots 3,4-bus 2 and 5,6-bus 3). Slots 7 and 8 are not shared slots.
- Compatible: card is accepted and runs at frequency shown.
- Incompatible-Frequency: card is rejected. The new card will not initialized and will power down due to frequency mismatch.
- Incompatible-Bus: Card is rejected. The new card will not initialize and will power down due to bus mode mismatch.
- Maximum bus mode and frequency supported on shared slots is PCI-X 66 MHz.

CAUTION If you are using Linux Red Hat Enterprise Advanced Server 4 Update 3 operating system and you want to install a 1000b-Sx GigE card, do not install it into a slot that shares a bus with a 33 MHz card. In this configuration the Linux driver will not initialize the new card.

CAUTION Do not use more than 3 RAID cards in any of the slots on your HP Integrity rx4640 server. Server power limitations restrict the use of more than 3 RAID cards per server.

Figure 4-25 Slot ID Numbering



Hot-Plug Operation Procedures

The hot-plug procedures described in this section will use the hardware interface only. Software interface procedures are described in Table 4-7, “Hot-Plug Hardware and Software Interfaces and OS Availability.” For a complete understanding of all HP-UX 11i v2 hot-plug techniques and concepts, it is recommended that you see the *Interface Card OL* Support for HP-UX Servers and Workstations* on the HP website at:

<http://docs.hp.com>

CAUTION Before adding or replacing a PCI-X card, determine if that card is critical to your servers operation. If you replace a card that is still operating and it is a critical resource to your server, you may cause undesired server downtime. Read *Interface Card OL* Support for HP-UX Servers and Workstations, Critical Resources* at <http://docs.hp.com>, prior to performing a hot-plug operation.

Online Addition-(OL-A)

Before installing a PCI-X card, ensure that the proper drivers for that PCI-X card are installed.

To add a PCI-X card into an empty slot, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** If the power LED is steady-on (power to slot is on), go to step 4. If the power LED is steady-off (power to slot is off), go to step 5.
- Step 4.** To turn off power to the slot, pull up on the manual retention latch (MRL) located on the OLX divider. The power LED goes to steady-off. Figure 4-26 shows the layout of the card divider.

CAUTION Do not pull up on the MRL of a powered-on, occupied slot or your server will crash. This OL-A procedure is for powering down a powered-on, unoccupied slot only. For a detailed procedure on how to power down an occupied slot see “Online Replacement-(OL-R)” or “Online Deletion (OL-D)”.

- Step 5.** Ensure that the MRL is already open and insert the PCI-X card to be added into the powered down slot. Figure 4-27 shows how to correctly install a PCI-X card.

CAUTION When inserting the PCI-X card, be careful you do not accidentally touch an attention button on the other OLX dividers—this will initiate an undesired shutdown of another PCI-X card/slot.

Also, ensure that you fully seat the card into the slot or undesired results may occur after power is re-applied to the slot.

- Step 6.** Push the manual retention latch down until it seats against the chassis wall.
- Step 7.** Turn the PCI-X card lock to the closed position to capture the PCI-X card and manual retention latch into the closed position.
- Step 8.** Press the attention button and the power LED starts to blink. Wait until the power LED goes from blinking to steady-on.

NOTE After pushing the attention button, you have 5 seconds to cancel the operation by pushing the attention button again.

Step 9. Replace the top cover.

Step 10. Push the HP server all the way back into the rack until it stops.

Figure 4-26 PCI-X OLX Divider Layout

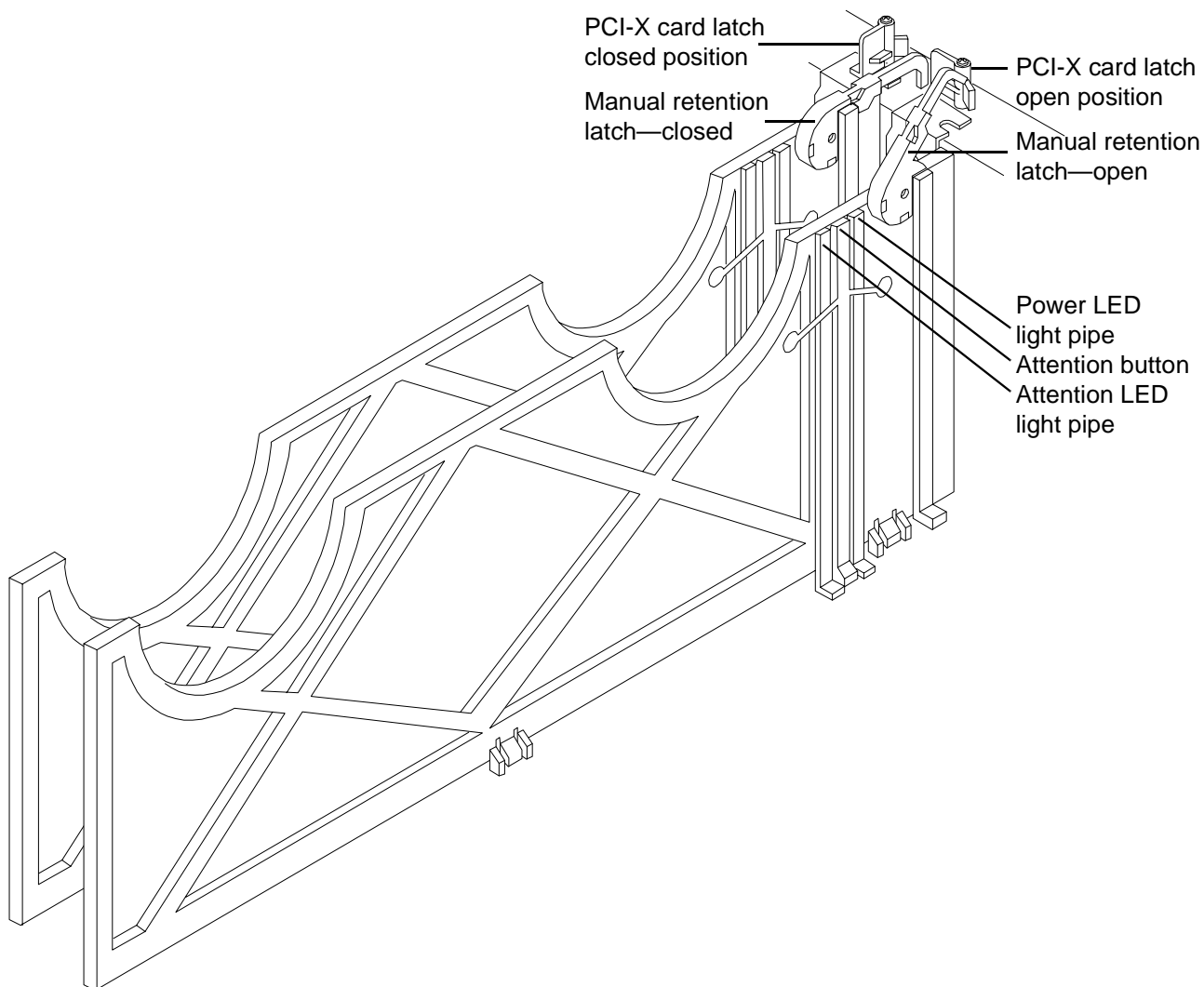
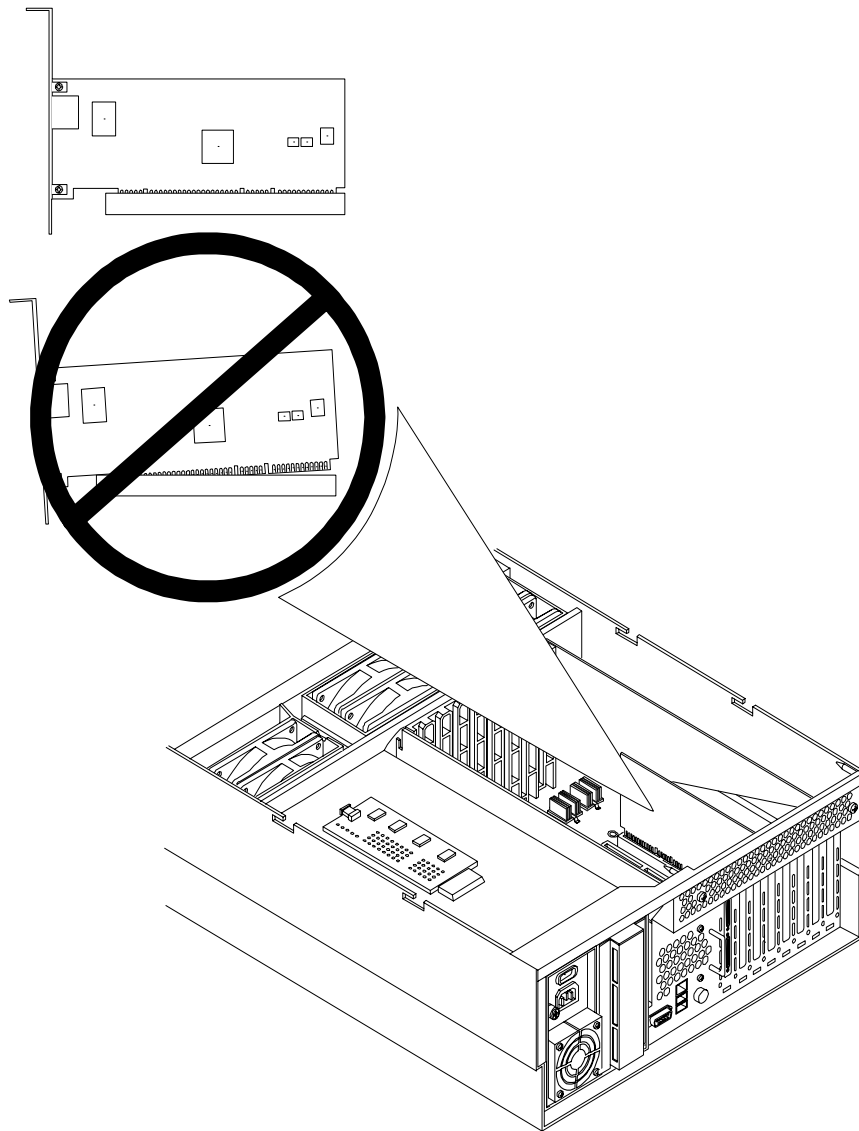


Figure 4-27 **Inserting PCI-X Card**



Online Deletion (OL-D)

To delete a PCI-X card from an occupied slot, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** Press the attention button located on the OLX divider that controls the affected slot—the power LED starts to blink. Wait until the power LED goes from blinking to steady-off.

NOTE After pushing the attention button, you have 5 seconds to cancel the operation by pushing the attention button again.

- Step 4.** Turn the PCI-X card lock on the chassis until the manual retention latch (MRL) is free to pull up.
- Step 5.** At this point, the power to the slot is off; pull up on the manual retention latch located on the OLX divider. Figure 4-26 shows the layout of the PCI-X card divider.
- Step 6.** Remove the existing PCI-X card from the slot.
- Step 7.** Push the manual retention latch down until it seats against the chassis wall.
- Step 8.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 9.** Push the HP server all the way back into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Online Replacement-(OL-R)

As discussed earlier, OL-R is a combination of an OL-D procedure followed by an OL-A procedure.

CAUTION For HP-UX 11i v2 only. You can only replace an existing card with a like card.

To remove and replace a PCI-X card into a populated slot, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** Press the attention button located on the OLX divider controls the affected slot—the power LED starts to blink. Wait until the power LED goes from blinking to steady-off.

NOTE After pushing the attention button, you have 5 seconds to cancel the operation by pushing the attention button again.

- Step 4.** Turn the PCI-X card lock on the chassis until the manual retention latch (MRL) is free to pull up.
- Step 5.** At this point, the power to the slot is off; pull up on the manual retention latch located on the OLX divider. Figure 4-26 shows the layout of the PCI-X card divider.
- Step 6.** Remove the existing PCI-X card from the slot.
- Step 7.** Insert the new PCI-X card into the powered down slot. Figure 4-27 shows how to correctly install a PCI-X card.

CAUTION When inserting the PCI-X card, be careful you do not accidentally touch an attention button on the other OLX dividers—this will initiate an undesired shutdown of another PCI-X card/slot. If you accidentally press the wrong attention button, you have five seconds to push the attention button again to cancel the action.

Also, ensure that you fully seat the card into the slot or undesired results may occur after power is re-applied to the slot.

- Step 8.** Push the manual retention latch down until it seats against the chassis wall.

- Step 9.** Turn the PCI-X card lock on the chassis to the closed position. This locks the PCI-X card into its slot and the manual retention latch into the closed position.
- Step 10.** Press the attention button—the power LED starts to blink.
- Step 11.** Wait for the power LED to stop blinking—the PCI-X card is now active.
- Step 12.** Replace the top cover. “Replacing the Top Cover” on page 44.
- Step 13.** Push the HP server all the way back into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing OLX Dividers

OLX dividers are located on the I/O baseboard, between the PCI cards. Six OLX dividers provide short circuit protection to the hot-plug PCI accessory boards by preventing inadvertent contact between boards during the replacement or addition of a board.

Additionally, each OLX divider has two light pipes that transfer illumination from one green power LED and one amber attention LED, mounted on the I/O board, to the top of the divider. The light pipes allow the LED status to be easily viewed when the top cover is removed.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing a PCI card divider.**

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing an OLX Divider

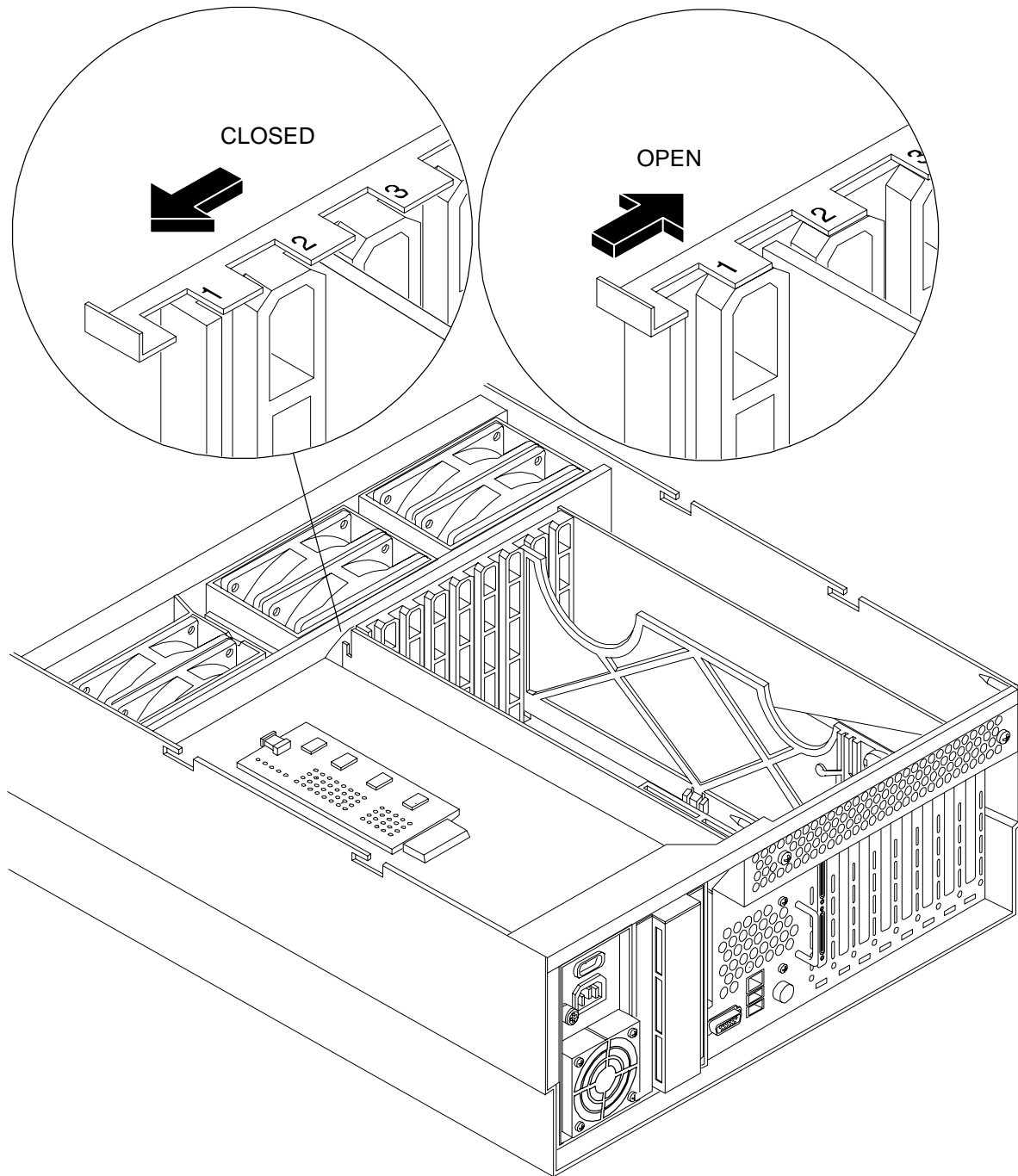
To remove an OLX divider, follow these steps:

NOTE An alternative method of removing OLX dividers individually is to remove all OLX dividers at once by removing the rack they are mounted in from the I/O baseboard, then removing or replacing the individual OLX divider, and then replacing the rack back on the I/O baseboard. The OLX divider rack is attached to the I/O baseboard with 4 torx T15 fasteners.

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.

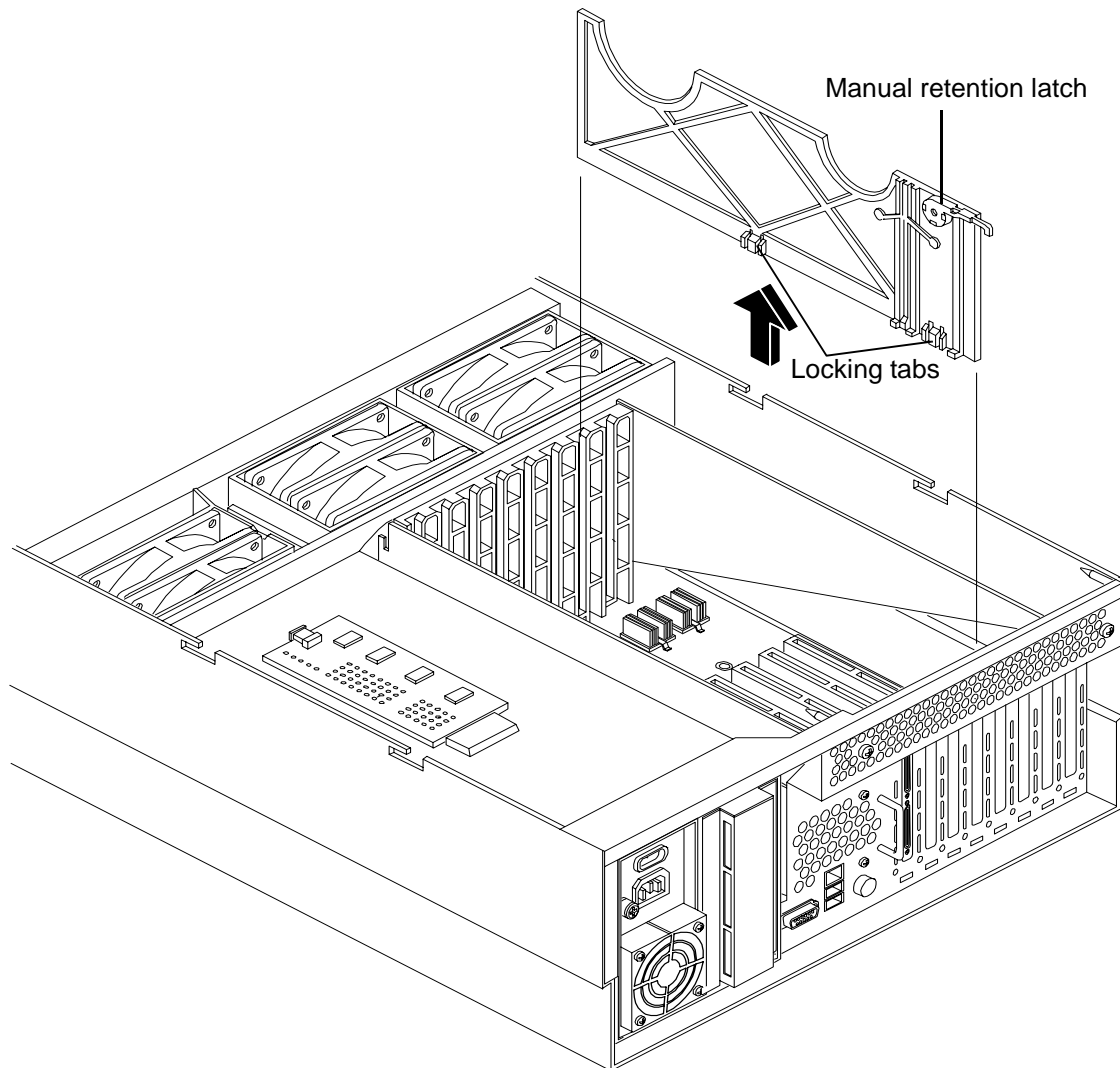
- Step 3.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 4.** Slide open the latch on the rear PCI cage wall to unlock the rear edge of the PCI divider. Figure 4-28 shows how to open the OLX divider latch.

Figure 4-28 Opening and Closing the OLX Divider Latch



- Step 5.** Pull up on the manual retention latch to unlock it from the chassis wall. Figure 4-29 shows where the manual retention latch is on the OLX divider.

Figure 4-29 Removing and Replacing the OLX Divider



- Step 6.** If you are removing the entire OLX divider rack, remove the four T15 fasteners holding the rack to the I/O baseboard.
- Step 7.** Using your fingers, push the two tabs that attach the OLX divider to the I/O baseboard and pull the OLX divider up sharply to disengage it from the I/O baseboard.

CAUTION When extracting the OLX divider, ensure that you release the locking tabs completely or you may damage them. If you damage the tabs, the OLX divider may not seat properly when you reinsert it.

Replacing an OLX Divider

To replace an OLX divider, follow these steps:

- Step 1.** Insert the OLX divider into the available slots on the I/O baseboard and push down firmly to seat it into the slots.
- Step 2.** At this point, if you are replacing the entire OLX divider rack on to the I/O baseboard, replace the four torx T15 fasteners.
- Step 3.** Slide the latch on the rear OLX divider wall closed, to lock the rear edge of the PCI divider. Figure 4-28 shows how to close the OLX divider latch.
- Step 4.** Push down on the manual retention latch until it locks into the chassis wall.
- Step 5.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 6.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 7.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing Core I/O Cards

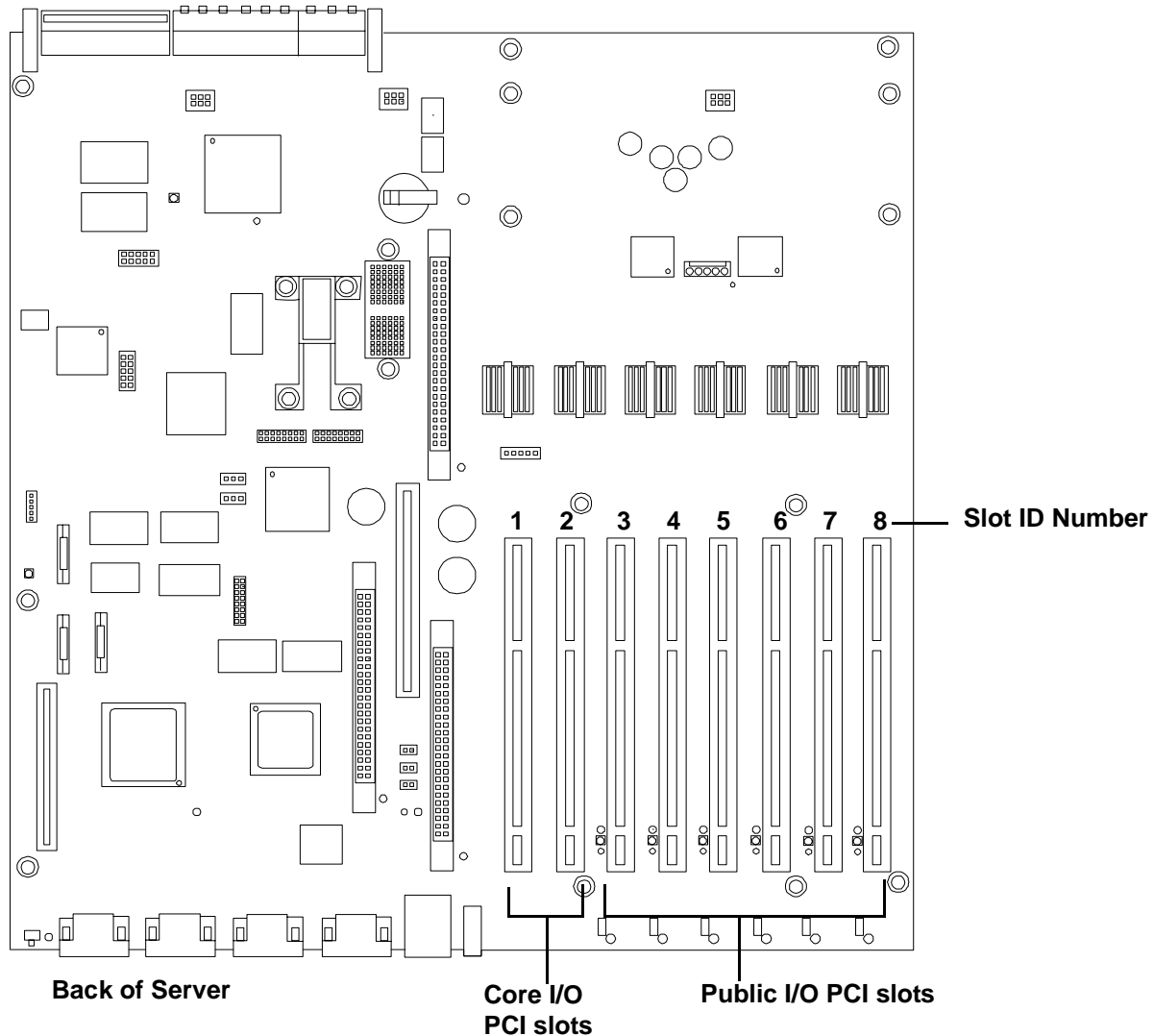
The HP Integrity rx4640 server has two I/O card slots that are dedicated for core I/O cards. They are labelled slots 1 and 2 on the I/O baseboard. Figure 4-30 shows the location of the core I/O slots on the I/O baseboard.

PCI Slot Locations and Configurations

The following describes configuration requirements for slots 1 and 2:

- PCI slot 1 is dedicated for use by a SCSI HBA card. Slot 1 **is not** hot-plug capable. Additional PCI expansion cards **may not** be placed in slot 1.
- PCI slot 2 is dedicated for use by a LAN card. Slot 2 **is not** hot-plug capable. Additional PCI expansion cards **may not** be placed in slot 2.

Figure 4-30 Slot ID Numbering



Removing and Replacing the SCSI Core I/O Card

The HP Integrity rx4640 server has two I/O card slots that are dedicated for core I/O cards.

PCI Slot Locations and Configurations

PCI slots are numbered from 1 through 8 in your HP server. Figure 4-30 shows the core I/O card locations on the I/O baseboard. The dedicated core I/O card slots are slots 1 and 2.

The following describes configuration requirements for slots 1 and 2:

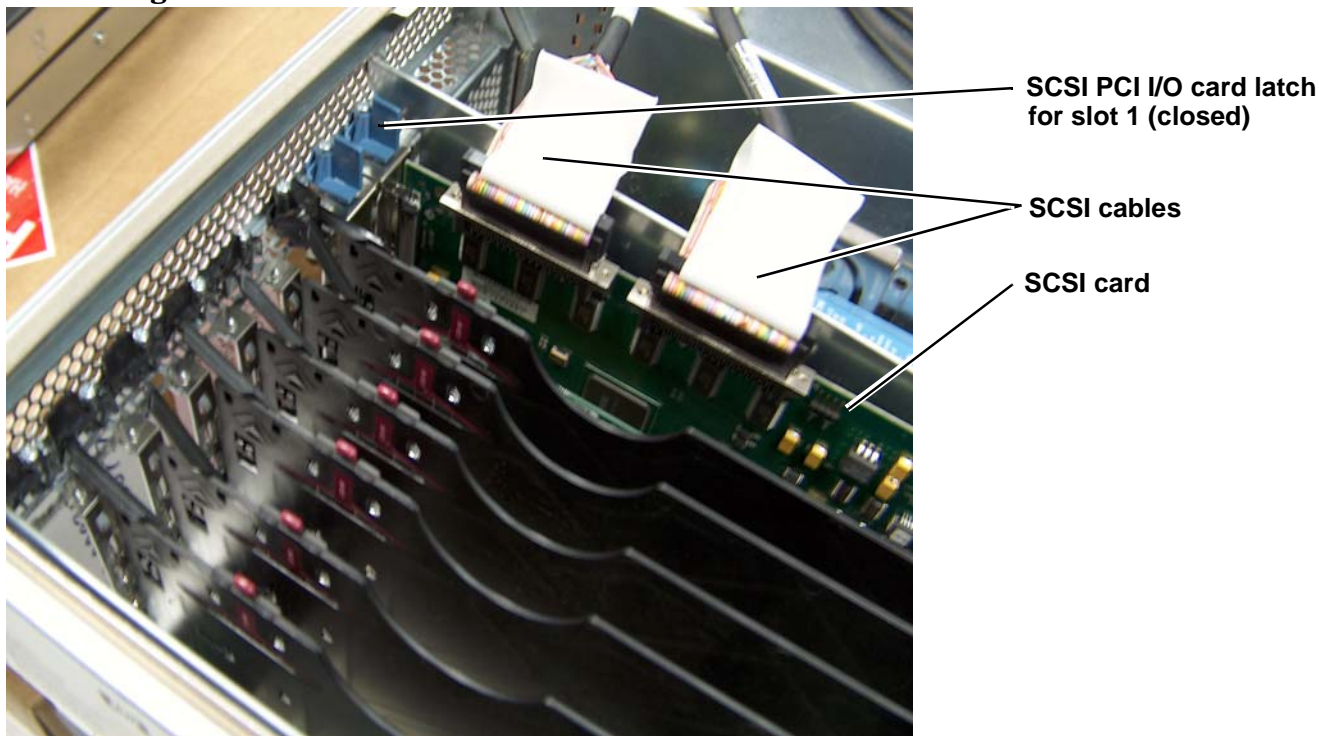
- PCI slot 1 is dedicated for use by a SCSI HBA card. Slot 1 **is not** hot-plug capable. Additional PCI expansion cards **may not** be placed in slot 1.
- PCI slot 2 is dedicated for use a LAN card. Slot 2 **is not** hot-plug capable. Additional PCI expansion cards **may not** be placed in slot 2.

Removing the SCSI Core I/O Card

To remove the SCSI core I/O card in slot 1, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** Disconnect any internal and external SCSI cables connected to the SCSI core I/O card.
- Step 4.** Open the blue PCI card latch for slot 1 by twisting it clockwise.

Figure 4-31 SCSI I/O Card Latch Location



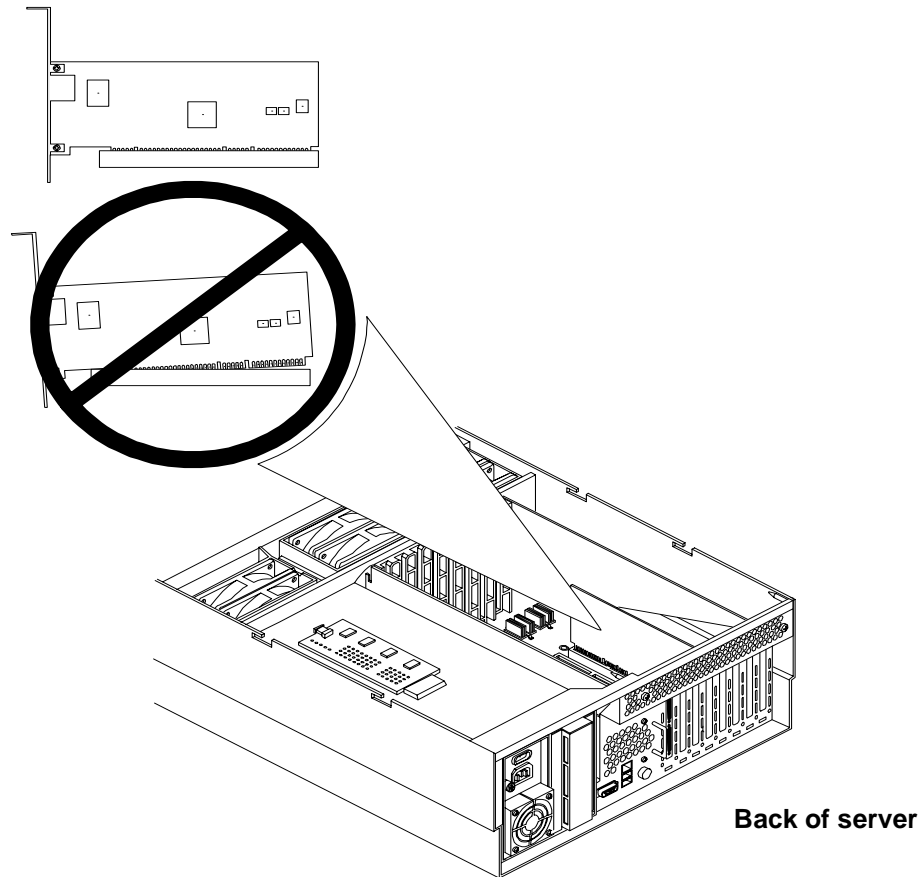
- Step 5.** Remove SCSI I/O card by pulling up carefully on the SCSI I/O card.

Step 6. Install replacement SCSI I/O card. Figure 4-32 shows the correct way to install the SCSI I/O card.

CAUTION Always handle I/O cards by their edges. Failure to comply with this precaution may result in damage to the card.

Ensure that you fully seat the card into the slot or the card may be damaged when power is re-applied to the slot.

Figure 4-32 Inserting SCSI I/O Card



Step 7. Close the blue PCI card latch for slot 1 by twisting it counter-clockwise.

Step 8. Reconnect the internal and external SCSI cable(s) to the SCSI core I/O card.

Step 9. Replace the top cover. See “Replacing the Top Cover” on page 44.

Step 10. Push the HP server back into the rack until it stops. “Inserting the Server into the Rack” on page 39.

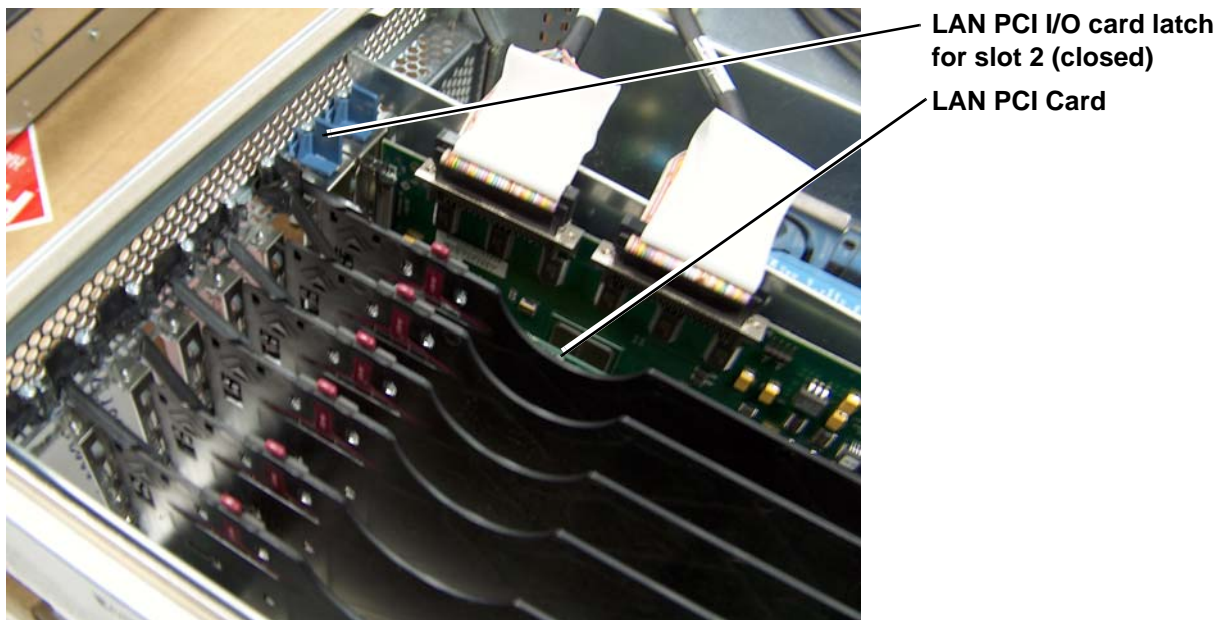
Removing and Replacing the LAN Core I/O Card

Removing the LAN Core I/O Card

To remove the LAN core I/O card in slot 2, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** Disconnect any LAN cables connected to the LAN core I/O card.
- Step 4.** Open the blue PCI card latch for slot 2 by twisting it clockwise.

Figure 4-33 LAN I/O Card Latch Location



- Step 5.** Remove LAN I/O card by pulling up carefully on the LAN I/O card.
- Step 6.** Install replacement LAN I/O card. Figure 4-32 shows how to install the LAN I/O card correctly.

CAUTION Always handle I/O cards by their edges. Failure to comply with this precaution may result in damage to the card.

Ensure that you fully seat the card into the slot or the card may be damaged when power is re-applied to the slot.

- Step 7.** Close the blue PCI card latch for slot 2 by twisting it counter-clockwise.
- Step 8.** Reconnect the LAN cable(s) to the LAN core I/O card.
- Step 9.** Replace the top cover. “Replacing the Top Cover” on page 44.
- Step 10.** Push the HP server back into the rack until it stops. “Inserting the Server into the Rack” on page 39.

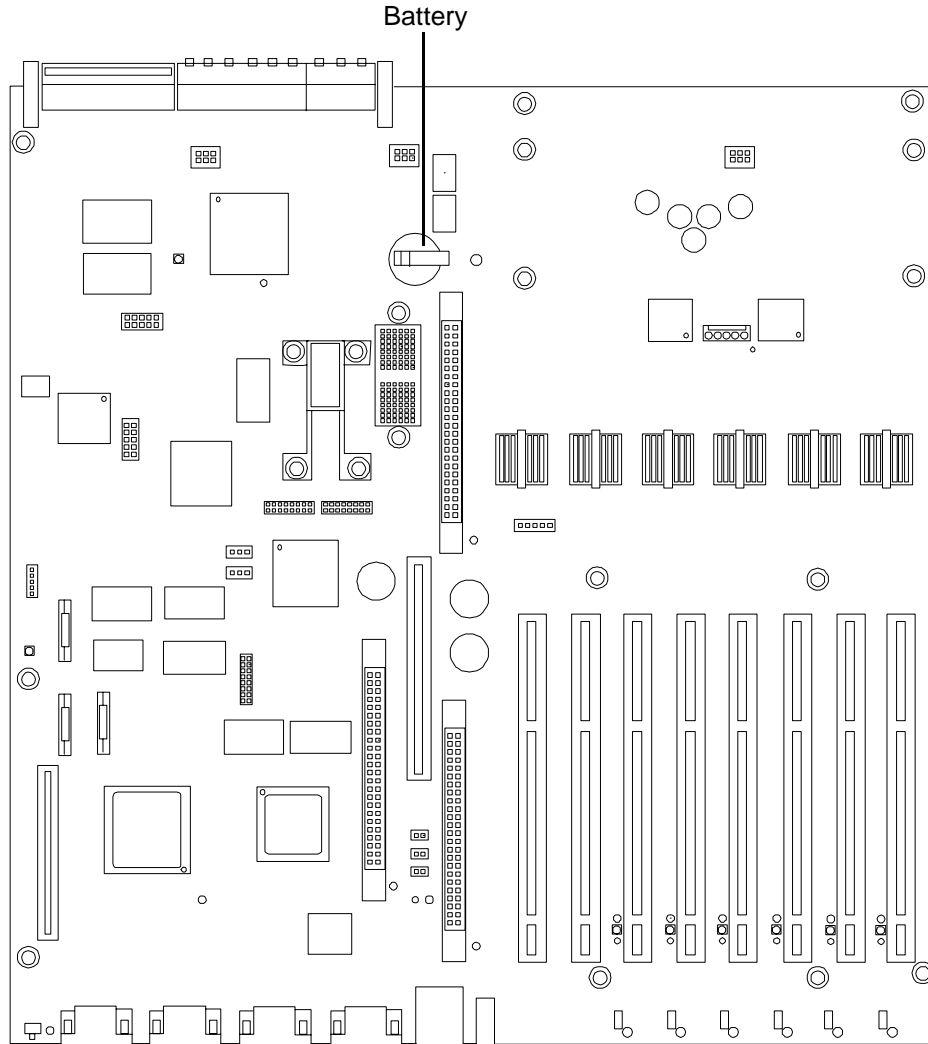
Removing and Replacing the Server Battery

The server battery may be replaced by removing the top cover and accessing the I/O baseboard.

To remove and replace the server battery, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover from the chassis. See “Removing the Top Cover” on page 43.
- Step 3.** Remove the I/O baseboard assembly from the chassis. See “Removing the I/O Baseboard” on page 66.
- Step 4.** Locate the battery on the I/O baseboard. Remove the battery by lifting the retaining clip and pull the battery from its socket.

Figure 4-34 Battery Location on the I/O Baseboard



- Step 5.** Install the new battery.

NOTE The positive terminal of the battery is designated by the “+” sign. The battery is installed with the “+” sign facing up.

Step 6. Replace the I/O baseboard assembly. See “Replacing the I/O Baseboard” on page 68.

Step 7. Replace the top cover. See “Replacing the Top Cover” on page 44.

Step 8. If rack mounted, slide the HP server all the way in until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing Hard Disk Drives

Use these procedures to remove and replace the hot-plug hard disk drives in your HP Integrity rx4640 server. The two hot-plug hard disk drives are located in the front of the server. Figure 4-35

CAUTION A hot-plug device may require interaction with the operating system before the device can be safely removed from or installed into the server. Verify that the operating system supports removing/replacing disk drives while the operating system is running. If the operating system does not support this feature, shut down the operating system before attempting this procedure. Failure to observe this caution results in server failure.

NOTE The replacement disk drive must be the same product ID as the disk drive that is being replaced.

HP often uses different manufacturers for disks that have the same product number. Since they have the same product number, the replacement disk drive has the same capacity and block size as the defective disk.

Removing a Hard Disk Drive

To remove a hot-plug disk drive, follow these steps:

Step 1. Place your finger in the lever on the latch of the selected disk drive.

Step 2. Push the tab to the right with your thumb to unlock the lever.

Step 3. Pull the lever out until the hard disk drive slides out of the server. Figure 4-36 shows how to remove a hard disk drive.

Replacing a Hard Disk Drive

One additional hot-plug disk drive may be added to your HP server in slot 2. Always use low profile disk drives (1.0” height) in your server. Figure 4-35 shows the slot locations on the front of the server.

To install a hot-plug disk drive, follow these steps:

Step 1. Slide the hot-plug hard disk into slot 1 until it is seated. Figure 4-36 shows how to install the hard disk drive.

Step 2. Close the drive-ejector handle by pushing it down until it clicks.

Step 3. The hot-plug disk drive is now correctly installed.

Figure 4-35 Hard Disk Drive and Slot Locations on the Front of the Server

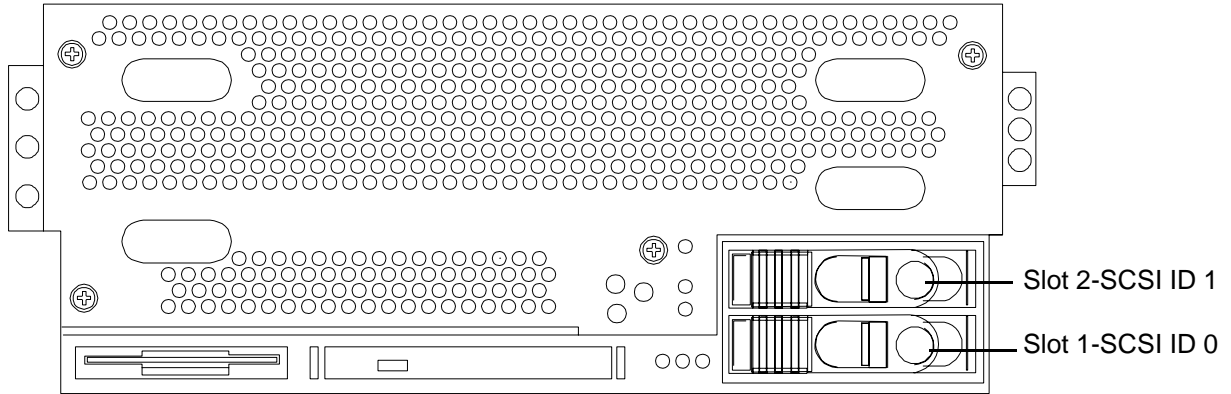
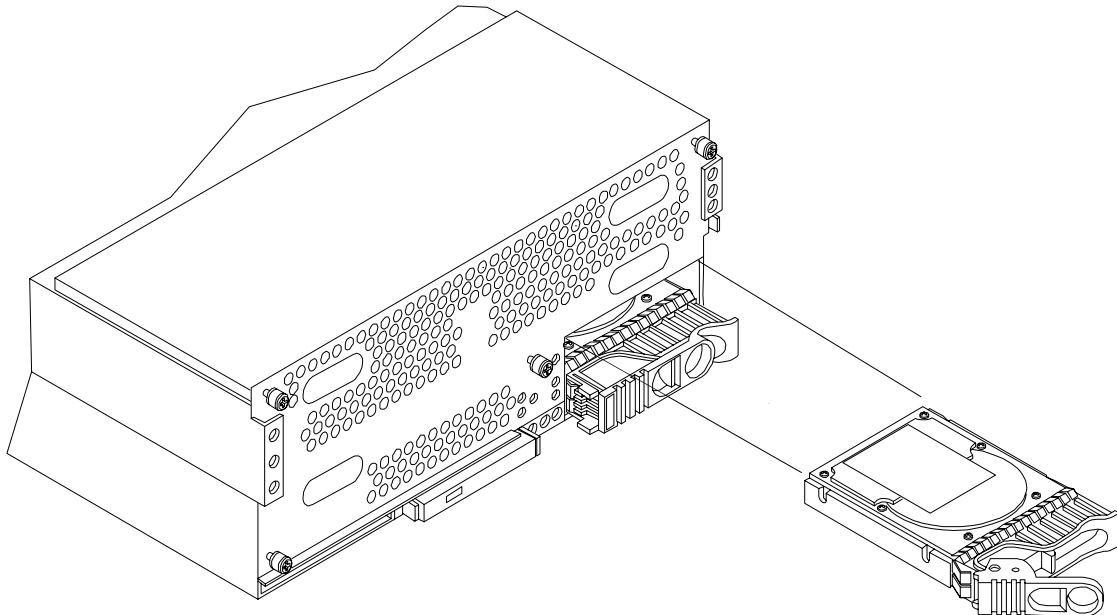
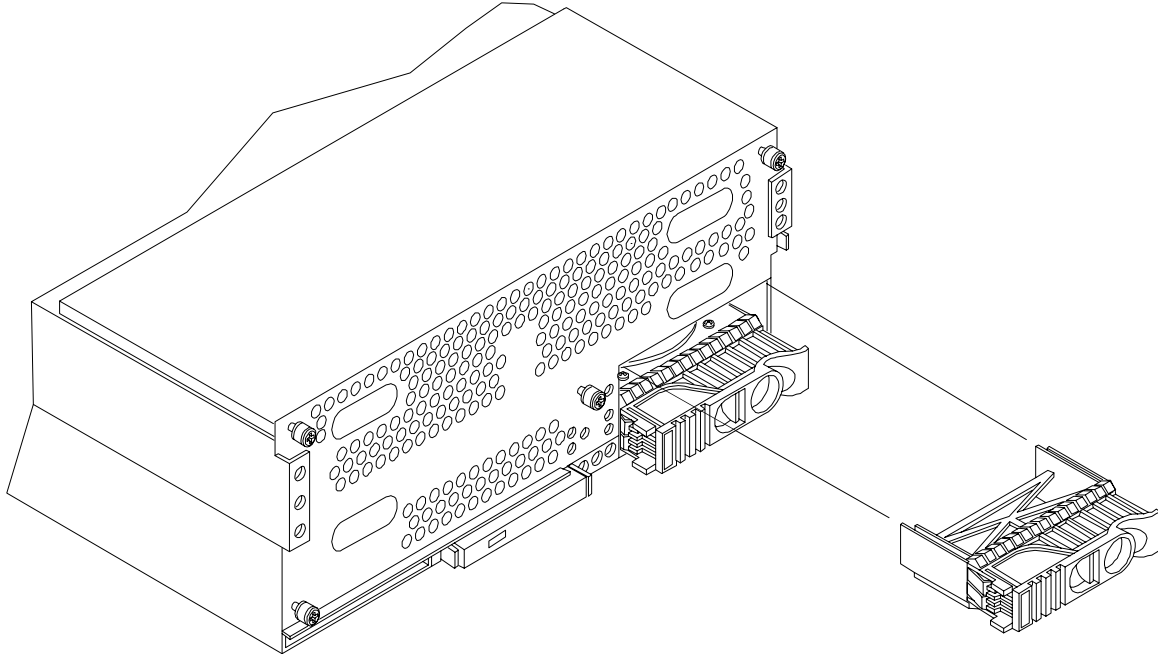


Figure 4-36 Removing and Replacing a Hard Disk Drive in Slot 2



NOTE If you are only removing a hard disk drive and not replacing it with another one, you must install a volume filler into the empty slot. Figure 4-37 shows how to install a volume filler in slot 2 of the server.

Figure 4-37 Installing a Volume Filler in Slot 2



Removing and Replacing the SCSI Backplane Board

Use these procedures to remove and replace the SCSI backplane board. The SCSI backplane board is attached to the rear of the disk media housing at the front, right side of the chassis.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the SCSI backplane.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure may result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

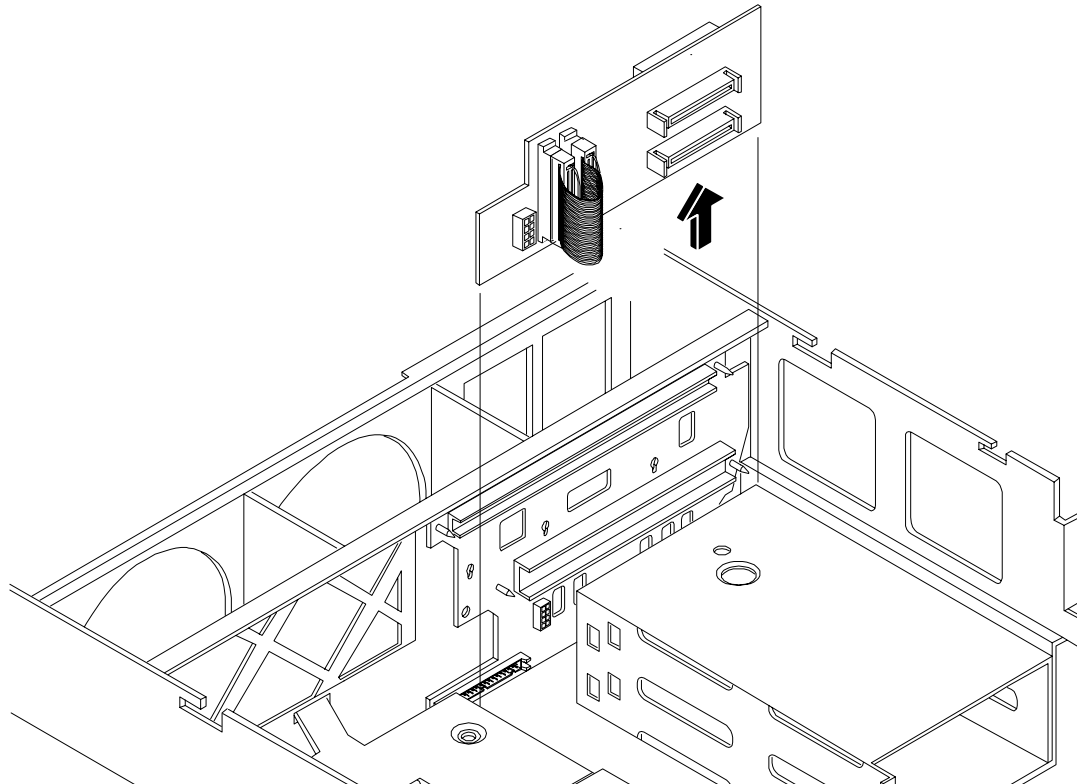
Removing the SCSI Backplane Board

To remove the SCSI backplane, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 5.** Remove the memory extender board. See “Removing the Memory Extender Board” on page 44.
- Step 6.** Remove the processor extender board. See “Removing the Processor Extender Board” on page 52.
- Step 7.** Remove the two hot-plug disk drives. See “Removing a Hard Disk Drive” on page 90.
- Step 8.** Unplug the internal SCSI cable(s) from the SCSI backplane board.
- Step 9.** Unplug the SCSI backplane-to-midplane riser cable from the SCSI backplane.
- Step 10.** Using your finger, turn the swivel latch on top of the hot-plug hard disk drive cage to unlatch the SCSI backplane board from the hard disk cage.
- Step 11.** Grasp the top edge of the SCSI backplane board and pull up until it releases from the keyway slots on the back of the hot-plug disk drive cage.

Step 12. Push the SCSI backplane board away from the disk drive cage and lift it up and out of the chassis. Figure 4-38 shows how to remove the SCSI backplane.

Figure 4-38 Removing and Replacing the SCSI Backplane Board



Replacing the SCSI Backplane Board

To replace the SCSI backplane, follow these steps:

- Step 1.** Replace the SCSI backplane to the rear of the disk drive cage.
- Step 2.** Replace the two hot-plug disk drives into the disk drive cage. See “Replacing a Hard Disk Drive” on page 90.
- Step 3.** Plug in the SCSI backplane-to-midplane cable back into the SCSI backplane.
- Step 4.** Plug in the internal SCSI cable into the SCSI back plane.
- Step 5.** Replace the processor extender board. See “Replacing the Processor Extender Board” on page 54.
- Step 6.** Replace the memory extender board. See “Replacing the Memory Extender Board” on page 46.
- Step 7.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 8.** Replace the front cover. See “Replacing the Front Cover” on page 43.
- Step 9.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 10.** If rack mounted, slide the HP server back into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing the Midplane Riser Board

The midplane riser board is attached to the main bulkhead in the center of the chassis.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the midplane riser backplane.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure will result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the Midplane Riser Board

To remove the midplane riser board, follow these steps:

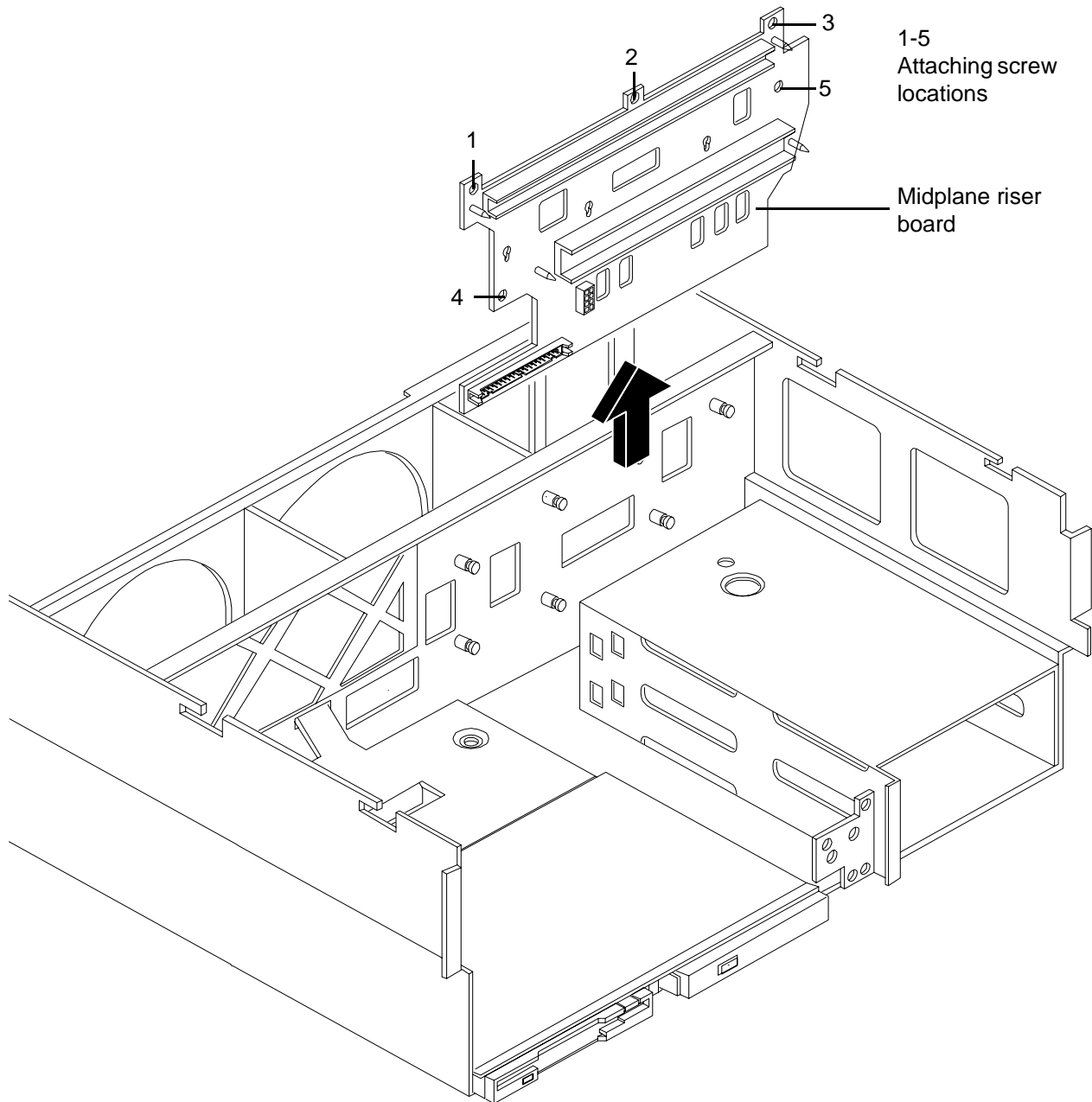
- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 5.** Remove the memory extender board. See “Removing the Memory Extender Board” on page 44.
- Step 6.** Remove the processor extender board. See “Removing the Processor Extender Board” on page 52.
- Step 7.** Remove the 3 chassis hot-swap fan units. See “Removing a Hot-Swap Chassis Fan Unit” on page 63.
- Step 8.** Remove the I/O baseboard assembly. See “Removing the I/O Baseboard” on page 66.
- Step 9.** Remove the SCSI backplane board. See “Removing the SCSI Backplane Board” on page 93.
- Step 10.** Unplug the power distribution board power cable and signal cable from the midplane riser board.
- Step 11.** Unplug the DVD relay board and front panel display board cable from the midplane riser board.
- Step 12.** Unplug the QuickFind diagnostic board cable from the midplane riser board.

NOTE At this point, all cables and connectors should be unplugged from the midplane riser board.

Step 13. Using a torx #15 driver, remove the five torx screws attaching the midplane riser board to the chassis.

Step 14. Grasp the top edge of the midplane riser board and lift straight up to release it from the keyway slots on the chassis. Then pull straight out and up to remove the midplane riser board from the chassis. Figure 4-39 shows how to remove the midplane riser board.

Figure 4-39 Removing and Replacing the Midplane Riser Board



Replacing the Midplane Riser Board

To replace the midplane riser board, follow these steps:

- Step 1.** Replace the midplane riser board onto the keyway slots on the chassis wall. Then push straight down until it seats onto the locking studs. Figure 4-39 shows how to install the midplane riser board.
- Step 2.** Using a torx #15 driver, replace and tighten the 5 torx screws attaching the midplane riser board to the chassis.
- Step 3.** Plug in the QuickFind diagnostic board cable to the midplane riser board.
- Step 4.** Plug in the DVD relay board and front panel display board cable to the midplane riser board.
- Step 5.** Plug in the power distribution board power cable and signal cable to the midplane riser board.
- Step 6.** Replace the SCSI backplane board. See “Replacing the SCSI Backplane Board” on page 94.
- Step 7.** Replace the I/O baseboard assembly. See “Replacing the I/O Baseboard” on page 68.
- Step 8.** Replace the three chassis hot-swap fan units. See “Replacing a Hot-Swap Chassis Fan Unit” on page 65.
- Step 9.** Replace the processor extender board. See “Replacing the Processor Extender Board” on page 54.
- Step 10.** Replace the memory extender board. See “Replacing the Memory Extender Board” on page 46.
- Step 11.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 12.** Replace the front cover. See “Replacing the Front Cover” on page 43.
- Step 13.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 14.** If rack mounted, slide the HP server back into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing the Power Supplies

The HP Integrity rx4640 server has two 200-240 VAC hot-swap power supply units (PSU). These PSUs are located at the rear of the HP server. The supported configuration of the HP Integrity rx4640 server requires a minimum of one PSU installed.

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

NOTE A hot-swap device does not require interaction with the operating system before the device is removed from or installed into the server.

The ac power to the server does not have to be off to remove or replace a hot-swap power supply.

Power Supply Load Order

The supported configuration of your HP Integrity rx4640 server requires a minimum of one 200-240 VAC PSU. A second, optional hot-swap PSU, may be installed to provide N+1 capability. Each PSU requires a separate power cord.

The left side (viewing from the rear) hot-swap PSU is identified as P 0, the second hot-swap power supply is identified as P 1. Each hot-swap PSU requires a separate power cord be installed in the appropriate power cord receptacle and attached to a power cord support bracket.

CAUTION The empty hot-swap PSU slot P 1 must remain closed with the supplied metal cover when a second PSU is not used. Your server may be damaged due to overheating if the cover does not remain in place.

WARNING **Be careful when installing a hot-swap power supply. It is heavier than it appears.**

CAUTION If the server is powered down, install the hot-swap PSU into the server before attaching the new power cord at the rear of the server. Failure to observe this caution results in damage to the server.

Removing a Hot-Swap Power Supply

To remove a hot-swap PSU, follow these steps:

CAUTION Be careful when removing the hot-swap power supply. It is heavier than it appears.

Step 1. If rack mounted, slide the HP server back out of the rack until it stops. See “Extending the Server from the Rack” on page 39.

Step 2. Remove the power cord plug from the power receptacle.

Step 3. Loosen the captive thumbscrew located at the top left of the PSU.

Step 4. Grasp the handle and pull the PSU out of the server. Figure 4-40 shows how to remove a PSU.

Replacing a Hot-Swap Power Supply

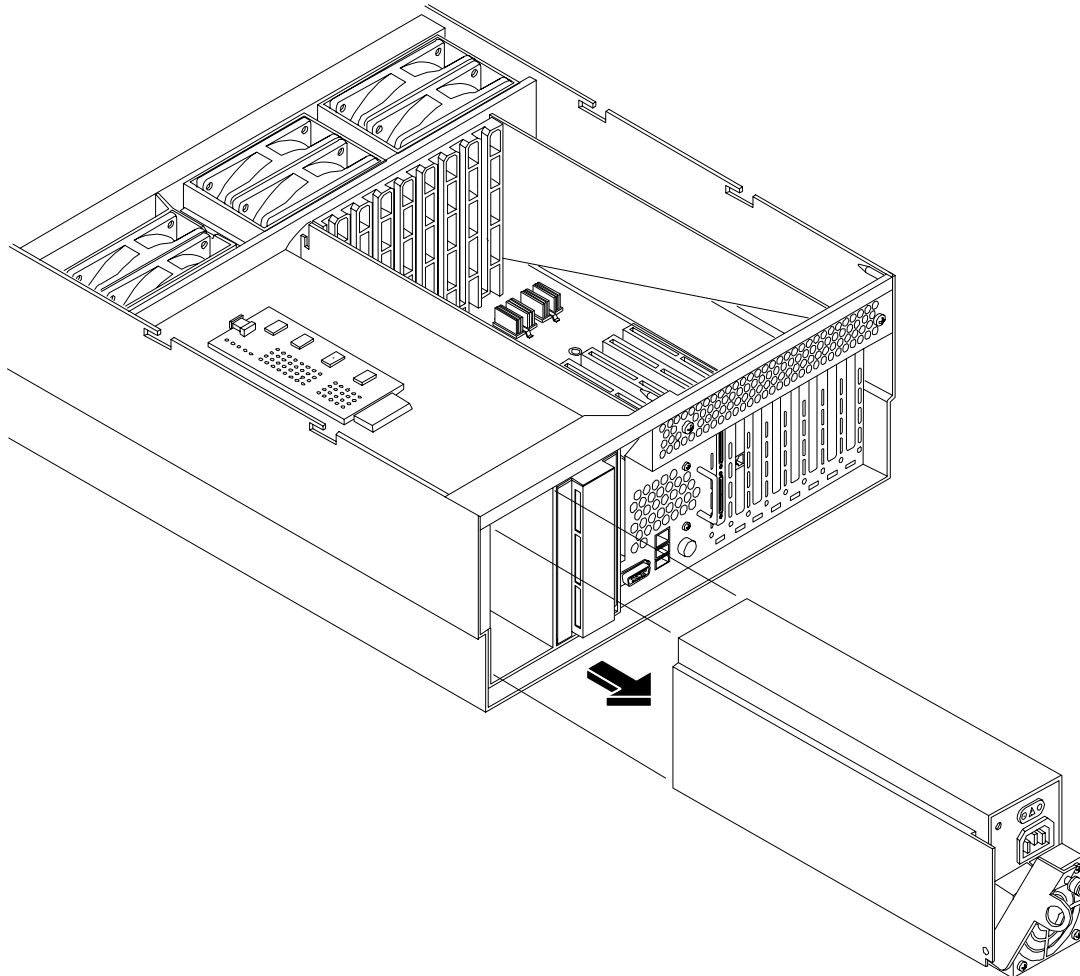
Step 1. Supporting the PSU with both hands, slide it into the empty slot until it plugs into the socket on the internal power distribution board. Tighten the thumbscrew hand-tight.

Step 2. Install the power cord into the PSU socket.

Step 3. Apply power to the new PSU and the LED should immediately turn on.

Step 4. If rack mounted, slide the HP server back into the rack until it stops. “Inserting the Server into the Rack” on page 39.

Figure 4-40 Removing and Replacing the Hot-Swap Power Supply



Removing and Replacing the Power Distribution Board

These procedures detail how to remove and replace the power distribution board in the server. The power distribution board is attached to the rear power supply cage, underneath the hot-swap power supply fan unit.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the power distribution board.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure results in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

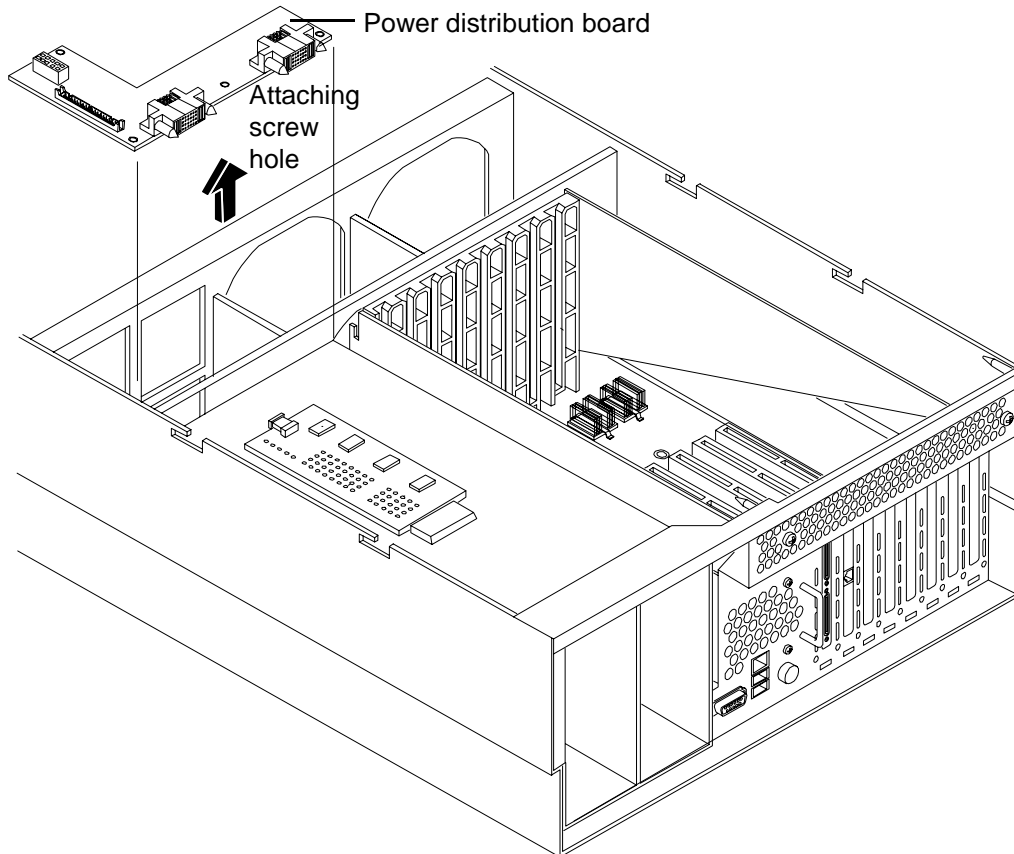
Removing the Power Distribution Board

To remove the power distribution board, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 3.** Remove the power supply fan unit from the chassis. See “Removing a Hot-Swap Chassis Fan Unit” on page 63.
- Step 4.** Remove the hot-swap power supply(s) from the chassis. See “Removing a Hot-Swap Power Supply” on page 98.
- Step 5.** Unplug the power cable and the signal cable from the midplane riser board.
- Step 6.** Using a torx #15 driver, loosen the one torx screw attaching the power distribution board to the chassis.

Step 7. Push the power distribution board towards the center of the chassis to release it from the keyway slots. Pull it off the keyway slots and up and out of the chassis. Figure 4-41 shows how to remove the power distribution board.

Figure 4-41 Removing and Replacing the Power Distribution Board



Replacing the Power Distribution Board

To replace the power distribution board, follow these steps:

- Step 1.** Replace the power distribution board over the keyway slots and push it towards the side of the chassis to lock it onto the studs.
- Step 2.** Reattach the power distribution board to the chassis bulkhead by replacing the one torx #15 screw. Tighten hand-tight.
- Step 3.** Plug the power and signal cables back into the midplane riser board.
- Step 4.** Replace the hot-swap power supply(s) into the chassis. See “Replacing a Hot-Swap Power Supply” on page 99.
- Step 5.** Replace the power supply fan unit into the chassis. See “Replacing a Hot-Swap Chassis Fan Unit” on page 65.
- Step 6.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 7.** If rack mounted, slide the HP server back into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing the DVD Drive

These procedures show how to remove and replace the DVD drive. The DVD drive is located on the front of the HP server.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing a DVD drive.**

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure will result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the DVD Drive

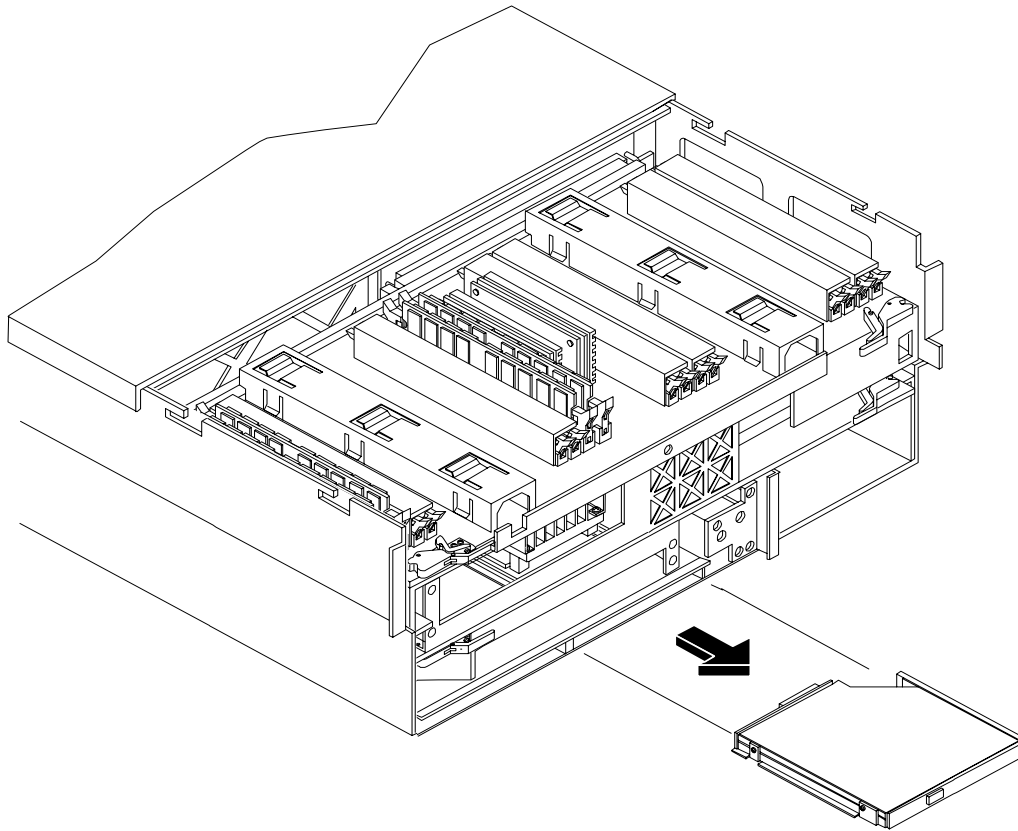
To remove a DVD drive, follow these steps:

Step 1. Grasp the front of the DVD drive and squeeze in on the locking tab to release the drive.

Step 2. Remove the front bezel. See “Removing the Front Bezel” on page 41.

Step 3. Pull the drive straight out to remove it from the chassis. Figure 4-42 shows how to remove the DVD drive.

Figure 4-42 Removing and Replacing the DVD Drive



Replacing the DVD Drive

To replace a DVD drive, follow these steps:

- Step 1.** Grasp the front of the DVD drive and squeeze in on the locking tab to release the drive.
- Step 2.** Push the drive straight into the drive bay until the locking tab clicks into place. Figure 4-42 shows how to replace the DVD drive.
- Step 3.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.

Removing and Replacing the DVD I/O Board

The DVD I/O board is located under a metal cover that is directly under DVD location at the front left of the chassis.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing a DVD I/O board.**

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure results in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

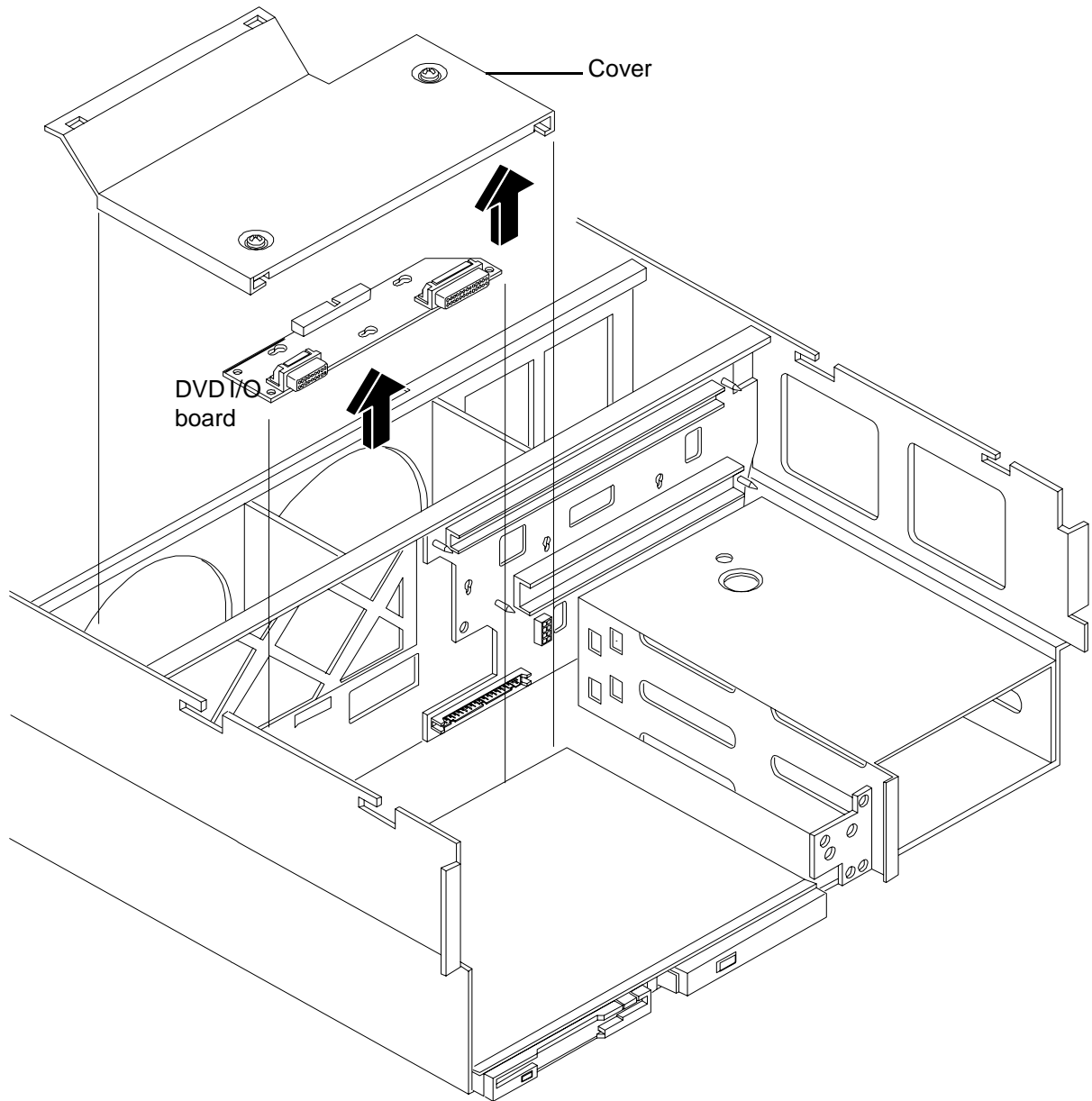
Removing the DVD I/O Board

To remove the DVD I/O board, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 5.** Remove the memory extender board. See “Removing the Memory Extender Board” on page 44.
- Step 6.** Remove the processor extender board. See “Removing the Processor Extender Board” on page 52.

- Step 7.** Using a torx #15 driver, remove the two torx screws holding the DVD I/O board cover plate to the chassis and remove the cover plate.

Figure 4-43 Removing and Replacing the DVD I/O Board



- Step 8.** Unfasten the release clip attaching the DVD I/O board to the chassis, and remove the I/O board from the chassis.
- Step 9.** Lift out the DVD I/O board and remove the midplane riser board connector cable and remove the DVD I/O board from the chassis.

Replacing the DVD I/O Board

To replace the DVD I/O board, follow these steps:

- Step 1.** Replace the DVD I/O board into the chassis and plug in the midplane riser board connector cable.
- Step 2.** Replace DVD I/O board to the chassis by refastening the release clip.
- Step 3.** Replace the cover plate using the two torx #15 screws and a torx #15 driver.
- Step 4.** Replace the processor extender board. See “Replacing the Processor Extender Board” on page 54.
- Step 5.** Replace the memory extender board. See “Replacing the Memory Extender Board” on page 46.
- Step 6.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 7.** Replace the front cover. See “Replacing the Front Cover” on page 43.
- Step 8.** Replace the front bezel. See “Replacing the Front Bezel” on page 41.
- Step 9.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

Removing and Replacing the Display Board

These procedures detail how to remove and replace the display board. The display board is located behind the control panel and under the front cover. The display board contains the server's on/off switch and three LEDs that indicate server status.

WARNING **Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the display board.**

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure will result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

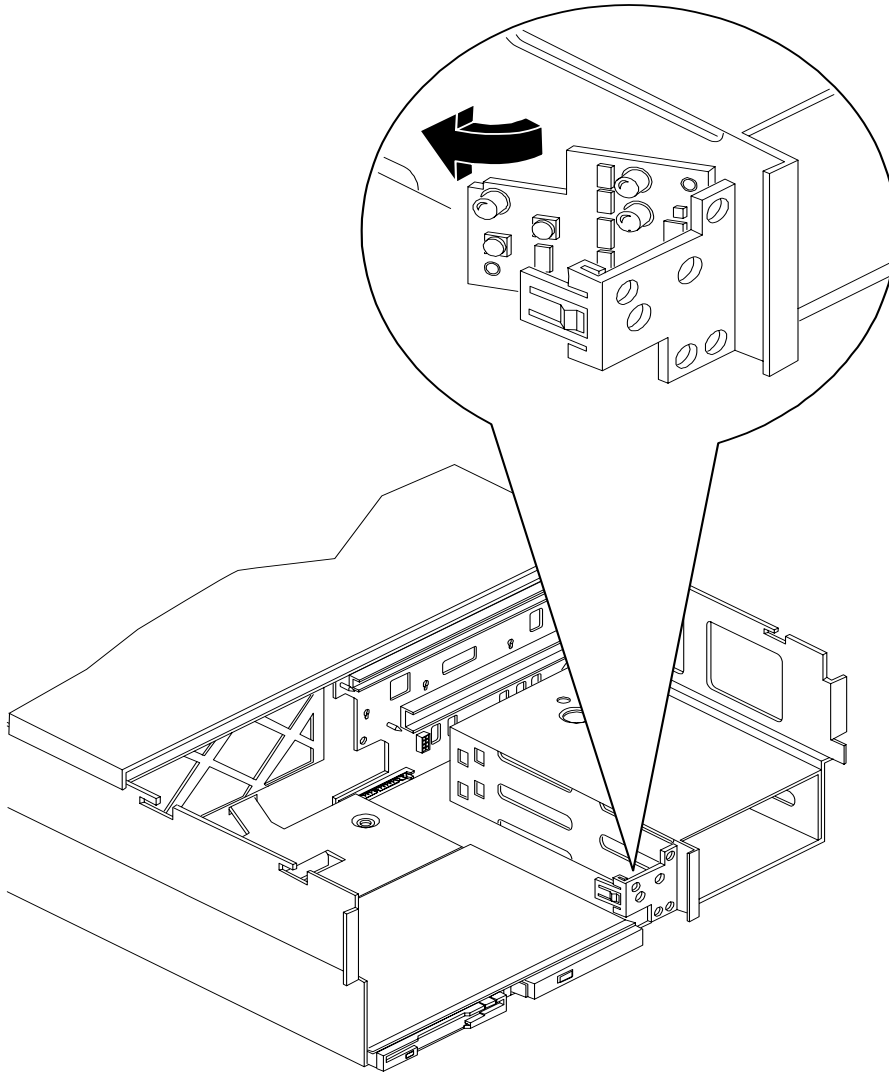
Removing the Display Board

To remove the display board, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Extending the Server from the Rack” on page 39.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 41.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 42.
- Step 4.** Using your finger, slightly pull out the retaining tab on the chassis that holds the display board in position.

Step 5. Gently unplug the midplane riser board connector cable from the display board and remove the board from the chassis. Figure 4-44 shows how to remove the display board.

Figure 4-44 Removing and Replacing the Display Board



Replacing the Display Board

To replace the display board, follow these steps:

- Step 1.** Gently plug in the midplane riser board cable into the display board.
- Step 2.** Hold the display board in position near the chassis and rotate it into the retaining clip until it clicks into place.
- Step 3.** Replace the front cover. “Replacing the Front Cover” on page 43.
- Step 4.** Replace the front bezel. “Replacing the Front Bezel” on page 41.
- Step 5.** If rack mounted, slide the HP server into the rack until it stops. “Inserting the Server into the Rack” on page 39.

Removing and Replacing the QuickFind Diagnostic Board

These procedures detail how to remove and replace the QuickFind diagnostic board. The QuickFind diagnostic board is located on top of the power supply cage, underneath the top cover.

WARNING Ensure that the server is powered down and all power sources have been disconnected from the server prior to removing or replacing the QuickFind diagnostic board.

Voltages are present at various locations within the server whenever an ac power source is connected. This voltage is present even when the main power switch is in the off position.

Failure to observe this warning could result in personal injury or damage to equipment.

CAUTION Failure to properly complete the steps in this procedure will result in erratic server behavior or server failure. For assistance with this procedure contact your local HP Authorized Service Provider.

Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

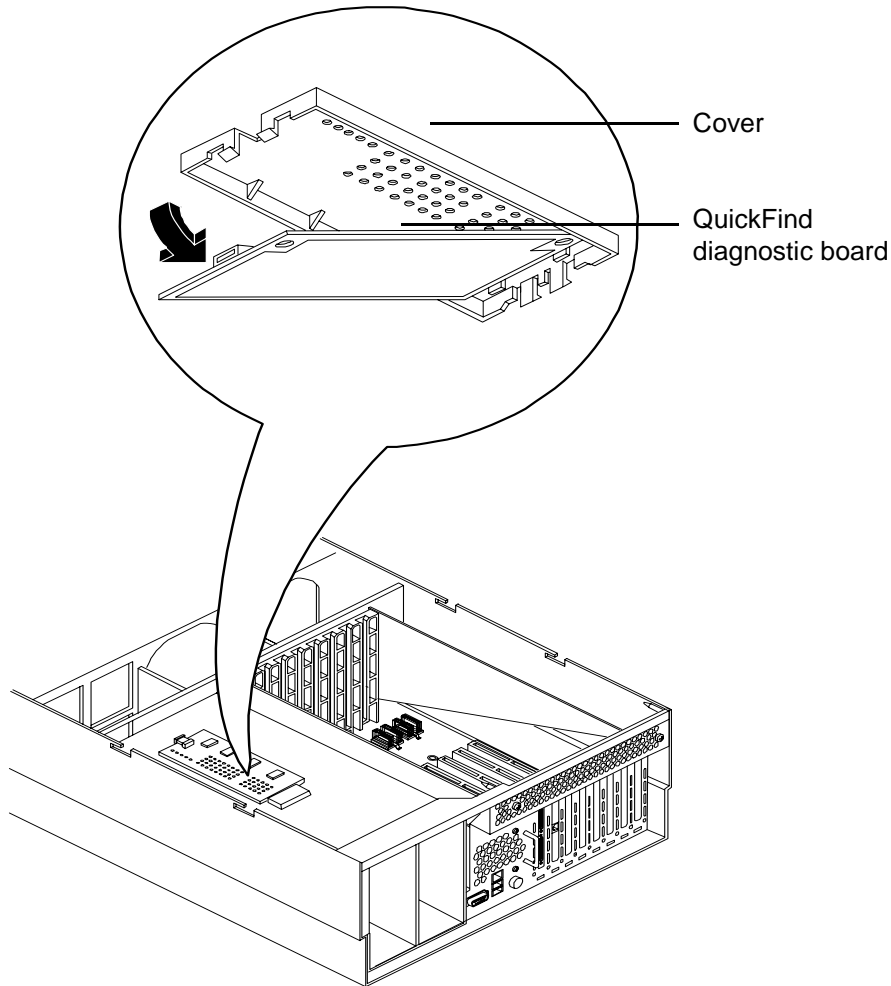
Removing the QuickFind Diagnostic Board

To remove the QuickFind diagnostic board, follow these steps:

- Step 1.** If rack mounted, slide the HP server out from the rack until it stops. See “Accessing a Rack Mounted Server” on page 38.
- Step 2.** Remove the top cover. See “Removing the Top Cover” on page 43.
- Step 3.** Gently squeeze the cover surrounding the QuickFind diagnostic board and remove the cover/board assembly from the top of the power supply cage.
- Step 4.** Turn this assembly upside down and remove the QuickFind diagnostic board from the cover.

Step 5. Unplug the cable from the connector on QuickFind diagnostic board and remove the board from the chassis. Figure 4-45 shows how to remove the QuickFind diagnostic board.

Figure 4-45 Removing and Replacing the QuickFind Diagnostic Board



Replacing the QuickFind Diagnostic Board

To replace the QuickFind diagnostic board, follow these steps:

- Step 1.** Gently plug the cable into the QuickFind diagnostic board connector.
- Step 2.** Replace the QuickFind diagnostic board into the cover by snapping it into place.
- Step 3.** Turn the assembly over and snap into place on top of the power supply cage.
- Step 4.** Replace the top cover. See “Replacing the Top Cover” on page 44.
- Step 5.** If rack mounted, slide the HP server into the rack until it stops. See “Inserting the Server into the Rack” on page 39.

5 Troubleshooting

This chapter provides basic troubleshooting instructions for the HP Integrity rx4640 server.

This chapter addresses the following topics:

- “Troubleshooting Tips” on page 112
- “Possible Problems” on page 113
- “Troubleshooting Using LED Indicators” on page 116
- “Diagnostics” on page 128
- “Recommended Cleaning Procedures” on page 131
- “Where to Get Help” on page 132

Troubleshooting Tips

WARNING Before removing a cover to service components that cannot be hot-swapped, always disconnect the ac power cords and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Disconnect the ac power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.

CAUTION Do not operate the HP server for more than two minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to server components may result due to improper cooling airflow.

However, you can safely remove a cover while the HP server is running to remove and replace PCI hot-plug boards. For any other service activity requiring access to the I/O baseboard or power distribution board, power-down the HP server and observe all safety precautions.

Troubleshooting Methodology

- Step 1.** This is the entry point to the troubleshooting process. Here, you pick from a set of symptoms, ranging from very simple (server LED is blinking) to the most difficult (Machine Check Abort [MCA]) has occurred. The following is a list of symptom examples:
- Server LED blinking
 - System Alert present on console
 - Server will not power-up
 - Server will not boot
 - Event/Error Message received
 - Machine Check Abort (MCA)
- Step 2.** This step narrows down the observed problem to the specific troubleshooting procedure required. Here you isolate the failure to a specific part of the server so that you can perform more detailed troubleshooting. For example:
- Problem-Server LED blinking
 - System Alert on console?
 - Analyze the alert by using the system event log (SEL) to identify the last error logged by the baseboard management controller. Use the iLO MP commands to view the SEL.
- Step 3.** At this point you will have a good idea about which area of the server requires further analysis. For example, if the symptom was “server will not power-up” then the initial troubleshooting procedure may have indicated a problem with the dc power supply not coming up after the power switch was turned on.

- Step 4.** You have now reached the point where the failed Field Replaceable Unit (FRU or FRUs) have been identified and need to be replaced. You must now perform the specific remove-and-replace verification steps.

NOTE If multiple FRUs are identified as part of the solution, a fix cannot be guaranteed unless all identified failed FRUs are replaced.

- Step 5.** There may be specific recovery procedures you need to perform to finish the repair. For example, if the display panel is replaced, you need to restore customer-specific information.

Possible Problems

This section contains example HP server problems and their possible solutions.

The Server Does Not Power On

- Step 1.** Check to see if the iLO MP is working. If so, access the `SEL` to determine the problem.
- Step 2.** Check all power connection cables.
- Step 3.** Verify that 200-240 VAC power is available at the ac power receptacle. Check the receptacle output with another device.
- Step 4.** Check the power supply fans to see if they are operating. The fans will operate off the dc voltage generated by the power supply.
- Step 5.** Check that the Power LED on Front Control Panel is illuminated. See “Front Control Panel LED Indicators” on page 117.
- Step 6.** Check all connections from the power supply to the power distribution module.
- Step 7.** Verify that all cables and modules are correctly connected. Especially check the display panel connection.
- Step 8.** Review the installation procedures for the server. See the *HP Integrity rx4640 Installation Guide*.
- Step 9.** If the server starts to power-on and then power-off, a voltage rail of the power supply may be out of specification. The BMC monitors voltages and prevents power-on when power values are out of specification.

The Server Does Not Boot

- Step 1.** Examine the front panel LEDs for warning or fault indications. The server LED will be flashing yellow with a warning indication and flashing red with a fault indication. See “Front Control Panel LED Indicators” on page 117.
- Step 2.** Examine the QuickFind Diagnostic Panel for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault. See “QuickFind Diagnostic Panel LED Indicators” on page 119.

- Step 3.** Display and examine the system event log (SEL) and forward progress log (FPL) for further information relating to warning or fault isolation.
- Step 4.** Review the firmware revisions of all firmware.

NOTE If the server does not boot to EFI, the only way to check firmware revisions is with the `iLO MP SR` command. However, the result may not be accurate because the versions it displays are updated by system firmware during the boot to EFI. If the system firmware does not boot to the point where it updates iLO MP firmware version, the versions displayed by the `SR` command may not be correct.

- Step 5.** Use the iLO MP command to cycle the server power: `pc off`, `pc on`, or `pc -cycle`.
- Step 6.** Turn the server off, wait at least twenty seconds, then turn the server back on to see if the failure can be cleared.
- Step 7.** Check that all DIMMs are seated properly.
- Step 8.** Check that the DIMM configuration on the I/O baseboard matches those approved. A minimum of one DIMM pair must be installed.
- Step 9.** Verify that the DIMMs are fully seated. When the DIMM is fully seated in the mating connector, the retaining latches are closed (they should be flush with the front of the DIMM). If the latches are not closed, reseal the DIMM fully by engaging the retaining latches and closing them fully.
- Step 10.** Check that the processors are installed in the correct sockets on the processor extender board. See Figure 4-13 on page 56 for the correct processor load order.
- Step 11.** Verify the processors are of the same type.
- Step 12.** Check the boot order with the SCSI configuration utility.
- Step 13.** Check the switch settings on the I/O baseboard. They should match Figure 4-24 on page 69.
- Step 14.** If there are no obvious errors, reflash the BMC firmware. (See Appendix C, “Utilities,” on page 161.)
- Step 15.** If the server will still not boot, it may be necessary to replace the base unit.

The Server Has Intermittent Failures

- Step 1.** Examine the front panel LEDs for warning or fault indications. The server LED flashes yellow with a warning indication and flashes red with a fault indication. See “Front Control Panel LED Indicators” on page 117.
- Step 2.** Examine the QuickFind Diagnostic Panel for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault. See “QuickFind Diagnostic Panel LED Indicators” on page 119.
- Step 3.** Display and examine the errdump logs for further information relating to warning or fault indications.
- Step 4.** Display and examine the system event log (SEL) and forward progress log (FPL) for further information relating to warning or fault indications.
- Step 5.** Make sure that the server fan assemblies are fully seated.

- Step 6.** Verify that the server is plugged into a power source that is within specifications described on the label of the power supply.
- Step 7.** Make sure that the internal SCSI chain is terminated and that termination is not enabled on any of the drives. Note that LVD SCSI termination is provided on the cable.
- Step 8.** Check that the processors are installed in the correct sockets and that terminators are installed in all unused sockets.
- Step 9.** Reset the main memory DIMMs.
- Step 10.** If date and time or customer settings are being cleared, the I/O baseboard battery may need to be replaced.

The Server LED or Diagnostic LEDs Are Not On and No Error Messages Appear

If the server does not work (with no LEDs illuminated) and no error messages appearing, check the following:

- Step 1.** Make sure that all cables and the ac power cord are plugged into their proper receptacles.
- Step 2.** Make sure that the ac outlet is working. If the server is plugged into a switched multiple-outlet box, make sure that the switch on the outlet box is turned on.
- Step 3.** Make sure that the server is turned on (the power-on light should be green and the fans should be on).
- Step 4.** Turn the server off, wait at least twenty seconds, then turn the server back on to see if the failure can be cleared.
- Step 5.** Make sure that all boards are installed properly and the processors are installed in the correct slot. They must be seated firmly in their slots and any cables must be connected firmly.
- Step 6.** If the server stopped working after you installed a new board, remove the board and turn on the server. If your server now works, check the installation instructions received with the new board for correct installation method. If the new board is preventing the server from powering on, it is likely to have a serious electrical problem.
- Step 7.** If the server still does not work, remove all boards and options that you have installed (do not remove the hard disk drives) and turn on the server.
- Step 8.** Add boards and options one at a time to determine which one is causing the problem.
- Step 9.** If you have added any memory, make sure that the DIMMs are seated properly in the board. Also check the DIMM configuration, and that the DIMMs are matched pairs.

Power Shuts Off and Does Not Come Back On

When certain critical conditions exist, the server shuts down all power.

The critical conditions that may shut down the server are:

- Critical temperature fluctuations or changes
- Voltage problems (external ac line, internal dc rails)
- Power supply failure (if only one power supply is installed in the server)
- More than one fan has failed

If the server powers-off, and before you try a restart, do the following:

- Step 1.** Examine the front panel LEDs for warning or fault indications. The server LED flashes yellow with a warning indication and flashes red with a fault indication. See “Front Control Panel LED Indicators” on page 117.
- Step 2.** Examine the QuickFind Diagnostic Panel for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault. See “QuickFind Diagnostic Panel LED Indicators” on page 119.
- Step 3.** Check to make sure power is getting to the server. Plug a known working device into the power outlet.
- Step 4.** Check for proper ventilation for the server. The server should have at least three inches of space around the front and rear for proper airflow when installed in a rack.

NOTE Temperature problems may be caused by a fluctuating power supply.

- Step 5.** Check the server specifications and make sure the environmental temperature and voltage are in the specified guidelines.
- Step 6.** Monitor the server to make sure you are not experiencing further temperature and voltage problems.
- Step 7.** Check the SEL for the event that caused the BMC to shut the server off.

Troubleshooting Using LED Indicators

Your HP Integrity rx4640 server has LED indicators located on the front control panel and an internal QuickFind diagnostic panel that you can use to determine what repair action is required. For descriptions of all LEDs on your HP Integrity rx4640 server see the *HP Integrity rx4640 Operations Guide* on the documentation CD included with your server.

Front Control Panel LED Indicators

The front control panel LEDs show you the server status at a glance. If warning or attention lights are flashing, then you should to query the QuickFind diagnostic panel or management processor for further information.

Figure 5-1 Front Control Panel

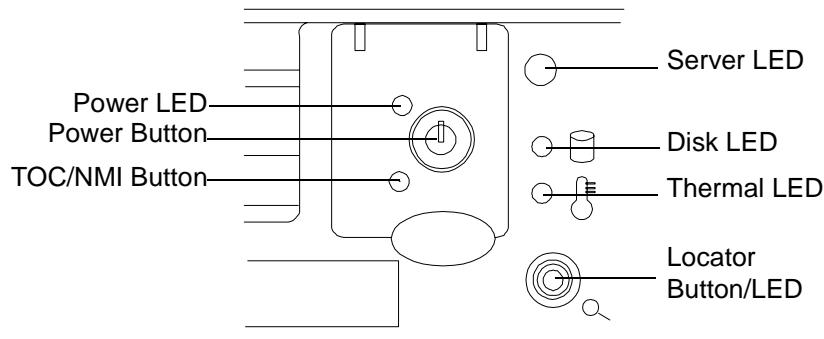


Table 5-1 Front Control Panel LED Definitions

LED/ Button	State	Flash Rate	Color	Description
Server	Running	Steady	Green	Green: Server normal-OS up and running
Server	Booting	Flashing at 0.5Hz	Green	Flashing green: OS booting or at EFI
Server	Attention	Flashing at 1 Hz	Yellow	Flashing yellow: Warning-server needs attention. Redundancy lost, component failure pending.
Server	Fault	Flashing at 2 Hz	Red	Flashing red: hard fault, server halted
Server	Off	Off	N/A	Off: server off
Power	On	Steady	Green	Green: power normal
Power	On	Steady	Yellow	Flashing yellow: Housekeeping voltage present
Power	Off	Off	Off	Off: Power off
Disk LED		Flashing at rate of disk activity	Green	Flashing green: disk activity
Thermal LED	OK	Steady	Green	Green: thermal OK
Thermal LED	Warning	Flashing at 1 Hz	Yellow	Flashing yellow-thermal warning
Locator LED/Button		Flashing at 1 Hz	Blue	Flashing blue: server locator LED may be remotely or locally activated/deactivated

Hard Disk Drive LED Indicators

The hot-swap disk drives have two LEDs per drive, as described below. Figure 5-2 shows the location of the hard disk drive LEDs. Definitions of the hard disk drive LEDs are detailed in Table 5-2.

- Status LED - The drive status LED displays green when disk power is on, and is off when disk power is off.
- Activity LED - The drive activity LED is green and indicates disk drive activity. This LED is controlled by the disk drive directly and turns on when a drive is accessed.

Figure 5-2 Hot-Swap Disk Drive LED Indicators

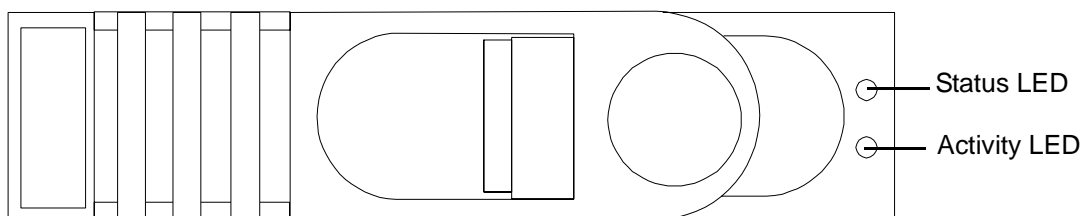


Table 5-2 Hot-Swap Disk Drive LED Definitions

LED	Color	Description
Status LED	Green	Drive/Slot normal (drive present)
	Off	No power to hard disk drive
Activity LED	Flashing green	Drive access under hard drive control.

DVD/DVD-R/DVD-RW Drive LED Indicators

The HP server is delivered with one DVD-RM drive (DVD-R and DVD-RW optional). Each of these devices has one activity LED as shown and described in Figure 5-3 and Table 5-3.

Figure 5-3 DVD-ROM Drive

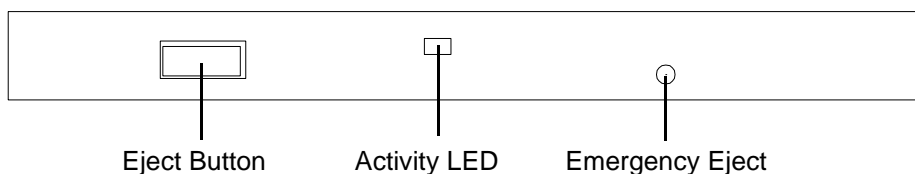


Table 5-3 DVD Drive LED Definitions

LED	Status	Description
Activity LED	Flashing green	Drive access under hard drive control.

QuickFind Diagnostic Panel LED Indicators

The QuickFind diagnostic panel is located under the top cover and is attached to the top of the power supply cage. Figure 5-4 and Table 5-4 show and describe the status of the various LEDs and what is wrong with the indicated component.

Figure 5-4 QuickFind Diagnostic Label

Refer to Reference Label for Additional Information				
	0	1	2	3
Processor	○	○	○	○
Subsystem	○	○	○	○
I/O VRM	○	○	○	○
CPU VRM	○	○	○	○
Fan	○	○	○	○
	A	B	C	D
Memory Bank 0	○	○	○	○
Memory Bank 1	○	○	○	○
Memory Bank 2	○	○	○	○
Memory Bank 3	○	○	○	○
Memory Bank 4	○	○	○	○
Memory Bank 5	○	○	○	○
Memory Bank 6	○	○	○	○
Memory Bank 7	○	○	○	○
Power Supply	○			
Memory Config Error	○			
Processor Config Error	○			
Missing Component	○			
System Temperature	○			
Check Event Log	○			

○ Marks unused LED positions covered by the label

Table 5-4 QuickFind Diagnostic Panel LED Definitions

Item	LED 0	LED 1	LED 2	LED3	Details
Processor	Socket 0	Socket 1	Socket 2	Socket 3	<p>If the Server LED (on front panel) is in the attention or fault state and the processor LED is on, then the processor or voltage regulator has failed—the processor module in the specified socket needs to be replaced.</p> <p>If the thermal LED is in the warning or critical state and the processor LED is on, then the processor exceeded the warning or critical level.</p>

Table 5-4 QuickFind Diagnostic Panel LED Definitions (Continued)

Item	LED 0	LED 1	LED 2	LED3	Details
Subsystem	CPU board	Memory board	I/O board	n/a	A soldered voltage regulator has failed—the specified board must be replaced.
I/O VRM	12 volt	5 volt	3 volt	n/a	A plug-in voltage regulator has failed—replace I/O baseboard.
CPU VRM	n/a	n/a	n/a	n/a	n/a
Fan Module	0	1	2	n/a	One or both fans in a fan module have failed—the module must be replaced. Fan 2 is in front of the power supplies.
Memory Bank X (0-7)	DIMM xA	DIMM xB	DIMM xC	DIMM xD	The specified DIMM has failed—the DIMM must be replaced. If all the LEDs for a rank (0-7) are lit and the memory config error LED is lit, then the DIMMs in the specified rank are mismatched—replace mismatched DIMM.
Check Power Supply	n/a	n/a	n/a		One of the power supply or power supply fans have failed—replace the power supply. The faulty power supply LED (located on Power supply) will be lit.
Memory Config Error	n/a	n/a	n/a		The DIMMs in a rank are mismatched. All the DIMMs in the specified rank (0-7) will be lit.
Processor Config Error	n/a	n/a	n/a		The processors are mismatched—replace mismatched processor.
Missing Component	n/a	n/a	n/a		A required component(s) is not installed in the server and thus preventing “power-up.”
Server Temp	n/a	n/a	n/a		The internal temperature of the server has exceeded the warning or critical level.
Check Event Log	n/a	n/a	n/a		An event has occurred that requires attention.

I/O Baseboard LED Indicators

Figure 5-5 shows the various LEDs, sensors, and reset or attention buttons found on the I/O baseboard. Table 5-5 describes the status of the various LEDs on the I/O baseboard.

Figure 5-5 I/O Baseboard LEDs, Buttons and Sensors

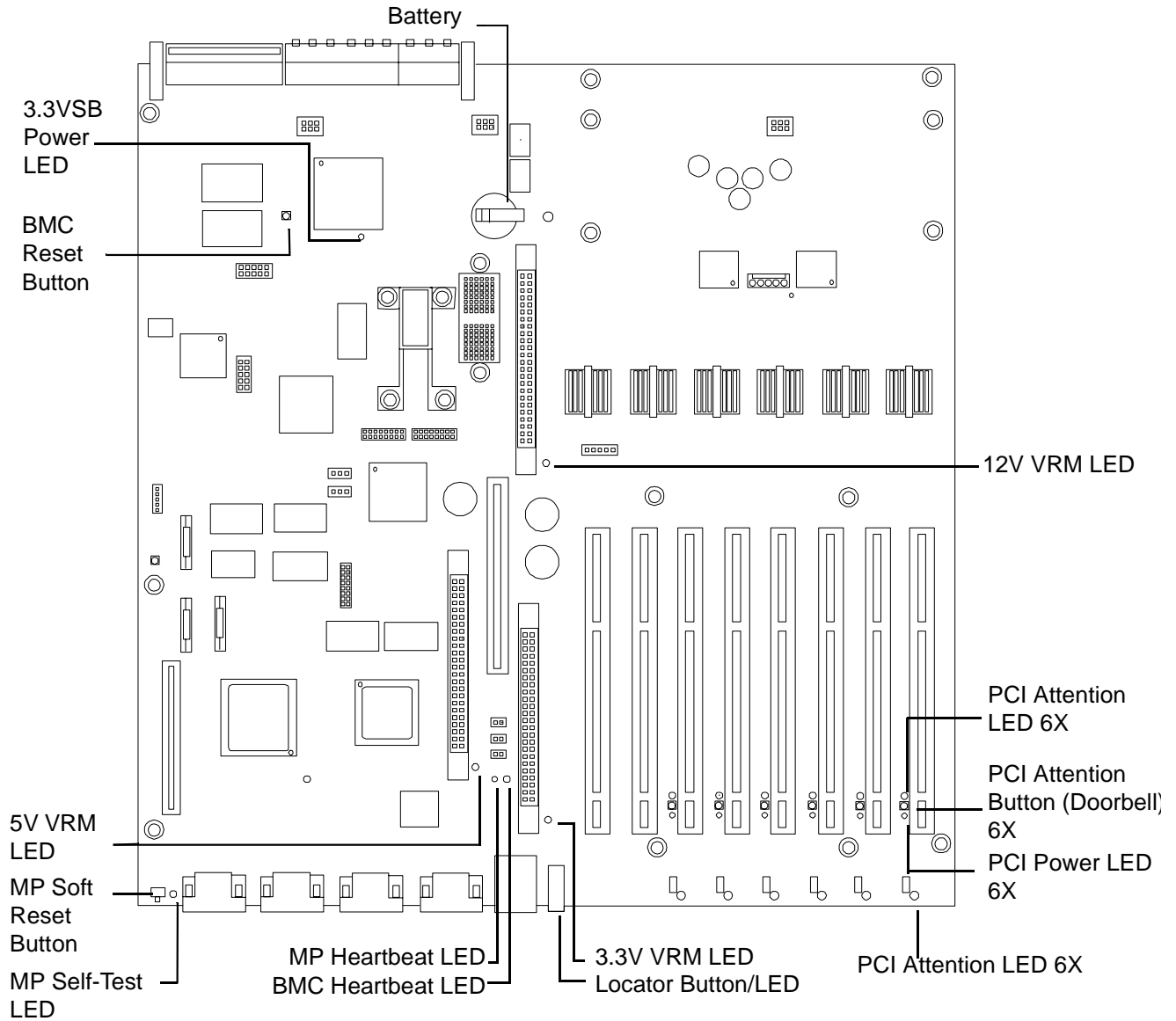


Table 5-5 I/O Baseboard LEDs, Buttons and Sensors

LED/Button	Color	Status	Condition
12 V VRM Power LED	Green	On	12 V VRM is functioning.
5 V VRM Power LED	Green	On	5 V VRM is functioning.
3.3 V VRM Power LED	Green	On	3.3 V VRM is functioning.
iLO MP Heartbeat	Green	Blinking	The management processor is functioning correctly.
iLO MP Self Test LED	Amber	On Off	The management processor is executing the internal self test. The management processor has passed the internal self test.
BMC Heartbeat	Green	Blinking	The baseboard management controller is functioning correctly.
3.3 VSB Power LED	Green	On	Standby power is available.
iLO MP Soft Reset Button	N/A	Press	Resets the management processors values.

Power Supply Status LED Indicators

Each of the two 200-240 VAC power supply unit has three status LEDs located on the back of the power supply on the rear panel. Consolidated status of all power supplies is reported by the front control panel by the power status LED.

Figure 5-6 Power Supply Status LED

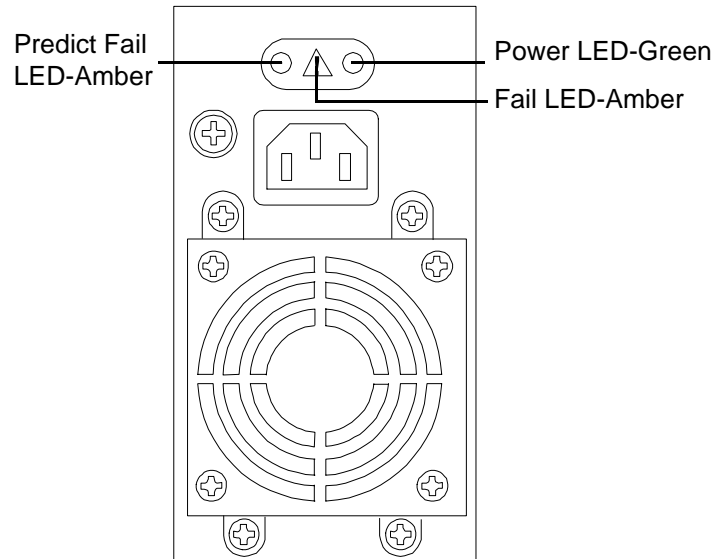


Table 5-6 Power Supply Status LED

Power LED-Green	Predict Fail LED-Amber	Fail LED-Amber	Status
Off	Off	Off	No ac power applied to all PSUs.
Off	Off	On	No ac power applied to this PSU only.
Blinking	Off	Off	ac present/standby outputs on.
On	Off	Off	PSU dc outputs on and OK.
Off	Off	On	Power supply failure.
On	Blinking	Off	Predictive failure—PSU about to fail because of poorly performing fan.
On	Off	Blinking	Current limit on 48 VDC output.

iLO MP LAN Port Link/Activity LED Display

The iLO MP LAN uses an RJ-45 type connector. This connector has two LEDs (LAN link and LAN activity) that signal status and activity.

Two versions of the iLO MP card exist for this server. Depending on which version of the card is installed in the server, the iLO MP LAN port LEDs display differently.

On some servers, the LEDs display as follows:

Figure 5-7 iLO MP LAN LEDs

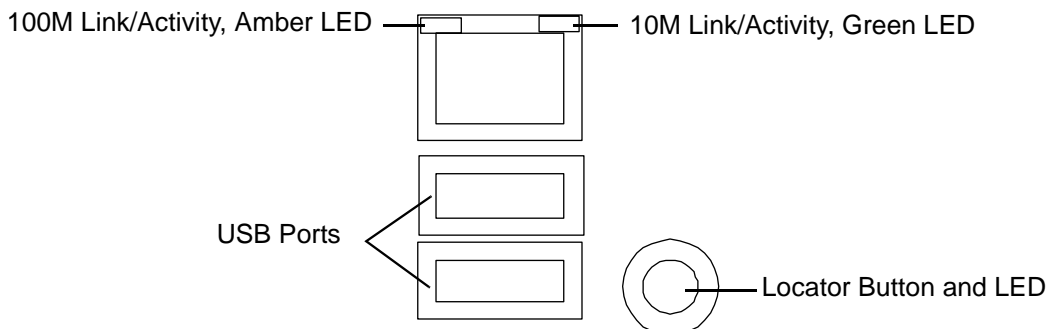


Table 5-7 iLO MP LED Status Descriptions

LED	Condition	Status
100M amber	On	Linked at 100MBps. No activity
100M amber	Blinking	Linked at 100MBps. Activity present
10M green	On	Linked at 10MBps. No activity
10M green	Blinking	Linked at 10MBps. Activity present

On other servers, the LEDs display as follows:

Figure 5-8 iLO MP LAN LEDs

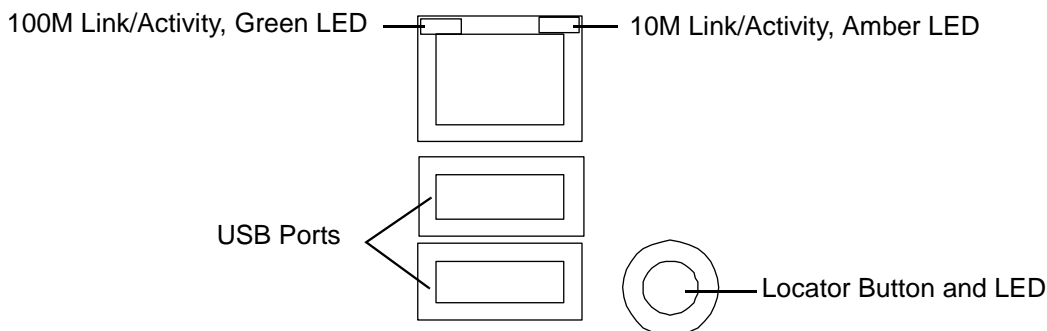


Table 5-8 iLO MP LED Status Descriptions

LED	Condition	Status
100M green	On	Linked at 100MBps. No activity
100M green	Blinking	Linked at 100MBps. Activity present
10M amber	On	Linked at 10MBps. No activity

Table 5-8 iLO MP LED Status Descriptions (Continued)

LED	Condition	Status
10M amber	Blinking	Linked at 10MBps. Activity present

Locator LED and Button

An LED and button is provided on the rear panel of the server. Another single blue LED and button is on the front control panel that enables/disables the locator function. See Figure 5-7 for the locator LED and button location.

PCI-X LEDs and Hardware Errors

The following table describes the hot-plug PCI-X LED error conditions.

Table 5-9 PCI-X LED Descriptions

Power LED-Green	Condition	Description
	On	PCI-X slot is powered on.
	Blinking	Hot-plug operation in progress—do not touch the slot.
	Off	PCI-X slot is powered off.
Attention LED-Amber	Condition	Description
	On	Hardware operational fault. NOTE: If slot is powered on, it will not power off. If slot is powered off, it will not power on.
	Blinking	Slot location being indicated. NOTE: If you want to learn how to activate the attention LED into the blinking/indicator state, read <i>Interface Card OL* Support for HP-UX Servers and Workstations, Turning Attention LED to Blink or Off</i> at http://docs.hp.com .
	Off	If power to slot is on, the slot is functioning normally.

Troubleshooting PCI-X Hot-Plug Operations

Sometimes a PCI-X card will not come online during a hot-plug operation due to a frequency mismatch between the PCI-X card and the slot bus or due to other hardware errors. To determine the type of error you are experiencing, observe the LED activity as described below. For a full understanding and description of HP-UX 11i v2 hardware errors, read *Interface Card OL* Support for HP-UX Servers and Workstations, Important Considerations* at <http://docs.hp.com>.

1. PCI-X Bus Mode or Frequency Mismatch

After you insert a PCI-X card into the slot and push the attention button, the power LED goes from blinking to steady-off and stays at steady-off; this means that the server firmware has rejected the PCI-X card, and indicates either bus frequency or bus mode mismatch.

NOTE After pushing the attention button, ensure that you wait the full duration of the 5 second operation cancellation window before taking further action.

2. Hardware Operation Fault

If the PCI-X card cannot be powered on during a hot-plug addition operation, the attention LED turns steady-on and the power LED turns steady-off.

CAUTION If your card does not power up, the power loss may be due to the existing PCI-X expansion cards using all the available power. Check the power ratings of your existing PCI-X cards. A known cause of power loss is the use of more than 3 RAID cards in your server.

If the PCI-X card cannot be powered off during a hot-plug removal operation, the attention button turns steady-on and the power LED remains steady-on.

CAUTION If your slot does not power off during a hot-plug removal operation, do not open the manual retention latch (MRL) on the OLX divider. This action may cause a server failure or an operating system crash.

Diagnostics

A suite of offline and online support tools are available to enable manufacturing, field support personnel, and you to troubleshoot server problems. In general, if the operating system (HP-UX) is already running, it is best not to shut it down. Use the online support tools.

If the OS cannot be booted, use the offline support tools to resolve the problem. The offline support tools are available from the EFI partition. Once you resolve the problem preventing booting, boot HP-UX, and use the online support tools for any further testing.

If it is not possible to reach the EFI from either the main disk or from LAN, you must troubleshoot, using the visual fault indicators, console messages, and system error logs that are available.

Online Diagnostics/Exercisers

Online support tools are provided under both operating systems. Centralized error archiving and hardware inventory tools for both OSEs are available as long as the agents/providers that support them are installed on the managed server.

On HP-UX systems, the legacy tools within OnlineDiag continue to be supported. The online support tools, on HP-UX 11.23 and greater, include the Support Tool Manager (STM) tools, and the additional Web-Based Enterprise Management (WBEM) features added by SysFaultMgmt.

The STM suite of tools includes verifiers, diagnostics, exercisers, information modules, and expert tools.

Verifiers quickly determine whether or not a specific device is operational by performing tasks similar in nature to the way applications use the device. No license is required to run the verifiers.

Diagnostics are tools designed to identify faulty or failed FRUs.

Exercisers stress devices in order to facilitate the reproduction of intermittent problems.

Information modules create a log of information specific to one device, including:

- The product identifier
- A description of the device
- The hardware path to the device
- The vendor
- Onboard log information (if applicable)
- Miscellaneous information associated with the device
- The firmware revision code, if firmware is present in the device, is also displayed

Expert tools are device-specific troubleshooting utilities for use by sophisticated users. Their functionality varies from tool to tool, but they are intended to be interactive, and rely on users to provide information necessary to perform a particular task. These tools require users to have the appropriate license, if they wish to run them.

Online Support Tool Availability

Online diagnostics are included in the HP-UX OE media, and are installed by default.

Online Support Tools List

The following online support tools are available on HP-UX 11.23 hosted servers. In some cases, a tool, such as a disk exerciser, is generic to many types of hardware; in other cases, a tool, such as a tape diagnostic, is specific to a particular technology or type of tape drive.

Table 5-10 Online Support Tools List

Functional Area	Information	Verify	Exercise	Diagnose	Expert
System	Yes	No	No	No	No
CPU/FPU	No	No	Yes	No	Yes
Memory	Yes	No	Yes	No	No
Graphics	Yes	Yes	Yes	No	No
Core I/O LAN	Yes	Yes	Yes	Yes	No
Disk/Arrays	Yes	Yes	Yes	No	No
Tape	Yes	Yes	Yes	Yes	Yes
M/O	Yes	No	No	No	Yes
Add-On Network I/O Cards	Yes	Yes	Yes	No	Yes
Add-On Mass Storage I/O Cards	Yes	No	No	No	No

Offline Support Tool Availability

Updates to the EFI HP service partition (HPSP) are available through the CD Installer option on the IPF Offline Diagnostics and Utilities CD. At a minimum, an ISO image of the IPF Offline Diagnostics and Utilities CD is available from the HP website.

Offline Support Tools List

The following offline support tools are available:

Table 5-11 Offline Support Tools List

Offline Tool	Functional Area
CPUDIAG	Processor Diagnostic
MEMDIAG	Memory Diagnostic
MAPPER	System Mapping Utility
PLUTODIAG	SBA/LBA Chipset
PERFVER	Peripheral Verifier
DFDUTIL	SCSI Disk Firmware Update Utility
DISKUTIL	Disk Test Utility (Non-Destructive)
COPYUTIL	Data Copy Utility

Table 5-11 Offline Support Tools List (Continued)

Offline Tool	Functional Area
DISKEXPT	Disk Expert Utility
IODIAG	I/O Diagnostics Launch Facility (Executes third party diagnostics and runs BIST, if available)
CIODIAG2	Core I/O Diagnostic
Specific Card I/O Diagnostics	Card-Specific I/O Diagnostics/BIST

General Diagnostic Tools

The following tools are currently available for support on other HP 9000 and Integrity server platforms. The distribution method is through the HP website.

Table 5-12 General Diagnostic Tools List

Diagnostic Tool	Description
IPMI Event Decoder	Provides detailed information about the IPMI event (Problem description, cause, action)

Fault Management Overview

The goal of fault management and monitoring is to increase server availability, by moving from a reactive fault detection, diagnosis, and repair strategy to a proactive fault detection, diagnosis, and repair strategy. The objectives are:

- To detect problems automatically, as close as possible to the time of occurrence.
- To diagnose problems automatically, at the time of detection.
- To automatically report (in understandable text) a description of the problem, the likely cause(s) of the problem, the recommended action(s) to resolve the problem, and detailed information about the problem.
- To ensure that tools are available to repair or recover from the fault.

HP-UX Fault Management

Proactive fault prediction and notification is provided on HP-UX by SysFaultMgmt WBEM indication providers, as well as by the Event Management Service (EMS). The Event Management Service and WBEM provide frameworks for monitoring and reporting events.

SysFaultMgmt WBEM indication providers and the EMS Hardware Monitors allow users to monitor the operation of a wide variety of hardware products, and alert them immediately if any failure or other unusual event occurs. By using hardware event monitoring, users can virtually eliminate undetected hardware failures that could interrupt server operation or cause data loss.

Complete information on installing and using EMS hardware event monitors, as well as a list of supported hardware, can be found in the *EMS Hardware Monitors Users Guide*. An electronic copy of this book is available on the HP website at:

<http://docs.hp.com/hpux/diag>.

WBEM indication providers and EMS Hardware Monitors

Hardware monitors are available to monitor the following components (these monitors are distributed free on the OE media):

- Chassis/Fans/Environment
- CPU monitor
- UPS monitor
- FC Hub monitor
- FC Switch monitor
- Memory monitor
- Core Electronics Components
- Disk drives
- Ha_disk_array

Recommended Cleaning Procedures

Suggested cleaning procedures for the HP Integrity rx4640 server are provided in the following table. Be sure to turn off power to the server when cleaning it. Table 5-13 details the components and procedures that need cleaning for the server.

Table 5-13 **Cleaning**

Component	Time Frame	Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use “HP Video Screen Cleaning Solution” found in 92193M Master Clean Kit.
Mouse	Regularly	See the mouse manual for mouse maintenance procedures.
Cooling fans and grills	Six Months	Check functions of cooling fans and clean the intake openings on the chassis of dust, lint, and other obstructions to airflow.

CAUTION DO NOT use petroleum-based cleaners (such as lighter fluid) or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage all plastic and painted surfaces.

Where to Get Help

HP customer care will help you solve server problems and, if necessary, initiate appropriate service procedures.

Support is available on the HP website and by phone.

For information on contacting the HP IT Resource Center (ITRC) near you, go to: <http://www.itrc.hp.com>.

Information to Collect Before you Contact Support

Before you contact HP support, you should:

Step 1. Check the previous sections of this chapter and attempt to solve the problem.

- Note failure symptoms and error indications (LEDs and messages).
- Capture and permanently log the current SEL and FPL contents.
- Try to determine precisely what did or did not happen.
- Capture errdump logs

Step 2. Collect the following information:

- The model number of your server (for example rx4640).
- The product number of your server. This can be found on the identification label, which is found on the pull-tab at the front of the server.
- The serial number of your server. This can be found on the identification label.

Step 3. Be familiar with your server configuration.

- Are you using the LAN, RS-232, or web interface to monitor the server?
- How many processors, DIMMs, and PCI cards have been installed?
- What versions of processor, memory, and PCI cards are used and where are they installed?
- What accessories are installed?

Step 4. Determine the following

- Which firmware versions are in use?
- When did the problem start?
- Have recent changes been made to the server?
- Which OS and version is in use?

Online Support

To contact HP Customer Support online, see the Worldwide Limited Warranty and Technical Support Guide or visit us at:

<http://www.hp.com/go/bizsupport>. On the web page, enter the server model number (rx4640) and search the field.

The following information is available on this HP website:

- Software and firmware updates
- The latest drivers and utilities
- Additional documentation

Phone Support

To contact HP customer support by phone, go to the HP IT Resource Center (ITRC) near you, at: <http://www.itrc.hp.com>. Local phone numbers are listed in your native language for help.

A Parts Information

This appendix provides server part information such as:

- Description
- Manufacturing part number
- Replacement part number
- Exchange part number

This appendix addresses the following topics:

- “Field Replaceable Parts List” on page 136.

Field Replaceable Parts List

The items in this list and the corresponding item numbers are the field replaceable units (FRUs) for the HP Integrity rx4640 server.

NOTE Part numbers are found by using the part nomenclature from this list to select the correct part from the HP Partsurfer. If a I/O baseboard needs to be replaced, remove processors, DIMMs, and adapter boards and transfer these to the new board. Ensure all jumper and switch settings on the old board are transferred to the new board.

Some part numbers shown in Table A-1 have two entries. The second entry is for the Restriction of the Use of Certain Hazardous Substances (RoHS) compliant parts.

Table A-1 **Parts List**

Description	Mfg. Part Number	Part Number Replacement	Part Number Exchange
PCA Boards			
PCA, Processor Extender	A6961-60007	A6961-67007	A6961-69007
PCA, Processor Extender - (RoHS)	A6961-60207	A6961-67207	A6961-69207
PCA, I/O baseboard (includes VRMs)	A6961-60201	A6961-67401	A6961-69401
PCA, I/O baseboard (includes VRMs) - (RoHS)	A6961-60401	A6961-67501	A6961-69501
PCA, I/O baseboard (includes VRMs) - (RoHS - dual core processors only)	A6961-60401	A6961-67411	A6961-69511
PCA, 16 slot Memory Board	A6961-60204	A6961-67204	A6961-69204
PCA, 16 slot Memory Board - (RoHS)	A6961-60804	A6961-67804	A6961-69804
PCA, 32 slot Memory Board	A7124-04006	A9739-67007	A9739-69007
PCA, 32 slot Memory Board - (RoHS)	A7124-04008	A9739-67008	A9739-69008
PCA, Midplane Riser Board (Apian)	A6961-60005	A6961-67005	n/a
PCA, Midplane Riser Board (Apian) - (RoHS)	A6961-60105	A6961-67105	A6961-69105
PCA, SCSI Backplane/Management Assy, includes Simplex board	A6961-04075	A6961-67024	n/a
PCA, SCSI Backplane/Management Assy, includes Simplex board - (RoHS)	A6961-04076	A6961-67025	n/a
PCA, SCSI Duplex Board (HP-UX)	A6961-60106	A6961-67106	n/a
PCA, SCSI Duplex Board (HP-UX) - (RoHS)	A6961-60206	A6961-67206	n/a
PCA, Front Panel Display	A6961-60008	A6961-67008	n/a
PCA, Front Panel Display - (RoHS)	A6961-60108	A6961-67108	n/a

Table A-1 Parts List (Continued)

Description	Mfg. Part Number	Part Number Replacement	Part Number Exchange
PCA, QuickFind Diagnostic Board (includes plastic cover and label)	A6961-60009	A6961-67009	n/a
PCA, QuickFind Diagnostic Board (includes plastic cover and label) - (RoHS)	A6961-60109	A6961-67109	n/a
PCA, Power Distribution Board	A6961-60015	A6961-67015	n/a
PCA, Power Distribution Board - (RoHS)	A6961-60115	A6961-67115	n/a
PCA, I/O Board to DVD connectivity (IDE/USB)	A6961-60113	A6961-67113	n/a
PCA, I/O Board to DVD connectivity (IDE/USB) - (RoHS)	A6961-60213	A6961-67213	n/a
Memory			
256 MB DIMM	A6967AX	A6967AX	n/a
512 MB DIMM	A6968AX	A6968AX	n/a
1 GB DIMM	A6969AX	A6969AX	A6969-69001
2 GB DIMM	A6970AX	A6970AX	A6835-69001
4 GB DIMM	AB475AX	AD041A	AB475-69001
Internal disks/removable media			
36 GB 15K RPM SCSI Disk (A6981A)	AB420-2101A	AB420-2101A	AB420-69001
73 GB 15K RPM SCSI Disk (A6983A)	AB421-2101A	AB421-2101A	AB421-69001
146 GB 10K RPM SCSI Disk (A6984A)	AB422-2101A	AB422-2101A	AB422-69001
300 GB 10K RPM SCSI Disk (A6984A)	AB423-2101A	AB423-2101A	AB423-69001
DVD-R/CD-R Drive	A7163-2100A	A7163-67002	n/a
DVD-R/CD-RW Drive	AB349-2100A	AB349-67101	n/a
Fans			
I/O Fan	A6961-04055	A6961-04055	n/a
Power Supply Fan	A6961-04028	A6961-04028	n/a
Processors			
Montecito CPU Assembly (1.6 GHz), 18 Mb cache	AD139AX	AD139A-67001	AD139-69001
Montecito CPU Assembly (1.6 GHz), 24 Mb cache	AD268AX	AD268A-67001	AD268-69001
Cable			
Cable, Internal SCSI	A6961-63006	A6961-63006	n/a
Cable, QuickFind Diagnostic to Midplane	A6961-63005	A6961-63005	n/a

Table A-1 Parts List (Continued)

Description	Mfg. Part Number	Part Number Replacement	Part Number Exchange
Cable, Power Distribution to Midplane Ribbon	A6961-63004	A6961-63004	n/a
Cable, Power Distribution to Midplane 10 pin	A6961-63003	A6961-63003	n/a
Cable, SCSI Controller Jumper (Simplex only)	A6961-63011	A6961-63011	n/a
Cable, SCSI Backplane to Midplane	A6961-63008	A6961-63008	n/a
Cable, Display to IDE to Midplane	A6961-63002	A6961-63002	n/a
Power Cord - S. Africa	8120-5341	n/a	
Power Cord - HK & UK & Singapore	8120-1351	n/a	
Power Cord - Australia	8120-1369	n/a	
Power Cord - Europe	8120-1689	n/a	
Power Cord - Swiss	8120-2104	n/a	
Power Cord - Denmark	8120-6814	n/a	
Power Cord - N. Amer 250 V / Japan	8121-0875	n/a	
Power Cord - Israel	8120-6800	n/a	
Power Cord - Argentina	8120-8390	n/a	
Power Cord - Chile	8120-8389	n/a	
Power Cord - China	8120-8376	n/a	
Power Cord - S. America	8121-0668	n/a	
Power Cord	8120-1351	8120-1351	
C13/C14 Jumper cord	8120-6514	n/a	
Miscellaneous			
Power Supply	0950-4428	A6961-67125	n/a
PCI Card OL* Divider (doorbell and latch included)	A6961-04047	A6961-67020	n/a
PCI Retention Clip	A6961-40021	A6961-67021	n/a
Server battery	1420-0386	BR2330	n/a
Filler, Memory, Air Blocker	A6961-40034	A6961-40034	n/a
Rack solutions			
Rack Mount Hardware, Right (included with Left Bracket in kit)	5069-3305	A6977-67001	n/a
Rack Mount Hardware, Left (included with Right Bracket in kit)	5069-3306	A6977-67002	n/a

Table A-1 Parts List (Continued)

Description	Mfg. Part Number	Part Number Replacement	Part Number Exchange
Bezel-Rack Mount	A6961-04043	A6977-67022	n/a
Rackless Kit	A6961-04001	n/a	n/a
Core I/O Cards			
U320 Dual Port SCSI Core I/O	A6961-60011	A6961-67011	n/a
Dual Port GigE LAN Card	AB352-60001	AB352-67001	n/a
PCI-X RAID Smart Array 6402 U320, 2ch	322391-001	309520-001N	309520-001
SPS-BD, Mem, 128, 72Bt, DDR, W.Bty (mounted on PCA for Prod # A9890A)	322391-001	309521-001N	309521-001
Monitor/Keyboard/Mouse			
18.1" LCD Flat panel Display (Prod # P9021Y)	303486-003	303486-003	
20" LCD Flat panel Display (Prod # P4831Y)	303102-003	303102-003	
19" CRT Color Monitor (Prod # P9009A)	302268-003	302268-003	
21" CRT Color Monitor (Prod # P4819A)	302270-003	302270-003	
24" CRT Color Monitor (Prod # P7217A)	A7217-60001	A7217-60001	
Serial Console (Prod # C1099A)	C1099-62000	C1099-67001	
Serial Console ROM Replacement Kit (Prod # C1099A)	C1099-62000	C1099-67002	
USB Keyboard and Mouse (Prod # A7861A)	Depends on product options		
USB to PS/2 Adapter (Prod # A7782A)	A7782-63001	A7782-63001	

B Booting the Operating System

This chapter covers procedures for booting and shutting down an operating system on the HP Integrity rx4640 server. The following operating systems are supported on HP Integrity servers: HP-UX 11i Version 2 (B.11.23), HP OpenVMS, Microsoft Windows Server 2003, Red Hat Enterprise Linux, and SuSE Linux Enterprise Server.

This chapter addresses the following topics:

- “Operating Systems Supported on HP Integrity Servers” on page 142.
- “Configuring System Boot Options” on page 142.
- “Bootting and Shutting Down HP-UX” on page 143.
- “Bootting and Shutting Down HP OpenVMS” on page 149.
- “Bootting and Shutting Down Microsoft Windows” on page 153.
- “Bootting and Shutting Down Linux” on page 157.

Operating Systems Supported on HP Integrity Servers

HP supports the following operating systems on entry-class HP Integrity servers.

- **HP-UX 11i Version 2 (B.11.23)**
For details see “Booting and Shutting Down HP-UX” on page 143.
- **HP OpenVMS I64**
For details see “Booting and Shutting Down HP OpenVMS” on page 149.
- **Microsoft® Windows® Server 2003**
For details see “Booting and Shutting Down Microsoft Windows” on page 153.
- **Red Hat Enterprise Linux 4**
For details see “Booting and Shutting Down Linux” on page 157.
- **SuSE Linux Enterprise Server 10**
For details see “Booting and Shutting Down Linux” on page 157.

Configuring System Boot Options

This section discusses the system boot options you can configure on entry-class HP Integrity servers, including the boot options list and the autoboot setting for the server.

- **Boot Options List**

The boot options list is a list of loadable items available for you to choose from the EFI Boot Manager menu. Ordinarily the boot options list includes the EFI Shell and one or more operating system loaders.

The following example includes boot options for HP OpenVMS, Microsoft Windows, HP-UX, and the EFI Shell. The final item in the EFI Boot Manager menu, the Boot Configuration menu, is not a boot option. The Boot Configuration menu allows server configuration through a maintenance menu.

```
EFI Boot Manager ver 1.10 [14.61] Please select a boot option
```

```
HP OpenVMS 8.2-1
EFI Shell [Built-in]
Windows Server 2003, Enterprise
HP-UX Primary Boot: 4/0/1/1/0.2.0
Boot Option Maintenance Menu
```

```
Use ^ and v to change option(s). Use Enter to select an option
```

NOTE In some versions of EFI, the **Boot Configuration Menu** is listed as the **Boot Option Maintenance Menu**.

To manage the boot options list for each server, use the EFI Shell, the EFI **Boot Configuration Menu**, or operating system utilities.

At the EFI Shell, the `bcfg` command supports listing and managing the boot options list for all operating systems, except Microsoft Windows. On HP Integrity servers with Windows installed, the `\MSUtil\nvrboot.efi` utility is provided for managing Windows boot options from the EFI Shell. For HP Integrity servers with OpenVMS installed, the `\efi\vms\vms_bcfg.efi` and `\efi\vms\vms_show` utilities are provided for managing OpenVMS boot options.

The **EFI Boot Configuration Menu** provides the **Add a Boot Option**, **Delete Boot Option(s)**, and **Change Boot Order** menu items (use this method if you must add an EFI Shell entry to the boot options list).

Operating system utilities for managing the boot options list include the HP-UX `setboot` command and the HP OpenVMS `@SYS$MANAGER:BOOT_OPTIONS.COM` command.

For details, see the following sections:

- Setting HP-UX boot options (see “Adding HP-UX to the Boot Options List” on page 144)
- Setting OpenVMS boot options (see “Adding HP OpenVMS to the Boot Options List” on page 149)
- Setting Windows boot options (see “Adding Microsoft Windows to the Boot Options List” on page 153)
- Setting Linux boot options (see “Adding Linux to the Boot Options List” on page 157)

- **Autoboot Setting**

The `autoboot` setting determines, at startup, whether a server automatically loads the first item in the boot options list, or remains at the EFI Boot Manager menu. When autoboot is enabled, EFI loads the first item in the boot options list after a designated timeout period.

Configure the autoboot setting for an HP Integrity server using either the `autoboot` EFI Shell command, or the **Set Auto Boot TimeOut** menu item from the **EFI Boot Configuration** menu.

For example, from the EFI Shell to disable autoboot issue the `autoboot off` command. To enable autoboot with the default timeout value issue the `autoboot on` command. To enable autoboot with a timeout of 60 seconds issue the `autoboot time 60` command.

Set autoboot from HP-UX using the `setboot` command. Enable autoboot from HP-UX using the `setboot -b on` command. Disable autoboot using the `setboot -b off` command.

Booting and Shutting Down HP-UX

This section covers booting and shutting down HP-UX on entry-class HP Integrity servers.

- To add an HP-UX entry to the boot options list, see “Adding HP-UX to the Boot Options List”.
- To boot HP-UX, use the following procedures:
 - “Standard HP-UX Booting” on page 145 describes the standard ways to boot HP-UX. Typically this results in booting HP-UX in multi-user mode.
 - “Single-User Mode HP-UX Booting” on page 146 describes how to boot HP-UX in single-user mode.
 - “LVM Maintenance Mode HP-UX Booting” on page 148 describes how to boot HP-UX in Logical Volume Management (LVM) maintenance mode.
- To shut down the HP-UX operating system, see “Shutting Down HP-UX” on page 148.

Adding HP-UX to the Boot Options List

This section describes how to add an HP-UX entry to the system boot options list.

You can add the `\EFI\HPUX\HPUX.EFI` loader to the boot options list from the EFI Shell or EFI Boot Configuration menu (or in some versions of EFI, the Boot Option Maintenance Menu).

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Adding an HP-UX Boot Option

This procedure adds an HP-UX item to the boot options list from the EFI Shell.

To add an HP-UX boot option when logged in to HP-UX, use the `setboot` command. For details see the *setboot* (1M) manpage.

Step 1. Access the EFI Shell environment.

Log in to the iLO MP and enter `CO` to access the server console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX`: where *X* is the file system number) for the device from which you want to boot HP-UX.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the HP-UX loader is `\EFI\HPUX\HPUX.EFI` and it should be on the device you are accessing.

Step 3. At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Display all items in the boot options list for the server.
- `bcfg boot rm #` — Remove the item number specified by `#` from the boot options list.
- `bcfg boot mv #a #b` — Move the item number specified by `#a` to the position specified by `#b` in the boot options list.
- `bcfg boot add # file.efi "Description"` — Add a new boot option to the position in the boot options list specified by `#`. The new boot option references `file.efi` and is listed with the title specified by `Description`.

For example, `bcfg boot add 1 \EFI\HPUX\HPUX.EFI "HP-UX 11i"` adds an HP-UX 11i item as the first entry in the boot options list.

See the `help bcfg` command for details.

Step 4. Exit the console and iLO MP interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

Standard HP-UX Booting

Use either of the following procedures to boot HP-UX:

- “Access the EFI Boot Manager menu for the server on which you want to boot HP-UX.” on page 145
- “Access the EFI Shell environment for the server on which you want to boot HP-UX.” on page 145

Booting HP-UX (EFI Boot Manager)

From the EFI Boot Manager menu, choose an item from the boot options list to boot HP-UX.

Step 1. Access the EFI Boot Manager menu for the server on which you want to boot HP-UX.

Log in to the iLO MP and enter **CO** to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

Step 2. At the EFI Boot Manager menu, choose an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments you use when booting the device.

Step 3. Press **Enter** to initiate booting using the chosen boot option.

Step 4. Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

Booting HP-UX (EFI Shell)

From the EFI Shell environment, boot HP-UX on a device by first accessing the EFI System Partition (for example **fs0:**) for the root device, then entering **HPUX** to initiate the loader.

Step 1. Access the EFI Shell environment for the server on which you want to boot HP-UX.

Log in to the iLO MP and enter **CO** to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. At the EFI Shell environment, issue the **map** command to list all currently mapped bootable devices.

The bootable file systems of interest typically are listed as **fs0:**, **fs1:**, and so on.

Step 3. Access the EFI System Partition (**fsX:** where **X** is the file system number) for the device from which you want to boot HP-UX.

For example, enter **fs2:** to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The file system number might change each time it is mapped (for example, when the system boots, or when the `map -r` command is issued).

- Step 4.** When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to initiate the `HPUX.EFI` loader on the device you are accessing.

The full path for the loader is `\EFI\HPUX\HPUX.EFI`. When initiated, the loader references the `\EFI\HPUX\AUTO` file and proceeds to boot HP-UX using the default boot behavior specified in the `AUTO` file.

You have 10 seconds to interrupt the automatic booting of the default boot behavior. Pressing any key during this 10-second period stops the HP-UX boot process and enables you to interact with the `HPUX.EFI` loader. To exit the loader (the `HPUX>` prompt) enter `exit` (this returns you to the EFI Shell).

To boot the HP-UX operating system, do not enter anything during the 10-second period given for stopping at the `HPUX.EFI` loader.

```
Shell> map
Device mapping table
  fs0  : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part1,Sig72550000)
  blk0 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)
  blk1 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part1,Sig72550000)
  blk2 : Acpi(000222F0,269)/Pci(0|0)/Scsi(Pun8,Lun0)/HD(Part2,Sig72550000)
  blk3 : Acpi(000222F0,2A8)/Pci(0|0)/Scsi(Pun8,Lun0)
  blk4 : Acpi(000222F0,2A8)/Pci(0|1)/Scsi(Pun2,Lun0)

Shell> fs0:
fs0:\> hpux

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HP-UX Boot Loader for IA64  Revision 1.723

Press Any Key to interrupt Autoboot
\efi\hpux\AUTO ==> boot vmunix
Seconds left till autoboot - 9
```

- Step 5.** Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter `X` at the Main Menu.

Single-User Mode HP-UX Booting

Use the following procedure to boot HP-UX in single-user mode.

Booting HP-UX in Single-User Mode (EFI Shell)

From the EFI Shell environment, boot in single-user mode by stopping the boot process at the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) and entering the `boot -is vmunix` command.

- Step 1.** Access the EFI Shell environment for the system on which you want to boot HP-UX in single-user mode.

Log in to the iLO MP and enter `CO` to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP-UX.
- Step 3.** When accessing the EFI System Partition for the desired boot device, issue the **HPUX** command to initiate the `\EFI\HPUX\HPUX.EFI` loader on the device you are accessing.
- Step 4.** Boot to the HP-UX Boot Loader prompt (`HPUX>`) by pressing any key within the 10 seconds given for interrupting the HP-UX boot process. Use the `HPUX.EFI` loader to boot HP-UX in single-user mode in the next step.

After you press a key, the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) launches. For help using the `HPUX.EFI` loader, enter the `help` command. To return to the EFI Shell, enter `exit`.

```
fs0:\> hpux

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HP-UX Boot Loader for IA64  Revision 1.723

Press Any Key to interrupt Autoboot
\efi\hpux\AUTO ==> boot vmunix
Seconds left till autoboot - 9

[User Types A Key to Stop the HP-UX Boot Process and Access the HPUX.EFI Loader ]

Type 'help' for help

HPUX>
```

- Step 5.** At the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) enter the `boot -is vmunix` command to boot HP-UX (the `/stand/vmunix` kernel) in single-user (`-is`) mode.

```
HPUX> boot -is vmunix
> System Memory = 4063 MB
loading section 0
..... (complete)
loading section 1
..... (complete)
loading symbol table
loading System Directory(boot.sys) to MFS
....
loading MFSFILES Directory(bootfs) to MFS
.....
Launching /stand/vmunix
SIZE: Text:25953K + Data:3715K + BSS:3637K = Total:33306K

Console is on a Serial Device
Booting kernel...
```

- Step 6.** Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

LVM Maintenance Mode HP-UX Booting

Use the following procedure to boot HP-UX in Logical Volume Management (LVM) maintenance mode.

Booting HP-UX in LVM-Maintenance Mode (EFI Shell)

From the EFI Shell environment, boot in LVM-maintenance mode by stopping the boot process at the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) and entering the `boot -lm vmunix` command.

Step 1. Access the EFI Shell environment for the server on which you want to boot HP-UX in LVM-maintenance mode.

Log in to the iLO MP and enter `CO` to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP-UX.

Step 3. When accessing the EFI System Partition for the desired boot device, issue the **HPUX** command to initiate the `\EFI\HPUX\HPUX.EFI` loader on the device you are accessing.

Step 4. Press any key within the 10 seconds given for interrupting the HP-UX boot process. This stops the boot process at the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`).

Step 5. At the `HPUX.EFI` interface, enter the `boot -lm vmunix` command to boot HP-UX (the `/stand/vmunix` kernel) in LVM-maintenance (`-lm`) mode.

Step 6. Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter `X` at the Main Menu.

Shutting Down HP-UX

To shut down HP-UX running on a server, use the `shutdown` command. You have the following options when shutting down HP-UX:

- To shut down and reboot an HP-UX server, use the `shutdown -r` command.
- To shut down and halt (power off) an HP-UX server, use the `shutdown -h` command.

For details see the `shutdown` (1M) manpage and the following procedure:

Shutting Down HP-UX (`/sbin/shutdown` Command)

From the HP-UX command line, issue the `shutdown` command to shut down the HP-UX operating system.

Step 1. Log in to HP-UX running on the server that you want to shut down.

You should log in to the iLO MP for the server and use the Console menu to access the system console. Accessing the console through the iLO MP enables you to maintain console access to the server after HP-UX has shut down.

Step 2. Issue the `shutdown` command with the appropriate command-line options.

The command-line options you specify dictate the way in which HP-UX shuts down, and whether the server is rebooted.

Use the following list to choose an HP-UX shutdown option for your server:

- To shut down HP-UX and halt (power off) the server, issue the **shutdown -h** command.
To reboot a halted server you must power on the server using the PC command at the iLO MP Command menu.
- To shut down HP-UX and reboot the server, issue the **shutdown -r** command.

Booting and Shutting Down HP OpenVMS

This section has procedures for booting and shutting down HP OpenVMS on entry-class HP Integrity servers, and procedures for adding HP OpenVMS to the boot options list.

- To add an HP OpenVMS entry to the boot options list, see “Adding HP OpenVMS to the Boot Options List” on page 149.
- To boot HP OpenVMS on an entry-class HP Integrity server, see “Booting HP OpenVMS” on page 150.
- To shut down HP OpenVMS, see “Shutting Down HP OpenVMS” on page 152.

Adding HP OpenVMS to the Boot Options List

On HP Integrity servers, you can use the following procedures to manage boot options list entries for HP OpenVMS.

You can add the `\efi\vms\vms_loader.efi` loader to the boot options list from the EFI Shell or EFI Boot Configuration menu (or in some versions of EFI, the Boot Option Maintenance Menu).

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Adding an HP OpenVMS Boot Option

This procedure adds an HP OpenVMS item to the boot options list from the EFI Shell.

To add an HP OpenVMS boot option when logged in to OpenVMS, use the `@SYS$MANAGER:BOOT_OPTIONS.COM` command.

Step 1. Access the EFI Shell environment.

Log in to the iLO MP and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

- Step 2.** Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP OpenVMS.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the HP OpenVMS loader is `\efi\vms\vms_loader.efi` and it should be on the device you are accessing.

- Step 3.** At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

You can also accomplish this step by using the `\efi\vms\vms_bcfg.efi` and `\efi\vms\vms_show.efi` utilities, which are available on the EFI System Partition for HP OpenVMS. Both `vms_bcfg` and `vms_show` are unique utilities for OpenVMS I64. The `vms_bcfg` utility differs from the `bcfg` EFI command in that `vms_bcfg` enables you to specify boot devices using VMS-style device names.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Displays all items in the boot options list for the server.
- `bcfg boot rm #` — Removes the item number specified by *#* from the boot options list.
- `bcfg boot mv #a #b` — Moves the item number specified by *#a* to the position specified by *#b* in the boot options list.
- `bcfg boot add # file.efi "Description"` — Adds a new boot option to the position in the boot options list specified by *#*. The new boot option references *file.efi* and is listed with the title specified by *Description*.

For example, `bcfg boot add 1 \efi\vms\vms_loader.efi "HP OpenVMS"` adds an HP OpenVMS item as the first entry in the boot options list.

See the `help bcfg` command for details.

- Step 4.** Exit the console and iLO MP interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

Booting HP OpenVMS

To boot HP OpenVMS on an entry-class HP Integrity server, use either of the following procedures:

- “Booting HP OpenVMS (EFI Boot Manager)” on page 150
- “Booting HP OpenVMS (EFI Shell)” on page 151

Booting HP OpenVMS (EFI Boot Manager)

From the EFI Boot Manager menu, choose an item from the boot options list to boot HP OpenVMS using the chosen boot option.

- Step 1.** Access the EFI Boot Manager menu for the server on which you want to boot HP OpenVMS.

Log in to the iLO MP and enter `CO` to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

Step 2. At the EFI Boot Manager menu, choose an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to use when booting the device.

Step 3. Press **Enter** to initiate booting using the chosen boot option.

Step 4. Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

Booting HP OpenVMS (EFI Shell)

From the EFI Shell environment, to boot HP OpenVMS on a device first access the EFI System Partition (for example `fs0:`) for the root device and enter `\efi\vms\vms_loader` to initiate the OpenVMS loader.

Step 1. Access the EFI Shell environment for the server on which you want to boot HP OpenVMS.

Log in to the iLO MP and enter `CO` to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. At the EFI Shell environment, issue the `map` command to list all currently mapped bootable devices.

The bootable file systems of interest typically are listed as `fs0:`, `fs1:`, and so on.

Step 3. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot HP OpenVMS.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

Also, the file system number might change each time it is mapped (for example, when the server boots, or when the `map -r` command is issued).

Step 4. When accessing the EFI System Partition for the desired boot device, issue the `\efi\vms\vms_loader` command to initiate the `vms_loader.efi` loader on the device you are accessing.

```
fs5:> \efi\vms\vms_loader.efi
```

```
HP OpenVMS Industry Standard 64 Operating System, Version XAV1-D2Y  
Copyright 1976-2005 Hewlett-Packard Development Company, L.P.
```

```
%PKA0, Copyright (c) 1998 LSI Logic PKW V3.2.20 ROM 4.19  
%PKA0, SCSI Chip is SYM53C1010/66, Operating mode is LVD Ultra3 SCSI  
%SMP-I-CPUTRN, CPU #01 has joined the active set.  
%SMP-I-CPUTRN, CPU #02 has joined the active set.  
%STDRV-I-STARTUP, OpenVMS startup begun at 13-JUL-2005 14:54:36.25  
%EWA0, Auto-negotiation mode set by console
```

```
...
```

Step 5. Exit the console and iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter X at the Main Menu.

Shutting Down HP OpenVMS

This section describes how to shut down the HP OpenVMS operating system on entry-class HP Integrity servers.

Step 1. From the HP OpenVMS DCL prompt, issue the **@SYS\$SYSTEM:SHUTDOWN** command to shut down the OpenVMS operating system.

Step 2. Log in to HP OpenVMS running on the server that you want to shut down.

You should log in to the iLO MP for the server and use the Console menu to access the system console. Accessing the console through the iLO MP enables you to maintain console access to the server after HP OpenVMS has shut down.

Step 3. At the OpenVMS DCL prompt issue the **@SYS\$SYSTEM:SHUTDOWN** command and specify the shutdown options in response to the prompts given.

```
>@SYS$SYSTEM:SHUTDOWN

SHUTDOWN -- Perform an Orderly System Shutdown
           on node RSNVMS

How many minutes until final shutdown [0]:
Reason for shutdown [Standalone]:
Do you want to spin down the disk volumes [NO]?
Do you want to invoke the site-specific shutdown procedure [YES]?
Should an automatic system reboot be performed [NO]? yes
When will the system be rebooted [shortly via automatic reboot]:
Shutdown options (enter as a comma-separated list):
  REBOOT_CHECK      Check existence of basic system files
  SAVE_FEEDBACK     Save AUTOGEN feedback information from this boot
  DISABLE_AUTOSTART Disable autostart queues
  POWER_OFF         Request console to power-off the system

Shutdown options [NONE]:

%SHUTDOWN-I-OPERATOR, this terminal is now an operator's console
%%%%%%%%%%%%% OPCOM 12-JUL-2005 18:47:51.01 %%%%%%%%%%%%%%
Operator status for operator _RSNVMS$OPA0:
CENTRAL, PRINTER, TAPES, DISKS, DEVICES, CARDS, NETWORK, CLUSTER, SECURITY,
...
```

NOTE HP OpenVMS I64 currently does not support the `POWER_OFF` shutdown option.

Booting and Shutting Down Microsoft Windows

This section describes how to boot and shut down Microsoft Windows on entry-class HP Integrity servers and how to add Windows entries to the system boot options list.

- “Adding Microsoft Windows to the Boot Options List” on page 153
- “Booting the Microsoft Windows Operating System” on page 154
- “Shutting Down Microsoft Windows” on page 155

Adding Microsoft Windows to the Boot Options List

To add a Microsoft Windows entry to the system boot options list you must do so from EFI by using the `\MSUtil\nvrboot.efi` utility to import boot options from the `EFI\Microsoft\WINNT50\Boot00...` file on the device from which Windows is loaded.

This procedure adds the Microsoft Windows item to the boot options list.

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Step 1. Access the EFI Shell environment.

Log in to the iLO MP and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX:` where `X` is the file system number) for the device from which you want to boot Windows.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the Microsoft Windows loader is `\efi\microsoft\winnt50\ia64ldr.efi` and it should be on the device you are accessing. However, you must only initiate this loader from the EFI Boot Menu and not from the EFI Shell.

Step 3. List the contents of the `\EFI\Microsoft\WINNT50` directory to identify the name of the Windows boot option file (`Boot00nn`) that you want to import into the system boot options list.

```
fs0:\> ls EFI\Microsoft\WINNT50
Directory of: fs0:\EFI\Microsoft\WINNT50

 09/18/03  11:58a <DIR>          1,024  .
 09/18/03  11:58a <DIR>          1,024  ..
 12/18/03  08:16a                354   Boot0001
           1 File(s)          354 bytes
           2 Dir(s)
```

```
fs0:\>
```

Step 4. At the EFI Shell environment, issue the `\MSUtil\nvrboot.efi` command to launch the Microsoft Windows boot options utility.

```
fs0:\> msutil\nvrboot

NVRBOOT: OS Boot Options Maintenance Tool [Version 5.2.3683]

    1. SUSE SLES 10
    2. HP-UX Primary Boot: 0/0/1/0/0.2.0
    * 3. Windows Server 2003, Datacenter
    4. EFI Shell [Built-in]

    * = Windows OS boot option

(D)isplay (M)odify (C)opy E(x)port (I)mport (E)rase (P)ush (H)elp (Q)uit

Select>
```

Step 5. Use the **Import** command to import the Window boot option file.

```
Select> i
Enter IMPORT file path: \EFI\Microsoft\WINNT50\Boot0001
Imported Boot Options from file: \EFI\Microsoft\WINNT50\Boot0001

Press enter to continue
```

Step 6. Enter **Q** to quit the NVRBOOT utility, and exit the console and management processor interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter **X** at the Main Menu.

Booting the Microsoft Windows Operating System

Boot the Windows Server 2003 operating system on an HP Integrity server by using the EFI Boot Manager to choose the appropriate Windows item from the boot options list. See “Shutting Down Microsoft Windows” on page 155 for details on shutting down the Windows operating system.

Step 1. From the EFI Boot Manager menu, choose an item from the boot options list to boot Windows using the chosen boot option.

Step 2. Access the EFI Boot Manager menu for the server on which you want to boot Windows.

Log in to the management processor and enter **CO** to choose the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the EFI Boot Manager heading.

Step 3. At the EFI Boot Manager menu, choose an item from the boot options list.

Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to be used when booting the device.

Step 4. Press **Enter** to initiate booting using the chosen boot option.

Step 5. Once Windows begins loading, wait for the Special Administration Console (SAC) to become available.

The SAC interface provides a text-based administration tool that is available from the system console. For details see the SAC online help (enter **?** at the `SAC>` prompt).

```
Loading.: Windows Server 2003, Datacenter
Starting: Windows Server 2003, Datacenter

                Starting Windows...
*****
Computer is booting, SAC started and initialized.

Use the "ch -?" command for information about using channels.
Use the "?" command for general help.

SAC>
```

Step 6. Exit the console and management processor interfaces when finished using them.

Press **Ctrl+B** to exit the console and return to the iLO MP Main Menu. To exit the iLO MP, enter X at the Main menu.

Shutting Down Microsoft Windows

Shut down the Windows operating system on HP Integrity servers by using the **Start** menu or the `shutdown` command.

CAUTION Do not shut down Windows using Special Administration Console (SAC) `restart` or `shutdown` commands under normal circumstances.

Issuing `restart` or `shutdown` at the `SAC>` prompt causes the server to restart or shutdown immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the `shutdown` command to shut down gracefully.

To shut down Windows use either of the following methods.

- Choose **Shut Down** from the **Start** menu and choose either **Restart** or **Shut down** from the pull-down menu.

The **Restart** menu item shuts down and restarts the server. The **Shut down** menu item shuts down the server.

You can use this method when using a graphical interface to the server.

- Issue the `shutdown` command from the Windows command line.

See “Log in to Windows running on the server that you want to shut down.” on page 156 for details.

You can issue this command from a command prompt through the Special Administration Console (SAC) or from any other command line.

The Windows `shutdown` command includes the following options:

<code>/s</code>	Shuts down and halts (power off) the server. This is the equivalent of Start—>Shut Down, Shut down . To power on the server, use the management processor <code>PC</code> command.
<code>/r</code>	Shuts down and restarts the server. This is the equivalent of Start—>Shut Down, Restart .
<code>/a</code>	Aborts a server shutdown.
<code>/t xxx</code>	Sets the timeout period before shutdown to <code>xxx</code> seconds. The timeout period ranges from 0–600, with a default of 30.

See the `help shutdown` Windows command for details.

Windows Shutdown from the Command Line

From the Windows command line, issue the **shutdown** command to shut down the operating system.

Step 1. Log in to Windows running on the server that you want to shut down.

For example, access the system console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the server.

Step 2. Check to see whether any users are logged in.

Use the `query user` or `query session` command.

Step 3. Issue the **shutdown** command and the appropriate options to shut down the Windows Server 2003 on the server.

You have the following options when shutting down Windows:

- To shut down Windows and reboot:

shutdown /r

or choose the **Start** → **Shut Down** action and choose **Restart** from the pull-down menu.

- To shut down Windows and halt (power off server hardware):

shutdown /s

or choose the **Start** → **Shut Down** action and choose **Shut down** from the pull-down menu.

To reboot a halted server you must power on the server using the `PC` command at the iLO MP Command menu.

- To abort a shutdown (stop a shutdown that has been initiated): **shutdown /a**

For example:

```
shutdown /r /t 60 /c "Shut down in one minute."
```

This command initiates a Windows server shutdown and reboot after a timeout period of 60 seconds. The `/c` option specifies a message that is broadcast to any other users of the server.

Booting and Shutting Down Linux

This section covers booting and shutting down Linux on entry-class HP servers. Procedures for Red Hat Enterprise Linux and SuSE Linux Enterprise Server are given in this section.

- To add a Linux entry to the boot options list, see “Adding Linux to the Boot Options List” on page 157.
- To boot Linux on entry-class HP Integrity servers, use the following procedures.
 - For details on Red Hat Enterprise Linux, see “Booting the Red Hat Enterprise Linux Operating System” on page 158
 - For details on SuSE Linux Enterprise Server, see “Booting the SuSE Linux Enterprise Server Operating System” on page 159.
- To shut down either Red Hat Enterprise Linux or SuSE Linux Enterprise Server, see “Shutting Down Linux” on page 160.

Adding Linux to the Boot Options List

This section describes how to add a Linux entry to the system boot options list. The processes for adding both Red Hat Enterprise Linux and SuSE Linux Enterprise Servers are given here.

You can add the `\EFI\redhat\elilo.efi` loader or the `\efi\SuSE\elilo.efi` loader to the boot options list from the EFI Shell or EFI Boot Configuration menu (or in some versions of EFI, the Boot Option Maintenance Menu).

NOTE On HP Integrity servers, the operating system installer automatically adds an entry to the boot options list.

Step 1. Access the EFI Shell environment.

Log in to the management processor and enter `CO` to access the system console.

When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, choose the **Exit** option from the submenus until you return to the screen with the `EFI Boot Manager` heading.

From the EFI Boot Manager menu, choose the **EFI Shell** menu option to access the EFI Shell environment.

Step 2. Access the EFI System Partition (`fsX:` where *X* is the file system number) for the device from which you want to boot Linux.

For example, enter `fs2:` to access the EFI System Partition for the bootable file system number 2. The EFI Shell prompt changes to reflect the file system currently accessed.

The full path for the Red Hat Enterprise Linux loader is `\EFI\redhat\elilo.efi` and it should be on the device you are accessing.

The full path for the SuSE Linux Enterprise Server loader is `\efi\SuSE\elilo.efi` and it should be on the device you are accessing.

Step 3. At the EFI Shell environment, use the `bcfg` command to manage the boot options list.

The `bcfg` command includes the following options for managing the boot options list:

- `bcfg boot dump` — Displays all items in the boot options list for the server.
- `bcfg boot rm #` — Removes the item number specified by `#` from the boot options list.
- `bcfg boot mv #a #b` — Moves the item number specified by `#a` to the position specified by `#b` in the boot options list.
- `bcfg boot add # file.efi "Description"` — Adds a new boot option to the position in the boot options list specified by `#`. The new boot option references `file.efi` and is listed with the title specified by `Description`.

For example, `bcfg boot add 1 \EFI\redhat\elilo.efi "Red Hat Enterprise Linux"` adds a Red Hat Enterprise Linux item as the first entry in the boot options list.

Likewise, `bcfg boot add 1 \efi\SuSE\elilo.efi "SLES 10"` adds a SuSE Linux item as the first entry in the boot options list.

See the `help bcfg` command for details.

Step 4. Exit the console and management processor interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the iLO MP Main Menu. To exit the iLO MP, enter `x` at the Main Menu.

Booting the Red Hat Enterprise Linux Operating System

You can boot the Red Hat Enterprise Linux operating system on HP Integrity servers using either of these methods:

- Choose a Red Hat Enterprise Linux entry from the EFI Boot Manager menu.
To load the Red Hat Enterprise Linux operating system at the EFI Boot Manager menu, choose its entry from the list of boot options.
Choosing a Linux entry from the boot options list boots the operating system using `ELILO.EFI` loader and the `elilo.conf` file.
- Initiate the `ELILO.EFI` Linux loader from the EFI Shell. For details, see “Access the EFI Shell.” on page 158.

On a Red Hat Enterprise Linux boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\EFI\redhat\elilo.efi  
\EFI\redhat\elilo.conf
```

After choosing the file system for the boot device (for example, `fs0:`) you can initiate the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO` boot prompt. To exit the `ELILO.EFI` loader, use the `exit` command.

Booting Red Hat Enterprise Linux from the EFI Shell

Use this procedure to boot Red Hat Enterprise Linux from the EFI Shell.

Step 1. Access the EFI Shell.

From the system console, choose the **EFI Shell** entry from the EFI Boot Manager menu to access the shell.

Step 2. Access the EFI System Partition for the Red Hat Enterprise Linux boot device.

Use the `map EFI Shell` command to list the file systems (`fs0`, `fs1`, and so on) that are known and mapped.

To choose a file system to use, enter its mapped name followed by a colon (:). For example, to operate with the boot device that is mapped as `fs3`, enter **fs3:** at the EFI Shell prompt.

Step 3. Enter **ELILO** at the EFI Shell command prompt to launch the `ELILO.EFI` loader.

If needed, you can specify the loader's full path by entering `\EFI\redhat\elilo` at the EFI Shell command prompt.

Step 4. Allow the `ELILO.EFI` loader to proceed with booting the Red Hat Enterprise Linux kernel.

By default, the `ELILO.EFI` loader boots the kernel image and options specified by the default item in the `elilo.conf` file.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO` boot prompt. To exit the loader use the `exit` command.

Booting the SuSE Linux Enterprise Server Operating System

You can boot the SuSE Linux Enterprise Server 10 operating system on HP Integrity servers using either of these methods:

- Choose a SuSE Linux Enterprise Server entry from the EFI Boot Manager menu.
To load the SuSE Linux Enterprise Server operating system at the EFI Boot Manager menu, choose its entry from the list of boot options.
Choosing a Linux entry from the boot options list boots the operating system using `ELILO.EFI` loader and the `elilo.conf` file.
- Initiate the `ELILO.EFI` Linux loader from the EFI Shell. See “Booting SuSE Linux Enterprise Server from the EFI Shell” on page 159.

On a SuSE Linux Enterprise Server boot device EFI System Partition, the full paths to the loader and configuration files are:

```
\efi\SuSE\elilo.efi  
\efi\SuSE\elilo.conf
```

After choosing the file system for the boot device (for example, `fs0:`) you can initiate the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default, the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO` boot prompt. To exit the `ELILO.EFI` loader, use the `exit` command.

Booting SuSE Linux Enterprise Server from the EFI Shell

Use this procedure to boot SuSE Linux Enterprise Server 10 from the EFI Shell.

Step 1. Access the EFI Shell.

From the system console, choose the **EFI Shell** entry from the EFI Boot Manager menu to access the shell.

Step 2. Access the EFI System Partition for the SuSE Linux Enterprise Server boot device.

Use the `map` EFI Shell command to list the file systems (`fs0`, `fs1`, and so on) that are known and mapped.

To choose a file system to use, enter its mapped name followed by a colon (:). For example, to operate with the boot device that is mapped as `fs3`, enter **fs3:** at the EFI Shell prompt.

Step 3. Enter **ELILO** at the EFI Shell command prompt to launch the `ELILO.EFI` loader.

If needed, you can specify the loader's full path by entering `\efi\SuSE\elilo` at the EFI Shell command prompt.

Step 4. Allow the `ELILO.EFI` loader to proceed with booting the SuSE Linux kernel.

By default, the `ELILO.EFI` loader boots the kernel image and options specified by the default item in the `elilo.conf` file.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO` boot prompt. To exit the loader use the `exit` command.

Shutting Down Linux

Use the `shutdown` command to shut down Red Hat Enterprise Linux or SuSE Linux Enterprise Server.

The Red Hat Enterprise Linux and SuSE Linux Enterprise Server `shutdown` command has the following options:

- h Halts (power off) after shutdown.
Use the `PC` command at the management processor Command menu to manually power on or power off server hardware, as needed.
- r Reboots after shutdown.
- c Cancels an already running shutdown.
- time* When to shut down. (Required.) You can specify *time* in any of the following ways:
 - Absolute time in the format *hh:mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits).
 - Number of minutes to wait in the format *+m*, in which *m* is the number of minutes.
 - `now` to immediately shut down; this is equivalent to using `+0` to wait zero minutes.

For details, see the `shutdown(8)` Linux manpage. Also see the Linux manpage for the `poweroff` command.

Step 1. From the command line for Red Hat Enterprise Linux or SuSE Linux Enterprise Server, issue the **shutdown** command to shut down the operating system.

Step 2. Log in to Linux running on the server you want to shut down.

Step 3. Issue the **shutdown** command with the desired command-line options, and include the required *time* argument to specify when the operating system shutdown is to occur.

For example, `shutdown -r +20` shuts down and reboots the server in twenty minutes.

C Utilities

This appendix describes the utilities that are part of the HP Integrity rx4640 server. These include the EFI boot manager, and EFI-POSSE.

This appendix addresses the following topics:

- “Extensible Firmware Interface Boot Manager” on page 162.
- “EFI/POSSE Commands” on page 166.
- “Specifying SCSI Parameters” on page 180.
- “Using the Boot Configuration Menu” on page 186.

Extensible Firmware Interface Boot Manager

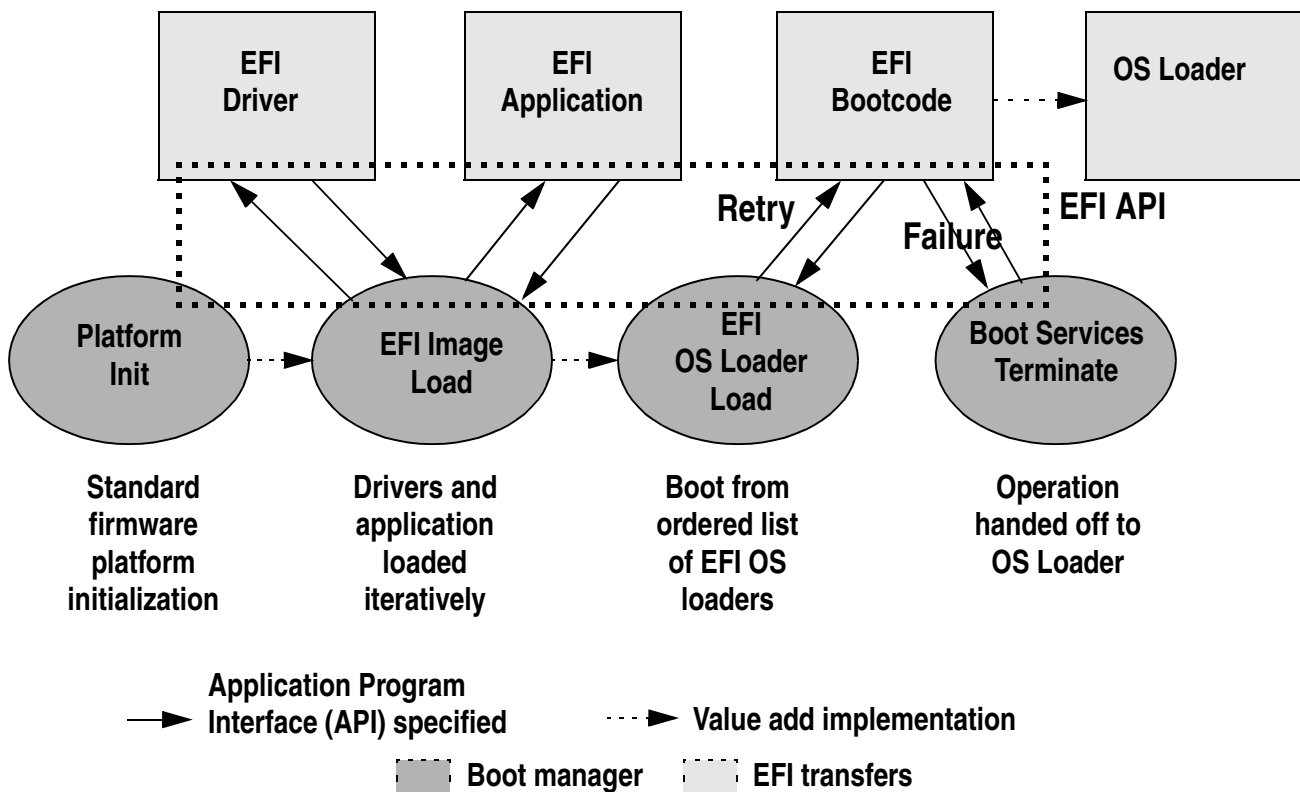
Extensible Firmware Interface (EFI) is an OS and platform-independent boot and pre-boot interface. EFI resides between the OS and platform firmware. This allows the OS to boot without having details about the underlying hardware and firmware. EFI supports boot devices; uses a flat memory model; and hides platform and firmware details from the OS.

NOTE EFI and Pre-OS System Environment (POSSE) are similar. EFI is an Intel specification, whereas POSSE is the HP implementation that aids HP support.

EFI consolidates boot utilities similar to those found in PA-RISC based servers, such as the Boot Console Handler (BCH), and platform firmware into a single platform firmware. EFI allows the selection of any EFI OS loader from any boot medium that is supported by EFI boot services. An EFI OS loader supports multiple options on the user interface.

EFI supports booting from media that contain an EFI OS loader or an EFI-defined server partition. An EFI-defined server partition is required by EFI to boot from a block device.

Figure C-1 EFI Boot Sequence



The EFI boot manager loads EFI applications (including operating system [OS] first stage loader) and EFI drivers from an EFI-defined file system or image loading service. Non-volatile RAM (NVRAM) variables point to the file to be loaded. These variables contain application-specific data that is passed directly to the EFI application. EFI variables provides system firmware a boot menu that points to all the operating systems, even multiple versions of the same operating systems.

The EFI boot manager allows you to control the server's booting environment. Depending on how you have configured the boot options, after the server is powered up the boot manager presents you with different ways to bring up the server. For example, you can boot to the EFI shell, to an operating system located on the network or residing on media in the server, or the Boot Configuration menu, see "Using the Boot Configuration Menu".

- *Boot From File*—Allows the user to explore the EFI file system and to choose a file to boot. The selected file will not be added to the boot option list.
- *Add Boot Entry*—Adds a boot option to the EFI boot manager. You select the boot option by exploring the available file systems for the EFI file you wish to add. After selecting the file, you will be prompted for the name of the boot option and for any optional ASCII or UNICODE arguments the file might use. After saving the boot option you may boot it by selecting it from the list of available boot options in the boot menu.
- *Remove Boot Entry*—Deletes a specific boot entry or all boot entries.
- *Edit OS Boot Order*—Controls the relative order in which the EFI boot manager attempts boot options. For help on the control key sequences you need for this option, see the help menu.
- *BootNext Configuration*—Selects a boot option to use one time (the next boot operation).
- *AutoBoot Configuration*—Defines the value in seconds that pass before the server automatically boots without user intervention. Setting this value to zero disables the timeout feature.

EFI Commands

Table C-1 lists EFI commands for the HP Integrity rx4640 server. The equivalent BCH commands found in PA-RISC based servers are also listed.

Table C-1 **EFI Commands**

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
These commands are found in all other menus			
info boot	Boot	[PRI HAA ALT <path>]	Boot from specified path
help <command>	HElp	[<menu> <command>]	Display help for specified command or menu
reset	RESEt		Reset the server (to allow reconfiguration of complex
exit (at EFI shell)	MAin		Return to the main menu
MAin			
EFI boot manager “change boot order”	PAth	[PRI HAA ALT CON KEY <path>]	Display or modify a path
bcfg	SEArch	[ALL]	Search for boot devices
bcfg	SEArch	[DIsplay IPL] [<path>]	Search for boot devices
many commands offer a [-b] parameter to cause 25 line breaks	ScRoll	[ON OFF]	Display or change scrolling capability
COnfiguration			
autoboot	AUto	[BOot SEArch SStart] [ON OFF]	Display or set the auto start flag
info boot	BootID	[<processor #>[<bootid #>]]	Display or set processor boot identifier
EFI boot manager	Boot info		Display boot-related information
autoboot	BootTimer	[0-200]	Seconds allowed for boot attempt
cpuconfig	CPUconfig	[<cpu>][ON OFF]	Config/deconfig processor
boottest	FastBoot	[ON OFF] or [test] [RUN SKIP]	Display or set boot tests execution

Table C-1 **EFI Commands (Continued)**

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
date	Time	[cn:yr:mo:dy:hr:mn[:ss]]	Read or set the date
time	Time	[cn:yr:mo:dy:hr:mn[:ss]]	Read or set the real time clock
INformation			
info all	ALL		Display all server information
info boot	BootINfo		Display boot-related information
info cpu	CAche		Display cache information
info chiprev	ChipRevisions		Display revision number of major VLSI
MP command <df>	FRU		Display FRU information
info fw	FwrVersion		Display firmware version for PDC, ICM, and complex
info io	IO		Display firmware version for PDC, ICM, and complex
lanaddress	LanAddress		Display core LAN station address
info mem	Memory		Display memory information
info cpu	PRocessor		Display processor information
SERvice			
errdump clear	CLEARPIM		Clear (zero) the contents of PIM
mm	MemRead	<addr> [<len>] [<type>]	Read memory locations scope of page deallocation
pdt	page deallocation table (pdt)		Display or clear the page deallocation table

Table C-1 **EFI Commands (Continued)**

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
errdump cmc errdump init	processor internal memory (PIM)	[<proc>] [HPMC LPMC TOC ASIC]	Display PIM information

EFI/POSSE Commands

This section describes the EFI/POSSE commands developed for the server.

NOTE EFI and Pre-OS System Environment (POSSE) are similar. EFI is an Intel specification, whereas POSSE is the HP implementation that aids HP support.

help

Provides information on the EFI shell commands. It also has an additional feature to aid those familiar with the BCH menus of PA-RISC servers to adjust to their equivalent functions in EFI.

Syntax

```
help [-b] <category>
help [-b] <cmd>
help [-b] bch <bchmenu> <bchcmd>
```

Parameters

```
-b                    Enable page breaking
category            Category of commands to view help on commands
cmd                 Shell command name on which to provide verbose information
bch                 Display the list of BCH commands and their corresponding EFI
bchmenu            BCH menu name taken from the top level of the BCH menu
bchcmd             BCH command on which to display information
```

Operation

If help is initiated with no parameters, it displays a list of shell command categories. To list all of the commands within a category, the user should enter **help <category>** (see examples). If initiated with the **-b** switch, any output longer than one page pauses after each page is displayed. If a shell command name is used as a parameter, verbose help is displayed for that command.

If help is initiated with the **bch** option, it displays a list of BCH commands and their corresponding EFI/POSSE commands. It instructs the user to repeat the command line followed by a menu name for more information on that menu. If help is initiated followed by **bch** and a menu name, it displays a list of commands that appear under that BCH menu. The user may then initiate help followed by **bch**, the menu name, and a BCH command name to display information on that command. This would point the user to the

command that has taken the place of that BCH functionality, or will inform the user that the functionality no longer exists. As a shortcut, the user may enter help followed by bch and a BCH command name to go straight to that command.

Example C-1 help Command

```
Shell> help
List of classes of commands:

boot          -- Booting options and disk-related commands
configuration -- Changing and retrieving system information
devices       -- Getting device, driver and handle information
memory        -- Memory related commands
shell         -- Basic shell navigation and customization
scripts       -- EFI shell-script commands
Type "help" followed by a class name for a list of commands in
that class
Type "help" followed by command name for full documentation
```

Example C-2 help bch Command

```
COnfiguration      help bch co
INformation        help bch in
PAtch              help bch pa
ScRool             help bch sr
SEArch            help bch sea
SERvice           help bch ser
BOot              help bch bo
HElp              help bch he
RESET             help bch reset
MAin              help bch ma
```

For more help on one of the commands above, at the prompt type:
 help bch <bchcmd>

Example C-3 help configuration Command

```
Shell> help configuration
Configuration commands:

cpuconfig -- Deconfigure or reconfigure cpus
date      -- Display or set date
err       -- Display or set error level
esiproc   -- Make an ESI call
errdump   -- View/Clear logs
info      -- Display hardware information
monarch   -- View or set the monarch processor
palproc   -- Make a PAL call
salproc   -- Make a SAL call
time      -- Display or set time
ver       -- Displays version info
```

Type "help" followed by command name for full documentation on that command.
 Type "help -a" to display a list of all commands.

Example C-4 help cpuconfig Command

```
Shell> help cpuconfig
Deconfigure or reconfigure cpus
CPUCONFIG [cpu] [on|off]
cpu      Specifies which cpu to configure
on|off   Specifies to configure or deconfigure a cpu
Notes:
  1. Cpu status will not change until next boot
```

2. Specifying a cpu number without a state will display configuration status.

Examples:

```
* To deconfigure CPU 0
fs0:\> cpuconfig 0 off
CPU will be deconfigured on the next boot
* To display configuration status of cpus
fs0:\> cpuconfig
<CPU configuration data displayed>
```

baud

Sets the baud rate and communication settings for a UART.

Syntax

```
baud <index> <baudrate>
```

Parameters

<index> 0 through the total number of UARTS minus one
<baudrate> baud rate.

Operation

This command is used to change the speed for a UART in the server. This command works for all UARTs visible to EFI/POSSE. If the UART is part of processor dependent hardware (PDH) space and is initialized by the core firmware, this command communicates the settings to core firmware so the UART can be initialized with the new settings on the next boot. Server default is 9600 baud.

Other Communication parameters are listed in Table C-2.

Table C-2 Communications Parameters

Parameter	Value
RECEIVE_FIFO_DEPTH	1
TIMEOUT	1000000
PARITY	No parity
DATA_BITS	8
STOP_BITS	1
CONTROL_MASK	0

boottest

Interacts with the speedy boot variable allowing it to be set appropriately.

Syntax

```
boottest           Displays status of all speedy boot bits
boottest on       Run all tests (for a normal boot time)
boottest off      Skip all tests (for a faster boot time)
boottest [test]   Displays status of specific Speedy Boot bit
boottest [test] [on|off] Sets or clears a specific Speedy Boot bit
```


Parameters

```
[test] Each test can be set or cleared:
booting_valid  Enable/disable system firmware response to BOOTING
                bit. If OS Speedy Boot aware set to on.
early_cpu      Enable/disable early CPU selftests.
late_cpu       Enable/disable late CPU selftests.
platform       Enable/disable system board hardware tests.
chipset        Enable/disable CEC tests.
io_hw          Enable/disable EFI driver Core I/O tests.
mem_init       Enable/disable memory initialization.
mem_test       Enable/disable full destructive memory tests.
```

Example C-5 boottest Command

```
Shell> boottest
BOOTTEST Settings Default Variable
Selftest          Setting
-----
booting_valid     On (OS speedy boot aware)
early_cpu         Run this test
late_cpu          Run this test
platform          Run this test
chipset           Run this test
io_hw             Run this test
mem_init          Run this test
mem_test          Run this test
```

Example C-6 boottest early_cpu off Command

```
Shell> boottest early_cpu off
BOOTTEST Settings Default Variable
Selftest          Setting
-----
booting_valid     On (OS speedy boot aware)
early_cpu         Skip this test
late_cpu          Run this test
platform          Run this test
chipset           Run this test
io_hw             Run this test
mem_init          Run this test
mem_test          Run this test
```

cpuconfig

Displays the config/deconfig state of processors in the server and allows the user to configure or reconfigure processors.

Syntax

```
cpuconfig <cpu> <on|off>
```

Parameters

```
<cpu>           specify a processor
<on|off>       state to set the processor to
```

Operation

Issuing `cpuconfig` with no parameters displays the config/deconfig status of all processors. A user can reconfigure CPUs by specifying a CPU number and a state (on or off). If a valid state is entered and is different from the current state of a CPU, its status changes on the next boot. The last remaining configured CPU in a server cannot be deconfigured.

Example C-7 `cpuconfig` Command

```
Shell> cpuconfig
PROCESSOR INFORMATION
```

CPU	Speed	Proc Rev	Model	Family	Arch Rev	Processor State
0	560Mhz	B1	0	31	0	Sched Deconf
1	560Mhz	B1	0	31	0	Active

ioconfig

Use this command to deconfigure or reconfigure I/O components or settings.

Syntax

```
ioconfig <fast_init | wol> <on|off>
```

Parameters

```
<fast_init>  specify device connection policy setting
<wol>        specify system wake-on-lan setting
<on|off>     specify to configure or deconfigure a feature or component
```

Operation

The `ioconfig` file is used to retain information on the server I/O configuration across reboots. The `ioconfig` file is created by `insf` at install time; and is modified by `insf`, `rmsf`, and `ioscan` when devices are added or removed. The only purpose of the `ioconfig` file to maintain configuration information when the system is not running.

Example C-8 `ioconfig` Command

```
Shell> ioconfig
Deconfigure or reconfigure IO components or settings

IOCONFIG [fast_init|wol [on|off]]

fast_init  Specifies device connection policy setting
wol        Specifies System Wake-On-LAN setting
on|off     Specifies to configure or deconfigure a feature or component
```

Note:

1. If `fast_init` is enabled, firmware will connect only the minimum set of devices during boot. This feature might cause boot failure; disable this feature if failure occurs.
2. Any pending Wake-On-LAN request will not be cleared until reboot if the setting is changed to disabled.

System will clear pending Wake-On-LAN requests each time the system reboots if the setting is disabled.

Examples:

- * To display the current settings
 fs0:\> ioconfig
 Fast initialization: Enabled
 System Wake-On-LAN: Disabled

- * To display the current device connection policy setting
 fs0:\> ioconfig fast_init
 Fast initialization: Enabled

- * To disable fast initialization
 fs0:\> ioconfig fast_init off
 Fast initialization: Disabled

- * To enable the System Wake-On-LAN setting
 fs0:\> ioconfig wol on
 System Wake-On-LAN: Enabled

default

Allows the user to restore non-volatile memory (NVM) to default values and clear NVM storage values.

Syntax

```
default [efi|sal]
default clear [bmc|efi|sal]
```

Parameters

```
clear clears NVM storage values
```

Operation

Default sets NVM and stable store values to predefined default values. To the normal user only a subset of values are available for default. Executing “default clear” resets the server.

errdump

Displays the contents of processor internal memory logged for all processors present in the server.

Syntax

```
errdump [cpe | cmc | init | la | clear]
```

Parameters

```
cpe dumps the Corrected Platform Error log
cmc dumps the Corrected Machine Check log
init dumps the Initialization log
la dumps the Logic Analyzer log
clear erases all of the logs (cpe, cmc, init, la)
```

Operation

If a user enters no parameters, the usage is displayed. Otherwise, the specified error log is displayed. Adding `-n` to the clear parameter disables the confirmation prompt. (The `errdump` command can also be accessed through the server Configuration menu.)

info

Allows the user to display most server information.

Syntax

```
info [ -b] [target]
```

Parameters

```
target:          valid targets are:
    all          display everything
    cpu          display information on cpus
    cache        display information on cache
    mem          display information on memory
    io           display information on io
    boot         display boot-related information
    chiprev      display information on chip revisions
    fw           display firmware version information
    sys          display system information
    warning      display warning and stop boot information
```

Example C-9 info all Command

```
Shell> info all
SYSTEM INFORMATION
Date/Time: Sep 24, 2004 17:27:17 (20:04:09:24:17:27:17)
Manufacturer: hp
Product Name: server rx4640
Product Number: AB333A
Serial Number: USR0418201
UUID: 336B81EE-A9AF-11D8-9653-3F6E1533CC31
System Bus Frequency: 200 MHz
PROCESSOR MODULE INFORMATION
      # of      L3      L4      Family/
CPU   Logical      Cache  Cache  Model      Processor
Module CPUs      Speed  Size  Size  (hex.)  Rev  State
-----
      0         1      1.3 GHz  3 MB  None  1F/01  B1      Active

MEMORY INFORMATION
      ---- DIMM A ----      ---- DIMM B ----
      DIMM  Current      DIMM  Current
      ----      ----
0      256MB  Active      256MB  Active
1      256MB  Active      256MB  Active
2      ----      ----
3      ----      ----
4      ----      ----
5      ----      ----

Active Memory   : 1024 MB
Installed Memory : 1024 MB

I/O INFORMATION
```

BOOTABLE DEVICES

Order	Media Type	Path
1	CDROM	Acpi(HWP0002,0)/Pci(2 0)/Ata(Primary,Master)/CDROM(Entry0)

Seg #	Bus #	Dev #	Fnc #	Vendor ID	Device ID	Slot #	Path
00	00	01	00	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 0)
00	00	01	01	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 1)
00	00	01	02	0x1033	0x00E0	XX	Acpi(HWP0002,0)/Pci(1 2)
00	00	02	00	0x1095	0x0649	XX	Acpi(HWP0002,0)/Pci(2 0)
00	20	01	00	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 0)
00	20	01	01	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 1)
00	20	02	00	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 0)
00	20	02	01	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 1)
00	40	01	00	0x1000	0x0021	03	Acpi(HWP0002,200)/Pci(1 0)
00	60	01	00	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 0)
00	60	01	01	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 1)
00	80	01	00	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 0)
00	80	01	01	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 1)
00	C0	01	00	0x1000	0x0021	04	Acpi(HWP0002,600)/Pci(1 0)
00	E0	01	00	0x103C	0x1290	XX	Acpi(HWP0002,700)/Pci(1 0)
00	E0	01	01	0x103C	0x1048	XX	Acpi(HWP0002,700)/Pci(1 1)
00	E0	02	00	0x1002	0x5159	XX	Acpi(HWP0002,700)/Pci(2 0)

System Wake-On-LAN: Enabled

BOOT INFORMATION

Monarch CPU:

Current	Preferred	
Monarch CPU	Monarch CPU	
Module/Logical	Module/Logical	Warnings
0/0	0/0	

AutoBoot: ON - Timeout is : 10 sec

Boottest:

BOOTTEST Settings Default Variable

OS is not speedy boot aware.

Selftest	Setting
early_cpu	Run this test
late_cpu	Run this test
platform	Run this test
chipset	Run this test
io_hw	Run this test
mem_init	Run this test
mem_test	Run this test

LAN Address Information:

EFI/POSSE Commands

```

LAN Address          Path
-----
*Mac(000E7F7E07FA)  Acpi(HWP0002,100)/Pci(2|0)/Mac(000E7F7E07FA)
Mac(000E7F7E07FB)  Acpi(HWP0002,100)/Pci(2|1)/Mac(000E7F7E07FB)

```

FIRMWARE INFORMATION

```

Firmware Revision: 86.10 [4432]
  PAL_A: 7.31/5.37
  PAL_B: 5.69
  EFI Spec: 1.10
  EFI Intel Drop: 14.62
  EFI Build: 86.10
  SAL Spec: 3.01
  SAL_A: 2.00
  SAL_B: 86.10
  POSSE: 0.10
  ACPI: 7.00
  SMBIOS: 2.3.2a:

```

```

BMC Revision: 3.42
  IPMI: 1.00
Management Processor Revision: E.03.02
Updatable EFI Drivers:

```

***** 2nd part *****

Seg #	Bus #	Dev #	Fnc #	Vendor ID	Device ID	Slot #	Path
00	00	01	00	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 0)
00	00	01	01	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 1)
00	00	01	02	0x1033	0x00E0	XX	Acpi(HWP0002,0)/Pci(1 2)
00	00	02	00	0x1095	0x0649	XX	Acpi(HWP0002,0)/Pci(2 0)
00	20	01	00	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 0)
00	20	01	01	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 1)
00	20	02	00	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 0)
00	20	02	01	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 1)
00	40	01	00	0x1000	0x0021	03	Acpi(HWP0002,200)/Pci(1 0)
00	60	01	00	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 0)
00	60	01	01	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 1)
00	80	01	00	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 0)
00	80	01	01	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 1)
00	C0	01	00	0x1000	0x0021	04	Acpi(HWP0002,600)/Pci(1 0)
00	E0	01	00	0x103C	0x1290	XX	Acpi(HWP0002,700)/Pci(1 0)
00	E0	01	01	0x103C	0x1048	XX	Acpi(HWP0002,700)/Pci(1 1)
00	E0	02	00	0x1002	0x5159	XX	Acpi(HWP0002,700)/Pci(2 0)

System Wake-On-LAN: Enabled

BOOT INFORMATION

Monarch CPU:

Current	Preferred	Warnings
Monarch CPU	Monarch CPU	
Module/Logical	Module/Logical	
-----	-----	-----
0/0	0/0	

AutoBoot: ON - Timeout is : 10 sec

Boottest:

BOOTTEST Settings Default Variable

OS is not speedy boot aware.

Selftest	Setting
-----	-----
early_cpu	Run this test
late_cpu	Run this test
platform	Run this test
chipset	Run this test
io_hw	Run this test
mem_init	Run this test
mem_test	Run this test

LAN Address Information:

LAN Address	Path
-----	-----
*Mac(000E7F7E07FA)	Acpi(HWP0002,100)/Pci(2 0)/Mac(000E7F7E07FA)
Mac(000E7F7E07FB)	Acpi(HWP0002,100)/Pci(2 1)/Mac(000E7F7E07FB)

FIRMWARE INFORMATION

```

Firmware Revision: 86.10 [4432]
  PAL_A: 7.31/5.37
  PAL_B: 5.69
  EFI Spec: 1.10
  EFI Intel Drop: 14.62
  EFI Build: 86.10
  SAL Spec: 3.01
  SAL_A: 2.00
  SAL_B: 86.10
  POSSE: 0.10
  ACPI: 7.00
  SMBIOS: 2.3.2a:
BMC Revision: 3.42
  IPMI: 1.00
Management Processor Revision: E.03.02
Updatable EFI Drivers:
  Floating-Point Software Assistance Handler: 00000118
  LSI Logic Ultra320 SCSI Driver: 01030000
  Broadcom Gigabit Ethernet Driver: 00070003
  Intel(R) PRO/1000 Ethernet Driver: 00002160

```

WARNING AND STOP BOOT INFORMATION

Error[55] : Invalid or inaccessible system ID(s)

CHIP REVISION INFORMATION

Chip Type	Logical ID	Device ID	Chip Revision
-----	-----	-----	-----
Memory Controller	0	122b	0023
Root Bridge	0	1229	0023
Host Bridge	0000	122e	0032
Host Bridge	0001	122e	0032
Host Bridge	0002	122e	0032
Host Bridge	0003	122e	0032
Host Bridge	0004	122e	0032
Host Bridge	0006	122e	0032
Host Bridge	0007	122e	0032

EFI/POSSE Commands

```

Other Bridge          0          0          0002
  Other Bridge        0          0          0009
    Baseboard MC      0          0          0342

```

Example C-10 info cpu Command

```
Shell> info cpu
```

PROCESSOR MODULE INFORMATION

CPU Module	# of Logical CPUs	Speed	L3 Cache Size	L4 Cache Size	Family/Model (hex.)	Rev	Processor State
0	4	1.4 GHz	6 MB	None	20/00	B0	Active
1	4	1.4 GHz	6 MB	None	20/00	B0	Active

CPU threads are turned on.

Example C-11 info mem Command

```
Shell> info mem
```

MEMORY INFORMATION

---- DIMM A ----			---- DIMM B ----		
DIMM	Current		DIMM	Current	
0	256MB	Active	256MB	Active	
1	256MB	Active	256MB	Active	
2	----		----		
3	----		----		
4	----		----		
5	----		----		

```

Active Memory      : 1024 MB
Installed Memory   : 1024 MB

```

Example C-12 info io Command

```
Shell> info io
```

I/O INFORMATION

BOOTABLE DEVICES

Order	Media Type	Path
1	CDROM	Acpi (HWP0002,0)/Pci (2 0)/Ata (Primary,Master)/CDROM (Entry0)

Seg #	Bus #	Dev #	Fnc #	Vendor ID	Device ID	Slot #	Path
00	00	01	00	0x1033	0x0035	XX	Acpi (HWP0002,0)/Pci (1 0)
00	00	01	01	0x1033	0x0035	XX	Acpi (HWP0002,0)/Pci (1 1)
00	00	01	02	0x1033	0x00E0	XX	Acpi (HWP0002,0)/Pci (1 2)
00	00	02	00	0x1095	0x0649	XX	Acpi (HWP0002,0)/Pci (2 0)
00	20	01	00	0x1000	0x0030	XX	Acpi (HWP0002,100)/Pci (1 0)
00	20	01	01	0x1000	0x0030	XX	Acpi (HWP0002,100)/Pci (1 1)
00	20	02	00	0x8086	0x1079	XX	Acpi (HWP0002,100)/Pci (2 0)


```

00 20 02 01 0x8086 0x1079 XX Acpi (HWP0002,100)/Pci (2|1)
00 40 01 00 0x1000 0x0021 03 Acpi (HWP0002,200)/Pci (1|0)
00 60 01 00 0x1077 0x2312 02 Acpi (HWP0002,300)/Pci (1|0)
00 60 01 01 0x1077 0x2312 02 Acpi (HWP0002,300)/Pci (1|1)
00 80 01 00 0x1000 0x000F 01 Acpi (HWP0002,400)/Pci (1|0)
00 80 01 01 0x1000 0x000F 01 Acpi (HWP0002,400)/Pci (1|1)
00 C0 01 00 0x1000 0x0021 04 Acpi (HWP0002,600)/Pci (1|0)
00 E0 01 00 0x103C 0x1290 XX Acpi (HWP0002,700)/Pci (1|0)
00 E0 01 01 0x103C 0x1048 XX Acpi (HWP0002,700)/Pci (1|1)
00 E0 02 00 0x1002 0x5159 XX Acpi (HWP0002,700)/Pci (2|0)

```

System Wake-On-LAN: Enabled

Example C-13 info boot Command

Shell> info boot

BOOT INFORMATION

Monarch CPU:

Current	Preferred	
Monarch	Monarch	
CPU	CPU	
Module/	Module/	
Logical	Logical	Warnings
-----	-----	-----
0/0	0/0	

AutoBoot: ON - Timeout is : 10 sec

Boottest:

BOOTTEST Settings Default Variable

OS is not speedy boot aware.

Selftest	Setting
-----	-----
early_cpu	Run this test
late_cpu	Run this test
platform	Run this test
chipset	Run this test
io_hw	Run this test
mem_init	Run this test
mem_test	Run this test

LAN Address Information:

LAN Address	Path
-----	-----
*Mac(000E7F7E07FA)	Acpi (HWP0002,100)/Pci (2 0)/Mac (000E7F7E07FA)
Mac(000E7F7E07FB)	Acpi (HWP0002,100)/Pci (2 1)/Mac (000E7F7E07FB)

lanaddress

Allows the user to display the core I/O MAC address.

Syntax:

lanaddress

Parameters

none

Example C-14 lanaddress Command

```
LAN Address Information:
  LAN Address      Path
  -----
  Mac(00306E4C4F1A) Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)
  *Mac(00306E4C0FF2) Acpi(HWP0002,100)/Pci(2|0)/Mac(00306E4C0FF2)
```

monarch

Displays or modifies the ID of the bootstrap processor. The preferred monarch number is stored in NVM.

Syntax

```
monarch <cpu>
```

Parameters

<cpu> specifies a cpu

Operation

If specified with no parameters, **monarch** displays the Monarch processor for the server. Specifying a processor number alters the preferred Monarch processor. None of these changes takes affect until after a reboot.

Example C-15 monarch Command

```
Shell> monarch
Current Preferred
Monarch Monarch Possible Warnings
-----
          0          0
          0          0
```

To view monarch: fs0 :\ monarch

```

          | Processor
-----+-----
current status | 0
next boot status | 0
```

To set the monarch processor to 1: fs0 :\ monarch 1

```

          | Processor
-----+-----
current status | 0
next boot status | 1
```

pdt

Displays or clears the contents of the Page Deallocation Table.

Syntax

```
pdt (clear)
```

Parameters

```
<clear>      clears the pdt
```

Operation

With no options specified, the command displays the PDT information for the server. The PDT is cleared and a reboot is required for memory reallocation and safe booting.

Example C-16 `pdt` Command

```
Shell> pdt
PDT Information for PD

Last Clear time for PD: PDT has not been cleared
Number of total entries in PD PDT:           100
Number of used entries in PD PDT:            0
Number of free entries in PD PDT:            50
Number of permanent correctable (SBE) entries in PD PDT:  0
Number of permanent uncorrectable (MBE) entries in PD PDT: 0
Address of first uncorrectable error in PD:  0x0000000000000000
```

Example C-17 `pdt clear` Command

```
Shell> pdt clear
Are you sure you want to clear the PDT? [y/N] y
Shell>

Shell> pdt
PDT Information

                Last Clear time: 10/21/01  5:00p
Number of total entries in PDT:           50
Number of used entries in PDT:            0
Number of free entries in PDT:            50
Number of single-bit entries in PDT:      0
Number of multi-bit entries in PDT:       0
Address of first multi-bit error: 0x0000000000000000
```

sysmode

Display or modify the system mode.

Syntax

```
sysmode <normal | admin| service>
```

Parameters

```
<normal>      sets system mode to normal
<admin>       sets system mode to admin
<service>     sets system mode to service
```

Operation

If specified alone, `sysmode` displays the system mode. If a mode is specified as a parameter, then the system mode is changed. This new mode takes effect immediately. The system mode is retained on successive boots. Interaction with `sysmode` in a variety of scenarios is outlined below.

Example C-18 `sysmode` Command

```
Shell> sysmode
System Mode: NORMAL

Shell> sysmode admin
You are now in admin mode.

Shell> sysmode service
You are now in service mode.

Shell> sysmode normal
You are now in normal mode
```

Specifying SCSI Parameters

The following SCSI parameters may be configured for the SCSI board:

- SCSI ID (SCSI initiator ID)
- Maximum data transfer rate (SCSI rate)
- Bus width
- Whether the HBA is bootable (driver support)
- Avoid bus resets (secondary cluster server)

Using the SCSI Setup Utility

Step 1. At the EFI shell prompt, enter the following command to map the parameters for all PCI cards installed in the server:

```
info io
```

A list of all the devices that are installed in the HP Integrity rx4640 server and managed by EFI drivers is displayed. The output may look like this:

I/O INFORMATION

BOOTABLE DEVICES

Order	Media	Type	Path				
1	CDROM		Acpi(HWP0002,0)/Pci(2 0)/Ata(Primary,Master)/CDROM(Entry0)				

Seg #	Bus #	Dev #	Fnc #	Vendor ID	Device ID	Slot #	Path
00	00	01	00	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 0)
00	00	01	01	0x1033	0x0035	XX	Acpi(HWP0002,0)/Pci(1 1)
00	00	01	02	0x1033	0x00E0	XX	Acpi(HWP0002,0)/Pci(1 2)
00	00	02	00	0x1095	0x0649	XX	Acpi(HWP0002,0)/Pci(2 0)
00	20	01	00	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 0)
00	20	01	01	0x1000	0x0030	XX	Acpi(HWP0002,100)/Pci(1 1)
00	20	02	00	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 0)
00	20	02	01	0x8086	0x1079	XX	Acpi(HWP0002,100)/Pci(2 1)
00	40	01	00	0x1000	0x0021	03	Acpi(HWP0002,200)/Pci(1 0)
00	60	01	00	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 0)
00	60	01	01	0x1077	0x2312	02	Acpi(HWP0002,300)/Pci(1 1)
00	80	01	00	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 0)
00	80	01	01	0x1000	0x000F	01	Acpi(HWP0002,400)/Pci(1 1)
00	C0	01	00	0x1000	0x0021	04	Acpi(HWP0002,600)/Pci(1 0)
00	E0	01	00	0x103C	0x1290	XX	Acpi(HWP0002,700)/Pci(1 0)
00	E0	01	01	0x103C	0x1048	XX	Acpi(HWP0002,700)/Pci(1 1)
00	E0	02	00	0x1002	0x5159	XX	Acpi(HWP0002,700)/Pci(2 0)

System Wake-On-LAN: Enabled

In the preceding example, a single SCSI interface is shown in the listing. The information for both channels of the SCSI interface is shown in **bold**, for highlighting purposes.

For each channel of the SCSI board, you need to note certain information. As an example, look at the information for the SCSI interface (the first two bold lines). For each channel of *this* SCSI interface, note the following information:

- **Bus #**—identifies the bus the device is on; for the SCSI interface, this is the same for both channels. In this example, the bus number is 20.
- **Dev #**—the ID the device is assigned on the bus; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface is device 01.
- **Fnc #**—identifies the channel of the device (00 for channel A, 01 for channel B, and so on). In this example, because the SCSI interface has two channels, one channel is 00 and the other is 01.
- **Vendor ID**—shows the device’s vendor ID; for the SCSI interface, this is the same for both channels. For all the SCSI interface the ID is 0x1000.
- **Device ID**—shows the device ID; for the SCSI interface, this is the same for both channels. For the SCSI interface the ID is 0x0030.
- **Slot #**—identifies the physical card slot in the server where the SCSI interface is installed; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface is on the I/O baseboard therefore the in slot number is xx.
- **Path**—identifies the device’s path; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface path is **Acpi(HWP0002,200)/Pci(1|0)** for channel A and **Acpi(HWP0002,200)/Pci(1|1)** for channel B.

Using the SCSI interface information from the example above, the pieces of information that, combined, tell you this is a SCSI interface are the following (shown in **bold**, for highlighting purposes):

```
00 20 01 00 0x1000 0x0030 xx Acpi(HWP0002,200)/Pci(1|0)
00 20 01 01 0x1000 0x0030 xx Acpi(HWP0002,200)/Pci(1|1)
```

Looking at all of the above information together, the vendor (**0x1000**) and device (**0x0030**) are the IDs for a SCSI interface. Of the devices with those IDs, this device has two channels (Fnc # of **00** immediately followed by Fnc # of **01**). Also, this SCSI interface has a non-numeric (**XX**) slot # indicating that it is on the I/O baseboard.

Step 2. Still at the EFI shell prompt, enter the following command to obtain the controller's handle for the SCSI interface:

devtree

A tree of all EFI-capable devices installed in the server is displayed. The output could look like this:

```
Shell> devtree
Device Tree
Ctrl[04]
Ctrl[06] VenHw(SYSROM)
Ctrl[0B] Acpi(HWP0002,0)
Ctrl[15] Usb Open Host Controller
Ctrl[16] Usb Open Host Controller
Ctrl[17] Acpi(HWP0002,0)/Pci(1|2)
Ctrl[18] PCI IDE/ATAPI Controller
Ctrl[56] DV-28E-C
Ctrl[91] FAT File System [FAT32] 118 MB
Ctrl[0C] Acpi(HWP0002,100)
Ctrl[1C] LSI Logic Ultra320 SCSI Controller
Ctrl[1D] LSI Logic Ultra320 SCSI Controller
Ctrl[1E] Acpi(HWP0002,100)/Pci(2|0)
Ctrl[57] Acpi(HWP0002,100)/Pci(2|0)/Mac(000E7F7E07FA)
Ctrl[1F] Acpi(HWP0002,100)/Pci(2|1)
Ctrl[58] Acpi(HWP0002,100)/Pci(2|1)/Mac(000E7F7E07FB)
Ctrl[0D] Acpi(HWP0002,200)
Ctrl[20] Acpi(HWP0002,200)/Pci(1|0)
Ctrl[0E] Acpi(HWP0002,300)
Ctrl[22] HP 2 Gb Dual Port PCI/PCI-X Fibre Channel Adapter ( Port 1)
Ctrl[23] HP 2 Gb Dual Port PCI/PCI-X Fibre Channel Adapter ( Port 2)
Ctrl[0F] Acpi(HWP0002,400)
Ctrl[24] Acpi(HWP0002,400)/Pci(1|0)
Ctrl[25] Acpi(HWP0002,400)/Pci(1|1)
Ctrl[10] Acpi(HWP0002,600)
Ctrl[26] Acpi(HWP0002,600)/Pci(1|0)
Ctrl[11] Acpi(HWP0002,700)
Ctrl[27] Acpi(HWP0002,700)/Pci(1|0)
Ctrl[28] Acpi(HWP0002,700)/Pci(1|1)
Ctrl[43] 16550 Serial UART Driver
Ctrl[44] VT-100+ Serial Console
Ctrl[3E] Primary Console Input Device
Ctrl[3F] Primary Console Output Device
Ctrl[3D] Primary Standard Error Device
Ctrl[29] Acpi(HWP0002,700)/Pci(2|0)
Ctrl[40] Acpi(PNP0501,0)
Ctrl[41] 16550 Serial UART Driver
Ctrl[42] VT-100+ Serial Console
Ctrl[54] VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
```

In the preceding example, the SCSI interface information is shown **highlighted bold**. You can tell the information is for the SCSI interface because the path on the first line—`Acpi (HWP0002, 100)`—is the path from the information displayed by the `info io` command. The next two lines are for the SCSI interface two channels, one line for each channel (they contain the SCSI interface description [LSI Logic Ultra320 SCSI Controller]). Note the value shown for `Ctrl`—17 and 18—at the beginning of each of those lines; this is the **controller’s handle** for each channel. You need to know it for the next step.

NOTE The controller’s handle values change on every boot.

Step 3. Still at the EFI shell prompt, enter the following command to obtain the EFI driver’s handle for the SCSI interface:

drvcfg

A list of all EFI-capable configurable components in the server displays. The output may look like this:

```
Shell> drvcfg
Configurable Components
Drv[3D] Ctrl[15] Lang[eng]
Drv[3F] Ctrl[19] Lang[eng]
Drv[45] Ctrl[17] Lang[eng]
Drv[45] Ctrl[18] Lang[eng]
```

This listing shows which driver controls which device (controller). In the above example, the SCSI interface information is shown highlighted **bold**. You can tell the information is for this SCSI interface because the values shown for `Ctrl`—17 and 18—are the controller’s handles for the SCSI interface two channels (from the information displayed by the `devtree` command).

NOTE The EFI driver’s handle values change on every boot.

TIP From this command (`drvcfg`), we recommend you record these two pieces of information for *each* channel of *each* SCSI interface for parameters to be changed:

- `Drv` (the EFI driver’s handle)
- `Ctrl` (the controller’s handle)

Step 4. Using the information (the driver’s handle [`Drv`] and the controller’s handle [`Ctrl`]) from the `drvcfg` command, start the EFI SCSI Setup Utility for *one* channel of *this* SCSI interface. Still at the EFI shell prompt, enter the following command:

drvcfg -s *drv_handle* *cntrl_handle*

where:

- *drv_handle* is the handle of the driver that controls the channel whose SCSI ID you want to display or change
- *cntrl_handle* is the handle of the controller for the channel whose SCSI ID you want to display or change

Continuing the example for Channel A of this SCSI interface, you would enter:

```
drvcfg -s 45 18
```

Step 5. The EFI SCSI Setup Utility starts and its main menu displays, showing a list of all the EFI capable SCSI interfaces in the server.

Move the cursor to highlight the channel of the SCSI interface; press **Enter**. (To determine which channel of the interface to highlight, match the PCI Bus, PCI Dev, and PCI Func values on this screen to the Bus #, Dev #, and Fnc # values from the `info io` command.)

CAUTION Do **not** select the <Global Properties> option on the main menu.

TIP To move the cursor in the EFI SCSI Setup Utility, you can use these keys:

- Arrow keys: ↑ ↓ ← →
- Alternate keys:
 - H** = left
 - J** = down
 - K** = up
 - L** = right
 - I** = home
 - O** = end

Step 6. The “Adapter Properties” screen for this channel of the SCSI interface is displayed. If you like, you can make sure the utility is running for the channel of the SCSI interface by comparing the values shown for PCI Bus, PCI Device, and PCI Function to the Bus #, Dev #, and Fnc # values from the `info io` command.

CAUTION Do **not** change the value for *any* of these fields on the “Adapter Properties” screen:

- Auto Termination
- SCSI Parity
- SCSI Bus Scan Order
- Spinup Delay (Secs)

Changing any of these fields can cause unpredictable results.

CAUTION Do **not** change the value for *any* of these fields on the “Device Properties” screen:

- Scan Id
- Scan LUNs > 0

- Disconnect
- SCSI Timeout
- Queue Tags
- Format
- Verify

Changing any of these fields can cause unpredictable results.

Step 7. You may display (and optionally change) any SCSI parameters listed below for the channel of the SCSI interface, or restore its SCSI parameters to their default values.

- SCSI ID
- Maximum data transfer rate
- Bus width
- Whether the SCSI interface is bootable (driver support)
- Avoid bus resets (secondary cluster server)
- Restore Defaults

Step 8. Use the arrow keys to navigate to the appropriate SCSI parameter.

Step 9. Use the plus (+) and minus (-) keys to scroll through the values.

Step 10. Press **Esc** to exit the **Adapter Properties** screen. You are given these choices:

- Cancel the exit from the screen (to stay in the **Adapter Properties** screen for the channel of the SCSI interface)
- Save the changes you made and then exit the screen
- Discard the changes you made and then exit the screen

Step 11. Move the cursor to the action (cancel, save, or discard) you want to take; press **Enter**.

If you selected cancel, you remain in the **Adapter Properties** screen for the channel of the SCSI interface. You can still change the channel's parameters listed above.

If you selected save or discard, you are placed in the EFI SCSI Setup Utility's main menu.

CAUTION Do *not* select the <Global Properties> option on the main menu.

Step 12. Press **Esc** to exit the main menu and the EFI SCSI Setup Utility.

Step 13. Select the option for exiting the utility.

Step 14. When you are prompted to, press **Enter** to stop the SCSI interface; you are now back at the EFI shell prompt.

Step 15. At the EFI shell prompt, enter the **reset** command:

The server starts to reboot. This is required to cause the new SCSI setting.

Using the Boot Configuration Menu

The Boot Configuration Menu menu allows you to select console output and input devices as well as various boot options. It contains the following items:

- Boot From File
- Add Boot Entry
- Edit Boot Entry
- Remove Boot Entry
- Edit OS Boot Order
- AutoBoot Configuration
- BootNext Configuration
- Driver Configuration
- Console Configuration
- System Reset

These items are described in the following sections.

In all menus, select:

- For help on menus and navigation, see the status bar on the bottom of the screen
- Enter to select an item after using the arrow keys to highlight the item
- Save Settings to NVRAM to save your changes

NOTE The options shown here are examples. Your server may have different options available based on the server configuration and installed hardware components.

Boot From File

Use this option to manually run a specific application or driver.

NOTE This option boots the selected application or driver one time only. When you exit the application, you return to this menu.

This option displays the file systems that are on your server or workstation and lets you browse these file systems for applications or drivers that are executable. Executable files end with the `.efi` extension. You can also select remote boot (LAN) options that have been configured on your network.

For example:

```
Boot From a File. Select a Volume
NO VOLUME LABEL [Acpi(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM
CD_FORMAT [Acpi(HWP0002,0)/Pci(2|0)/Ata(Secondary,Master)/CDROM
Removable Media Boot [Acpi(HWP0002,500)/Pci(2|0)/Ata(Secondary,Master)
Load File [EFI Shell [Built-in]]
```

```
Load File [Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)]  
Exit
```

In this example:

- NO VOLUME LABEL is a hard drive. When you format a hard drive, the EFI tools provide an option to LABEL the disk. In this example, the volume was not labelled.
- CD_FORMAT is the label created for the disk currently inside the DVD drive.
- Removable Media Boot allows you to boot from a removable media drive (CD/DVD drive). This option does not support booting from a specific file on a specific removable media disc.
- The two Load Files are the EFI Shell and the LAN.

Add Boot Entry

Use this option to add items to the EFI boot menu.

This option displays the file systems that are on your server and lets you browse these file systems for applications or drivers that are executable. Executable files end with the .efi extension. You can also select remote boot (LAN) options that have been configured on your network. The option you have selected will be added to the EFI boot menu.

If you add a new drive to your server, you must manually add its boot options list if you want to make it a bootable device.

When adding a boot option that already exists in the Boot Manager list of boot options, you can choose whether to create a new option or modify the existing one. If you:

- Choose to modify an existing option, you may change the boot option name and/or add boot option arguments to the existing option.
- Create a new boot option for an already existing option, multiple instances of the same boot option exist.

For example:

```
Add a Boot Option. Select a Volume  
NO VOLUME LABEL [Acpi(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM  
Removable Media Boot [Acpi(HWP0002,0)/Pci(2|0)/Ata(Secondary,Master)  
Load File [EFI Shell [Built-in]]  
Load File [Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)]  
Exit
```

In this example:

- Most of the items are the same options in Boot From a File.
- NO VOLUME LABEL is a hard drive. You can search through the disk for bootable applications to add to the Boot Manager list of Boot options.
- Removable Media Boot will treat the Removable Media (generally a CD) as a bootable device.
- Load File EFI Shell adds a new instance to the EFI Shell. Load File with the MAC address adds a network boot option

Edit Boot Entry

Use this option to remove boot options from the EFI boot menu.

NOTE This does not delete any files, applications or drivers from your server.

This option displays a list of boot options that are configured on your server. The names will match the options on the main Boot Manager menu (above).

If you remove a drive from your server, you must manually delete it from the boot options list.

- To delete an item from the list, use the arrow keys to highlight the item and press Enter.
- To remove all of the entries from the EFI boot menu, select Delete All Boot Options. This setting may be used as a security device on servers that are accessed remotely.

Remove Boot Entry

Use this option to change the order of boot options. The order in which options are listed in the EFI boot menu also reflects the order in which the server attempts to boot. If the first boot option fails, the server tries booting the second, then the third, and so forth, until a boot option succeeds or until all options have failed.

For example, if you normally boot using a configuration on your LAN but would like to boot from a local hard drive if the LAN is unavailable, move the LAN boot option to the top of the list, followed by the hard drive boot option.

The menu lists boot options that currently exist in the main Boot Manager menu. You can change the priority of the items by moving them up or down in the list:

- Press U to move an option up.
- Press D to move an option down.
- Select Save Settings to NVRAM to modify the order in the Boot Manager menu, which modifies the order that the Boot Manager will attempt to boot the options.
- The items at the bottom of the screen (shown in bold in these examples) are descriptions of the selected option.

For example:

```
Change boot order. Select an Operation
EFI Shell [Built-in]
Current OS
Save Settings to NVRAM
Help
Exit

VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
Boot0000
```

BootNext Configuration

Use this option to run the selected boot option immediately upon entering the main Boot Manager menu. This option is useful for booting an option that only needs to be booted once, without changing any other setting in the main Boot Manager menu. This is a one-time operation and does not change the permanent system boot settings.

This option displays the file systems that are on your server and lets you browse these file systems for applications or drivers that are executable. Executable files end with the .efi extension. You can also select remote boot (LAN) options that have been configured on your network.

To restore the default boot next setting, select Reset BootNext Setting.

For example:

```
Manage BootNext setting. Select an Operation
EFI Shell [Built-in]
Current OS
Reset BootNext Setting
Save Settings to NVRAM
Help
Exit

VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
Boot0000
```

AutoBoot Configuration

Use this option to set the amount of time the server pauses before attempting to launch the first item in the Boot Options list.

For example:

```
Set Auto Boot Timeout. Select an Option
Set Timeout Value
Delete/Disable Timeout
Help
Exit
```

Interrupting the timeout during the countdown stops the Boot Manager from loading any boot options automatically. If there is no countdown, boot options must be selected manually.

- To set the auto boot timeout value, in seconds, select Set Timeout Value and enter the desired value.
- To disable the timeout function, select Delete/Disable Timeout.

NOTE When this option is selected, the server does not automatically boot. The server stops at the EFI boot menu and waits for user input.

Driver Configuration

Use this option to define the devices that display output from the system console. This list normally includes the VGA monitor and a serial port for directing output to a terminal emulation package.

NOTE If you install a modem in your server, make sure you disable the modem serial port in both the Active Console Input and Active Console Output device lists.

NOTE Some operating systems support multiple consoles, such as a simultaneous serial and VGA output. See your OS documentation to determine how many consoles are supported with your server. Multiple consoles are not supported for HP-UX or Windows (use the Smart Setup CD to switch between COM A and the iLO MP on Windows systems).

For example:

```
Select the Console Output Device(s)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (VtUtf8)
```

Using the Boot Configuration Menu

```

Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (VtUtf8)
* Acpi (HWP0002,700) /Pci (2|0)

```

* indicates a currently selected device.

This menu is identical to Console Error Devices. The HP Integrity rx4640 server does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

Table C-3 Console Output Devices

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP Serial Console	Acpi(HWP0002,700)/Pci(1 0)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP VGA Port	Acpi(HWP0002,700)/Pci(2 0)

- Each option is identified with an EFI device path. Not all options will be available, depending on the configuration of the server and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device (can be changed with the EFI shell baud command), VenMsg Vt100+ is the current emulation type (several different terminal emulation protocols are supported, see list above).
- Only one terminal emulation type (PcAnsi, Vt100, etc.) can be selected for each serial console, but multiple serial consoles can be selected at a time.

Driver Configuration

Use this option to define the devices that display output from the system console. This list normally includes the VGA monitor and a serial port for directing output to a terminal emulation package.

NOTE If you install a modem in your server, make sure you disable the modem serial port in both the Active Console Input and Active Console Output device lists.

NOTE Some operating systems support multiple consoles, such as a simultaneous serial and VGA output. See your OS documentation to determine how many consoles are supported with your server. Multiple consoles are not supported for HP-UX or Windows (use the Smart Setup CD to switch between COM A and the iLO MP on Windows systems).

For example:

```

Select the Console Output Device(s)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100)

```

```
* Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (VtUtf8)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (VtUtf8)
* Acpi (HWP0002,700) /Pci (2|0)
```

* indicates a currently selected device.

This menu is identical to Console Error Devices. The HP Integrity rx4640 does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

Table C-4 Console Output Devices

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP Serial Console	Acpi(HWP0002,700)/Pci(1 1)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP VGA Port	Acpi(HWP0002,700)/Pci(2 0)

- Each option is identified with an EFI device path. Not all options will be available, depending on the configuration of the server and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device (can be changed with the EFI shell baud command), VenMsg Vt100+ is the current emulation type (several different terminal emulation protocols are supported, see list above).
- Only one terminal emulation type (PcAnsi, Vt100, etc.) can be selected for each serial console, but multiple serial consoles can be selected at a time.

Console Configuration

Use this option to define the devices that display output from the system console. This list normally includes the VGA monitor and a serial port for directing output to a terminal emulation package.

NOTE If you install a modem in your server, make sure you disable the modem serial port in both the Active Console Input and Active Console Output device lists.

NOTE Some operating systems support multiple consoles, such as a simultaneous serial and VGA output. See your OS documentation to determine how many consoles are supported with your server. Multiple consoles are not supported for HP-UX or Windows (use the Smart Setup CD to switch between COM A and the iLO MP on Windows systems).

For example:

Using the Boot Configuration Menu

```

Select the Console Output Device(s)
  Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(PcAnsi)
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100)
* Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(VtUtf8)
Acpi(HWP0002,700)/Pci(1|1)/Uart(9600 N81)/VenMsg(PcAnsi)
Acpi(HWP0002,700)/Pci(1|1)/Uart(9600 N81)/VenMsg(Vt100)
* Acpi(HWP0002,700)/Pci(1|1)/Uart(9600 N81)/VenMsg(Vt100+)
Acpi(HWP0002,700)/Pci(1|1)/Uart(9600 N81)/VenMsg(VtUtf8)
* Acpi(HWP0002,700)/Pci(2|0)

```

* indicates a currently selected device.

This menu is identical to Console Error Devices. The HP Integrity rx4640 server does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

Table C-5 Console Output Devices

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP Serial Console	Acpi(HWP0002,700)/Pci(1 1)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP VGA Port	Acpi(HWP0002,700)/Pci(2 0)

- Each option is identified with an EFI device path. Not all options will be available, depending on the configuration of the server and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device (can be changed with the EFI shell baud command), VenMsg Vt100+ is the current emulation type (several different terminal emulation protocols are supported, see list above).
- Only one terminal emulation type (PcAnsi, Vt100, etc.) can be selected for each serial console, but multiple serial consoles can be selected at a time.

System Reset

Use this option to define the devices that display output from the system console. This list normally includes the VGA monitor and a serial port for directing output to a terminal emulation package.

NOTE If you install a modem in your server, make sure you disable the modem serial port in both the Active Console Input and Active Console Output device lists.

NOTE Some operating systems support multiple consoles, such as a simultaneous serial and VGA output. See your OS documentation to determine how many consoles are supported with your server. Multiple consoles are not supported for HP-UX or Windows (use the Smart Setup CD to switch between COM A and the iLO MP on Windows systems).

For example:

```
Select the Console Output Device(s)
  Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (VtUtf8)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (PcAnsi)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100+)
Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (VtUtf8)
* Acpi (HWP0002,700) /Pci (2|0)
```

* indicates a currently selected device.

This menu is identical to Console Error Devices. The HP Integrity rx4640 server does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

Table C-6 Console Output Devices

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP Serial Console	Acpi(HWP0002,700)/Pci(1 1)/Uart(9600 N81)/VenMsg(Vt100+)
iLO MP VGA Port	Acpi(HWP0002,700)/Pci(2 0)

- Each option is identified with an EFI device path. Not all options will be available, depending on the configuration of the server and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device (can be changed with the EFI shell baud command), VenMsg Vt100+ is the current emulation type (several different terminal emulation protocols are supported, see list above).
- Only one terminal emulation type (PcAnsi, Vt100, etc.) can be selected for each serial console, but multiple serial consoles can be selected at a time.

Using the System Configuration Menu

The System Configuration Menu (on servers with EFI firmware version 2.0 or higher) includes the following options:

- Advanced System Information
- Set System Time
- Set System Date
- Set User Interface
- Set System Wake-On LAN
- Set System Defaults

Advanced System Information

The Advanced System Information Menu displays information about server and component configuration.

Set System Time

Set System Time lets you modify the system time.

Set System Date

Set System Date lets you modify the system date.

Set User Interface

Set User Interface lets the user change the legacy boot manager user interface.

Set System Wake-On LAN

Set System Wake-On LAN lets the user enable/disable the system Wake-On_LAN settings.

Set System Defaults

Set System Defaults lets you select system default settings.

Using the Security Configuration Menu

The Security Configuration Menu (on servers with EFI firmware version 2.0 or higher) includes the following options:

- Administrator Password options
- User Password options

Administrator Password Options

Administrator Password Options lets the user set and clear the administrator password.

User Password Options

User Password Options lets the user set and clear the administrator password.

If you forget your passwords, they can be reset using an MP command. See the *HP Integrity and HP 9000 integrated Lights-Out Management Processor operations Guide* for more information.

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