

# **Installation Guide**

## **HP Integrity rx4640 Server**



**Manufacturing Part Number: A6961-96011**

**Seventh Edition**

**August 2006**

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## Localized Documentation

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## About This Document

This document provides information and instructions on installing the HP Integrity rx4640 server into a standard rack or tower configuration.

The document printing date and part number indicate the document's current edition. The printing date changes when a new edition is printed. Minor changes may be made at reprint without changing the printing date. The document part number changes when extensive changes are made.

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## 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 document is being updated as part of upgrading the HP Integrity rx4640 server.

## 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 or CD documentation.

**Table 1** Publishing History Details

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
A6961-90001	HP-UX, Windows®, Linux®	rx4640	January 2004
A6961-90008	HP-UX, Windows®, Linux®	rx4640	November 2004
A6961-96011	HP-UX, Windows®, Linux®, OpenVMS®	rx4640	August 2006

## Document Organization

This guide is divided into the following chapters.

Chapter 1	<b>Introduction</b> Use this chapter to learn about the features and specifications of the HP Integrity rx4640 server.
Chapter 2	<b>Unpack and Inspect the Server</b> Use this chapter to inspect the server in its shipping packaging, and unpacking it.
Chapter 3	<b>Installing Additional Components</b> Use this chapter for procedures on installing additional components purchased with the server that were not factory installed.
Chapter 4	<b>Installing the Server into a Rack or Tower</b> Use this chapter for procedures on how to mount the server into a rack or tower configuration.
Chapter 5	<b>Connecting Cables</b> Use this chapter for procedures on how to connect external cables to the server.
Chapter 6	<b>Console Connection and Setup</b> Use this chapter for procedures on how to start a console session on a newly installed server.
Chapter 7	<b>Powering on the Server</b> Use this chapter for procedures on how to power the server on.
Chapter 8	<b>Accessing the Host Console</b> Use this chapter to learn the different ways to access the host console.
Chapter 9	<b>Booting the Operating System</b> Use this chapter for procedures on how to boot the operating system on the server if not factory installed.
Chapter 10	<b>Troubleshooting</b> Use this chapter to learn about high-level troubleshooting procedures when installing the server.

## Typographic Conventions

This document uses the following conventions.

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

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

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

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*Book Title* 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.

*Emphasis* 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.
<b>UserInput</b>	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.

### Web Site 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 Web sites, among others:

- [http://docs.hp.com/windows\\_nt/](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/> Web site. This site has manuals, tutorials, FAQs, and other reference material.

### **Web Site for HP Technical Support:**

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

### **Books about HP-UX Published by Prentice Hall**

The <http://www.hp.com/hpbooks/> Web site 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](http://www.hp.com/hpbooks/prentice/ptr_0130600814.html)
- *HP-UX Virtual Partitions*  
[http://www.hp.com/hpbooks/prentice/ptr\\_0130352128.html](http://www.hp.com/hpbooks/prentice/ptr_0130352128.html)

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Please include title, manufacturing part number, and any comment, error found, or suggestion for improvement you have concerning this document. Also, please include what we did right so we can incorporate it into other documents.

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# 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-ROM. Its high availability features include redundant hot-swappable fans and redundant 200-240 VAC power supplies, hot-plug disk drives, and hot-plug PCI-X cards.

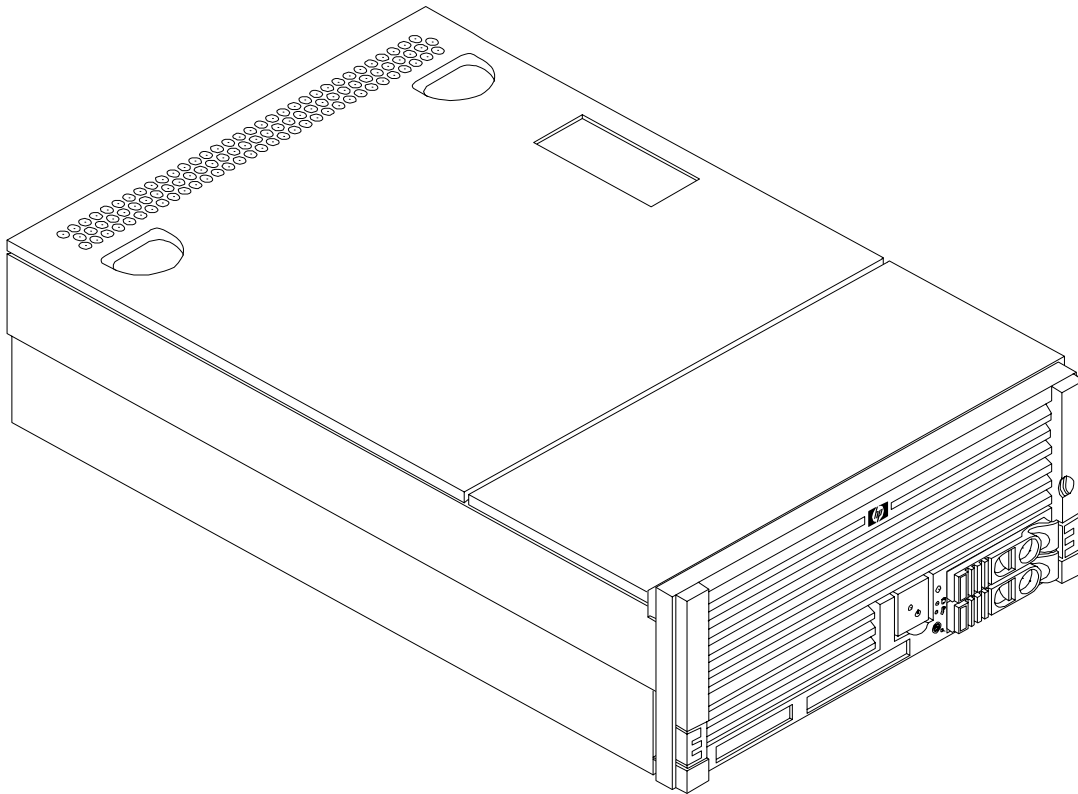
This chapter addresses the following topics:

- “Server Overview” on page 16.
- “Server Dimensions and Weight” on page 17.
- “Server Components” on page 18.
- “Supported Operating Systems” on page 20.
- “I/O Baseboard Switches and Jumpers” on page 21.

## Server Overview

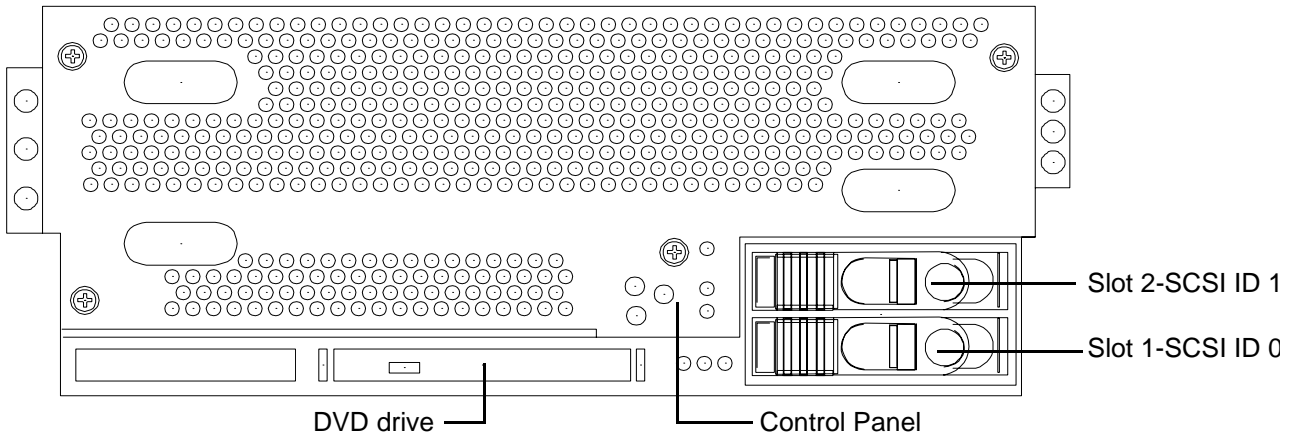
The HP Integrity rx4640 server is a 4U high Electronics Industry Association (EIA) enclosure, which mounts in any standard 19" EIA rack. All external cabling enters and exits from the rear of the enclosure. With the server installed in the rack, service access is enhanced by the use of chassis slides. 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, system locator switch and LED are located in the front within the control panel access door on the bezel. There is also a system locator switch and LED in the back of the server for easy identification in the rack. Refer to 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**

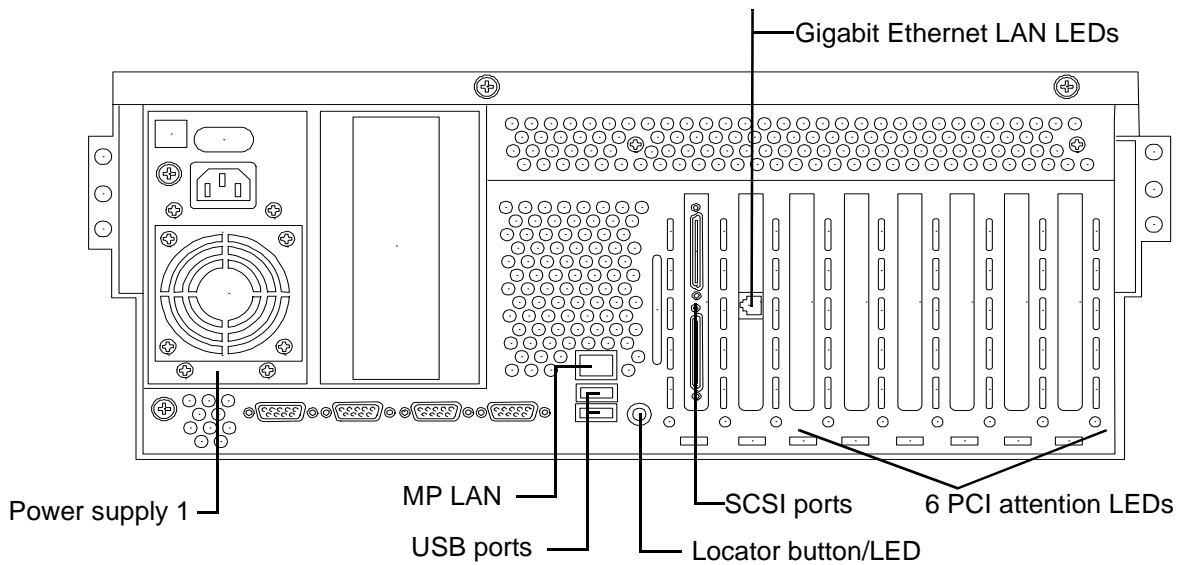




**Figure 1-2 HP Integrity rx4640 Server (front view with bezel removed)**



**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	68.8 cm (27.1 in.)
Weight	Unloaded - 34 kg (75 lb) Fully loaded - 43 kg (95 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
- All processors are dual core. The processor configuration options are 1-processor/2-core (1p/2c), 2p/4c, 3p/6c, or 4p/8c. The server can also be a 16 way server with hyperthreading turned on. However, the default is hyperthreading turned off at the factory.

### 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 266, CL2, registered, ECC
- 100 MHz memory bus frequency, 200 MTransfers/s data (data MUXing allows 400 MTranfers/sec), 12.8 GB/s peak data bandwidth
- DIMMs loaded by quads enable interleaved mode and chip sparing

### PCI Riser

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

### Internal Core I/O

- Dual channel SCSI U160 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 serial ports
- Two external USB 2.0 ports

- Two SCSI Ultra160/320 68-pin connectors. Two-port U320 RAID is also supported
- One 10/100/1000Base-T ethernet LAN connector
- Two 10/100 iLO MP LAN ports
- One VGA port

## Power Supply Unit

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

## Server Manageability

- Baseboard Management Controller (BMC)
- Temperature monitoring and fans regulation by BMC
- System Event Logs (SELs) provided 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 the Integrated Lights Out Management Processor

The integrated Lights Out Management Processor (iLO MP) provides the ability to manage and monitor many of the server's processes and functions, including:

- LAN telnet console
- Web GUI
- Serial port for local console
- Serial port for modem console
- Duplication of console screen content across all consoles
- Remote system power and reset control
- Access to the field replaceable unit identification (FRUID) numbers

## 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 Chapter 9, “Booting the Operating System,” on page 81.



**Table 1-2 I/O Baseboard Indicators, Connectors, and Jumpers**

LED Indicators		Connectors		Jumpers	
Ref Des	Function	Ref Des	Function	Ref Des	Function
DS0907	Slot 8 attn	P2314	DHPC JTAFG	P5704	AC range-off
DS0805	Slot 8 attn	P4506	BMC DUART	P5705	Console mux-off
DS0806	Slot 8 power	P5301	12V VRM module	P5708	Mfg/Schmoo-off
DS1922	Slot 7 attn	P5603	3.3V VRM module	P8412	Manual power on-off
DS1810	Slot 7 attn	J6607	5V VRM module	S5102 Pos 1	VGA enable On-rx4640
DS1808	Slot 7 power	J6305	PDH monitor connector	S5102 Pos 2	N/A
DS1921	Slot 6 attn	P5401	RiLoe connector	S5102 Pos 3	N/A
DS1811	Slot 6 attn	J5604	Scan connector	S5102 Pos 4	N/A
DS1813	Slot 6 power	P6406	BMC JTAG	S5103 Pos 1	
DS2917	Slot 5 attn	P6407	BMC test header	S5103 Pos 2	
DS2807	Slot 5 attn	J7605	MP JTAG	S5103 Pos 3	
DS2809	Slot 5 power	P7502	12C bus 2 header	S5103 Pos 4	Don't care
DS2918	Slot 4 attn	P7503	12C bus 1 header		

**Table 1-2 I/O Baseboard Indicators, Connectors, and Jumpers (Continued)**

LED Indicators		Connectors		Jumpers	
Ref Des	Function	Ref Des	Function	Ref Des	Function
DS2808	Slot 4 attn	P8204	ACPI events		
DS2806	Slot 4 power	P8304	LPC bus header		
DS3916	Slot 3 attn	J9503	MP data bus debug header		
DS3808	Slot 3 attn	J98611	MP data bus debug header		
DS3809	Slot 3 power	J9602	MP data bus debug header		
DS5501	12V power	P9505	IPMB bus between BMC and MP		
DS5808	3.3V power	J9803	Core I/O debug connector		
DS6113	3.3 VSB power	J2001	Left fan or fan 0		
DS5809	5V power	J6002	Middle fan or fan 1		
DS5815	BMC heartbeat	J7001	Right fan or fan 2		
DS5816	MP heartbeat	J6004	Hi-speed backplane for ropes		
DS8816	MP ROM error	J7003	Hi-speed backplane for ropes		
DS9906	MP selftest	J7002	Hi-speed backplane for ropes		
		J9006	Low-speed backplane for ropes		
		J5910	Dual USB and MP LAN		
		J6921	DB-15 analog video		
		JD7901	DB-9 remote/console RS-232		
		J8906	DB-9 auxillary RS-232		
		J9905	DB-9 local RS-232		
		J6502	Frequency input for margin		

## Data Pathing Information

Table 1-3 shows information about data pathing in the HP Integrity rx4640 server.

**Table 1-3 Data Pathing**

Slot Number	Bus Number	Device Number	Function Number	Device ID	Path
xx	00	01	00	0x1290	Acpi(HWP0002,PNP0A03,0)/Pci(1 0)
xx	00	01	01	0x1048	Acpi(HWP0002,PNP0A03,0)/Pci(1 1)
xx	00	02	00	0x0035	Acpi(HWP0002,PNP0A03,0)/Pci(2 0)
xx	00	02	01	0x0035	Acpi(HWP0002,PNP0A03,0)/Pci(2 1)
xx	00	02	02	0x00E0	Acpi(HWP0002,PNP0A03,0)/Pci(2 2)
xx	00	03	00	0x0649	Acpi(HWP0002,PNP0A03,0)/Pci(3 0)
xx	00	04	00	0x5159	Acpi(HWP0002,PNP0A03,0)/Pci(4 0)
01	20	01	00	0x0021	Acpi(HWP0002,PNP0A03,100)/Pci(1 0)
01	20	01	01	0x0021	Acpi(HWP0002,PNP0A03,100)/Pci(1 1)
02	20	02	00	0x1645	Acpi(HWP0002,PNP0A03,100)/Pci(2 0)
03	80	01	00	0x2312	Acpi(HWP0002,PNP0A03,400)/Pci(1 0)
03	80	01	01	0x2312	Acpi(HWP0002,PNP0A03,400)/Pci(1 1)
04	80	02	00	0x01A7	Acpi(HWP0002,PNP0A03,400)/Pci(2 0)
05	A0	01	00	0x000B	Acpi(HWP0002,PNP0A03,500)/Pci(1 0)
05	A0	01	01	0x000B	Acpi(HWP0002,PNP0A03,500)/Pci(1 1)
06	A0	02	00	0x1029	Acpi(HWP0002,PNP0A03,500)/Pci(2 0)
07	40	01	00	0x1029	Acpi(HWP0002,PNP0A03,200)/Pci(1 0)
08	C0	01	00	0x01A7	Acpi(HWP0002,PNP0A03,600)/Pci(1 0)
08	C1	04	00	0x2312	Acpi(HWP0002,PNP0A03,600)/Pci(1 0)/
08	C1	06	00	0x16C7	Acpi(HWP0002,PNP0A03,600)/Pci(1 0)/



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## 2 Unpacking and Inspecting the Server

This chapter describes procedures performed before installation. You must ensure that you have adequately prepared your environment for your new server, received the components that you ordered, and verified that the server and its containers are in good condition after shipment.

This chapter addresses the following topics:

- “Verify Site Preparation” on page 26.
- “Inspect the Shipping Containers for Damage” on page 26.
- “Unpack the Server” on page 26.
- “Check the Inventory” on page 27.
- “Damaged Equipment Returns” on page 27.
- “Unload the Server with a Lifter” on page 27.

## Verify Site Preparation

Verifying site preparation is an essential factor of a successful server installation, and includes the following tasks:

- Gather LAN information: Determine the two separate IP addresses for the MP LAN and the server LAN.
- Establish a method to connect to the server console. For more information on console connection methods, see Chapter 6, “Console Connection and Setup,” on page 63.
- Verify electrical requirements: Ensure the grounding specifications and power requirements have been met.
- Validate server physical space requirements.
- Confirm environmental requirements.

For more information on server electrical, physical space, and environmental requirements, refer to the *HP Integrity rx4640 Site Preparation Guide*.

---

## Inspect the Shipping Containers for Damage

HP shipping containers protect their contents under normal shipping conditions. After the equipment arrives, carefully inspect each carton for signs of shipping damage. Shipping damage constitutes moderate to severe damage, such as punctures in the corrugated carton, crushed boxes, or large dents. Normal wear or slight damage to the carton is not considered shipping damage. If you find shipping damage to the carton, contact your HP customer service representative immediately.

---

## Unpack the Server

The following procedure describes how to unpack a nonracked server.

- Step 1.** Use the instructions printed on the outside top flap of the carton; remove the banding and the outer carton from the server pallet.
  - Step 2.** Remove all inner accessory cartons and the top foam cushions, leaving only the server.
- 

**IMPORTANT** Inspect each carton for shipping damage as you unpack the server.

---

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## Check the Inventory

The sales order packing slip lists all of the equipment shipped from HP. Use this packing slip to verify that all of the equipment has arrived.

---

**NOTE** To identify each item by part number, refer to the sales order packing slip.

---

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## Damaged Equipment Returns

If the equipment has any damage, you must immediately contact your HP customer service representative. The service representative initiates appropriate action through the transport carrier or the factory and assists you in returning the equipment.

---

## Unload the Server with a Lifter

To unload the server from the pallet using a lifter (if necessary), perform the following steps:

---

**WARNING** Use caution when using a lifter. Because of the weight of the server, you must center the server on the lifter forks before lifting it off the pallet to avoid injury.

---

- Step 1.** Unpack the server.
- Step 2.** Unroll the bottom corrugated tray corresponding to the side on which the lifter will be placed and slide the server as close to that edge of the pallet as possible.
- Step 3.** Break off any foam packaging which could prevent the lifter from being fully inserted under the server. Do not remove the foam packaging from the corners of the server. This foam is required to elevate the server and allow the forks of the lifter to be placed under the server.
- Step 4.** Insert the lifter forks under the server.
- Step 5.** Carefully roll the lift forward until it is fully positioned against the side of the server.
- Step 6.** Slowly raise the server off the pallet until it clears the pallet cushions.
- Step 7.** Carefully roll the lifter and server away from the pallet. Do not raise the server any higher than necessary when moving it over to the rack.

---

**NOTE** HP recommends the use of a lifter, such as a RonI Company model 17000 SP 400 lifting device, when moving a non-racked server.

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# 3 Installing Additional Components

This chapter provides instructions needed to install additional components into the HP Integrity rx4640 server.

This chapter addresses the following topics:

- “Safety Information” on page 30.
- “Service Tools Required” on page 30.
- “Accessing a Rack-Mounted Server” on page 30.
- “Accessing a Pedestal-Mounted Server” on page 31.
- “Installing External Components” on page 33.
- “Accessing Internal Components” on page 36.
- “Installing Internal Components” on page 39.

## Safety Information

This chapter describes installing additional or optional hardware to your HP Integrity rx4640 server.

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.**

---

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## 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 an HP Integrity rx4640 server that is mounted in an approved rack.

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**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.**

---

## Extend the Server from the Rack

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**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, perform the following steps:

- Step 1.** Remove the T-25 screws that fasten the server to the rack.
- 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. After your server is fully extended, the front and top covers are accessible.

## Insert the Server into the Rack

To insert the server into the rack, perform the following 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

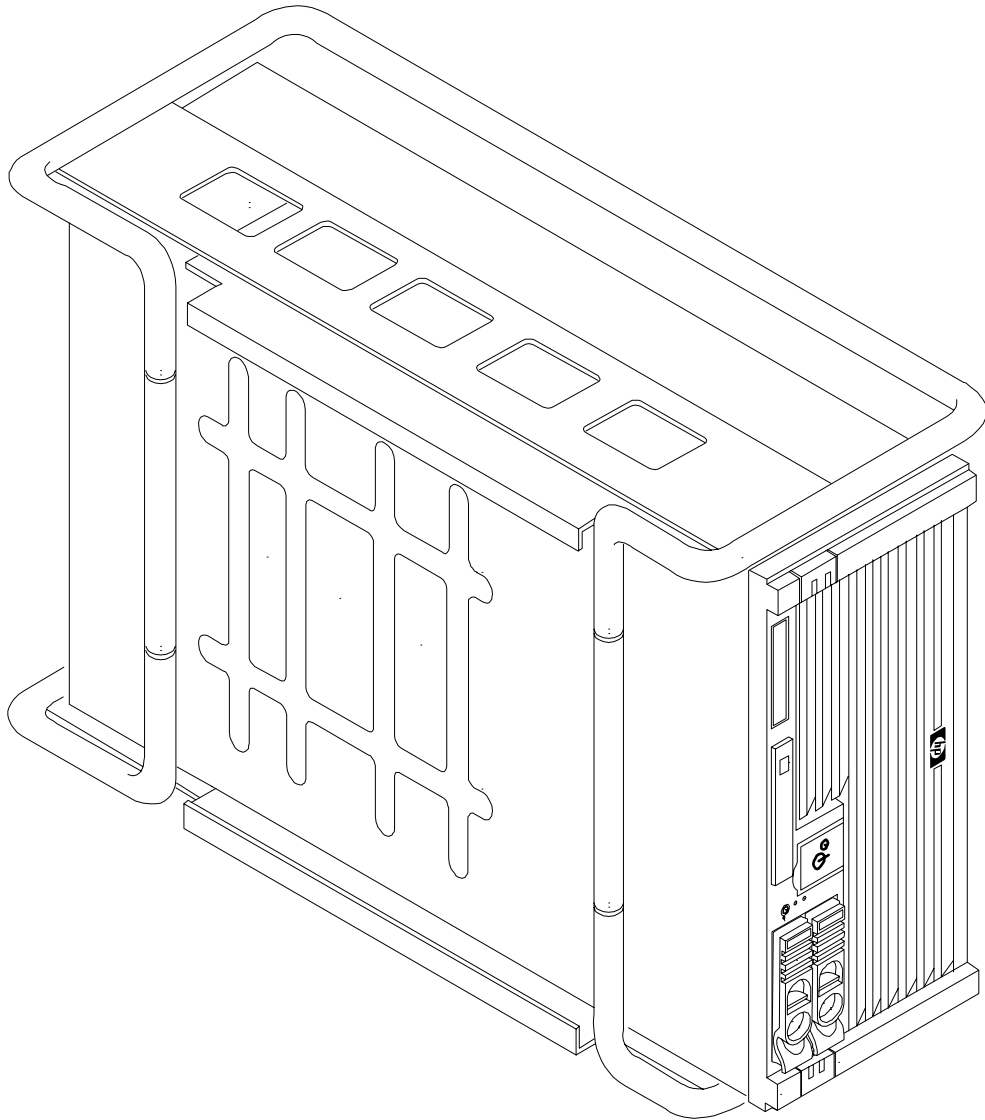
The HP Integrity rx4640 server is also designed to be pedestal mounted. You do not need to remove the pedestal from the HP server to gain access to internal components. The front bezel, front cover, and top cover may be removed with the pedestal attached to the HP server.

---

**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 3-1 Pedestal Mounted HP Integrity rx4640**





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## Installing External Components

This section provides information about installing external components in the HP Integrity rx4640 server. The external components are the power supplies and hot-plug disk drives. The hard disk drives are located on the front panel, and the power supplies are located at the rear of the server.

### Installing a Hard Disk Drive

One additional hot-plug disk drive may be added to your HP Integrity rx4640 server in slot 2. Always use low profile disk drives (1.0" height) in your HP server. Figure 3-2 shows the hard disk drive slot locations.

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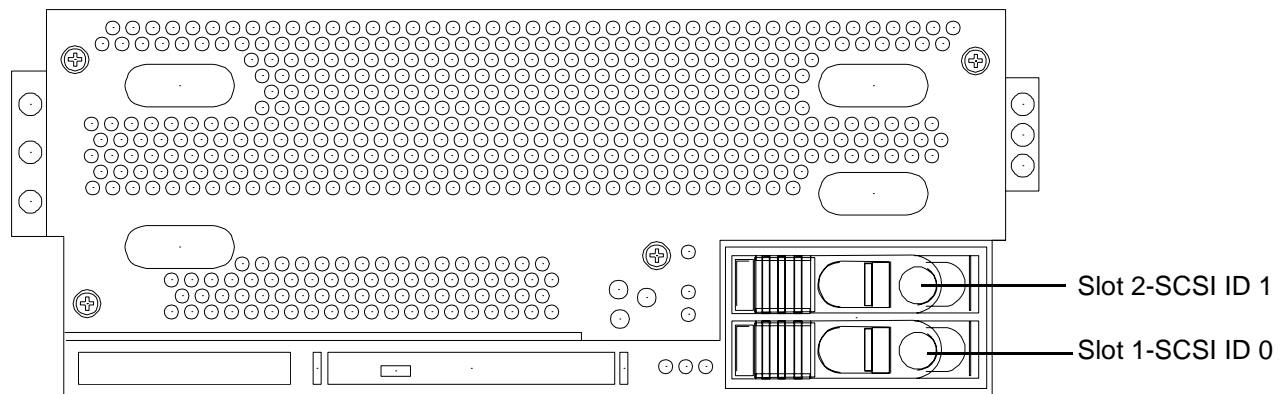
**NOTE** The hard disk drives are hot-pluggable.

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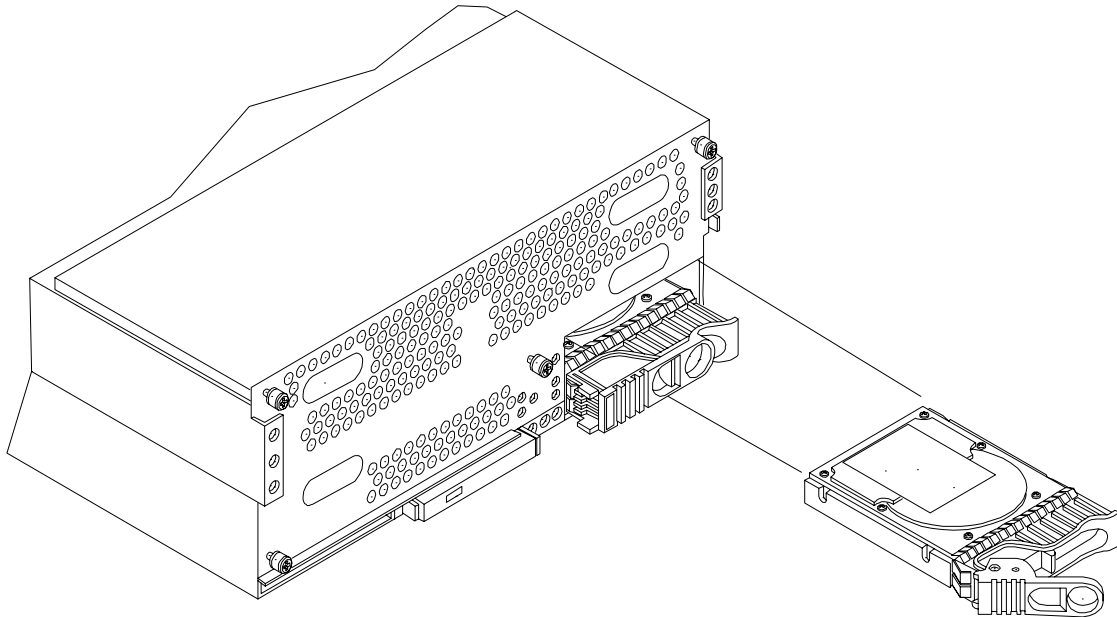
To install an additional hot-plug disk drive, perform the following steps:

- Step 1.** Remove the hard disk drive slot filler from slot 2 by grasping it and pulling it straight out.
- Step 2.** Slide the hot-plug hard disk into slot 2 until it is seated.
- Step 3.** Close the drive ejector handle by pushing it down until it clicks.
- Step 4.** The hot-plug disk drive is now correctly installed.

**Figure 3-2** Disk Drive Slot Locations



**Figure 3-3**      **Disk Drive Installation in Slot 2**



### Installing a Power Supply Unit

The supported configuration of an HP Integrity rx4640 server requires a minimum of one 200-240 VAC power supply unit to be installed. A second PSU can be installed to provide N+1 capability.

The left side (viewing from the rear) hot-swap PSU is identified as P 0, and the second hot-swap power supply is identified as P 1. Each PSU requires a separate power cord, installed in the appropriate power cord receptacle, and attached to a power cord support bracket. Figure 3-4 shows the power supply locations on the rear panel of the server.

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**NOTE**      The power supplies are hot-swappable.

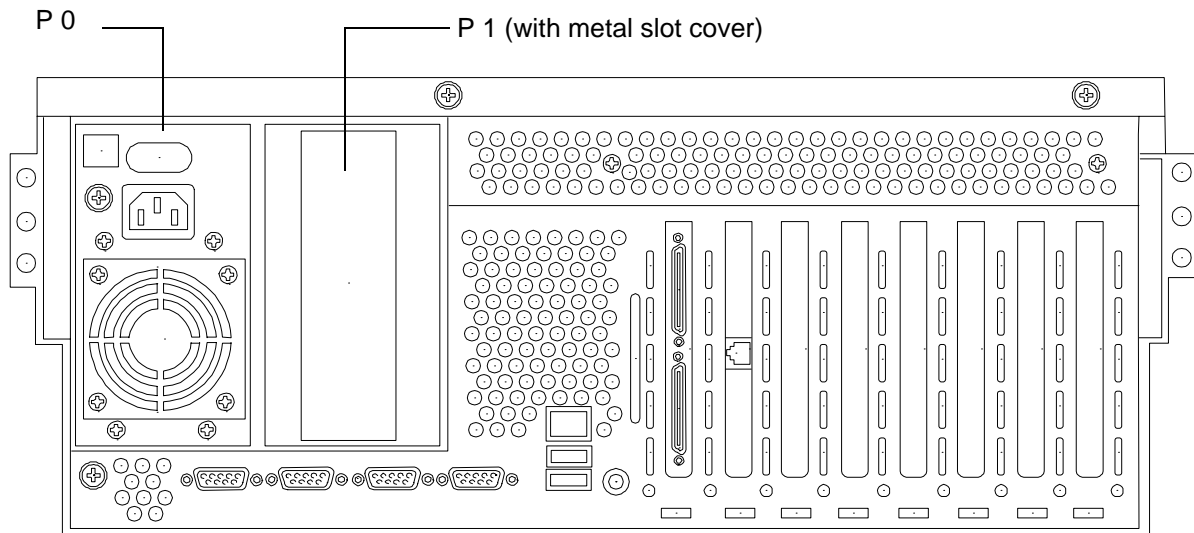
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**WARNING**    **Be careful when installing a power supply. It is heavier than it appears.**

---

**Figure 3-4** Power Supply Locations



To install a hot-swap power supply to slot P 1, perform the following steps:

- Step 5.** From the rear of the server, remove the metal cover from slot P 1. Grasp the metal cover and pull straight out.
- Step 6.** Supporting the PSU with both hands, slide it into slot P 1 until it plugs into the socket on the internal power supply board. Tighten thumbscrew hand tight.
- Step 7.** Install the power cord into the PSU socket and secure it to the power cord bracket.
- Step 8.** Apply power to the new PSU; the LED should immediately turn on.

## Accessing Internal Components

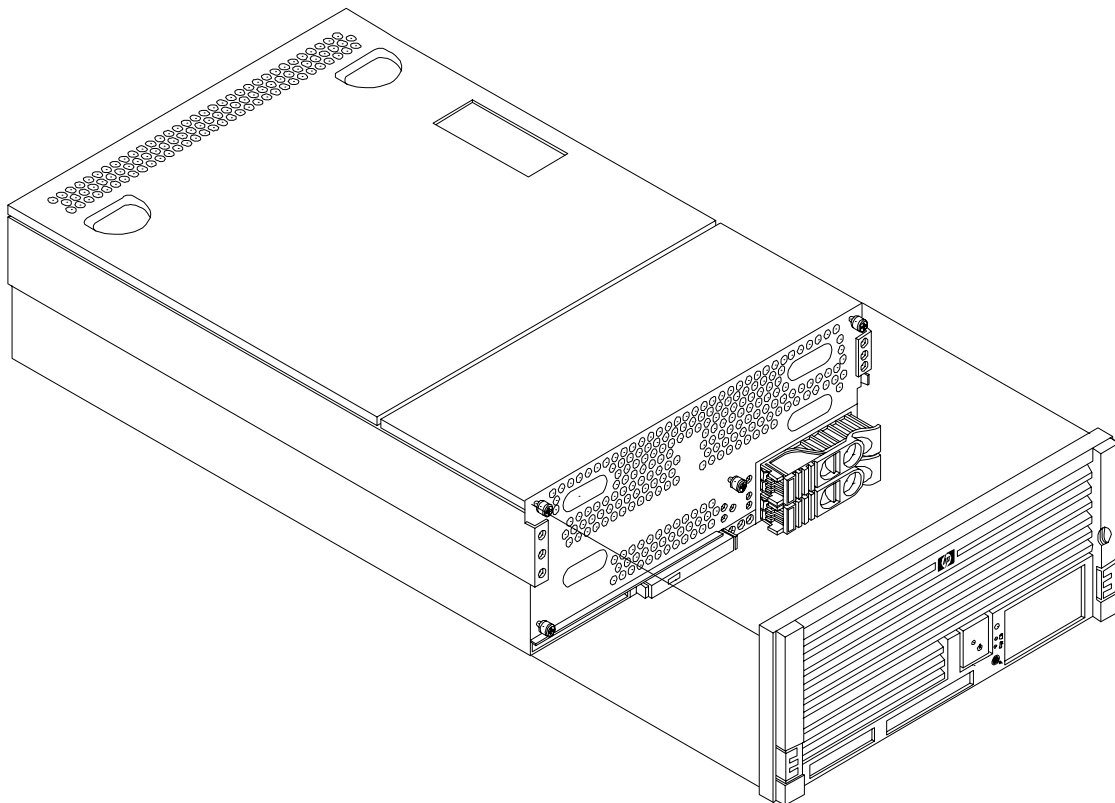
The following sections detail how to access the internal components of the HP Integrity rx4640 server. The server has a front bezel, a front cover, and a top cover that need to be removed to access the internal components. They include:

- “Removing the Front Bezel” on page 36.
- “Removing the Front Cover” on page 37.
- “Removing the Top Cover” on page 38.

### Removing the Front Bezel

The server does not have to be powered off to remove the front bezel.

**Figure 3-5** 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.

#### Installing the Front Bezel

To install the front bezel, perform the following step:

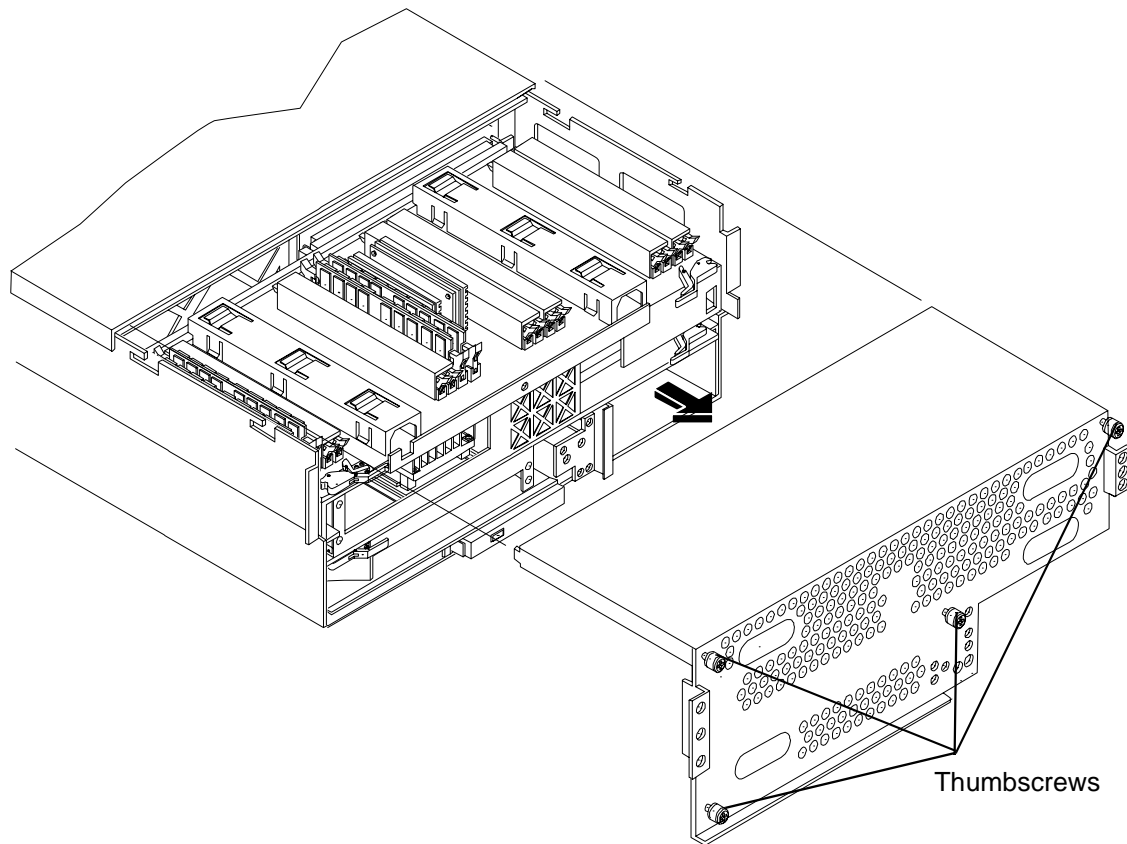
**Step 1.** Push the front bezel straight into the chassis until it snaps into place.

## Removing the Front Cover

**CAUTION** Do not operate the server without the front and top covers in place. Operation of the HP server without the front and top covers in place makes the server susceptible to EMI and overheating problems, which results in server failure.

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

**Figure 3-6** Removing and Replacing the Front Cover



To remove the front cover, perform the following 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 30.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 36.
- Step 3.** Loosen the four captive thumbscrews that hold the front cover in place. Figure 3-6 shows the thumbscrews on the front panel.
- 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, perform the following steps:

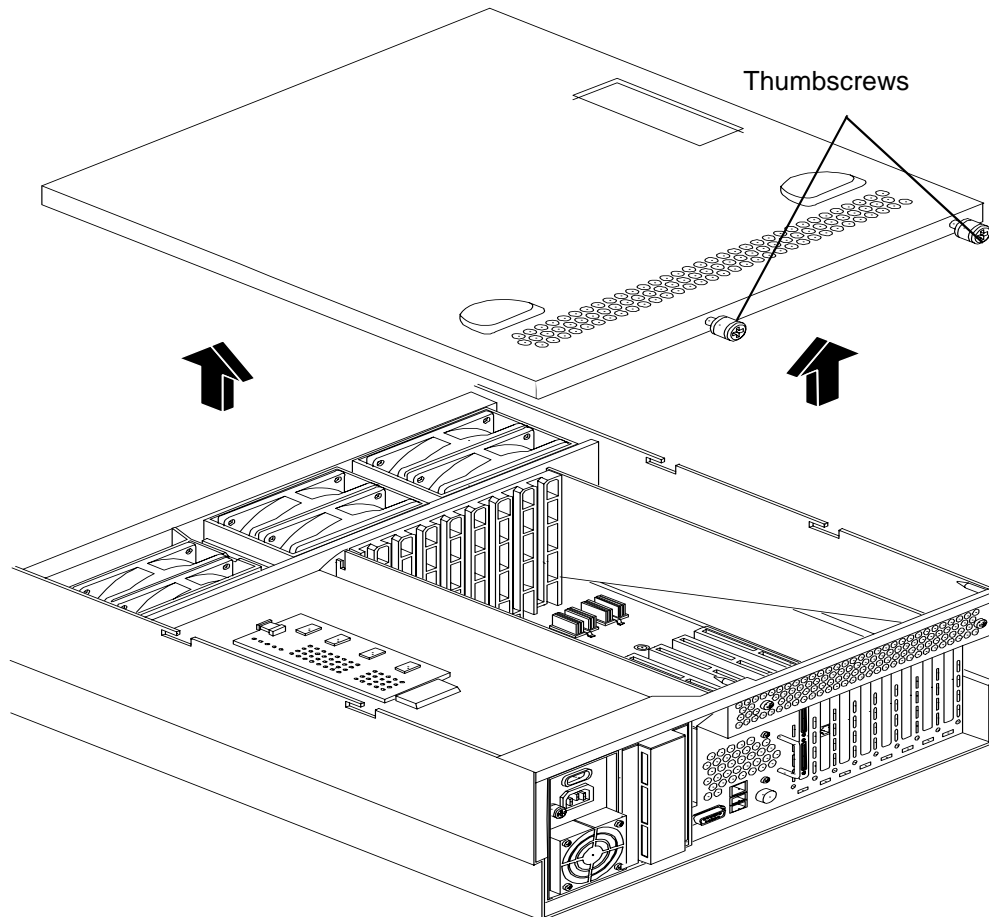
- Step 1.** Align the tabs at the rear of the front cover with the corresponding slots in the chassis and fully seat the tabs into the slots.
- Step 2.** Tighten the four thumbscrews securely.
- Step 3.** Replace the front bezel.
- Step 4.** If rack-mounted, slide the HP server into the rack until it stops.

### Removing the Top Cover

To remove the top cover, perform the following 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 30.
- Step 2.** Loosen the two captive thumbscrews on the rear panel of the server that hold the top cover in place. Figure 3-7 shows the thumbscrew locations.
- Step 3.** Pull the cover toward the rear of the server to free the tabs from the slots in the center of the chassis and lift it straight up.

**Figure 3-7** Removing and Replacing the Top Cover



## Replacing the Top Cover

To replace the top cover, perform the following steps:

- Step 1.** Align the tabs at the rear of the top cover with the corresponding slots in the chassis and fully seat the tabs into the slots and push forward until it seats.
- Step 2.** Tighten the two thumbscrews securely.
- Step 3.** If rack-mounted, slide the HP server into the rack until it stops.

---

## Installing Internal Components

This section provides information about installing additional internal components into the HP Integrity rx4640 server. This includes processors, memory and PCI-X cards. The processors and memory extender boards are located under the front cover, and the PCI-X cards are located under the top cover.

---

**WARNING** 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.

**Ensure that the server is powered-down and all power sources have been disconnected from the server prior to attempting the following procedures.**

**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 may result in damage to the server.

---

## Installing Processors

---

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

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

---

---

**NOTE** Additional processors come with a processor installation wrench shown in Figure 3-12. Use the wrench to install an additional processor.

---

### Processor Load Order

Processors are attached to the processor extender board, which is located under the top cover in the top service bay, directly under the memory extender board. The processor extender board holds up to four processors. Sockets CPU 0 and CPU 1 are located on the top of the processor extender board, and sockets CPU 2 and CPU 3 are located on the bottom. Processors must be installed in a specific order. The processor installation order is shown in Table 3-1.

**Table 3-1 Processor Load Order**

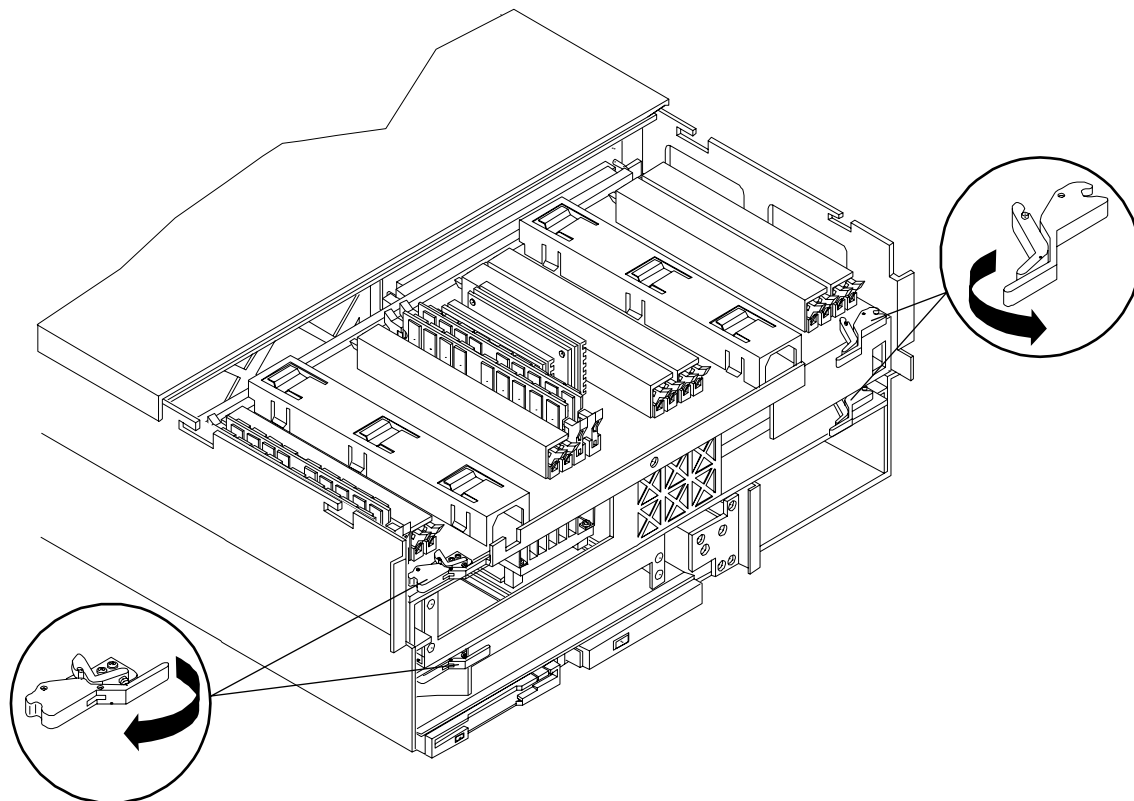
Processors	Socket
First	CPU 0
Second	CPU 1
Third	CPU 2
Fourth	CPU 3

---

**CAUTION** Do not modify the settings of the DIP switches located on the processor extender board. These switches are for factory use only. Failure to observe this caution results in server failure.

---

**Figure 3-8 Extender Board Latches**





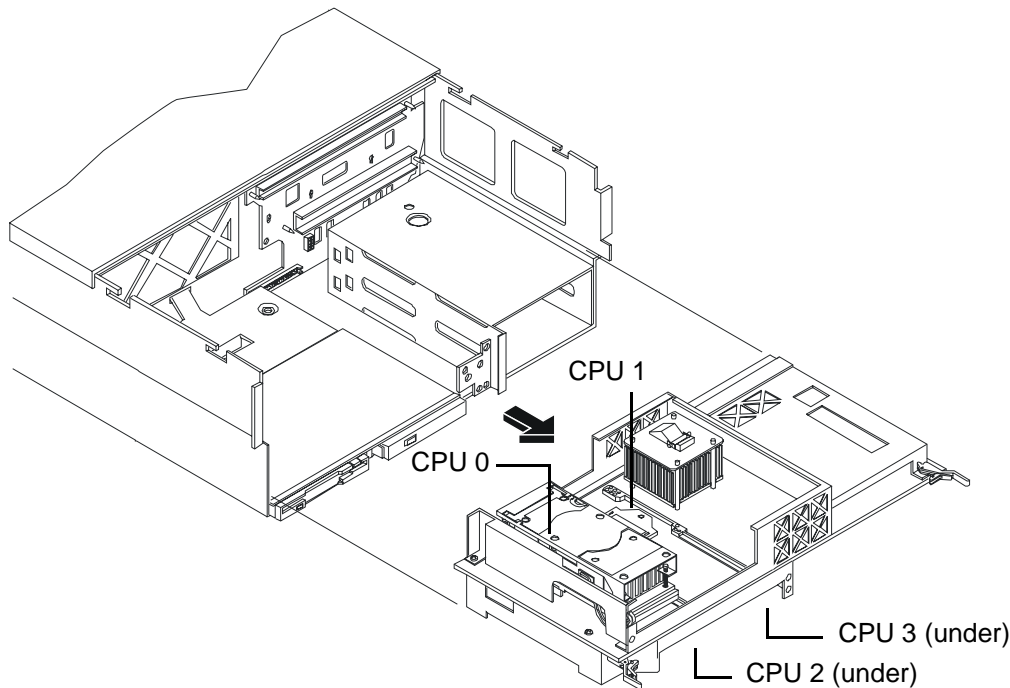
## Installing an Additional Processor on the Extender Board

To install a processor on the processor extender board, perform the following steps:

Prior to installing a processor into your server, read the following instructions carefully, and see Figure 3-12 for a complete understanding of this process.

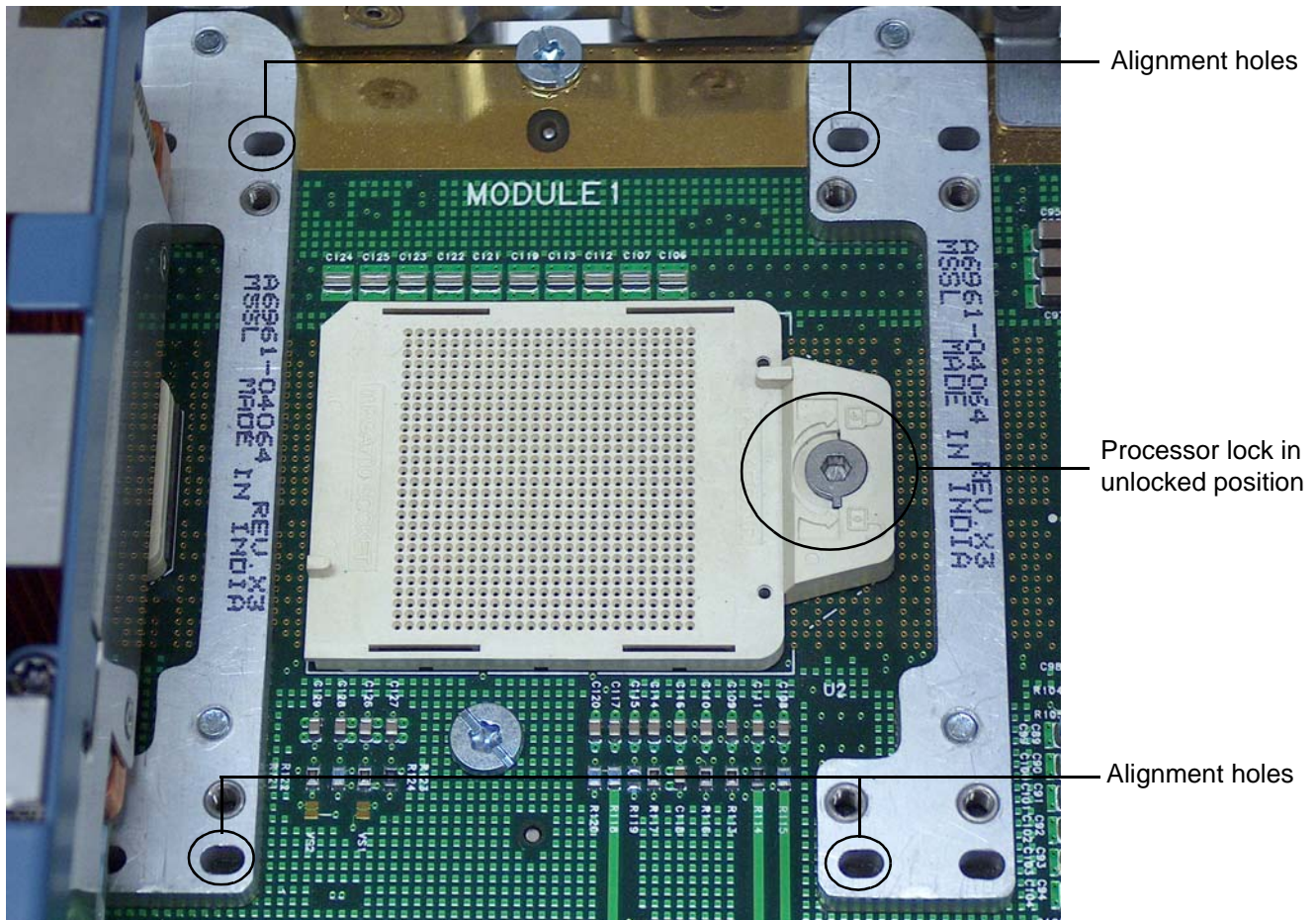
- Step 1.** If rack-mounted, slide the HP server out from the rack until it stops. See “Accessing a Rack-Mounted Server” on page 30.
- Step 2.** Remove the front bezel. See “Removing the Front Bezel” on page 36.
- Step 3.** Remove the front cover. See “Removing the Front Cover” on page 37.
- Step 4.** Press the latch on each extraction lever located on each side of the processor extender board.
- Step 5.** Pull out on the extraction levers to unplug the processor extender board from the socket located on the midplane riser board.

**Figure 3-9** Removing Processor Extender Board



- Step 6.** Using an antistatic wrist strap, place the extender board on a grounding mat (Electrically Conductive Field Service Grounding Kit-HP 9300-1155).
- Step 7.** Ensure that the processor socket lock is in the unlocked, counterclockwise position as shown in Figure 3-10.

**Figure 3-10 CPU 1 Socket Unlocked**



**Step 8.** Carefully lower the processor, without the sequencer clamp, onto the processor socket. Align the pins on the bottom of the heatsink to the holes in the retention frame on the extender board as shown in Figure 3-10.

---

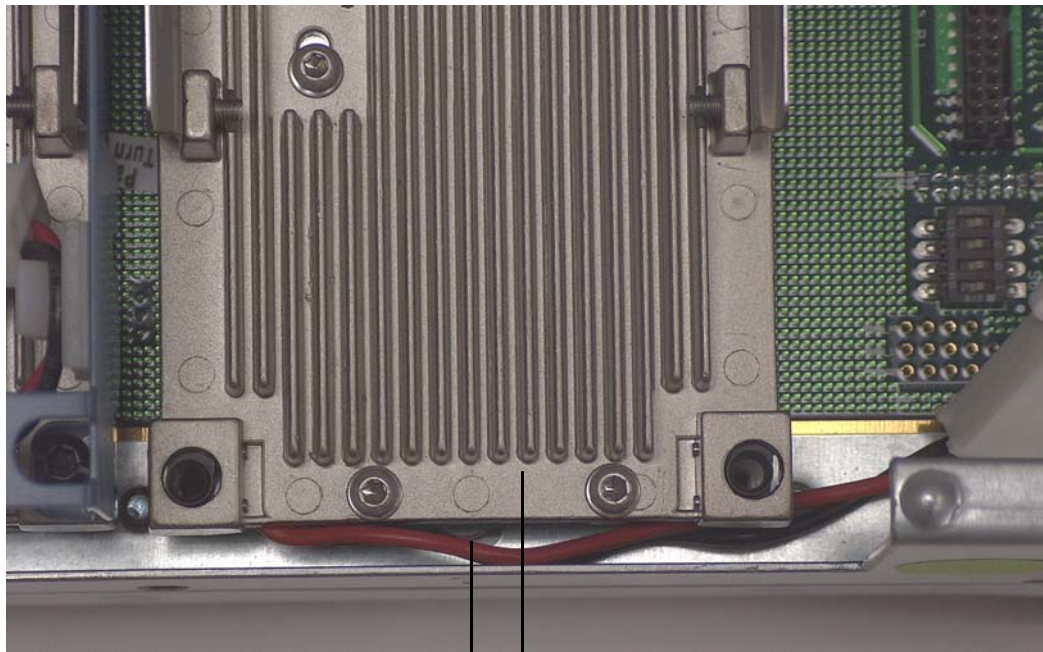
**CAUTION** Test the alignment of the assembly to the socket by gently moving the assembly back and forth with the palm of your hand—you should feel little or no sideplay. However, because the assembly is not yet tightened, it may tilt slightly towards the center of the extender board—this is acceptable.

---

**CAUTION** Before locking the processor assembly into its socket, ensure that the power cable is not pinched between the heatsink and sheetmetal frame of the extender board, or routed under the processor when installing the processor onto the processor extender board. Figure 3-11 shows the power cables routed correctly next to the processor.

---

**Figure 3-11 Processor Cable Placed Correctly**



**Correct routing of CPU 1 power cable** — **CPU 1**

**Step 9.** Lock the assembly to the socket by rotating the cam on the socket 180 degrees clockwise with the processor installation tool.

---

**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.

---

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

**Step 11.** Place the sequencer frame over the processor as shown in Figure 3-12.

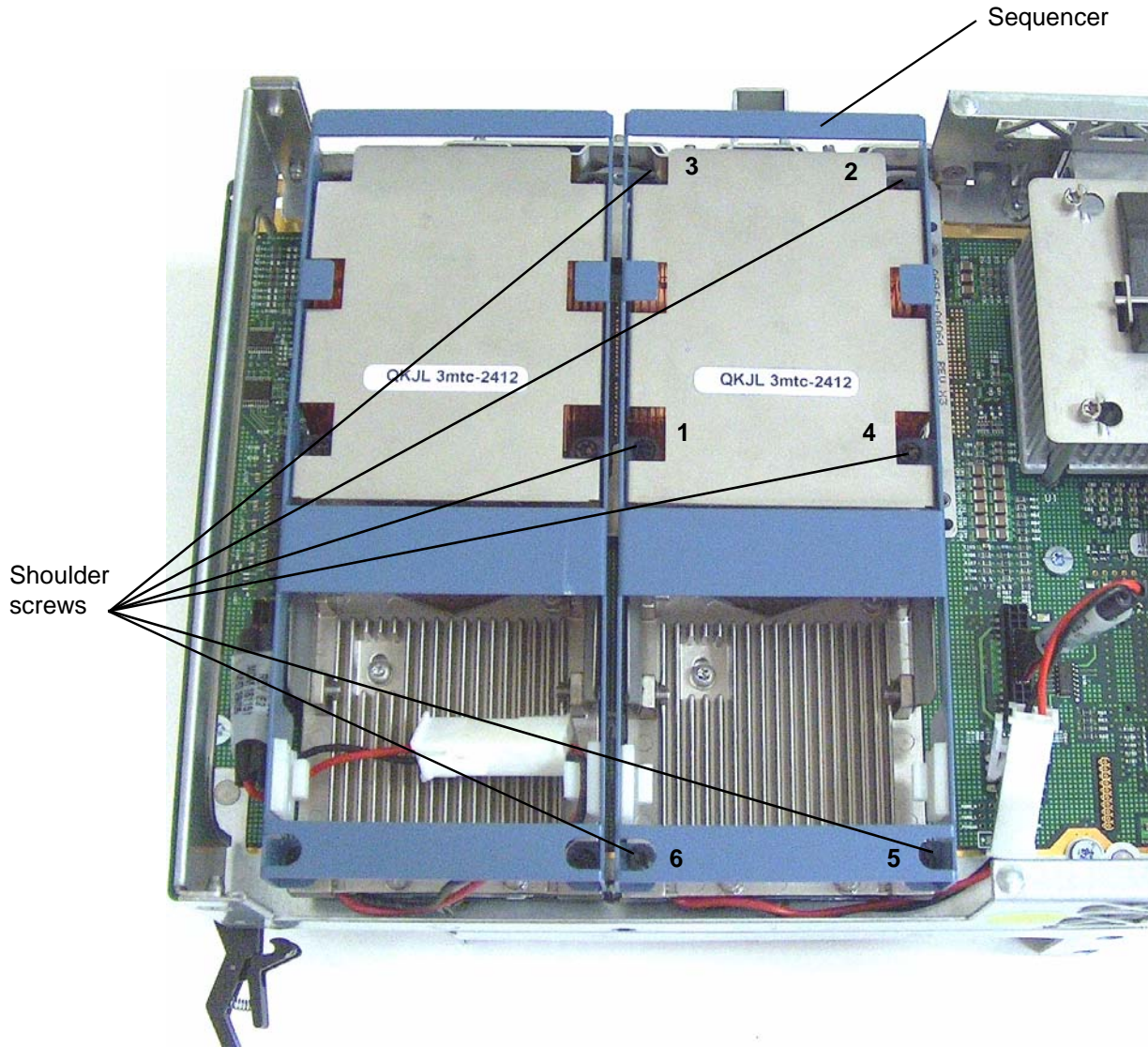
**Step 12.** Using the supplied torx T15 driver, tighten the six shoulder screws in the sequence shown in Figure 3-12.

---

**CAUTION** Do not overtighten the 6 shoulder screws—they may shear off if overtightened. Stop tightening the shoulder screws when you feel them just bottom out.

---

**Figure 3-12**      **Installing Additional Processor on Extender Board**



- Step 13.** Replace the extender board into the chassis.
- Step 14.** Replace the front cover.
- Step 15.** Replace the front bezel.
- Step 16.** If rack-mounted, slide the HP server into the rack until it stops.

## Installing Additional Memory

Your HP Integrity rx4640 server comes with a 16 DIMM memory extender board that is minimally configured with 1 GB of memory (four 256 Mb DIMMs loaded in quad 0 (slots 0A, 0B, 0C, and 0D)). Figure 3-13 shows the minimum configuration and the slot locations on the 16 DIMM memory extender board. The maximum memory supported is 64 GB (sixteen 4 GB DIMMs).

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. Figure 3-14 shows the minimum configuration and the slot locations on the 32 DIMM memory extender board. The maximum memory supported is 128 GB (thirty-two 4 GB DIMMs).

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 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, use DIMM fillers to fill unused slots.

### DIMM Slot Quads

Table 3-2 and Table 3-3 show the DIMM slot quads for the standard 16 DIMM memory extender board and the optional 32 DIMM memory extender board.

**Table 3-2 Quads on the Standard 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 3-3 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

**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 3-4 and Table 3-5 for filler requirements of the 16 and 32 DIMM 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 you will always retain the correct configuration.

---

**Table 3-4 DIMM Filler Requirements for 16 DIMM Extender Board**

<b>16 DIMM Extender Board</b>	
<b>DIMMs Loaded</b>	<b>Fillers Required<sup>a</sup></b>
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 quads 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.

**Table 3-5 DIMM Filler Requirements for 32 DIMM Extender Board**

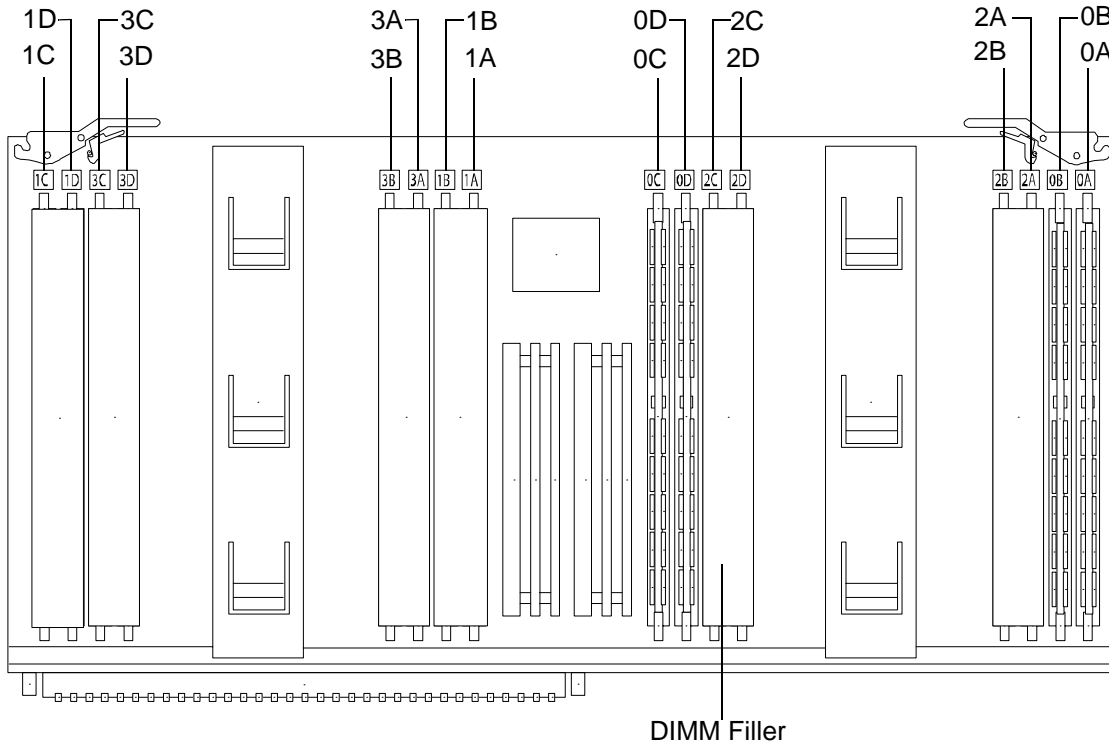
<b>32 DIMM Extender Board</b>	
<b>DIMMs Loaded</b>	<b>Fillers required<sup>a</sup></b>
4 DIMMs in quad 0	12 fillers total: 2 fillers in quads 1, 3, 4, 5, 6 and 7 (quad 2 remains unfilled)

**Table 3-5 DIMM Filler Requirements for 32 DIMM Extender Board (Continued)**

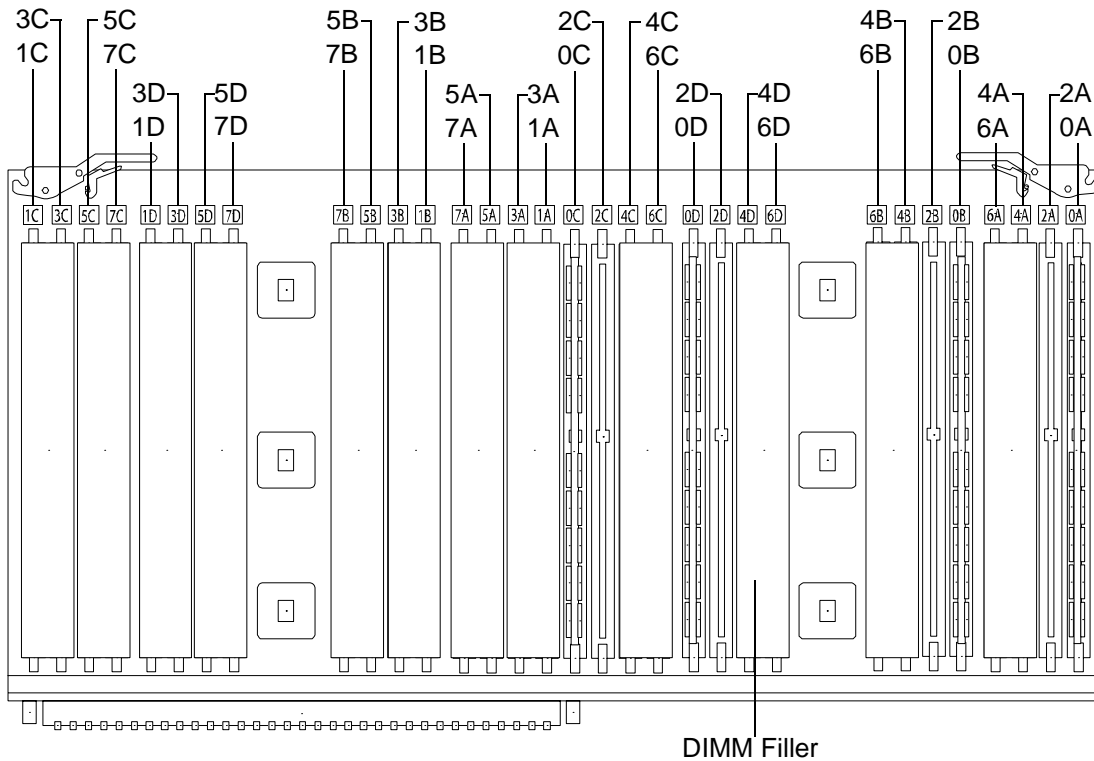
<b>32 DIMM Extender Board</b>	
8 DIMMs in quads 0 and 1	8 fillers total: 2 fillers in quads 4, 5, 6 and 7 (quads 2 and 3 remain unfilled)
12 DIMMs in quads 0, 1, and 2	8 fillers total: 2 fillers in quads 4, 5, 6 and 7 (quad 3 remains unfilled)
16 DIMMs in quads 0, 1, 2, and 3	8 fillers total: 2 fillers 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.

**Figure 3-13 16 DIMM Extender Board Minimum Configuration and Slot Locations**



**Figure 3-14 32 DIMM Extender Board Minimum Configuration and Slot Locations**





### Removing the Memory Extender Board

To remove a memory extender board, perform the following steps:

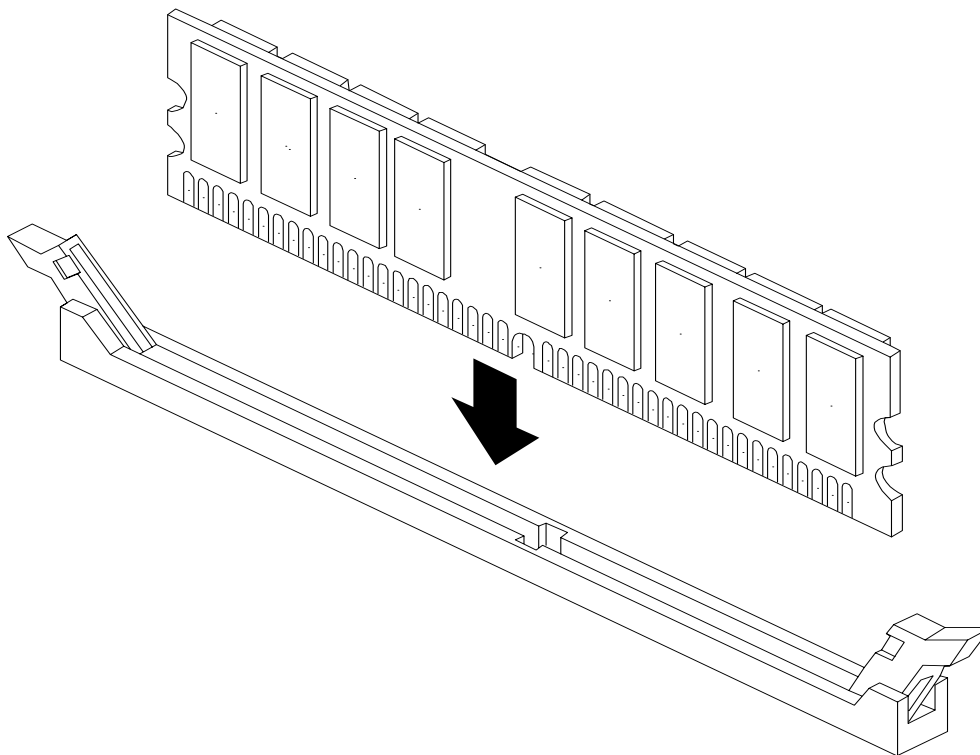
- Step 1.** If rack-mounted, slide the HP server out from the rack until it stops. See “Accessing a Rack-Mounted Server” on page 30.
- Step 2.** Remove the front bezel from the chassis. See “Removing the Front Bezel” on page 36.
- Step 3.** Remove the front cover from the chassis. See “Removing the Front Cover” on page 37.
- Step 4.** Press each latch on the two extraction levers located on each side of the memory extender board.
- 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.

### Installing DIMMs

To install DIMMs, perform the following 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.
- Step 3.** Replace the front and top covers.
- Step 4.** Replace the front bezel.
- Step 5.** If rack-mounted, slide the HP server into the rack until it stops.

**Figure 3-15**      **Inserting DIMM into Extender Board Slot**



## Installing the Memory Extender Board

To replace the memory extender board, perform the following steps:

- Step 1.** Ensure the extraction levers are positioned in the outward, unlocked position.
- Step 2.** Align the memory extender board with the left and right chassis guide slots.
- Step 3.** Slide the memory extender board in 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 plug in the memory extender board into the midplane riser board.
- Step 5.** Replace the front cover onto the chassis.
- Step 6.** Replace the front bezel onto the chassis.
- Step 7.** If rack-mounted, slide the HP server into the rack until it stops.

## Installing PCI-X Cards

This section provides information on how to install additional PCI-X cards into your HP Integrity rx4640 server. The server supports PCI-X hot-plug technology and offers six PCI-X, hot-plug capable slots. For details regarding PCI-X specifications, see “PCI-X Slot Locations and Configurations” below, or the *HP Integrity rx4640 User Service Guide* for more detailed information. For procedures describing how to add, replace, delete, and locate PCI-X cards, go to “Installing Additional PCI-X Cards” on page 53.

---

**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 results in server degradation, or server failure.

---

---

**NOTE** The PCI-X cards are hot-pluggable.

---

## PCI-X Slot Locations and Configurations

PCI-X slots are numbered from 1 through 8 in the Server. Figure 3-16 shows the slot locations on the I/O baseboard.

The following describes configuration requirements for slots 1 through 8:

- PCI slots 1 and 2 are dedicated for use by the core I/O cards—SCSI HBA card in slot 1 and Gigabyte Ethernet LAN card in slot 2. Slots 1 and 2 **are not** hot-plug capable. Additional PCI-X expansion cards **cannot** be placed in slots 1 or 2.

- Slot 3 and 4 is the first pair of shared slots, and slot 5 and 6 is the second pair of shared slots. The maximum capability of each of the shared slot is PCI-X 66MHz. If a PCI-X 133 MHz card is placed in a shared slot, then the maximum capability the 133 MHz card can run at is 66MHz. If different modes (PCI vs. PCI-X) or slower speeds (33 MHz) are used, the slot used 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 is rejected. If the new card has a faster capability than the current bus configuration, it only runs at the bus mode and frequency of the current bus configuration (slower).

- If you have a 66 MHz card in slot 3 and you hot-plug insert a 33 Mhz card into slot 4, the operation will not work. The new 33 MHz card does not initialize and the slot powers down, because you cannot change bus speeds during hot-plug operations.

---

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

---

- If you have a 33 MHz card in slot 3 and you hot-plug insert a 66 Mhz card into slot 4, it works, but the new card runs at 33 MHz. This also applies to slots 5 and 6 as they are shared (both use a common bus).
- 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 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. The maximum capability of each slot is PCI-X 133MH. Only slots 7 and 8 allow 133 Mhz, PCI-X cards to run at full speed. These two slots are not limited by incompatibilities that are related to bus mode frequency.

**Table 3-6 PCI-X Card vs. Slot Frequency/Bus Mode Compatibility for Shared Slots<sup>a</sup>**

Current PCI Bus Mode and Frequency for the Shared Slot	Cards to be installed			
	PCI 33	PCI 66	PCI-X 66	PCI-X 133
<b>PCI 33 MHz</b>	Compatible <sup>b</sup>	Compatible <sup>b</sup> New card running at PCI 33	Compatible <sup>b</sup> New card running at PCI 33	Compatible <sup>b</sup> New card running at PCI 33
<b>PCI 66 MHz</b>	Incompatible-Frequency <sup>c</sup>	Compatible <sup>b</sup>	Compatible <sup>b</sup> New card running at PCI 66	Compatible <sup>b</sup> New card running at PCI 66
<b>PCI-X 66 MHz</b>	Incompatible-Frequency <sup>c</sup>	Incompatible-Bus <sup>d</sup>	Compatible <sup>b</sup>	Compatible <sup>b</sup> New card running at PCI-X 66
<b>PCI-X 133 MHz<sup>e</sup></b>	Incompatible-Frequency <sup>c</sup>	Incompatible-Frequency <sup>c</sup>	Compatible <sup>b</sup> New card running at PCI-X 66	Compatible <sup>b</sup> New card running at PCI-X 66

- a. 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.
- b. Compatible: card is accepted and runs at frequency shown.
- c. Incompatible-Frequency: card is rejected. The new card does not initialize and powers down due to frequency mismatch.
- d. Incompatible-Bus: Card is rejected. The new card does not initialize and powers down due to bus mode mismatch.
- e. Maximum bus mode and frequency supported on shared slots is PCI-X 66 MHz.

---

**CAUTION** If you are using Linux Red Hat Advanced Server 2.1 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.

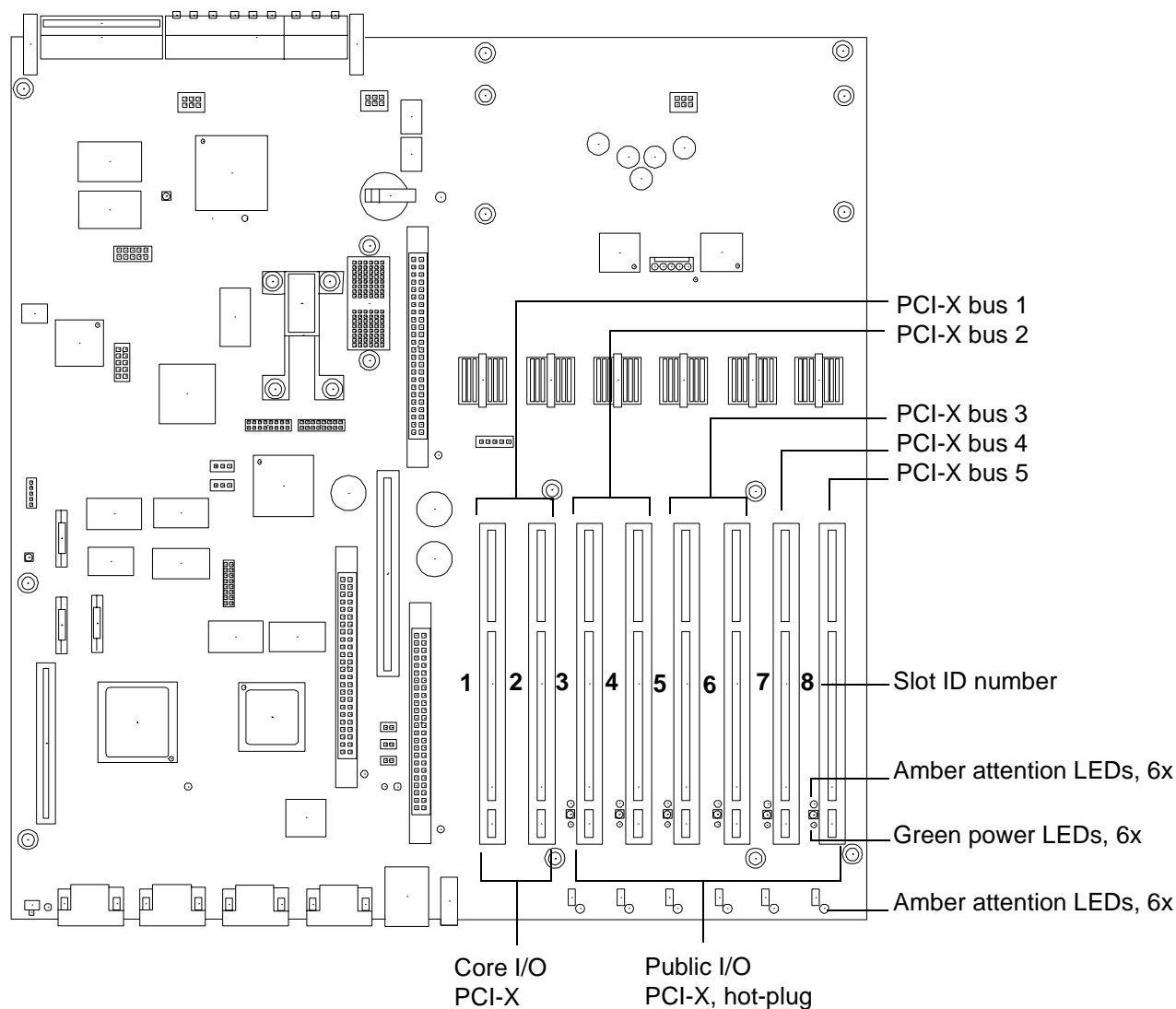
---

---

**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 3-16 Slot ID Numbering**



### Installing Additional PCI-X Cards

The hot-plug procedures described in this section use the hardware interface only. For a complete understanding of all HP-UX 11i v2 hot-plug techniques and concepts it is recommended that you refer to *Interface Card OL\* Support for HP-UX Servers and Workstations, B2355-90804* at <http://docs.hp.com>.

**CAUTION** Before adding or replacing a PCI-X card, determine if that card is critical to your server operation. If you replace a card that is still operating and 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, B2355-90804*, at <http://docs.hp.com>, prior to performing a hot-plug operation.

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, perform the following 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 30.
- Step 2.** Remove the top cover from the chassis. See “Removing the Front Cover” on page 37.
- 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 turns steady-off. Figure 3-17 shows OLX divider components.

---

**CAUTION** Do not pull up on the MRL of a powered-on, occupied slot or your server will crash. This procedure is for powering off a powered-on, unoccupied slot only.

---

- Step 5.** Ensure that the MRL is already open and insert the PCI-X card to be added into the powered-down slot. Figure 3-18 shows the correct way to 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 initiates an undesired shutdown of another PCI-X card/slot. If you push the wrong attention button, you have 5 seconds to cancel the operation by pushing the attention button again.

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

---

- Step 6.** Push the MRL 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 MRL 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.

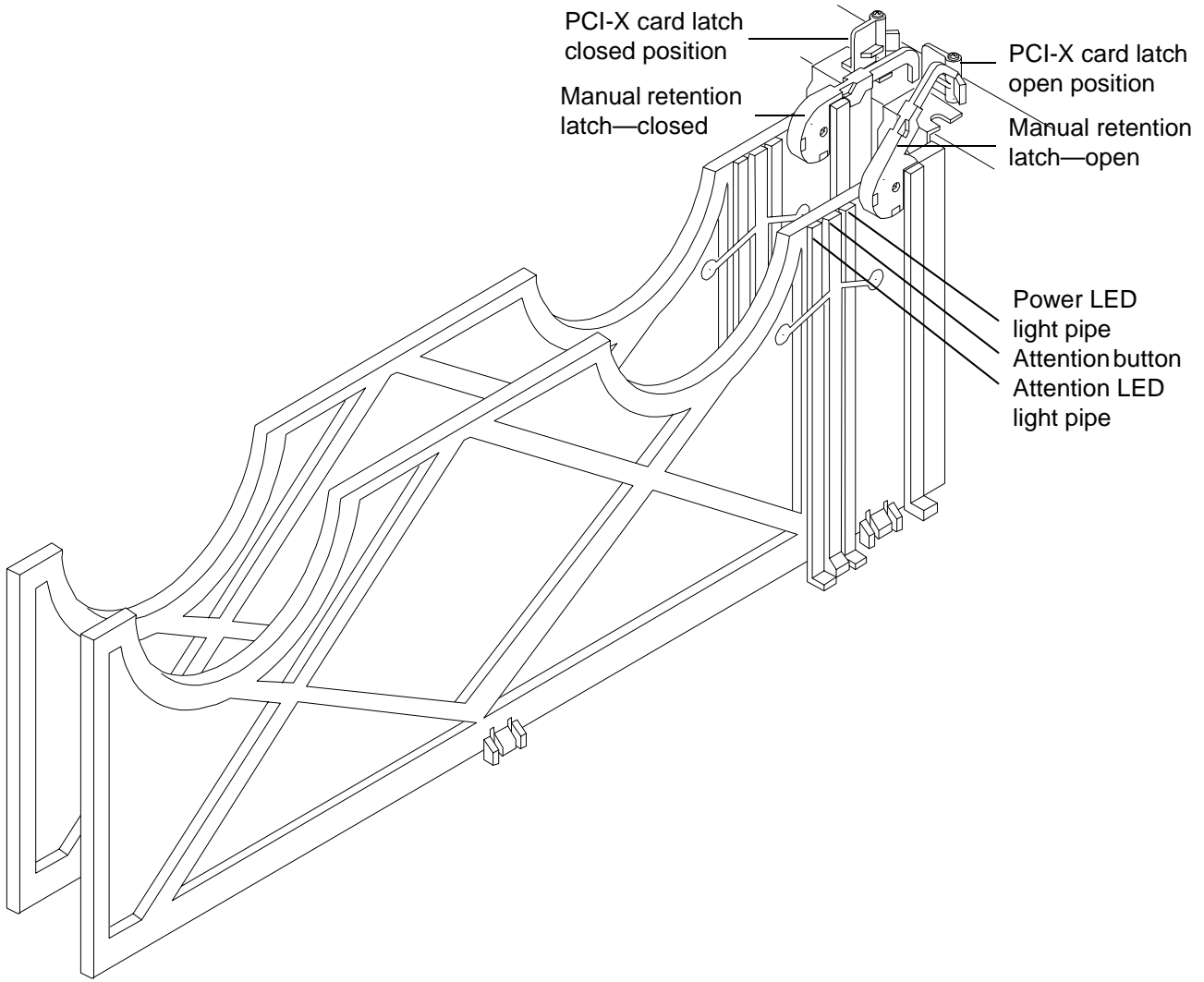
---

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

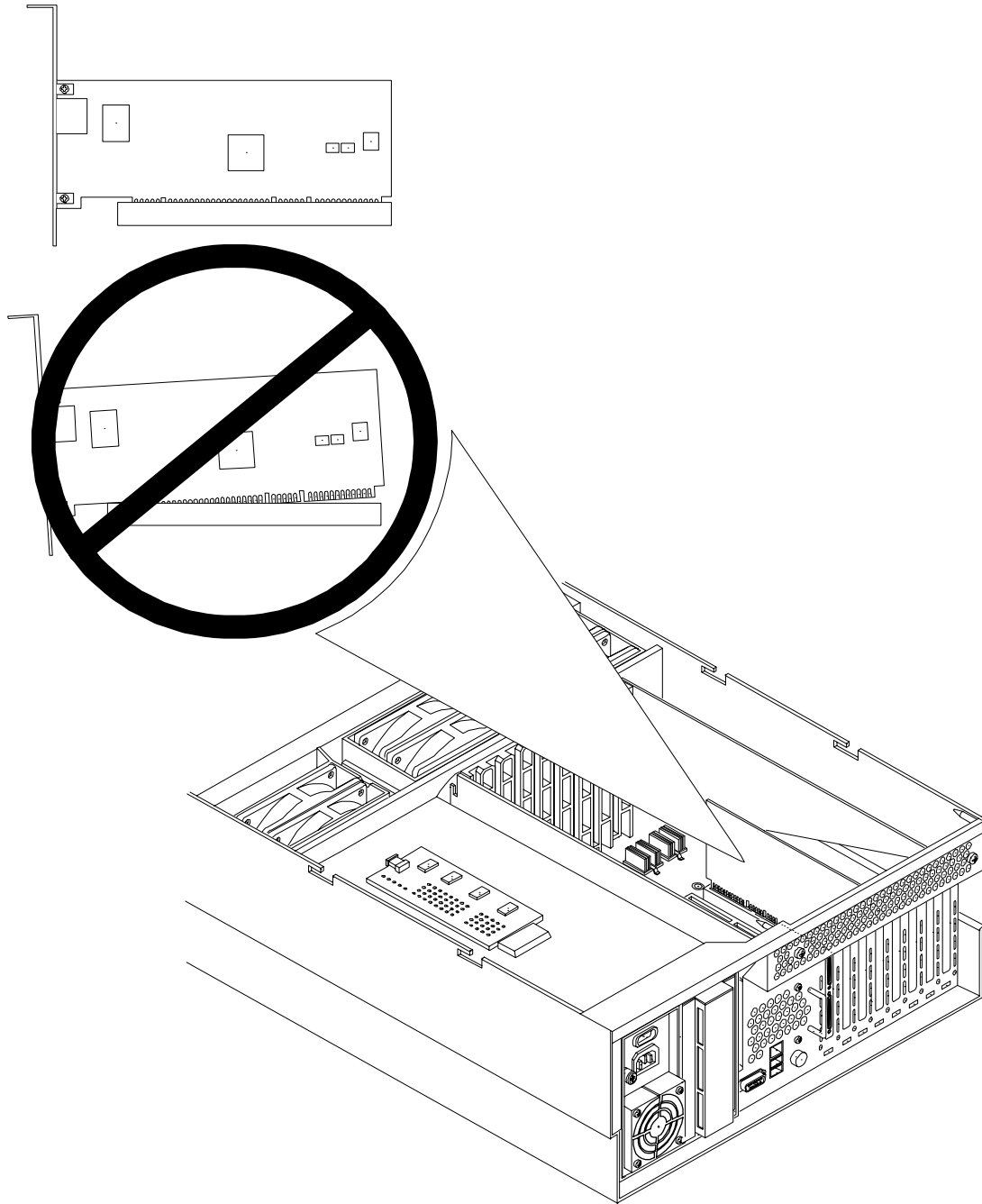
---

- Step 9.** Replace the top cover. See “Replacing the Top Cover” on page 39.
- Step 10.** Push server all the way back into the rack until it stops.

**Figure 3-17** PCI-X OLX Divider Layout



**Figure 3-18**      **Inserting PCI-X Card**





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## 4 Installing the Server into a Rack or Tower

This chapter provides instructions on how to install the server into a rack or a tower mount configuration.

The following sections are included in this chapter:

- “Install the Server into a Rack” on page 58
- “Install the Server into a Tower Mount” on page 58

## Install the Server into a Rack

The following information describes how to install the server into an HP rack, or an approved nonHP rack.

### HP Rack

HP Integrity entry-class servers that are installed into racks are shipped with equipment mounting slides. With each set of slides comes an installation guide: *Installation Guide, Mid-Weight Slide Kit, 5065-7291*. Follow the steps in this installation guide to determine where and how to place the server into the rack.

The following are additional instructions for installing the server into the rack:

1. The cable management arm (CMA) is factory-configured to mount on the left side of the server (as viewed from the rear of the chassis). You must switch the CMA from a left- to a right-mount configuration. Mount the CMA on the right side of the server to ensure easy removal of the power supplies.
2. You must remove two T120 screws from the server bezel; one screw from the same location on each side of the server. The screws are located behind the pull handles.

### Non-HP Rack

There is a guide for evaluating the installation of HP equipment in non-HP racks. Use this document when you need to qualify whether you can install, maintain, and service any HP equipment in a non-HP rack.

The guide is located on the Web at <http://www.hp.com/racksolutions>.

Once there, select “Mounting information” from the menu, then select the guide titled *Mounting in non-HP racks*.

---

## Install the Server into a Tower Mount

Your server ships with a tower mount if you order the rackless configuration option. The tower mount is packaged in a separate carton that is attached to the server carton.

If you want to change your server from a rack mount to a rackless configuration, you need a Server Rackless Mount Kit. Your rackless mount kit comes with an installation guide: *Converting Your Rack Server to a Rackless Mount*. Follow the steps in this installation guide to attach the tower mount to your server.

---

# 5 Connecting Cables

This chapter describes the cables that you must connect to install the server.

This chapter addresses the following topics:

- “AC Input Power” on page 60
- “LAN” on page 62

---

## AC Input Power

The server can receive AC input from two different AC power sources. If two separate power sources are available, you can plug the server into the separate power sources, increasing server reliability should one power source fail. The power receptacles are located at the rear of the chassis. They are labeled PWR 1 and PWR 2.

---

**CAUTION** Do not route data and power cables together in the same cable management arm.

Do not route data and power cables in parallel paths in close proximity to each other. The suggested minimum distance that the data and power cables should be apart is 7.62 cm (3 inches).

The power cord has current flowing through it, which creates a magnetic field. The potential to induce electromagnetic interference in the data cables exists, thereby causing data corruption.

---

You can install a maximum of two power supply units (PSU) in the server. Installing two PSUs in the server provides n+1 redundancy, meaning that if one PSU fails, there is another power supply to power the server. You must promptly replace the failed PSU to restore n+1 functionality.

A minimum of one PSU is required to power the server. There is no n+1 capability in this case.

## 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 MP `PC` command, or the power button is activated. In the off state, the power cords are not plugged in. Table 5-1 lists the server power states.

**Table 5-1** Power States

Power States	Power Cable Plugged Into Receptacle	Power Activated through the MP <code>PC</code> 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 MP `PR` command, the server may automatically power on to the full power state.

---

## Apply Standby Power to the Server

Perform the following steps to apply standby power to the server:

---

**IMPORTANT** If the server has one BPS, you must plug the power cable into the receptacle labeled PWR 1.

---

- Step 1.** Locate the appropriate receptacle on the rear of the chassis and plug the power cord into the receptacle.
- Step 2.** Observe the following LEDs at two different intervals to ensure the server is in the standby power state:
- Interval One** After you plug the power cord into the server, the bulk power supplies flash amber and an amber light is present on the hard disk drives.
- Interval Two** Approximately 30 seconds later, the bulk power supplies flash green and the amber light is still present on the hard disk drives. Standby power is on at this point.

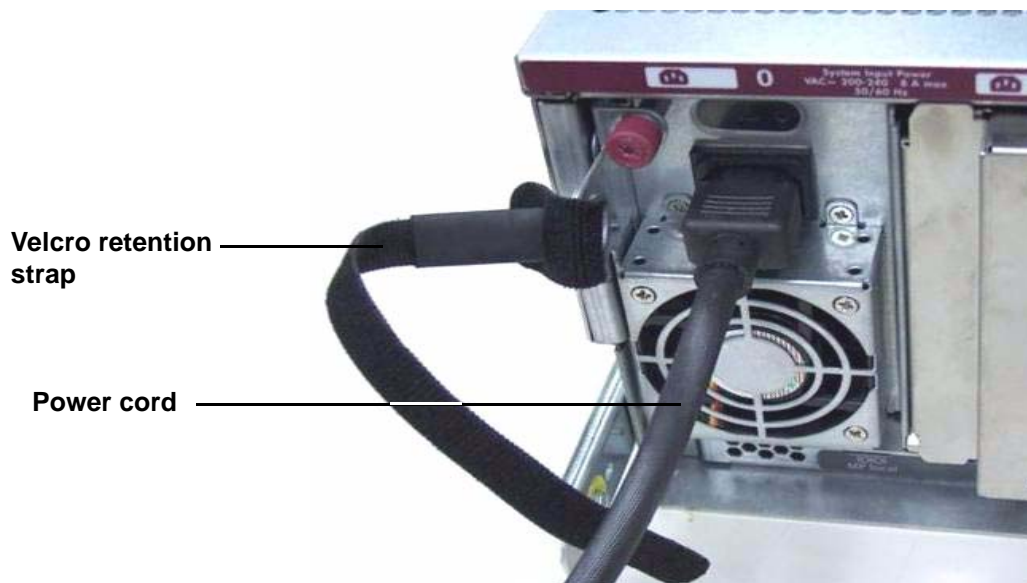
---

## Power Cord Retention

The following procedure shows how to install the power cord retention strap onto the back of the server.

- Step 1.** Attach the velcro retention strap to the ring on the power supply on the rear of the server, as shown in Figure 5-1 (if not already attached).

**Figure 5-1 Power Supply Retention Strap**



LAN

**Step 2.** Loop the power cord once, and wrap the velcro strap around the power cord and the ring on the power supply as shown in Figure 5-2.

**Figure 5-2 Retention Strap Attached to Rear of Server**



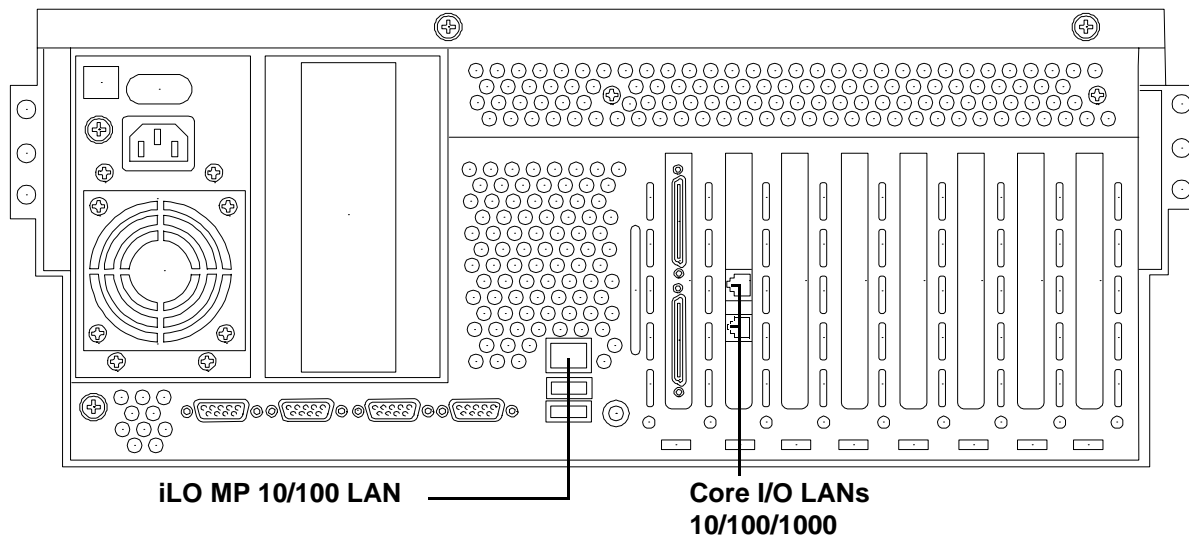
Velcro retention strap wrapped around power cord and ring on server

---

## LAN

The server has two LAN ports that can provide network connectivity, and one iLO MP LAN port. Figure 5-3 shows the available LAN ports for the server.

**Figure 5-3 Rear Panel LAN Ports**



To enable general network connectivity for the server, follow these steps:

- Step 1.** Obtain valid IP addresses for each LAN port you plan to activate.
- Step 2.** Connect the LAN cable from an available LAN port into a live connection on the network.

---

# 6 Console Connection and Setup

Setting up the console involves the following:

- Determining the physical access method to connect cables. There are two physical connections to the Integrity iLO MP: RS-232 and LAN.
- Configuring the Integrity iLO MP and assigning an IP address if necessary. Though there are several methods to configuring the LAN, DHCP with DNS is the preferred one. DHCP with DNS comes preconfigured with default factory settings, including a default user account and password. Other options include:
  - ARP-Ping
  - Local RS-232 serial port
  - Remote/modem port

This chapter addresses the following topics:

- “Setup Checklist” on page 64
- “Setup Flowchart” on page 65
- “Preparation” on page 66
- “Configuring the iLO MP LAN Using DHCP and DNS” on page 68
- “Configuring the iLO MP LAN Using ARP Ping” on page 69
- “Configuring the iLO MP LAN Using the RS-232 Serial Port” on page 70
- “Logging In to the iLO MP” on page 72
- “Additional Setup” on page 72

## Setup Checklist

Use the checklist in Table 6-1 to assist you with the Integrity iLO MP setup process.

**Table 6-1 Setup Checklist**

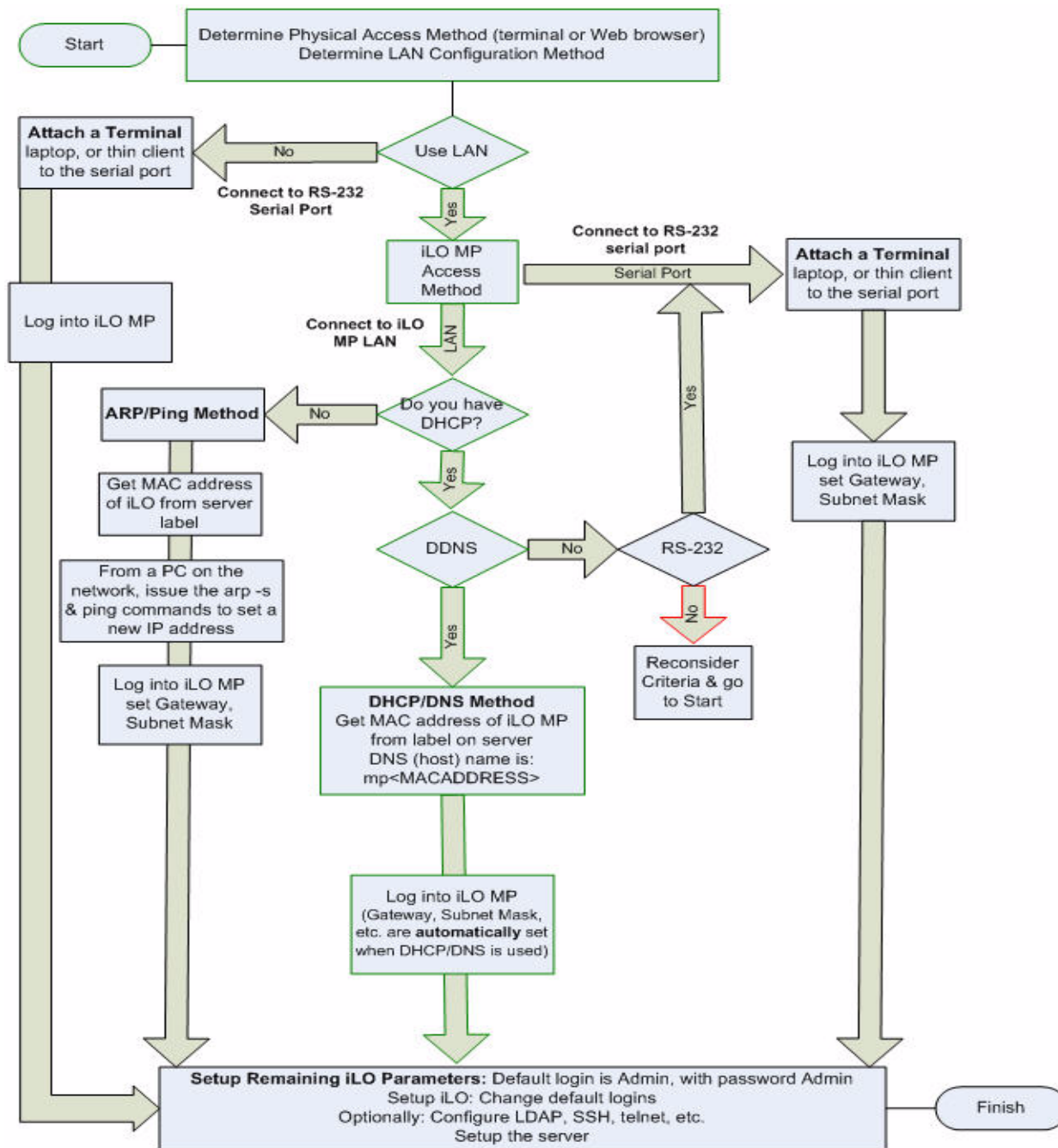
	<b>Step</b>	<b>Action</b>	<b>X</b>
	<i>Standard and Advanced</i>		
1	Preparation	1. Determine access method to select and connect cables. 2. Determine LAN configuration method and assign IP address if necessary.	
2	Configure the iLO MP LAN	There are three methods to configure the LAN for iLO MP access: <ul style="list-style-type: none"> <li>• DHCP with DNS</li> <li>• ARP Ping</li> <li>• RS-232 serial port</li> </ul>	
3	Log on to the iLO MP	Log in to the iLO MP from a supported Web browser or command line using the default user name and password.	
4	Change default user name and password	Change the default user name and password on the administrator account to your predefined selections.	
5	Set up user accounts	Set up the user accounts if using the local accounts feature.	
6	Set up security access	Set up the security access settings.	
	<i>Advanced</i>		
	Activate Advanced Pack Features	Activate advanced features by entering a license key.	



## Setup Flowchart

Use this flowchart as a guide to assist in the iLO MP setup process.

Figure 6-1 iLO MP Setup Flowchart



## Preparation

There are several tasks to perform before you can configure the iLO MP LAN.

- Determine the physical access method to select and connect cables.
- Determine the iLO MP LAN configuration method and assign an IP address if necessary.

### Determining the Physical iLO MP Access Method

Before you can access the iLO MP, you must first determine the correct physical connection method. The iLO MP has a separate LAN port from the system LAN port. It requires a separate LAN drop, IP address, and networking information from that of the port used by the operating system. See your server installation guide for rear panel console connection port identification and cable connection information.

Table 6-2 lists the appropriate connection method, required connection components, and connectors to the host console. Use Table 6-2 to determine your physical connection method.

**Table 6-2 Console Connection Matrix**

Operating System	Console Connection Method	Required Connection Components
HP-UX	Local RS-232 serial port  Remote/modem port	1. M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> <li>• Console</li> <li>• Remote</li> <li>• UPS</li> </ul> 2. RS-232 DB-9F to DB-9F cable 3. Console device (for example, a laptop or ASCII terminal)
	LAN port	10/100 LAN cable
Linux	Local RS-232 serial port  Remote/modem port	1. M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> <li>• Console</li> <li>• Remote</li> <li>• UPS</li> </ul> 2. RS-232 DB-9F to DB-9F cable 3. Console device (for example, a laptop or ASCII terminal)
	LAN port	10/100 LAN cable

**Table 6-2 Console Connection Matrix (Continued)**

Operating System	Console Connection Method	Required Connection Components
OpenVMS	Local RS-232 serial port  Remote/modem port	<ol style="list-style-type: none"> <li>M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> <li>• Console</li> <li>• Remote</li> <li>• UPS</li> </ul> </li> <li>RS-232 DB-9F to DB-9F cable</li> <li>Console device (for example, a laptop or ASCII terminal)</li> </ol>
	LAN Port	10/100 LAN cable
Windows	VGA Port (no iLO MP access; EFI only)	<ol style="list-style-type: none"> <li>Monitor (VGA)</li> <li>Keyboard (USB)</li> <li>Mouse (USB)</li> </ol>
	LAN port	10/100 LAN cable

### Determining the iLO MP LAN Configuration Method

To access the iLO MP through the iLO MP LAN, the iLO MP must acquire an IP address. The way the iLO MP acquires an IP address is dependent upon whether DHCP is enabled or disabled on the server, and if DHCP and DNS services are available to the server. (See Table 6-3 for possible scenarios.)

Once you have determined the iLO MP access, you must determine how you will configure the iLO MP LAN in order to acquire an IP address using the following methods:

- DHCP/DNS
- ARP Ping
- Local S-232 serial port
- Remote/modem port

Table 6-3 provides all the possible scenarios to consider. Use this table to help you select the appropriate LAN configuration method to obtain an IP address.

**Table 6-3 LAN Configuration Methods**

DHCP	DNS	RS-232 Serial Port (MP LC command)	LAN Configuration Method
Yes	Yes	No	DHCP
Yes	Yes	Yes	DHCP, RS-232 serial port, or remote/modem port
No	No	No	ARP Ping

**Table 6-3 LAN Configuration Methods (Continued)**

DHCP	DNS	RS-232 Serial Port (MP LC command)	LAN Configuration Method
No	Yes	No	ARP Ping
No	Yes	Yes	ARP Ping, RS-232 serial port, or remote/modem port
Yes	No	Yes	RS-232 serial port, or remote/modem port
No	No	Yes	RS-232 serial port, remote/modem port, or ARP Ping
Yes	No	No	Cannot set up the LAN. Reconsider your criteria.

Once you have determined how you will configure the iLO MP LAN in order to acquire an IP address, you must configure the iLO MP LAN using the selected method.

---

## Configuring the iLO MP LAN Using DHCP and DNS

DHCP automatically configures all DHCP-enabled servers with IP addresses, subnet masks, and gateway addresses. All HP Integrity entry class servers with the iLO MP are shipped from the factory with DHCP enabled.

HP recommends using the DHCP and DNS method to simplify access to the iLO MP.

When you use DHCP and DNS, you can connect to the iLO MP by typing the default host name in your browser rather than an IP address only if the following applies:

- DHCP must be enabled (DHCP is enabled by default).
- You are using a DHCP server that provides the domain name and the primary DNS server IP address.
- The primary DNS server accepts dynamic DNS (DDNS) updates.
- The primary DNS server IP address has been configured through the DHCP server.

To configure the iLO MP using DHCP and DNS, follow these steps:

**Step 1.** Obtain the factory-set host name from the iLO MP Media Access Protocol (MAC) address label on the rear of the server. The default host name is 14 characters long, consisting of the letters **mp** followed by the 12 characters of the MAC address (example: mp0014c29c064f). This address is assigned to the iLO MP iLO hardware. The iLO hardware has a unique MAC address that identifies the hardware on the network.

---

**IMPORTANT** Make sure you obtain the MAC address to the iLO hardware and not the MAC address to the server core LAN card.

---

**Step 2.** Connect the LAN cable from the server to an active network port.

**Step 3.** Apply AC power to the server.

**Step 4.** Open a browser, telnet, or SSH client and enter the default host name. The default host name is the letters **mp** followed by the 12 characters of the MAC address. The **iLO MP Log In** window opens.

## Configuring the iLO MP LAN Using ARP Ping

The Address Resolution Protocol (ARP) and Packet Internet Grouper (Ping) utility uses ARP packets to ping, or discover, a device on the local network segment. The IP address you assign to the server must use the same network segment, or subnet, as the computer assigning the address. ARP does not work across routed or switched networks.

ARP Ping operational issues:

- You can use ARP Ping regardless of the status of DHCP unless an IP address has ever been acquired using DHCP.
- When ARP Ping is successful, DHCP status is disabled.
- Some DHCP server options can cause the apparent issuance of ARP Ping to the iLO MP which will negate the DHCP/DDNS method.
- The PC and the server must be on the same physical subnet.
- When a new server is first booted, DHCP is automatically available (factory-set default); but ARP Ping does not start for three minutes after the iLO MP is booted. This applies to every subsequent boot of the iLO MP until an IP address is obtained by DHCP or has been assigned by using the LC command or ARP Ping succeeds.

There are two methods to use the ARP Ping utility:

1. Connect a PC to the network that is on the same physical subnet as the server and run the ARP Ping commands from the PC.
2. Locate an existing server on the network, log into it, and run the ARP Ping commands from the server.

Table 6-4 lists the ARP Ping commands.

**Table 6-4 ARP Ping Commands**

ARP Command	Description
arp -s	This command assign the IP address to the iLO MP MAC address. This ARP table entry maps the MAC address of the iLO MP LAN interface to the static IP address designated for that interface.
ping	This command tests network connections. It verifies the iLO MP LAN port is configured with the appropriate IP address.

The following procedure explains how to use the ARP Ping utility using a PC that is connected to the network that is on the same physical subnet as the server.

To configure a static IP address using the ARP Ping utility, follow these steps:

- Step 1.** Obtain the iLO MP MAC address. To set the IP address using ARP, you must know the MAC address of the iLO MP LAN. You can find the MAC address of the iLO MP LAN on a label on the server.

---

**IMPORTANT** Make sure you obtain the MAC address to the iLO MP LAN and not the MAC address to the server core LAN.

---

**Step 2.** Verify that an active LAN cable on the local subnet is connected to the iLO MP LAN port on the server.

**Step 3.** Access a PC on the same physical subnet as the server.

**Step 4.** Open a DOS window on the PC.

**Step 5.** At the DOS prompt, enter **arp -s** to assign the IP address to the iLO MAC address.

Syntax

```
arp -s <IP address you want to assign to the iLO MAC address> <iLO MAC address>
```

Example from Windows

```
arp -s 192.0.2.1 00-00-0c-07-ac-00
```

**Step 6.** At the DOS prompt, enter **ping** followed by the IP address to verify that the iLO MP LAN port is configured with the appropriate IP address. The destination address is the IP address that is mapped to the iLO MAC address. Perform this task from the PC that has the ARP table entry.

Syntax

```
ping <IP address just assigned to the iLO MAC address>
```

Example from Windows

```
ping 192.0.2.1
```

**Step 7.** Use this IP address to connect to the iLO MP LAN.

**Step 8.** Use Web or telnet access to connect to the iLO MP from a host on the local subnet and complete the rest of the LAN parameter (gateway, subnet).

---

## Configuring the iLO MP LAN Using the RS-232 Serial Port

To configure the iLO MP LAN using the RS-232 serial port, follow these steps:

---

**IMPORTANT** Do not configure duplicate IP addresses on different servers within the same network. The duplicate server IP addresses conflict and the servers cannot connect to the network.

---

The **LC** command enables you to configure an IP address, host name, subnet mask, and gateway address.

---

**IMPORTANT** Ensure you have a console connection through the RS-232 serial port or a network connection through the LAN to access the iLO MP and use the **LC** command.

---

To assign a static IP address using the **LC** command, follow these steps:

- Step 1.** Ensure the emulation software device is properly configured. The terminal emulation device runs software that interfaces with the server. The software emulates console output as it would appear on an ASCII terminal screen and displays it on a console device screen. To ensure the emulation software is correctly configured, follow these steps:
- a.** Verify that the communication settings are configured as follows:
    - 8/none (parity)
    - 9600 baud
    - None (receive)
    - None (transmit)
  - b.** Verify that the terminal type is configured appropriately. Supported terminal types are:
    - hpterm
    - vt100
    - vt100+
    - vt-utf8

---

**IMPORTANT** Do not mix hpterm and vt100 terminal types at the same time.

---

There are many different emulation software applications. Consult the help section of the emulation software application for instructions on how to configure the software options.

- Step 2.** Use Table 6-2 to determine the required connection components, and the ports used to connect the server to the console device.
- Step 3.** Connect the cables.
- a.** Connect the DB25 end of the M-cable to the console RS232 serial port.
  - b.** Connect the DB9 end of the RS-232 serial port female-to-female cable to the M-cable connector labeled Console.
  - c.** Connect the other end of the DB9 female-to-female cable to the console device.
- Step 4.** Start the emulation software on the console device.
- Step 5.** Log in to the iLO MP. See “Logging In to the iLO MP” on page 72.
- Step 6.** At the **MP Main Menu**, enter **CM** and press **Enter** to select command mode.
- Step 7.** At the command mode prompt, enter **LS** and press **Enter**. The screen displays the default LAN configuration values. Write down the default values, or log the information to a file. You may need the information for future troubleshooting.
- Step 8.** Use the **LC** command to disable DHCP.
- a.** From the **LC** command menu, type **D** and press **Enter**.
  - b.** Follow the instructions on the screen to change the DHCP status from Enabled to Disabled.
  - c.** Enter **XD -R** to reset the iLO MP.
- Step 9.** Use the **LC** command to enter information for the IP address, host, subnet mask, gateway parameters, and so on.
- Step 10.** Enter **XD -R** to reset the iLO MP.

**Step 11.** After the iLO MP resets, log in to the iLO MP again and enter **CM** at the **MP:>** prompt.

**Step 12.** Enter **LS** to confirm that DHCP is disabled and display a list of updated LAN configuration settings.

---

## Logging In to the iLO MP

To log in to the iLO MP, follow these steps:

- Step 1.** Access the iLO MP using the LAN, RS-232 serial port, telnet, SSH, or Web method. The iLO MP login prompt displays.
- Step 2.** Log in using the default the iLO MP user name and password (Admin/Admin). The **MP Main Menu** screen displays.

---

**TIP** For security reasons, HP strongly recommends you modify the default settings during the initial login session. See “Modifying User Accounts and Default Password” on page 72.

---

Following is the **MP Main Menu** screen:

```
MP MAIN MENU:
CO: Console
VFP: Virtual Front Panel
CM: Command Menu
CL: Console Logs
SL: Show Event Logs
HE: Main Menu Help
X: Exit Connection
```

This example shows the **MP Main Menu** accessed through the local serial port. The list of commands displayed on the screen can be different depending on the method of access to the iLO MP.

When logging in using the local or remote RS-232 serial ports, the login prompt may not display if another user is logged in through these ports. Use **Ctrl+B** to access the **MP Main Menu** and the iLO MP prompt (**MP>**).

---

## Additional Setup

This section provides additional information to setup the iLO MP.

### Modifying User Accounts and Default Password

The iLO MP comes preconfigured with default factory settings, including a default user account and password. The two default user accounts on initial login are:

- All Rights (Administrator) level user:  
login = **Admin**  
password = **Admin**



- Console Rights (Operator) level user:  
login = **Oper**  
password = **Oper**

Login and password are case sensitive.

---

**TIP** For security reasons, HP strongly recommends you modify the default settings during the initial login session.

---

Make the following changes using any of the iLO MP user interfaces.

To modify default account configuration settings, follow these steps:

- Step 1.** Log in as the administrator. You must log in as the administrator in order to modify default user configuration settings
- Step 2.** To modify default passwords:
- a. Access the **MP Main Menu**.
  - b. Enter **CM** at the MP> prompt.
  - c. Enter **UC** at the MP:CM> prompt and follow the prompts to modify default passwords.
- Step 3.** To setup user accounts:
- a. Access the **MP Main Menu**.
  - b. Enter **CM** at the MP> prompt.
  - c. Enter **UC** at the MP:CM> prompt and follow the prompts to modify user accounts.

## Setting Up Security

For greater security and reliability, HP generally recommends that iLO MP management traffic be on a separate dedicated management network and that only administrators be granted access to that network. This not only improves performance by reducing traffic load across the main network, it also acts as the first line of defense against security attacks. A separate network allows administrators to physically control which workstations are connected to the network.

HP also strongly recommends you modify the default settings during the initial logon session and determine the security access required and what user accounts and privileges are needed. Create local accounts or use directory services to control user access. See “Modifying User Accounts and Default Password” on page 72.

### Security Access Settings

Determine the security access required and what user accounts and privileges are needed. The iLO MP provides options to control user access. Select one of the following options to prevent unauthorized access to the iLO MP:

---

**CAUTION** When DHCP is enabled, the system is vulnerable to security risks because anyone can access the iLO MP until you change the default user name and password.

HP strongly recommends you assign user groups and rights before proceeding.

---

**Additional Setup**

- Change the default user name and password. See “Modifying User Accounts and Default Password” on page 72).
- Create local accounts. You can store up to 19 user names and passwords to manage iLO MP access. This is ideal for small environments such as labs and small-to-medium sized businesses.
- Use directory services. Use the corporate directory to manage iLO MP user access. This is ideal for environments with a large number of frequently changing users. If you plan to use directory services, HP recommends leaving at least one local account enabled as an alternate method of access.

---

# 7 Powering On the Server

This chapter provides information and procedures for powering on the server to full power.

This chapter addresses the following topic:

- “Powering On the Server to Full Power” on page 76

## Powering On the Server to Full Power

Full power occurs when the power cord is plugged into the appropriate receptacle, and either the power is activated through the MP `PC` command, or the power button is activated.

### Powering On the Server

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

- MP `PC` command
- Power button

### Powering On the Server Using the MP

---

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

---

To power on the server through the 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 Chapter 9, “Booting the Operating System,” on page 81 or the operating system documentation for more information.)

### Powering On the Server Manually

---

**NOTE** If the power restore feature is set to **Always On** through the 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 Chapter 9, “Booting the Operating System,” on page 81, or your operating system documentation for more information.)

---

## 8 Accessing the Host Console

There are several ways to access the host console of an HP Integrity server:

This chapter addresses the following topics:

- “Accessing the Host Console With the TUI - CO Command” on page 78
- “Interacting with the iLO MP Using the Web GUI” on page 78
- “Accessing the Graphic Console Using VGA” on page 80

## Accessing the Host Console With the TUI - CO Command

This section provides the steps to access the host console using the text user interface (TUI).

To access the host console through the iLO MP, follow these steps:

- Step 1.** Log in using your user account name and password at the login page.
- Step 2.** At the iLO MP login prompt (MP>), enter the CO command to switch the console terminal from the **MP Main Menu** to mirrored/redirected console mode. All mirrored data displays.
- Step 3.** To return to the iLO MP command interface, type **Ctrl+B**, or **Esc** and **+**.

---

## Interacting with the iLO MP Using the Web GUI

Web browser access is an embedded feature of the iLO MP.

The iLO MP has a separate LAN port from the system LAN port. It requires a separate LAN drop, IP address, and networking information from that of the port used by the operating system.

---

**IMPORTANT** Make sure you use the MAC address to the iLO MP LAN and not the MAC address to the server core LAN.

---

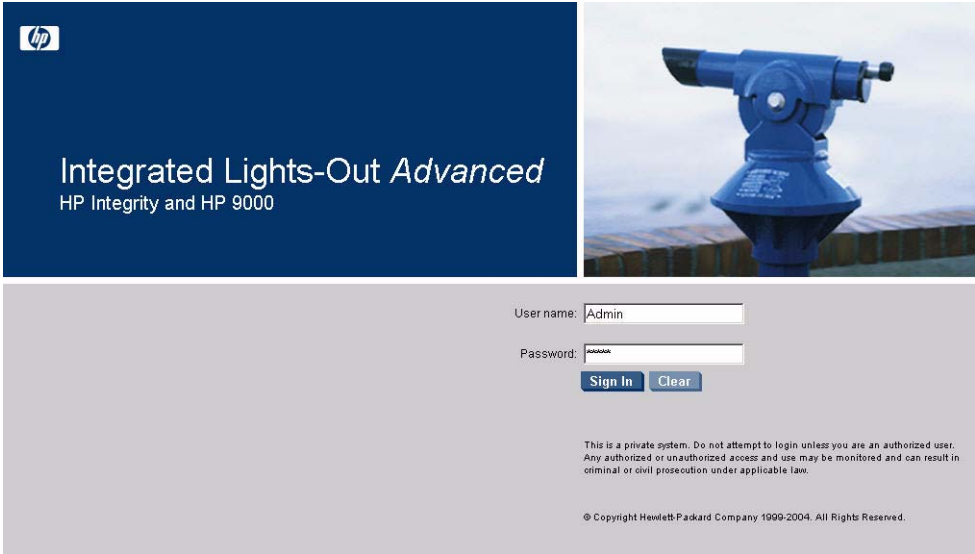
Before starting this procedure, you must have the following information:

- IP address for the iLO MP LAN
- Host name (this is used when messages are logged or printed)

To interact with the iLO MP through the Web GUI, follow these steps:

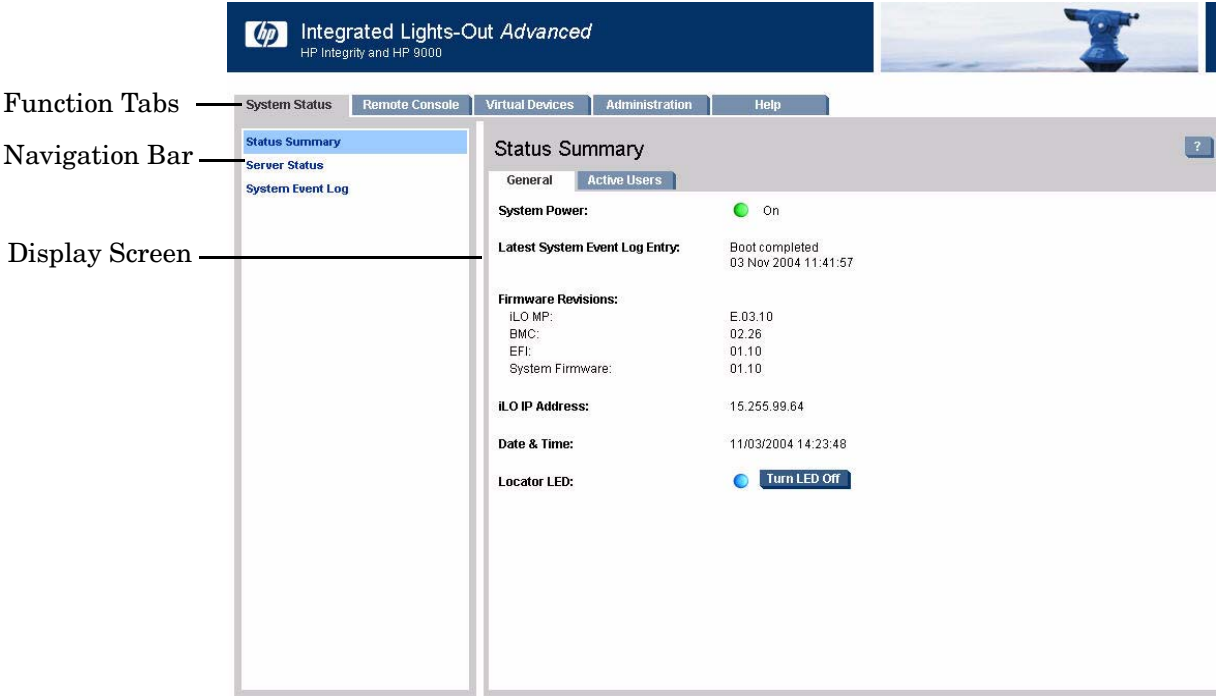
- Step 1.** Open a Web browser and enter the host name or the IP address for the iLO MP.
- Step 2.** Log in using your user account name and password at the login page. Figure 8-1 shows the login page.

**Figure 8-1 Web Login Page**



**Step 3.** Click **Sign In**. The **Status Summary** page (Figure 8-2) displays after login.

**Figure 8-2 Status Summary Page**



**Step 1.** Select the Web interface functions by clicking the **Function** tabs at the top of the page. Each function lists options in the **Navigation Bar** on the left side of the page.

**Step 2.** Click an option link to display data in the **Display** screen.

**Step 3.** Click **Refresh** to update the display.

The iLO MP Web interface has a robust help system. To launch iLO MP help, click the **Help** tab in the **Display** screen or click the **?** at the top right corner of each page to display help about that page.

---

## Accessing the Graphic Console Using VGA

VGA is a method you can use to access the graphic console.

---

**NOTE** You cannot access the iLO MP using VGA.

---

This method requires three elements:

- Monitor (VGA connector)
- Keyboard (USB connector)
- Mouse (USB connector)

The graphic console output displays on the monitor screen.

---

**IMPORTANT** The server console output does not display on the console device screen until the server boots to the EFI Shell. Start a console session using the RS-232 serial port method to view console output prior to booting to the EFI Shell or to access the iLO MP. See “Configuring the iLO MP LAN Using the RS-232 Serial Port” on page 70.

---

To access the graphic console with VGA, follow these steps:

**Step 1.** Perform preparation tasks.

**Step 2.** Connect the cables. See your user service guide for specific port information.

- a. Connect the monitor VGA cable to the appropriate VGA port on your server.
- b. Connect the keyboard USB cable to the appropriate USB port on your server.
- c. Connect the mouse USB cable to the appropriate USB port on your server.

**Step 3.** Power on the server. The EFI Shell prompt displays.



---

# 9 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 82
- “Configuring System Boot Options” on page 82
- “Booting and Shutting Down HP-UX” on page 84
- “Booting and Shutting Down HP OpenVMS” on page 90
- “Booting and Shutting Down Microsoft Windows” on page 94
- “Booting and Shutting Down Linux” on page 97

## 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 refer to “Booting and Shutting Down HP-UX” on page 84.
- **HP OpenVMS I64**  
For details refer to “Booting and Shutting Down HP OpenVMS” on page 90.
- **Microsoft® Windows® Server 2003**  
For details refer to “Booting and Shutting Down Microsoft Windows” on page 94.
- **Red Hat Enterprise Linux 4**  
For details refer to “Booting and Shutting Down Linux” on page 97.
- **SuSE Linux Enterprise Server 10**  
For details refer to “Booting and Shutting Down Linux” on page 97.

---

## 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.

Refer to the following sections for details:

- Setting HP-UX boot options (refer to “Adding HP-UX to the Boot Options List” on page 84)
- Setting OpenVMS boot options (refer to “Adding HP OpenVMS to the Boot Options List” on page 90)
- Setting Windows boot options (refer to “Adding Microsoft Windows to the Boot Options List” on page 94)
- Setting Linux boot options (refer to “Adding Linux to the Boot Options List” on page 98)

- **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, refer to “Adding HP-UX to the Boot Options List”.
- To boot HP-UX, use the following procedures:
  - “Standard HP-UX Booting” on page 85 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 87 describes how to boot HP-UX in single-user mode.
  - “LVM Maintenance Mode HP-UX Booting” on page 88 describes how to boot HP-UX in Logical Volume Management (LVM) maintenance mode.
- To shut down the HP-UX operating system, refer to “Shutting Down HP-UX” on page 89.

### 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 refer to the `setboot` (1M) manpage.

**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-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.

Refer to the `help bcfg` command for details.

**Step 4.** Exit the console and 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, type `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 85
- “Access the EFI Shell environment for the server on which you want to boot HP-UX.” on page 86

### 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 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 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, type `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 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 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 `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 type 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
```

```
(c) Copyright 1990-2002, Hewlett Packard Company.
All rights reserved
```

```
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 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, type **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 server on which you want to boot HP-UX in single-user mode.

Log in to the 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
```

```
(c) Copyright 1990-2002, Hewlett Packard Company.
All rights reserved
```

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

```
HP-UX> 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 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, type **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 HP-UX.EFI interface (the HP-UX Boot Loader prompt, HP-UX>) 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 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 **HP-UX** command to initiate the `\EFI\HP-UX\HP-UX.EFI` loader on the device you are accessing.

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

**Step 5.** At the HP-UX.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 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, type **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 refer to 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 MP for the server and use the Console menu to access the system console. Accessing the console through the 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 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, refer to “Adding HP OpenVMS to the Boot Options List” on page 90.
- To boot HP OpenVMS on an entry-class HP Integrity server, refer to “Booting HP OpenVMS” on page 91.
- To shut down HP OpenVMS, refer to “Shutting Down HP OpenVMS” on page 93.

### 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 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.

Refer to the `help bcfg` command for details.

**Step 4.** Exit the console and 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, type `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 91
- “Booting HP OpenVMS (EFI Shell)” on page 92

### 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 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 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, type **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 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 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, type **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 MP for the server and use the Console menu to access the system console. Accessing the console through the 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 94
- “Booting the Microsoft Windows Operating System” on page 95
- “Shutting Down Microsoft Windows” on page 96

### 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 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 Windows 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.** Type **Q** to quit the NVRBOOT utility, and 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, type **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. Refer to “Shutting Down Microsoft Windows” on page 96 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 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 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 refer to the SAC online help (type **?** 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 iLO MP 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, type **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.

Refer to “Log in to Windows running on the server that you want to shut down.” on page 97 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:

- `/s` 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 iLO MP `PC` command.
- `/r` Shuts down and restarts the server. This is the equivalent of **Start—>Shut Down, Restart**.
- `/a` Aborts a server shutdown.
- `/t xxx` Sets the timeout period before shutdown to `xxx` seconds. The timeout period ranges from 0–600, with a default of 30.

Refer to 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 `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, refer to “Adding Linux to the Boot Options List” on page 98.
- To boot Linux on entry-class HP Integrity servers, use the following procedures.
  - Refer to “Booting the Red Hat Enterprise Linux Operating System” on page 99 for details on Red Hat Enterprise Linux.
  - Refer to “Booting the SuSE Linux Enterprise Server Operating System” on page 100 for details on SuSE Linux Enterprise Server.
- To shut down either Red Hat Enterprise Linux or SuSE Linux Enterprise Server, refer to “Shutting Down Linux” on page 101.

## 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 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 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.

Refer to 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, type **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.

Refer to “Access the EFI Shell.” on page 99 for details.

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, type 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, type 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. Refer to “Booting SuSE Linux Enterprise Server from the EFI Shell” on page 100 for details.

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, type 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, type 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 `iLO MP 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.

Refer to the `shutdown(8)` Linux manpage for details. Also refer to 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.



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# 10 Troubleshooting

This chapter provides basic server troubleshooting information. It is designed to help you diagnose common issues that can occur during server installation. For more advanced troubleshooting tools and procedures, see the *HP Integrity rx4640 User Service Guide*.

This chapter addresses the following topics:

- “Troubleshooting Methodology” on page 104.
- “Server Does Not Power On” on page 105.
- “Server Does Not Power Off” on page 105.
- “EFI Menu is Not Available” on page 106.
- “Operating System Does Not Boot” on page 106.
- “Operating System Boots with Problems” on page 107.
- “Intermittent Server Problems” on page 107.
- “DVD Problems Occur” on page 107.
- “Hard Drive Problems Occur” on page 108.
- “Console Problems Occur” on page 108.
- “Downloading and Installing the Latest Version of the Firmware” on page 108.

## Troubleshooting Methodology

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**WARNING** Always disconnect the power cords before removing the server cover. Disconnect the power cords to avoid exposure to high energy levels that can cause burns when parts are short-circuited by metal objects such as tools or jewelry.

---

**CAUTION** Do not operate the server for more than two minutes with any cover removed. The covers also provide EMI containment and direct airflow within the chassis. Depending on which cover or assembly is missing, the server can shut down, interrupting operations. In addition, damage to server components can result due to overheating.

You can safely remove the front bezel while the HP server is running to remove and replace hot-swappable fans. You can replace the hot-swappable power supplies at any time. For any other service activity requiring access to internal components, power off the server and observe all safety precautions.

---

The server was tested prior to shipping. Failures encountered during installation can be due to damage that occurred in transit. Reseating connectors can clear problems that result from rough handling. If you are installing components or assemblies, compatibility problems or incorrect installations can be the cause of the problems. If you are installing components or assemblies, check that items are correctly installed and that all connectors are fully engaged. If the unit does not power on, check the power source before proceeding.

If a problem is encountered during initial operation, remove any add-in or optional components and retest the server before continuing. Verify basic server operation before installing additional cards and configuring software and hardware for the server requirements.

Troubleshooting is based on observation of server status indications and error messages, and by checking system event logs. You can observe the LED indicators on the front and rear of the server, and also the QuickFind diagnostic panel under the top cover. Error messages display on local and remote consoles. Server history (console, event, and history logs) is available through the iLO MP, and is accessed through the console. Additional information about troubleshooting is available in the *HP Integrity rx4640 User Service Guide* included on the CD provided with the server.

Offline troubleshooting programs are available on the resource CD that is shipped with the HP server. To troubleshoot the server, you must be familiar with the Offline Diagnostics Environment (ODE) which runs in the Extensible Firmware Interface (EFI). Descriptions and user information about offline troubleshooting tools are available at <http://www.docs.hp.com>. The offline tools are available for downloading at <http://www.software.hp.com>.



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## Server Does Not Power On

The server power button on the front panel operates differently depending on how long the button is held in, and on what the server is doing when the button is pressed. You must be aware of its uses to properly troubleshoot the server.

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**NOTE** If the server is off, and power is not connected to server power supplies, pressing the power button has no effect.

---

Power problems during installation are usually related to the installation process. If the server does not power on, check the LED indicators on the power supply rear panels and follow these steps.

- If the AC In indicators are lit, it is assumed that power is available to the server.
- If a fault indicator is lit, reseal the power supply. If the problem persists, remove and reseal boards within the server. If the problem persists, use the SEL to determine why the BMC is not allowing the server to power on.
- If the AC Out indicators are lit, it is assumed that power is available to the server circuits. If the console shows that the server is powered on, but server LEDs indicate that power is off, remove and reseal connectors on the LED status board. If the problem persists, replace the LED status board.

If the console shows that the server is not powered on (server is off), remove and reseal connectors on the I/O baseboard. If the problem persists, replace the power supply interface board or the I/O baseboard.

See the *HP Integrity rx4640 User Service Guide* for more information.

---

## Server Does Not Power Off

The server power button on the front panel operates differently depending on how long the button is held in, and on what the server is doing when the button is pressed. You must be aware of its uses to properly troubleshoot the server.

Table 10-1 describes what happens when the server is at EFI, and you press the power button.

**Table 10-1 Server Power Button Functions When Server is On and at EFI**

Action	Reaction
1-3 seconds	Server power turns off immediately (hard power off).
5 seconds or longer	Server power turns off immediately (hard power off).

Table 10-2 describes what happens when the server is on with the operating system running, and you press the power button.

**Table 10-2 Server Power Button Functions When Server is On and OS is Running**

Action	Reaction
1-3 seconds	Server power turns off (software controlled power off).
5 seconds or longer	Server power turns off immediately (hard power off).

If the server is off, and power is not connected to server power supplies, pressing the power button has no effect.

If the server is off, and power is connected to server power supplies, the front panel power LED blinks at a 1 Hz rate. In this state, standby power is available to server circuits, but main power is off. Table 10-3 describes what happens when the server is off, and you press the power button.

**Table 10-3 Server Power Button Functions When Server is Off**

Action	Reaction
1-3 seconds	Server power turns on.

## EFI Menu is Not Available

If you cannot access the EFI from either the main disk partition or the CD, use the following tools to help solve the problem:

- Front panel LEDs
- QuickFind diagnostic panel LEDs
- iLO MP
  - Console messages
  - System event logs (SEL)

See the *HP Integrity rx4640 User Service Guide* for a description of the LEDs.

## Operating System Does Not Boot

If the operating system does not boot, but you are able to reach the EFI from either the main disk partition or the CD, use the following tools to help solve the problem:

- Using the EFI Shell, check the system logs and analyze any error messages.
- Offline Diagnostic Environment (ODE)

See the *HP Integrity rx4640 User Service Guide* for more information.

## Operating System Boots with Problems

If the operating system is running and you are experiencing problems, use the following tools to help solve the problem:

- LEDs
- Error Messages and event logs

See the *HP Integrity rx4640 User Service Guide* for more information.

---

## Intermittent Server Problems

You can usually trace intermittent problems that occur during installation to power source problems, a loose connector, or some other hardware problem. If you are experiencing intermittent problems, follow these steps:

1. Check MP logs and analyze the problem. Determine if there is more than one symptom and if the problem is random.
2. Verify that the AC power source is stable.
3. Reseat all rear panel connectors.
4. Reseat all hot-swappable fans and power supplies.
5. Reseat all main memory DIMMs.
6. Reseat all cable harnesses and board connectors.

See the *HP Integrity rx4640 User Service Guide* for more information.

---

## DVD Problems Occur

DVD problems that occur during installation are usually related to faulty connections. If you are experiencing DVD problems, follow these steps:

1. Remove and reinsert the disk.
2. Replace the disk.
3. Remove and reinstall the DVD drive. Check that connectors are fully engaged.
4. Replace the DVD drive.

## Hard Drive Problems Occur

Hard drive problems that occur during installation are usually due to rough handling. The drive may not be correctly seated or may have been damaged in transit. If you are experiencing hard drive problems, follow these steps:

1. Remove and reinsert the faulty hard drive.
  2. Swap the hard drive with one from another slot or with a known good spare.
  3. Remove and reinstall the hard drive backplane. Check that connectors are fully engaged.
  4. Replace the hard drive backplane.
- 

## Console Problems Occur

Console problems during installations can be caused by faulty interconnections. If you are experiencing monitor, keyboard, or mouse problems, follow these steps:

1. Check the monitor controls. Adjust contrast and brightness as required.
  2. Inspect all power and interconnecting cables. Check that all console connectors are fully engaged.
  3. Check that all MP board connectors are fully engaged.
  4. Exercise the appropriate self-test features of the console software.
- 

## Downloading and Installing the Latest Version of the Firmware

HP makes every effort to provide you with the most current version of firmware. However, there can be instances when this is not the case.

To ensure you have the latest version of the firmware running on the server, download the latest version of the firmware from the Web, and create a CD to install the firmware on the server.

### Downloading the Latest Version of the Firmware

To download the latest version of the firmware from the Web, follow these steps:

**Step 1.** Go to:

<http://www.hp.com/go/bizsupport>

**Step 2.** Select **download drivers and software**.

**Step 3.** Select **Itanium-based servers** from the Server category.

**Step 4.** Select your product from the servers listed.

- Step 5.** Select your operating system.
- Step 6.** Select the firmware category you want to download.
- Step 7.** Download the firmware to a CD.

### **Installing the Latest Version of the Firmware on the Server**

To install the latest version of the firmware on the server, follow these steps:

- Step 1.** Initiate a server console session. See Chapter 6, “Console Connection and Setup,” on page 63.
- Step 2.** Insert the CD with the copy of the latest version of the firmware.
- Step 3.** Using the EFI Boot Manager menu, boot to the drive that contains the CD with the updated firmware.
- Step 4.** Follow the instructions to update the firmware.



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