

Installation Guide

HP Integrity rx2620 Server



Manufacturing Part Number: AD117-9001A

Third Edition

August 2006

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Localized Documentation

This Installation Guide has been translated to:

日本語 <http://www.docs.hp.com/ja/index.html>

한글 <http://www.docs.hp.com/ko/index.html>

简体中文 http://www.docs.hp.com/zh_cn/index.html

繁體中文 http://www.docs.hp.com/zh_tw/index.html

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About This Document

This document provides information and instructions on installing the HP Integrity rx2620 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.

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

The latest version of this document can be found on line at <http://www.docs.hp.com>.

Intended Audience

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

This document is not a tutorial.

New and Changed Information in This Edition

- This document is being updated as part of upgrading the HP Integrity rx2620 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
AB331-90002	HP-UX, Windows®, Linux®	rx2620	September 2004
AB331-90005	HP-UX, Windows®, Linux®, OpenVMS®	rx2620	June 2005
AD117-9001A	HP-UX, Windows®, Linux®, OpenVMS®	rx2620	August 2006

Document Organization

This guide is divided into the following chapters.

Chapter 1	Introduction Use this chapter to learn about the features and specifications of the HP Integrity rx2620 server.
Chapter 2	Unpack and Inspect the Server Use this chapter to inspect the server in its shipping packaging, and unpacking it.
Chapter 3	Installing Additional Components Use this chapter for procedures on installing additional components purchased with the server that were not factory installed.
Chapter 4	Installing the Server into a Rack or Tower Use this chapter for procedures on how to mount the server into a rack or tower configuration.
Chapter 5	Connecting Cables Use this chapter for procedures on how to connect external cables to the server.
Chapter 6	Console Connection and Setup Use this chapter for procedures on how to connect and set up a console session.
Chapter 7	Powering on the Server Use this chapter for procedures on how to power the server on.
Chapter 8	Accessing the Host Console Use this chapter to access the console session you have just set up.
Chapter 9	Booting the Operating System Use this chapter for procedures on how to boot the operating system on the server if not factory installed.
Chapter 10	Troubleshooting Use this chapter to learn about high-level troubleshooting procedures when installing the server.

Typographic Conventions

This document uses the following conventions.

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

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

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

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

HP-UX Release Name and Release Identifier

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

Table 2 HP-UX 11i Releases

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

Related Documents

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

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://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
- *HP-UX Virtual Partitions*
http://www.hp.com/hpbooks/prentice/ptr_0130352128.html

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

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HP encourages your comments concerning this document. We are truly committed to providing documentation that meets your needs.

Please send comments to: netinfo_feedback@cup.hp.com.

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.

1 Introduction

The HP Integrity rx2620 server is a 2-socket server based on the Itanium processor architecture. The server supports the following operating systems: Microsoft Windows, HP-UX, Linux, and OpenVMS. The server is available in either rack-mount or tower configurations. The server accommodates up to 12 DIMMs and internal peripherals, including disks and a DVD-ROM. Its high availability features include hot-swap power supplies and hot-plug disk drives.

This chapter addresses the following topics:

- “Server Overview” on page 16
- “Server Components” on page 17
- “System Board Components” on page 20
- “Firmware” on page 26
- “Safety Information” on page 27
- “Installation Sequence and Checklist” on page 28

Server Overview

The HP Integrity rx2620 server chassis is a 2U Electronics Industry Association (EIA) enclosure, which mounts in any standard 19 inch EIA rack. All external cabling connects through 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 front of the product. There are 3 low-profile hot swappable hard disk drives accessible from the front, and a slim-line optical drive for a CD-R, CD-RW, DVD-R or DVD+RW. There are N + 1 redundant, hot-swappable system fans, all clearly identified and easily accessible. System status indication, a power switch, system locator switch and LED are located in the front within the bezel. There is also a system locator switch and LED in the back of the system for easy identification in the rack. See Figure 1-1, Figure 1-2, and Figure 1-3 for front and back views of the server.

Figure 1-1 HP Integrity rx2620 Server (front view)

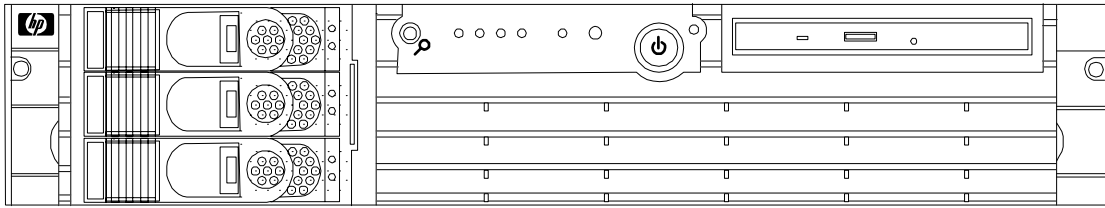


Figure 1-2 HP Integrity rx2620 Server (front view with bezel removed)

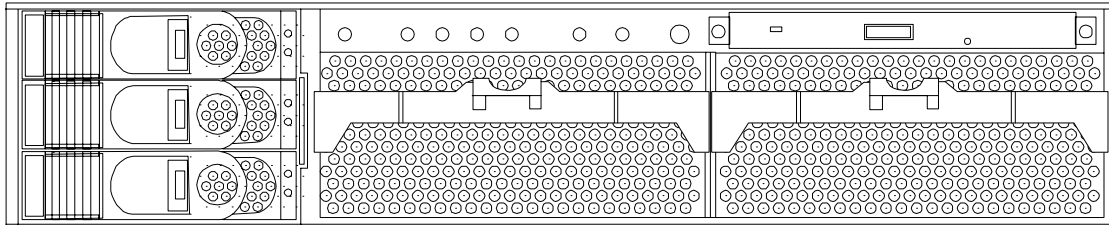
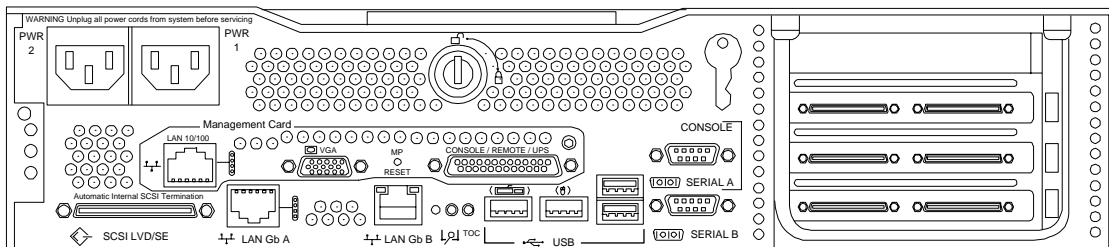


Figure 1-3 HP Integrity rx2620 Server (rear view)



Server Dimensions

Table 1-1 shows the dimensions and weight of the rx2620 server.

Table 1-1 Server Dimensions

Dimensions	Value
Rack units	2U
Height	8.6 cm (3.4 in.)
Width	48.3 cm (19.0 in.)
Depth	67.9 cm (26.8 in.)
Weight	
• Min.	17.5 kg (38.6 lb.)
• Max.	22.2 kg (49.0 lb.)

Server Components

The following components make up the HP Integrity rx2620 server:

- “Itanium-2 Processors” on page 17
- “Memory” on page 18
- “PCI Riser” on page 18
- “Internal Core I/O” on page 18
- “External Core I/O” on page 18
- “Power Supply Unit” on page 18
- “System Board Manageability” on page 19
- “Enhanced Server Manageability Using the Integrated Lights Out Management Processor” on page 19
- “Hard Disk Drives” on page 19

The following sections contain details of the listed components.

Itanium-2 Processors

- 1.4 GHz/12 MB L3 cache dual-core processor
- 1.6 GHz/18 MB L3 cache dual-core processor

Memory

- 12 memory DIMM slots
- 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB standard 184 pins 2.5 V DDR1, CL2, registered, ECC
- 133 MHz memory bus frequency, 266 MTransfers/s data, 8.5 Gb/s peak data bandwidth
- Minimum memory size of 1 GB with four 256 MB DIMMs
- Maximum memory size of 32 GB with eight 4 GB DIMMs
- Upgrades must be made by quads of DIMMs
- DIMMs loaded by quads enable interleaved mode & chip spare

PCI Riser

- Four independent PCI-X 133 MHz 64 bit, 3.3 V, 15 W slots. There is no 5 V card & hot plug support

NOTE Some 25 W cards are supported. See the following slot matrix (by server):
<http://www.docs.hp.com/en/SSM1-EL/slotmatrix.htm>
For more information regarding specific I/O cards, see:
<http://www.docs.hp.com/en/netcom.html>

Internal Core I/O

- Dual channel SCSI U320 interface, two internal 68 pin connectors, one 68 pin external connector
- The three internal SCSI drive connectors are the 80 pin type and provide drive electrical hot-plug capability
- One internal IDE connector for a slim-line optical device (CD and DVD)
- No floppy connector

External Core I/O

- One SCSI U320 68 pin connector
- Two 10/100/1000Base-T ethernet LAN connectors for twisted pair cable
- Four USB 2.0 ports
- Two general purpose 9 pin serial ports, 16550 compatible

Power Supply Unit

- 600 W output power
- The power supply is split in a front-end block (the actual power supply case) that converts the line voltage into a high DC voltage. Back-end voltage regulation modules (on the system board) step down the front end DC voltage to the required voltages
- Redundant and hot-pluggable power supplies (front-end block only)

System Board Manageability

- Baseboard Management Controller (BMC)
- Temperature monitoring and fan regulation by BMC
- BMC manageability console shared with system console and general purpose serial port
- Intelligent platform management interface (IPMI) protocol for communication between BMC/system/integrated lights out (iLO) manageability card
- BMC hardware diagnostics display on the front status panel
- Locator front and rear LEDs
- Field replacement units monitoring by BMC
- Serial port for local and modem console
- Wake-on-LAN and Alert-on-LAN capabilities from the 10/100/1000 BT LAN port

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:

- Web Graphical User Interface (GUI)
- LAN telnet console
- Web console
- Serial port for local console
- Serial port for modem console
- Duplication of console screen content across all consoles
- VGA and 2D graphics display
- Advanced Features:
 - Secure Shell (SSH) access
 - Group actions through the HP Systems Insight Manager (HPSIM)
 - Directory-based authentication and authorization (LDAP)

Hard Disk Drives

The following hard disk drives are supported by the rx2620 server:

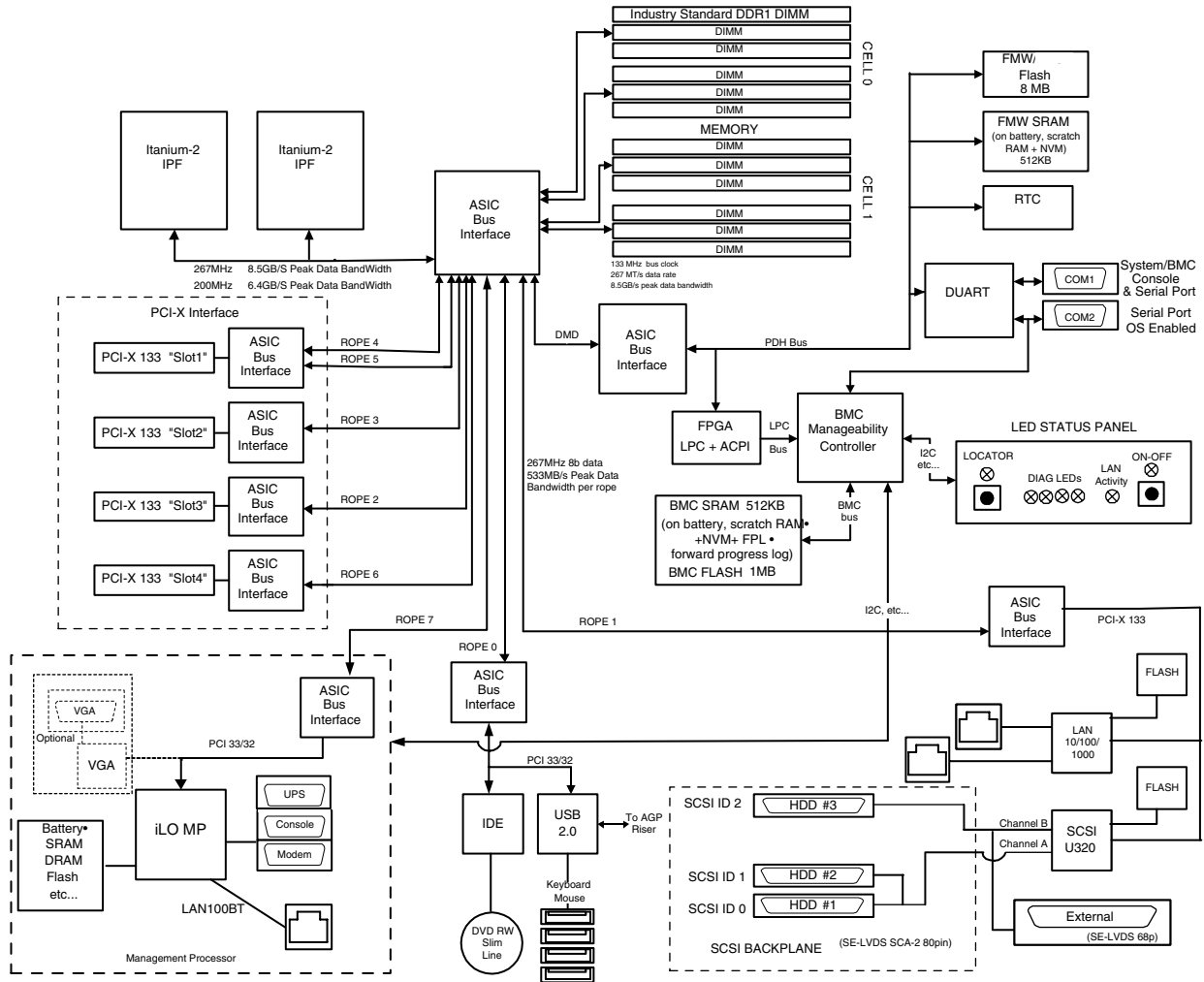
- 36 GB 15K HotPlug Ultra320 SCSI drive
- 73 GB 15K HotPlug Ultra320 SCSI drive
- 146 GB 10K HotPlug Ultra320 SCSI drive
- 300 GB 10K HotPlug Ultra320 SCSI drive

The server holds up to three hard disk drives.

System Board Components

This section provides a block diagram of the system board and descriptions of key components (integrated circuits) on the board. Figure 1-4 shows a block diagram of the rx2620 server.

Figure 1-4 System Block Diagram



The following describes the main components of the system board:

- “Processor Sockets” on page 21
- “Processor Bus” on page 21
- “ZX1 I/O and Memory Controller” on page 21
- “System Memory” on page 21
- “I/O Bus Interface” on page 23
- “Processor Dependent Hardware Controller” on page 23

- “Dual Serial Controller” on page 24
- “Field Programmable Gate Array” on page 24
- “Baseboard Management Controller” on page 24
- “SCSI Controller” on page 25
- “IDE Interface” on page 25
- “1 Gb System LAN” on page 25
- “USB Connectors” on page 25
- “User Interface” on page 26
- “Event IDs for Errors and Events” on page 26

Processor Sockets

The system board consists of two zero insertion force (ZIF) processor sockets, the core electronic complex (CEC), and circuitry for clock and power generation and distribution, boundary scan, in-target probe, and debug.

The front side bus (FSB) is the IA64 processor bus, based on bus protocol from Intel. Unlike previous PA-RISC microprocessors that utilized HP's proprietary processor bus, this processor is designed to utilize the FSB. This allows processor field replaceable units (FRUs) to be dropped in, provided that electrical and mechanical compatibility and support circuitry exist. For the purposes of this document, a FRU consists of a single processor with power pod, and the heatsink assembly.

Each processor plugs directly into, and is powered by its own 12 V to 1.2 V power pod. Other power for the system board comes from multiple on-board DC to DC converters. Each processor is attached to the board through a ZIF socket and the entire FRU secured by a heatsink.

Processor Bus

The FSB runs at 200 MHz. Data on the FSB are transferred at a double data rate, which allows a peak FSB bandwidth of 6.4 Gb/sec.

ZX1 I/O and Memory Controller

The HP Integrity rx2620 server supports the following features of the ZX1 I/O and memory controller chip:

- 8.5 Gb/s peak I/O bandwidth
- Seven communication paths
- Peak memory bandwidth of 8.5 Gb/s.
- Two memory cells, 144 data bits each.

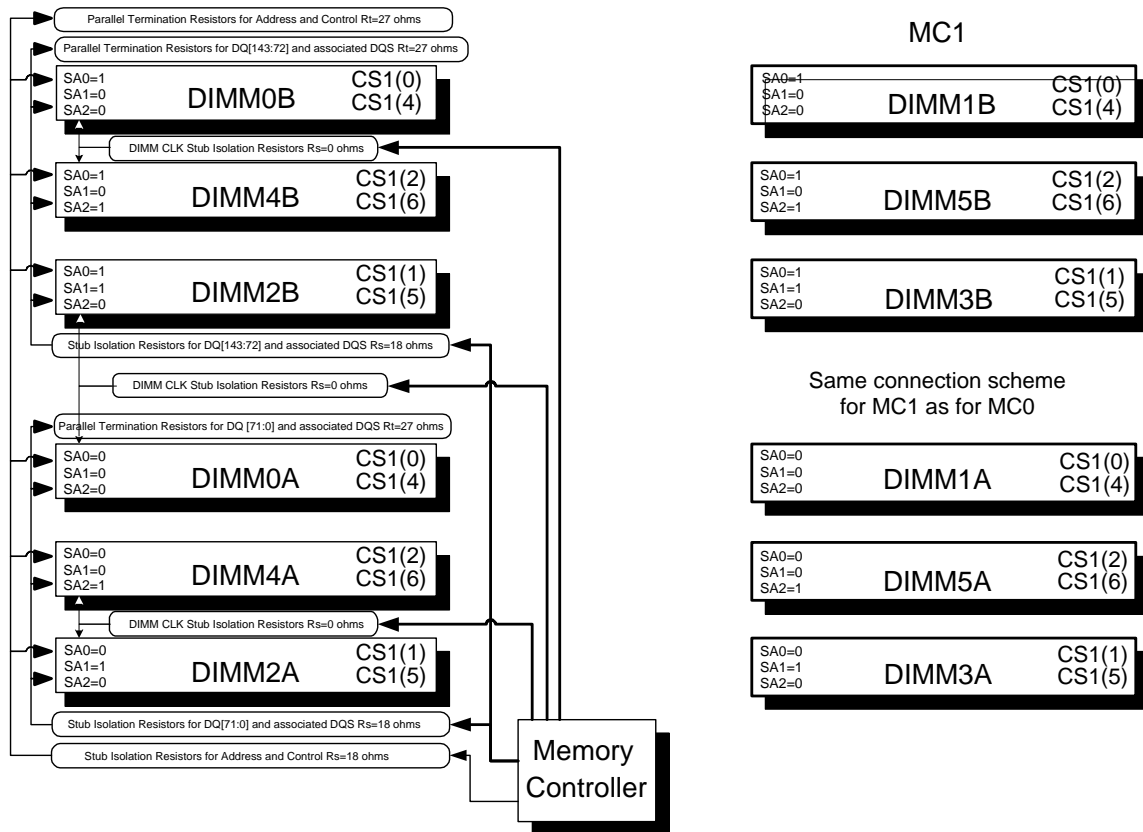
System Memory

The memory subsystem provides two memory cells, each of which is 144 data bits wide. Each cell has six DIMM slots, which means a total of 12 DIMM slots are available. The memory bus clock speed is 133 MHz, and the data transfer rate is 266 Mtransfers/second as data is clocked on both edges of the clock. The peak data bandwidth for this memory subsystem design is 8.5 Gb/s. Load DIMMs in quads with qualified modules. Memory is protected by data ECC, and the hardware implementation supports chip-spare.

The minimum amount of memory supported by the server is 1 GB (four 256 MB modules). The maximum amount of memory supported by the server is 32 GB (eight 4 GB modules).

This design does not support any non industry standard DDR DIMMs. Only qualified DIMMs are supported. Figure 1-5 shows a block diagram of the server memory.

Figure 1-5 Memory Block Diagram
MC0



Memory Architecture

The I/O ASIC memory interface supports two DDR cells, each of which is 144 data bits wide. The memory subsystem physical design uses a comb-filter termination scheme for both the data and the address and control buses. This part of the topology is similar to other DDR designs in the computer industry. Clocks are distributed directly from the I/O ASIC; each clock pair drives 2 DIMMs.

Memory data is protected by the ECC. Eight ECC bits per DIMM protect 64 bits of data. The use of ECC allows correction of single-bit errors, and detection of multi-bit errors. Only DIMMs with ECC are qualified or supported.

DIMMs

The memory subsystem supports only DDR SDRAM (Double Data Rate Synchronous Dynamic Random Access Memory) technology utilizing industry-standard PC-1600 type DDR SDRAM DIMMs, 1.2" tall. The DIMMs use a 184-pin JEDEC standard connector.

DIMMs are loaded in groups of four, known as a quad. All four DIMMs in a quad must be the same size. Table 1-2 summarizes the memory solutions.

Table 1-2 Memory Array Capacities

Min / Max Memory Size	Single DIMM Size	DDR SDRAM Count, Type and Technology
1 GB / 3 GB	256 MB DIMM	18 x 32 MB x 4 DDR1 SDRAMs (128 MB)
2 GB / 6 GB	512 MB DIMM	36 x 32 MB x 4 DDR1 SDRAMs (128 MB)
4 GB / 12 GB	1024 MB DIMM	36 x 64 MB x 4 DDR1 SDRAMs (256 MB)
8 GB / 24 GB	2048 MB DIMM	36 x 128 MB x 4 DDR1 SDRAMs (512 MB)
16 GB / 32 GB	4096 MB DIMM	36 x 256 MB x 4 DDR1 SDRAMs (1024 MB)

I/O Bus Interface

The I/O bus interface provides these features:

- Industry standard PCI 33 MHz and 66 MHz, PCI-X 66 MHz to 133 MHz, 32 or 64 data bit support
- Uses 3.3 V PCI only, and it does not support 5 V PCI
- Optimizes for DMA performance
- Supports 3.3 V or Universal keyed PCI cards. 5 V keyed PCI cards are not supported
- Supports up to four PCI sockets

Processor Dependent Hardware Controller

The processor dependent hardware (PDH) controller provides these features:

- 16-bit PDH bus with reserved address space for:
 - Flash memory
 - Non-volatile memory
 - Scratch RAM
 - Real Time Clock
 - Universal asynchronous receivers and transmitters (UARTs)
 - External registers
 - Firmware read/writable registers
 - Two general purpose 32-bit registers
 - Semaphore registers
 - Monarch selection registers
 - Test and Reset register
- Reset and INIT generation

Dual Serial Controller

The dual serial controller is a dual universal asynchronous receiver and transmitter (DUART). This chip provides enhanced UART functions with 16-byte first-in, first-out (FIFO) processing. Registers on this chip provide onboard error indications and operation status. An internal loopback capability provides onboard diagnostics.

Features include:

- Data rates up to 115.2 kbps
- 16550A fully compatible controller
- A 16-byte transmit FIFO to reduce the bandwidth requirement of the external CPU
- A 16-byte receive FIFO with four selectable interrupt trigger levels and error flags to reduce the bandwidth requirement of the external CPU
- UART control that provides independent transmit and receive
- Modem control signals (-CTS, -RTS, -DSR, -DTR, -RI, -CD, and software controllable line break)
- Programmable character lengths (5, 6, 7, 8) with Even, Odd or No Parity
- A status report register

Field Programmable Gate Array

The field programmable gate array (FPGA) provides ACPI and LPC support for the PDH bus and provides these features:

- ACPI 2.0 interface
- LPC bus interface to support BMC
- Decoding logic for PDH devices

Baseboard Management Controller

The baseboard management controller (BMC) supports the industry-standard IPMI specification. This specification describes the management features that have been built into the system board. These features include: local and remote diagnostics, console support, configuration management, hardware management, and troubleshooting.

The BMC provides the following:

- Compliance with IPMI 1.0
- Tachometer inputs for fan speed monitoring
- Pulse width modulator outputs for fan speed control
- Push-button inputs for front panel buttons and switches
- One serial port, multiplexed with the sever console port
- Remote access and intelligent chassis management bus (ICMB) support

- Three I²C primary and secondary ports (one port is used for the intelligent platform management bus [IPMB])
- Low pin count (LPC) bus provides access to three keyboard controller style (KCS), and one-block transfer (BT) interface
- 32-bit ARM7 processor
- 160-pin low profile flat pack (LQFP) package
- Firmware is provided for the following interfaces:
 - IPMI
 - IPMB

SCSI Controller

The SCSI controller is an LSI Logic 53C1030 chip. This chip is fully compliant with the SCSI Peripheral Interface-3 Specification (SPI-3). It has two independent SCSI channels supporting devices at speeds up to 320 Mb/seconds each. The 53C1030 adheres to the PCI-X addendum to the PCI Local Specification and is hard-wired to PCI ID 1 which corresponds to bit 17 of the PCI AD bus.

IDE Interface

The IDE controller (PCI649) supports the ATAPI zero to five modes (from 16 to 100 Mb/s). The usable speed on this system is limited to 16 MHz (ATA-33 mode, 33 Mb/s) because the slimline CD/DVD devices do not support the ATA-66 and 100 modes.

The primary IDE channel is the only channel that is implemented. The IDE cable provides only one drive connector, of the Primary type, for the DVD peripheral.

1 Gb System LAN

The 1 Gb system LAN port provides:

- Main system LAN
- 10/100/1000 Mb capability

USB Connectors

The USB connectors provide:

- High speed 480 Mb/sec. capability
- Full speed 12 Mb/second and low speed 1.5 Mb/second
- Support for USB keyboard and mouse
- HP-UX supports HP USB keyboard and mouse

Firmware

Firmware consists of many individually linked binary images that are bound together by a single framework at run time. Internally, the firmware employs a software database called a device tree to represent the structure of the hardware platform and to provide a means of associating software elements with hardware functionality.

The firmware incorporates the following main interfaces:

- Processor Abstraction Layer (PAL). PAL provides a seamless firmware abstraction between the processor and system software and platform firmware.
- System Abstraction Layer (SAL). SAL provides a uniform firmware interface and initializes and configures the platform.
- Extensible Firmware Interface (EFI). EFI provides an interface between the operating system and the platform firmware. EFI uses data tables that contain platform-related information, and boot and runtime service calls that are available to the operating system and its loader to provide a standard environment for booting.
- Advanced Configuration and Power Interface (ACPI). ACPI provides a standard environment for configuring and managing server systems. ACPI moves system power configuration and management from the system firmware to the operating system and abstracts the interface between the platform hardware and the operating system software. This allows each to evolve independently of the other.

The firmware supports the HP-UX 11i version 2, June 2006 release, Linux®, Windows®, and OpenVMS 8.3 operating systems through the Itanium processor family standards and extensions, and has no operating system-specific functionality included. All operating systems are presented with the same interface to system firmware, and all features are available to the operating system.

User Interface

The Itanium processor family firmware employs a user interface defined by an HP standard called Pre-OS System Startup Environment (POSSE). The POSSE shell is based on the EFI standard shell. Several commands were added to the standard EFI shell to support HP value-added functionality. Refer to the POSSE specifications for further details.

Event IDs for Errors and Events

The system firmware generates event IDs for errors, events, and forward progress to the MP through common shared memory. The MP interprets and stores event IDs. Reviewing these events helps you diagnose and troubleshoot problems with the server.

Safety Information

Use care to prevent injury and equipment damage when performing removal and replacement procedures. Voltages can be present within the server. Many assemblies are sensitive to damage by electrostatic discharge.

Follow the safety conventions listed below to ensure safe handling of components, to prevent injury, and to prevent damage to the server:

- When removing or installing any server component, follow the instructions provided in this guide.
- If installing a hot-swappable or hot-pluggable component when power is applied (fans are running), reinstall the server cover immediately to prevent overheating.
- If installing a hot-pluggable component, complete the required software intervention prior to removing the component.
- If installing an assembly that is neither hot-swappable, nor hot-pluggable, disconnect the power cable from the external server power receptacle.

WARNING **Ensure that the system is powered off and all power sources are disconnected from the server prior to removing or installing server hardware unless you are removing or installing a hot-swappable or hot-pluggable component.**

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 turned off.

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

- Do not wear loose clothing that can snag or catch on the server or on other items.
- Do not wear clothing subject to static charge buildup, such as wool or synthetic materials.
- If installing an internal assembly, wear an antistatic wrist strap and use 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.

Installation Sequence and Checklist

Follow the steps in Table 1-3 sequentially to ensure successful installation of the server.

Table 1-3 Installation Sequence Checklist

Step	Description	Completed
1	Unpack and inspect the server shipping container; inventory the contents using the packing slip. See Chapter 2, “Unpacking and Inspecting the Server,” on page 29.	
2	Install additional components shipped with the server. See Chapter 3, “Installing Additional Components,” on page 33.	
3	Install the server into a rack or tower mount. See Chapter 4, “Installing the Server into a Rack or Tower,” on page 55.	
4	Connect cables to the server. See Chapter 5, “Connecting Cables,” on page 57.	
	a: Connect AC input power cable. See “AC Input Power” on page 58.	
	b: Connect LAN core I/O cable. See “LAN” on page 60.	
5	Start a console session. See Chapter 6, “Console Connection and Setup,” on page 61.	
6	Power on the server. See Chapter 7, “Powering On the Server,” on page 73.	
7	Access the host console. See Chapter 8, “Accessing the Host Console,” on page 75.	
8	Boot the operating system. See Chapter 9, “Booting the Operating System,” on page 79.	
9	Verify the server configuration. See Chapter 9, “Booting the Operating System,” on page 79.	

2 Unpacking and Inspecting the Server

This chapter describes procedures performed before installation. 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:

- “Verifying Site Preparation” on page 30.
- “Inspecting the Shipping Containers for Damage” on page 30.
- “Unpacking the Server” on page 30.
- “Checking the Inventory” on page 31.
- “Returning Damaged Equipment” on page 31.
- “Unloading the Server with a Lifter” on page 31.

Verifying 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 system 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 61.
- 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 rx2620 Site Preparation Guide*.

Inspecting 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.

Unpacking 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.

Checking 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.

Returning Damaged Equipment

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.

Unloading 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.

NOTE HP recommends that you follow your local guidelines when lifting equipment.

- 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 system 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 system.

3 Installing Additional Components

This chapter provides information on the controls and indicators of the server and instructions required in installing additional components and configuring the HP Integrity rx2620 server.

This chapter addresses the following topics:

- “Service Tools Required” on page 34
- “ESD Information” on page 34
- “Installing Internal Hard Disk Drives” on page 37
- “Installing Additional System Memory” on page 40
- “Installing Additional PCI Cards” on page 43
- “Installing PCI Cards” on page 46
- “Installing an Additional Power Supply” on page 47
- “Installing an Additional Processor” on page 49

Service Tools Required

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

- IPF CPU Install Tool Kit (P/N 5069-5441), consisting of:
 - Disposable ESD Kit
 - Label-less CPU install tool (P/N 09901-04007)
- 1/4 inch Flat Blade Screwdriver
- ACX-10 Torx Screwdriver
- ACX-15 Torx Screwdriver
- ACX-25 Torx Screwdriver

ESD Information

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

- Use an anti-static 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.

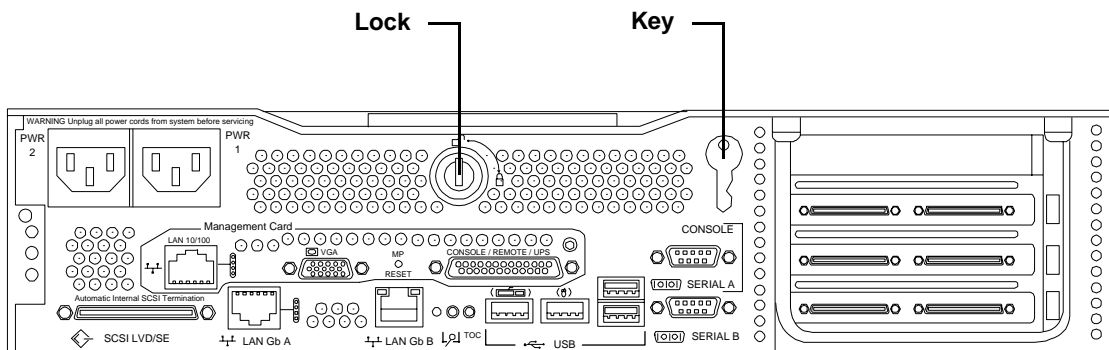
Removing and Replacing the Top Metal Cover

To access any of the internal components in the HP Integrity rx2620 server, you need to remove the top metal cover. The following procedures describe how to remove and replace the top metal cover.

Removing the Top Metal Cover

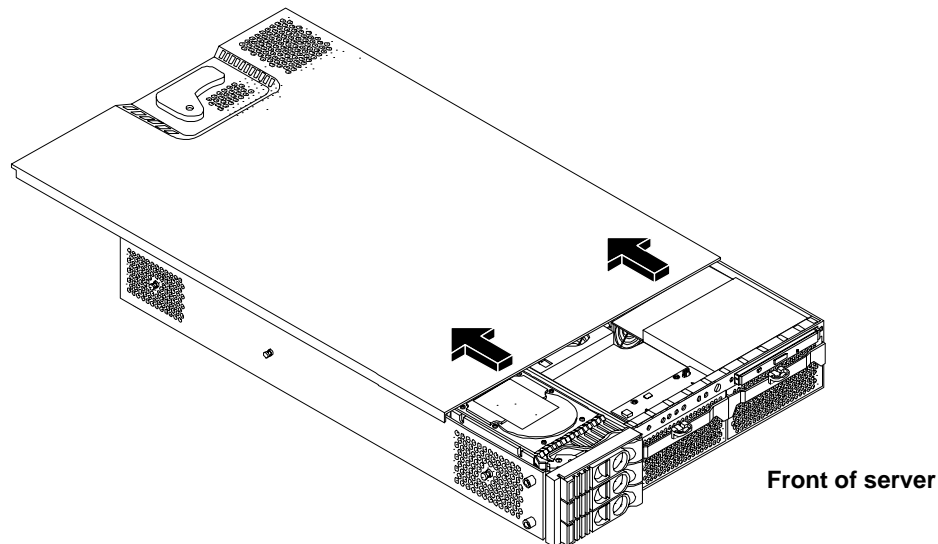
- Step 1.** Unlock the top metal cover lock with the key provided on the rear of the server. Figure 3-1 shows the location of the lock.

Figure 3-1 Top Metal Cover Lock Location



- Step 2.** Rotate the blue release lever toward the back of the system and slide the cover toward the back of the system. See Figure 3-2 for more information.

Figure 3-2 Removing and Replacing the Top Metal Cover



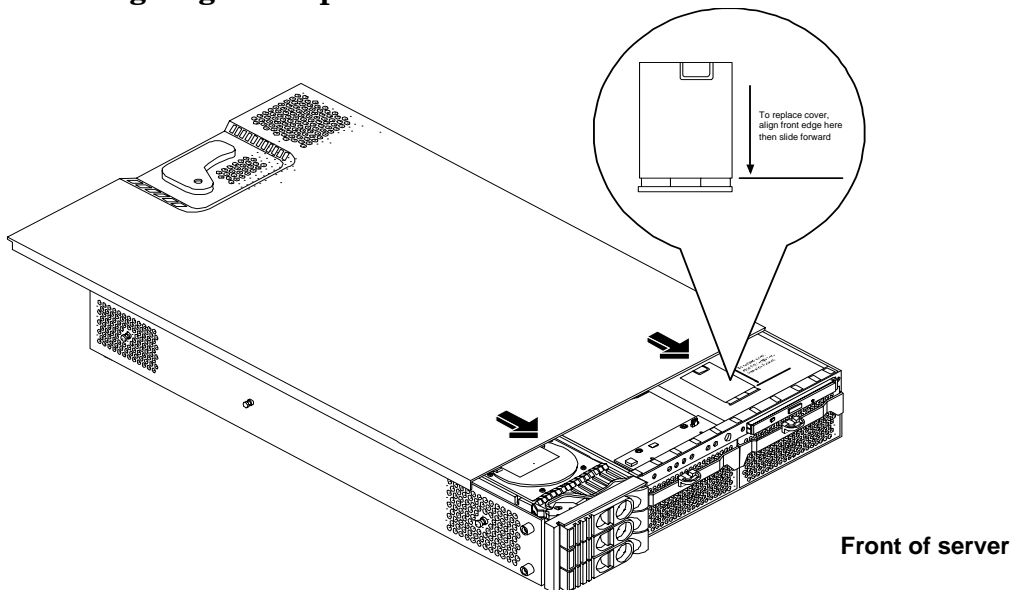
- Step 3.** Lift the top metal cover off the system chassis.

Replacing the Top Metal Cover

CAUTION Secure any wires or cables in your server so they do not get cut or interfere with the replacement of the top metal cover.

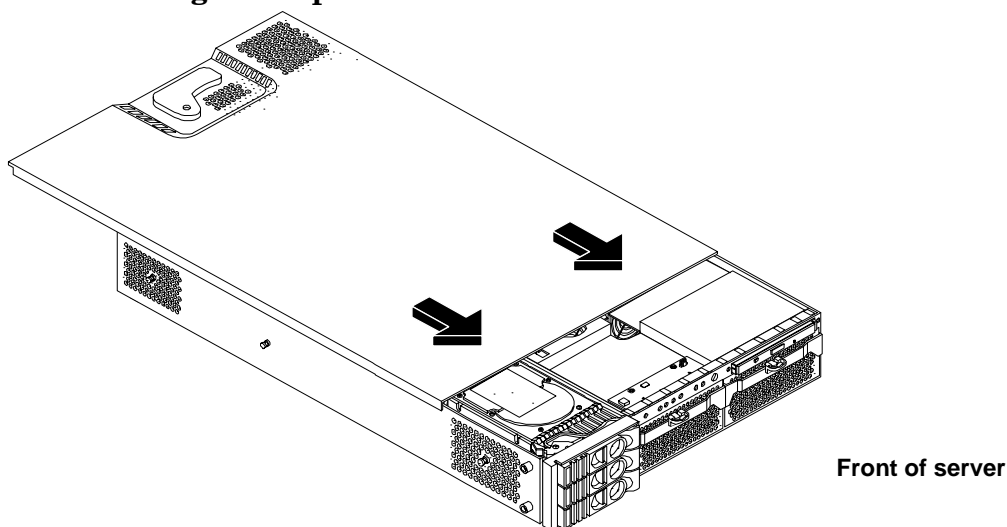
Step 1. Align the front edge of the top metal cover with the alignment mark on the optical drive bay. See Figure 3-3 for more information.

Figure 3-3 Aligning the Top Metal Cover



Step 2. Grasp the blue release lever and slide the top metal cover toward the front of the system until the lever snaps into place. See Figure 3-4 for more information.

Figure 3-4 Closing the Top Metal Cover



Step 3. Lock the top metal cover and return the key to its stored position.

Installing Internal Hard Disk Drives

This section provides information about removing and replacing internal hard disk drives.

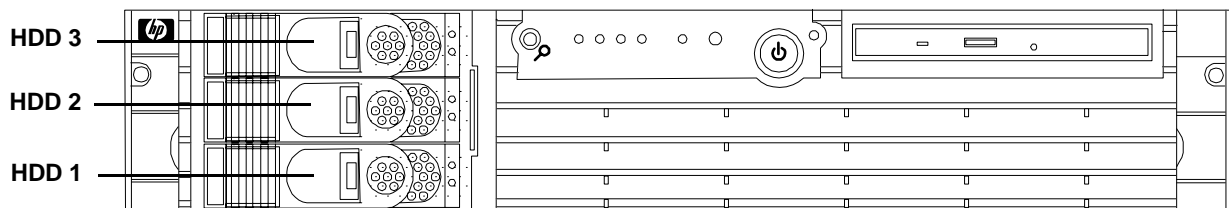
The HP Integrity rx2620 server supports up to three hot-pluggable, low-voltage differential (LVD) hard disk drives. These hard disk drives are 3.5-inch form factor devices that connect to Ultra 320 Wide LVD SCSI interfaces on the disk cage backplane. See Figure 3-5 for hard disk drive locations.

There is a significant difference between the terms hot-pluggable and hot-swappable:

- Hot swapping happens at the device level. A hot-swappable device is removed and installed without assistance from operating system commands.
- Hot-plugging allows you to replace a defective disk drive in a high-availability system while it is running.

CAUTION A hot-plug device may require interaction with the operating system before you install it into the server. Verify that the operating system supports installing disk drives while the operating system is running. If the operating system does not support this feature, shut down the operating system before attempting this procedure. Failure to observe this caution results in system failure.

Figure 3-5 Front View of the HP Integrity rx2620 Server



Two additional hard disk drive may be added to your HP server in slots 2 and 3. Always use low profile disk drives (1.0" height) in your server. The drives may be locked in position by a toggle switch inside the server.

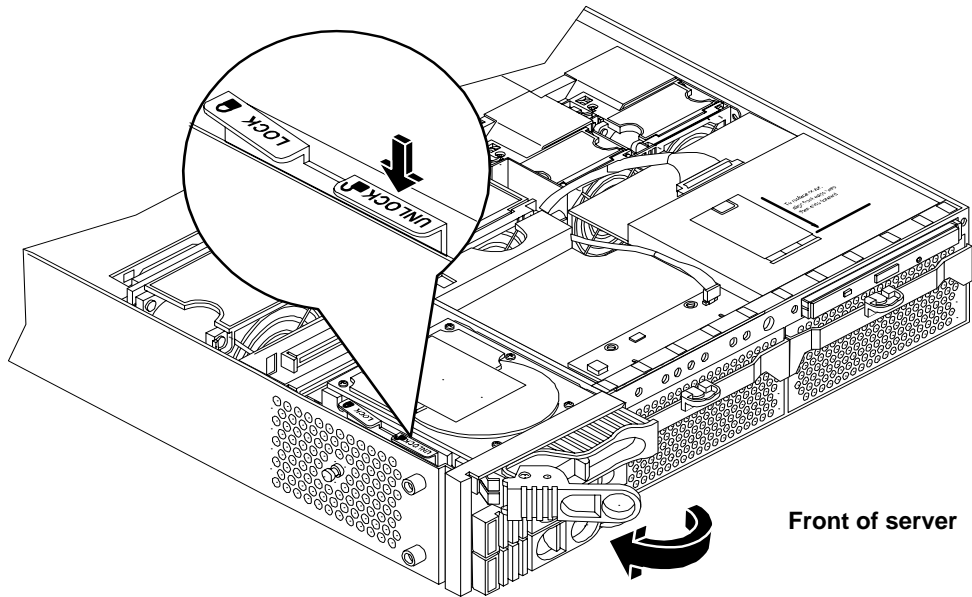
CAUTION If you try to remove a hard disk drive without unlocking it from the system, you will damage the hard drive bay.

NOTE If the drive bay is not locked, you can install additional hard disk drives without removing the server from the rack, and it is not necessary to remove the top metal cover. Completion of the procedure does not require locking the disk bay, replacing the top metal cover, or replacing the server in the rack. If the drive bay is not locked, go to step 4.

To install a hard disk drive when the drive bay is locked, perform the following steps:

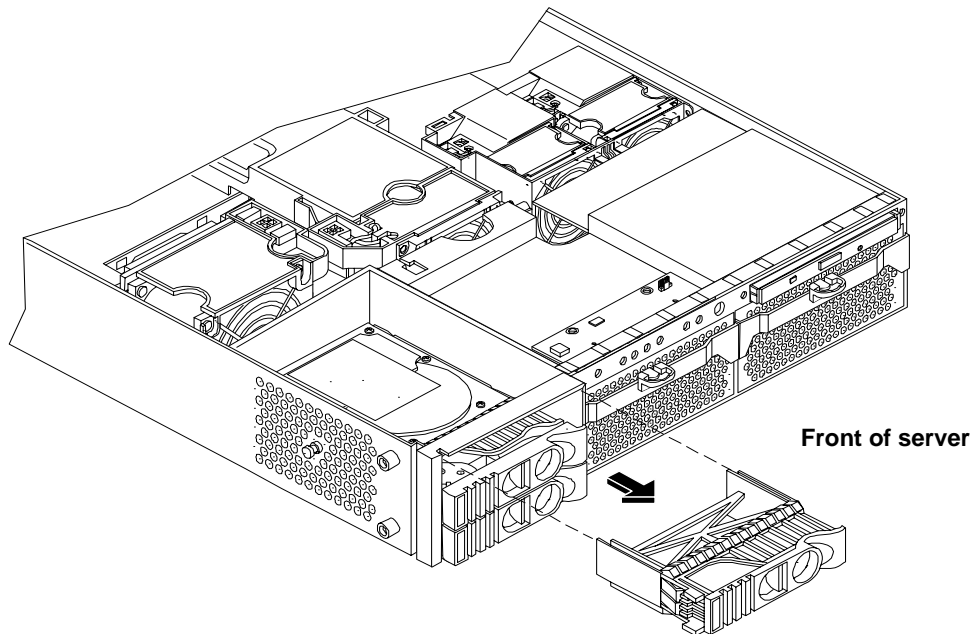
- Step 1.** Remove the top metal cover. See “Removing the Top Metal Cover” on page 35.
- Step 2.** Locate the Lock/Unlock lever located between the drive bay and the side of the server at the front left side of the server. See Figure 3-6 for the lever location.

Figure 3-6 Lock/Unlock Lever



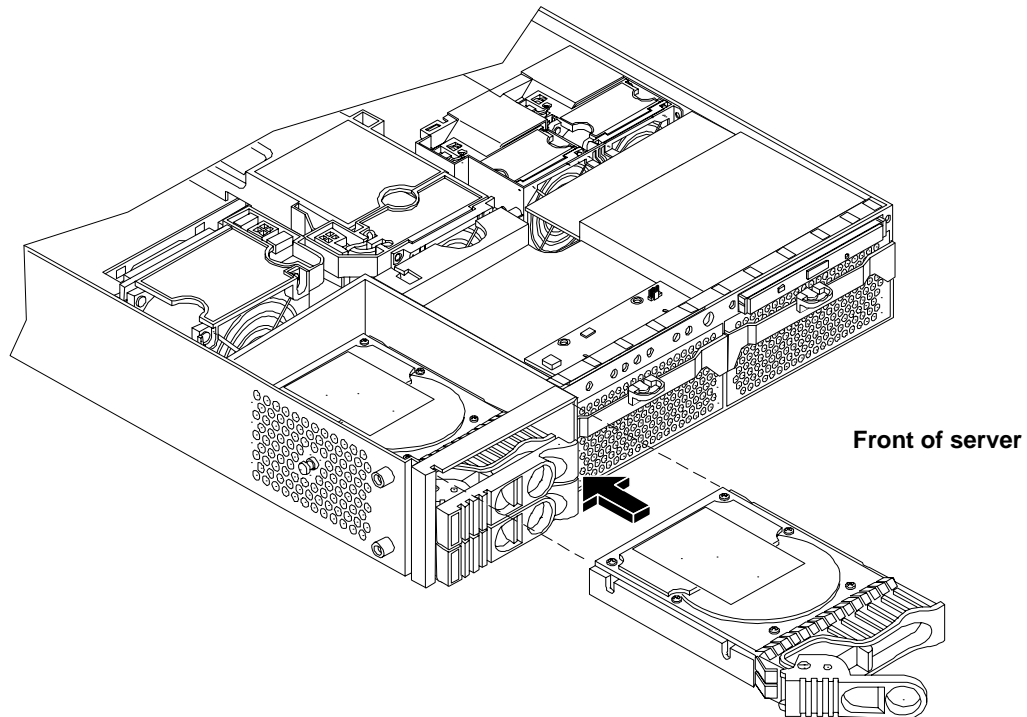
- Step 3.** Press down on the **Unlock** lever to disengage the drive lock.
- Step 4.** Remove the slot filler by pulling it out of the server. Figure 3-7 shows how to remove the slot filler.

Figure 3-7 Filler Removal from Slot



- Step 5.** Release the lock on the drive being installed and swing the drive ejection handle to the open position.
- Step 6.** Slide the hard disk drive into the slot until it is nearly seated. Figure 3-8 shows the installation of a hard disk drive.

Figure 3-8 Disk Drive Installation



- Step 7.** Close the drive ejector handle by pushing it inward until it clicks.
- Step 8.** At the disk bay lock, press down on the **Lock** lever to re-engage the drive bay lock (if necessary).

NOTE If you want the drives to be accessible without removing the top metal cover, leave the drive lock lever in the **Unlock** position.

- Step 9.** Install the top metal cover (if necessary) unless you are installing more components. See “Replacing the Top Metal Cover” on page 36 if necessary.

Installing Additional System Memory

The HP Integrity rx2620 server has 12 memory sockets for installing DDR SDRAM memory modules (DIMMs). These DIMMs can either be 256 MB, 512 MB, 1 GB, 2 GB, or 4GB. The system supports memory combinations from 1 GB up to 32 GB.

System memory DIMMs are located on the system board.

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

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

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

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

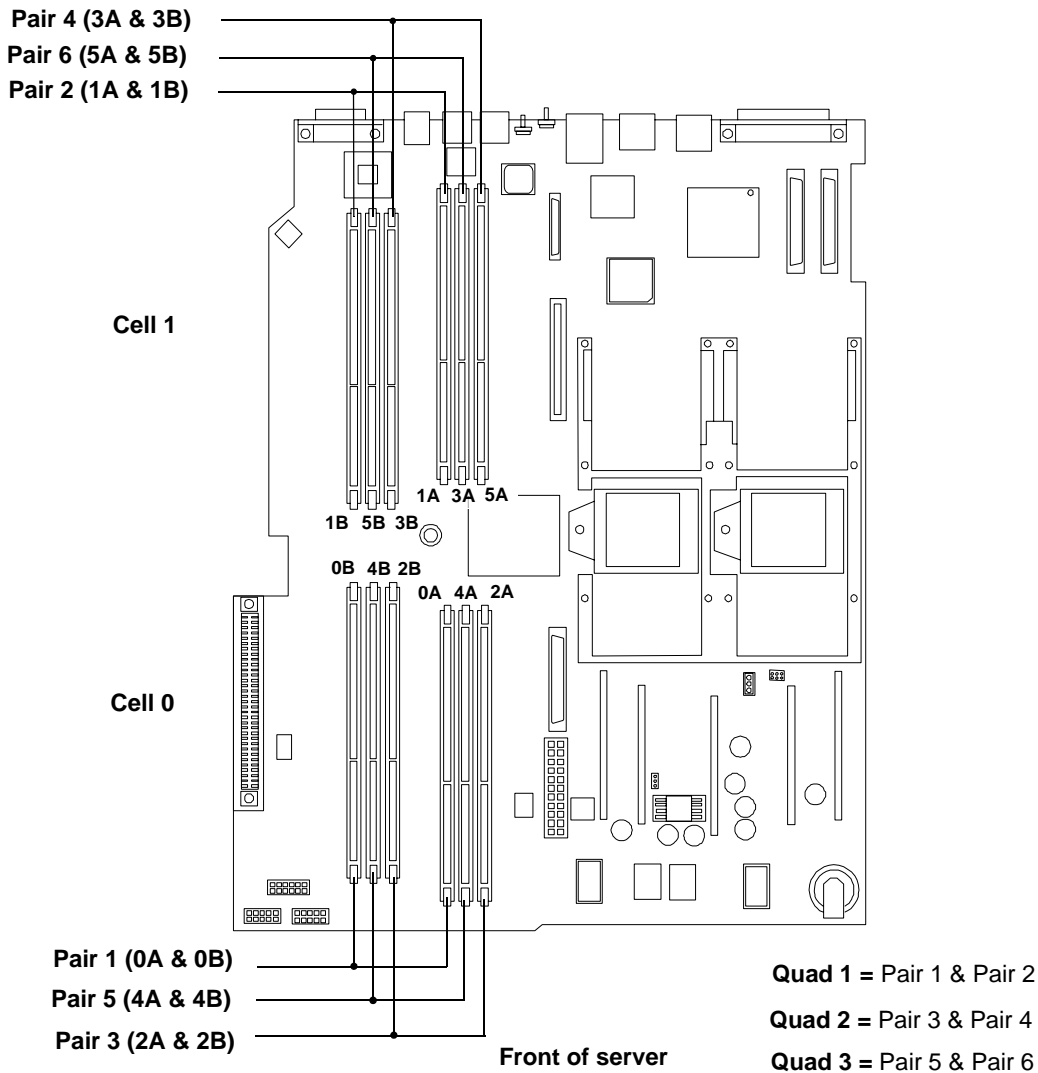
Supported DIMM Sizes

Supported DIMM sizes are 256 MB, 512 MB, 1 GB, 2 GB, and 4 GB. If 4 GB DIMMs are used, only two configurations (four or eight 4 GB DIMMs in the first four or eight sockets) are supported. You can use dissimilar DIMM sizes across the entire system board (except when using 4 GB DIMMs) but both DIMMs in a pair, and all four DIMMs of any quad must be identical. Figure 3-9 shows the DIMM slot locations.

NOTE The system firmware required for 4 GB DIMM operation is 4.0 or later.

If you use 4 GB DIMMs, the only configurations allowed are four or eight 4 GB DIMMs, with no other DIMMS allowed in the remaining slots.

Figure 3-9 DIMM Slot Identification



Installing System Memory

You must load the memory modules in the correct order:

- You must install the DIMMs in the HP Integrity rx2620 server in matched quads. Two matched memory card pairs of equal size (that is, four identical DIMMs) must be installed, one pair per memory cell, as listed below:
 - 0A, 0B and 1A, 1B must be matched pairs of equal size
 - 2A, 2B and 3A, 3B must be matched pairs of equal size
 - 4A, 4B and 5A, 5B must be matched pairs of equal size

NOTE DIMMs match if they have the same HP part number. The DIMMs are 184-pin, industry-standard, DDR266, CL2, registered ECC modules. Industry standard means the DIMMs meet specifications detailed in the JEDEC Standard No. 21-C, Module 4, titled “PC2100 and PC1600 DDR SDRAM Registered DIMM Design Specification.” A complete and current list of acceptable DIMMs is provided on the parts website at: <http://partsurfer.hp.com>.

You can mix module sizes, as long as DIMMs in each quad match, unless you are using 4 GB DIMMs. If you install 4 GB DIMMs, the only configurations allowed are four or eight 4 GB DIMMs. For example:

- On HP Integrity rx2620 servers, it is acceptable to load a quad of 256 MB DIMMs in quad 1 (slots 0A, 0B, 1A and 1B), and a quad of 1 GB DIMMs in quad 2 (slots 2A, 2B, 3A and 3B).
- If using 4 GB DIMMs, the only configurations allowed are:
 - Four 4 GB DIMMs in quad 1 (slots 0A, 0B, 1A, 1B), quad 2 (slots 2A, 2B, 3A, and 3B) and quad 3 (slots 4A, 4B, 5A, and 5B) remain empty
 - Eight 4 GB DIMMs in quad 1 and quad 2, with quad 3 empty.

The memory subsystem supports chip-spare functionality. Chip spare enables the server to bypass an entire SDRAM chip on a DIMM (logically replaced) in the event that a multi-bit error is detected on that SDRAM.

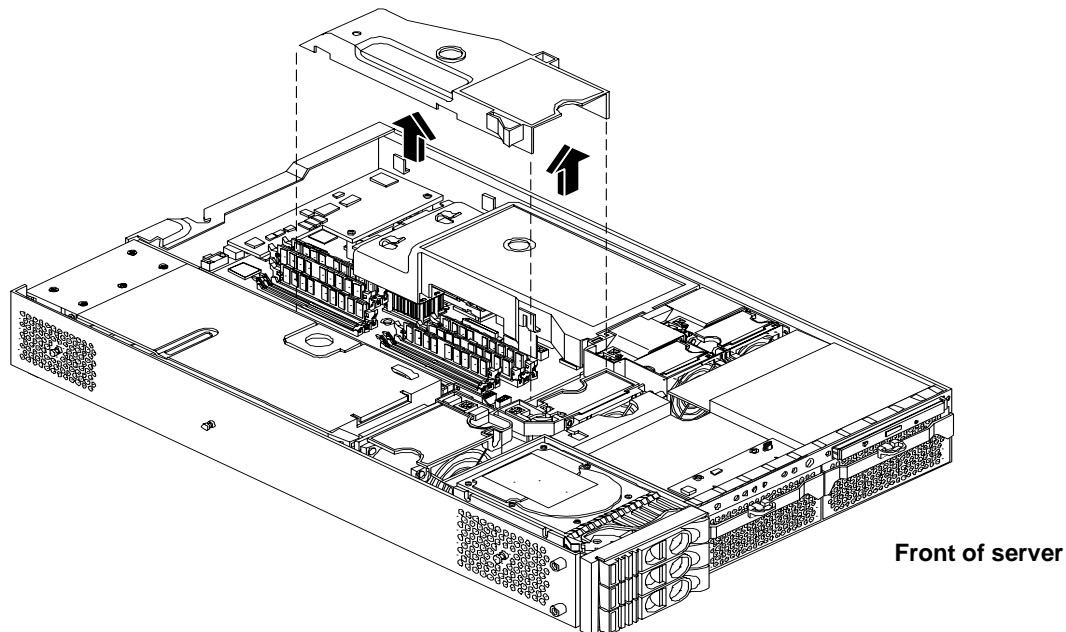
In order to use the chip spare functionality, use only DIMMs built with x4 SDRAM parts, You must load these DIMMs in quads. See Figure 3-9 for the DIMM quads on the system board.

Each DIMM within a quad must be identical to all the other DIMMs in the quad.

To install DIMMs, perform the following steps:

- Step 1.** Remove the top metal cover if it is not already removed. See “Removing the Top Metal Cover” on page 35 if necessary.
- Step 2.** Grasp the memory airflow guide and lift it out of the system. Figure 3-10 shows how to remove the memory airflow guide.

Figure 3-10 Removing the Memory Airflow Guide

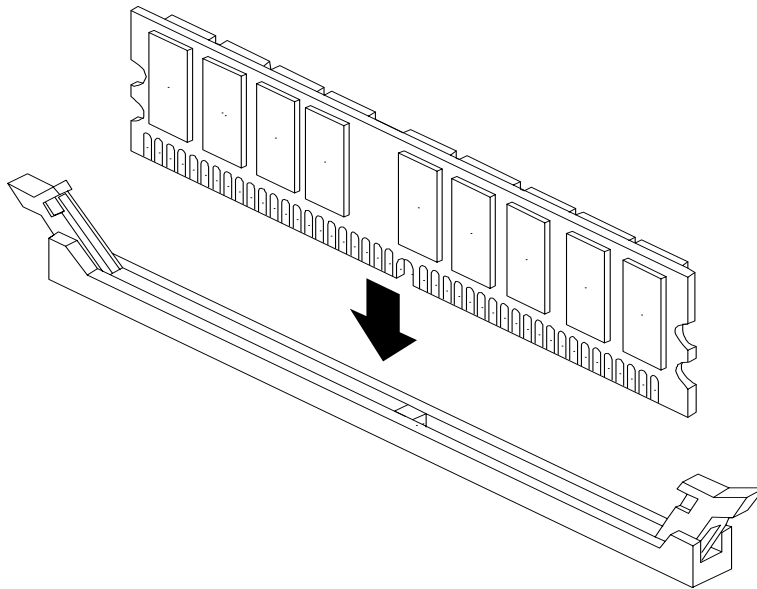


Step 3. Hold the memory module by the left and right edges and insert into the socket.

The memory modules are keyed and can only be inserted in one direction. When the module is correctly seated, the retainer clips will return to their fully upright position. Snap the clips firmly into place to properly seat the DIMMs.

Step 4. Gently and evenly push on each side of the DIMM until it seats in the socket. Ensure the extraction levers are in the closed position. Figure 3-11 shows how to install a DIMM.

Figure 3-11 **Inserting DIMM into Slot**



Step 5. Replace the memory airflow guide. See Figure 3-10.

Step 6. Install the top metal cover, unless you are installing more components. See “Replacing the Top Metal Cover” on page 36.

Installing Additional PCI Cards

Accessory cards are installed in a removable PCI cage. This section explains how to access the PCI cage, as well as how to install accessory cards.

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

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

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

CAUTION There are restrictions on the number of PCI-X cards that can be installed in the rx2620 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 A9890A cards maximum plus one unpopulated slot
- Two 337972-B21 cards maximum plus two unpopulated slots
- One AB287A card maximum plus three unpopulated slots

Failure to observe this caution results in system degradation, or system failure.

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

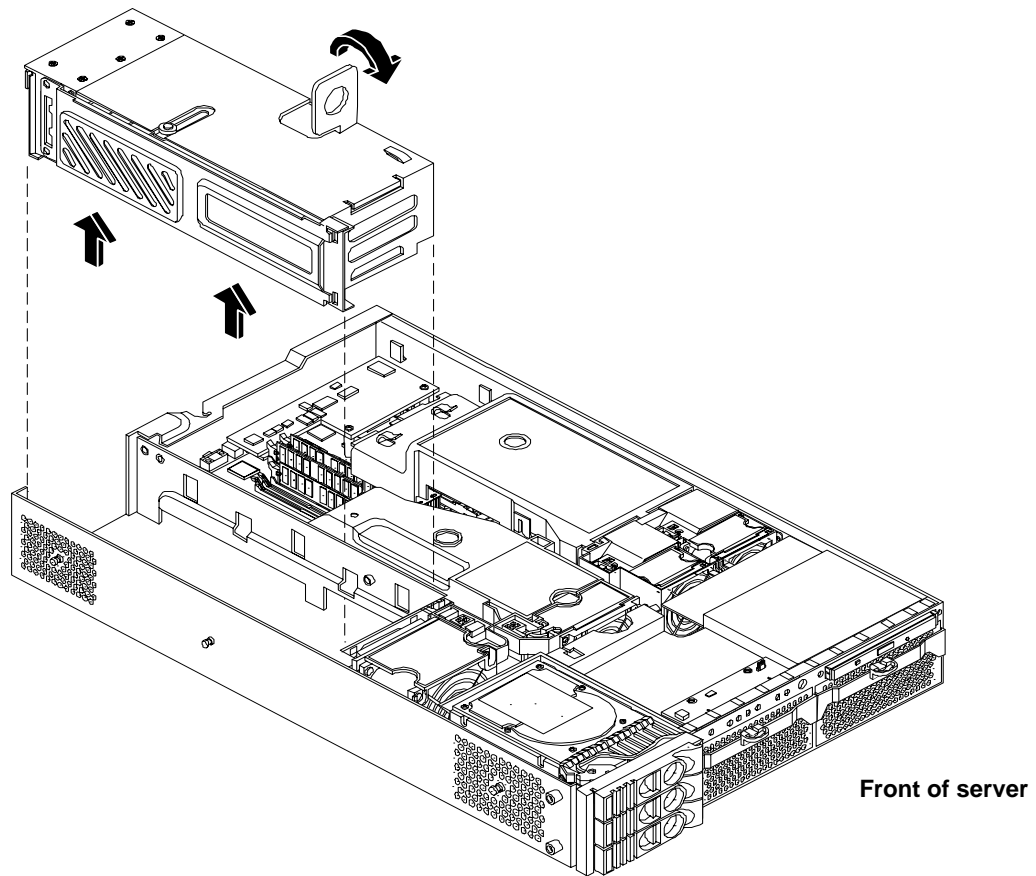
Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Removing the PCI Cage

To remove the PCI cage from the server, perform the following steps:

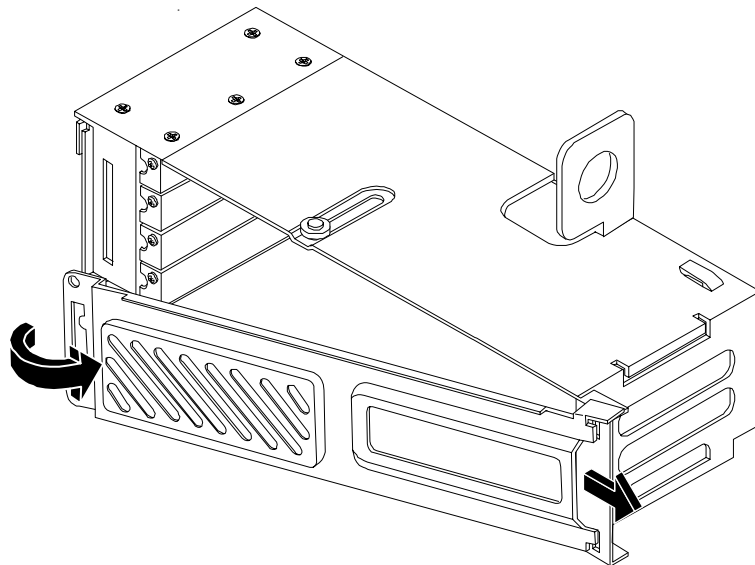
- Step 1.** Remove the top metal cover if not already removed See “Removing the Top Metal Cover” on page 35.
- Step 2.** Lift up on the PCI cage release lever and the back edge of the PCI cage and lift the PCI cage out of the system. Figure 3-12 and Figure 3-13 show how to remove the PCI card cage.

Figure 3-12 Removing the PCI Cage



Step 3. Grasp the PCI cage cover and slide it away from the bulkhead end of the cage, then lift the cover off.

Figure 3-13 Removing the PCI Cage Cover



Step 4. Unscrew the bulkhead screw that holds the accessory card in place. The PCI slots are now accessible for the installation of additional cards.

Installing PCI Cards

The server may contain up to four PCI cards. PCI cards are located in the PCI cage.

CAUTION There are restrictions on the number of PCI-X cards that can be installed in the rx2620 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 A9890A cards maximum plus one unpopulated slot
- Two 337972-B21 cards maximum plus two unpopulated slots
- One AB287A card maximum plus three unpopulated slots

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

The HP Integrity rx2620 server has the following accessory card sockets:

- Four 64-bit, 133 MHz PCI-X card sockets

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

Carefully read the following information concerning PCI slot configuration. Inserting a PCI card into a slot that is not configured to accept it may cause operation failure or the PCI card to operate at less than optimum speed. PCI slots are numbered 1 (top of cage) through 4 (bottom of cage). See the labels on the rear panel of the chassis for correct PCI slot number identification.

Installing a PCI Card

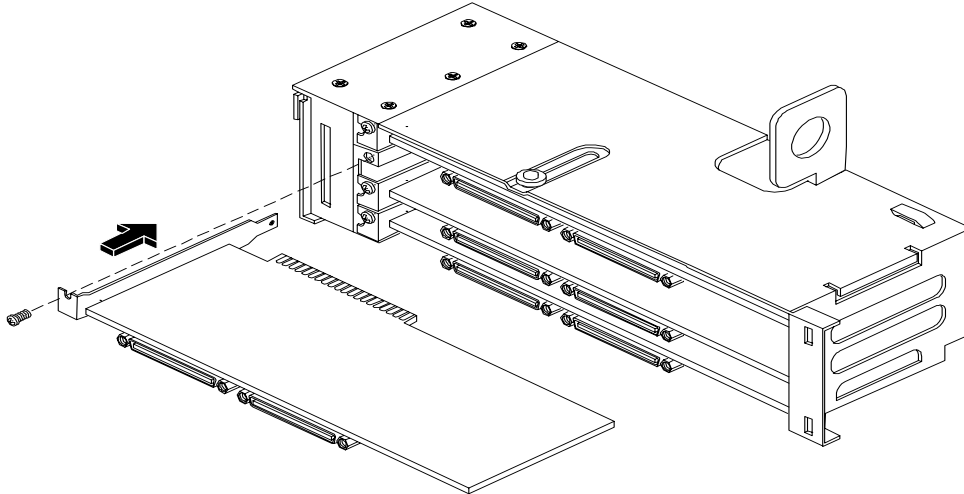
Step 1. Remove the top metal cover if not already removed. See “Removing the Top Metal Cover” on page 35.

Step 2. Remove the PCI cage. See “Removing the PCI Cage” on page 44.

Step 3. Remove and open the PCI cage. Refer to “Removing the PCI Cage” on page 44.

- Step 4.** Grasp the edges of the PCI card you are installing, and gently press the card into the PCI backplane connector. Figure 3-14 shows how to install a PCI card.

Figure 3-14 Installing a PCI Card



- Step 5.** Reinstall the PCI cage. See “Installing PCI Cards” on page 46.
- Step 6.** Connect any internal cables that are required by the PCI card.
- Step 7.** Install the top metal cover, unless you are installing more components. See “Replacing the Top Metal Cover” on page 36.

Installing an Additional Power Supply

The supported configuration of an HP Integrity rx2620 server requires a minimum of one power supply unit (PSU). You can install a second hot-swap PSU to provide redundant (N+1) capability.

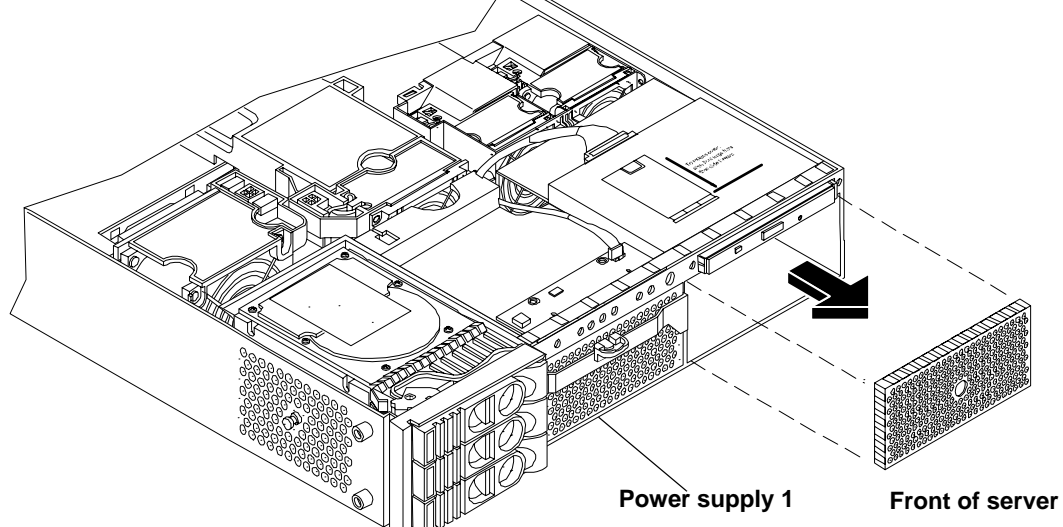
The power supplies in the HP server are hot-swappable. If one power supply stops working or exhibits voltage problems, the remaining supply can support the system until you replace the failed unit. You can remove and replace a power supply without turning off the server on servers with two power supplies.

CAUTION Before removing a power supply, make sure the second power supply is functioning properly. Check the two green LEDs inside the second power supply. If they are illuminated, the second power supply is on and able to power the server. You can safely remove the failed power supply.

To install the power supply, perform the following steps:

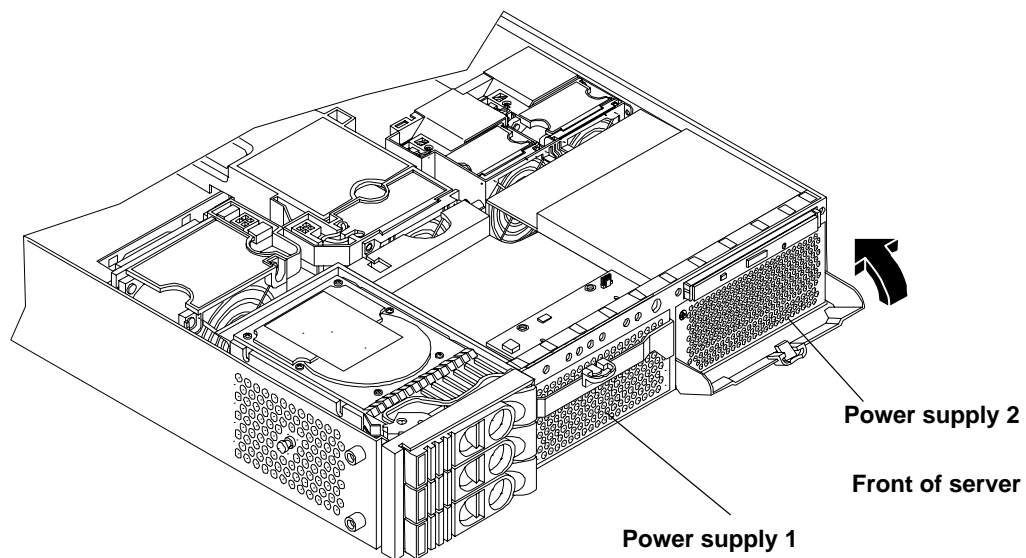
- Step 1.** Remove the front bezel from the system and remove the power supply filler panel. Figure 3-15 shows how to remove the power supply filler panel.

Figure 3-15 Removing the Power Supply Filler Panel



- Step 2.** Open the power supply release lever and slide the power supply into place. Figure 3-16 shows how to install a power supply.

Figure 3-16 Replacing the Power Supply



- Step 3.** Push in on the power supply release lever to lock the retaining clip in place.
- Step 4.** Verify that both power supply LEDs, visible through the front of the power supply, are illuminated.
- Step 5.** Replace the front bezel.
- Step 6.** Install the top metal cover, unless you are installing more components. See “Replacing the Top Metal Cover” on page 36.

Installing an Additional Processor

This section provides information about installing processors. The processors are located on the system board, accessible by removing the top metal cover.

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

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

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

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

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

Processors are located on the system board. The system board can support either one or two processor. The CPU 0 socket is located to the right of the system board (closer to the server chassis) and the CPU 1 socket is located on the left of the system board near the memory DIMMs. In a single CPU configuration, you must install the single processor in the CPU 0 socket. The load order is CPU 0, then CPU 1.

Figure 3-17 and Figure 3-18 show the processor locations).

Figure 3-17 Processor Location

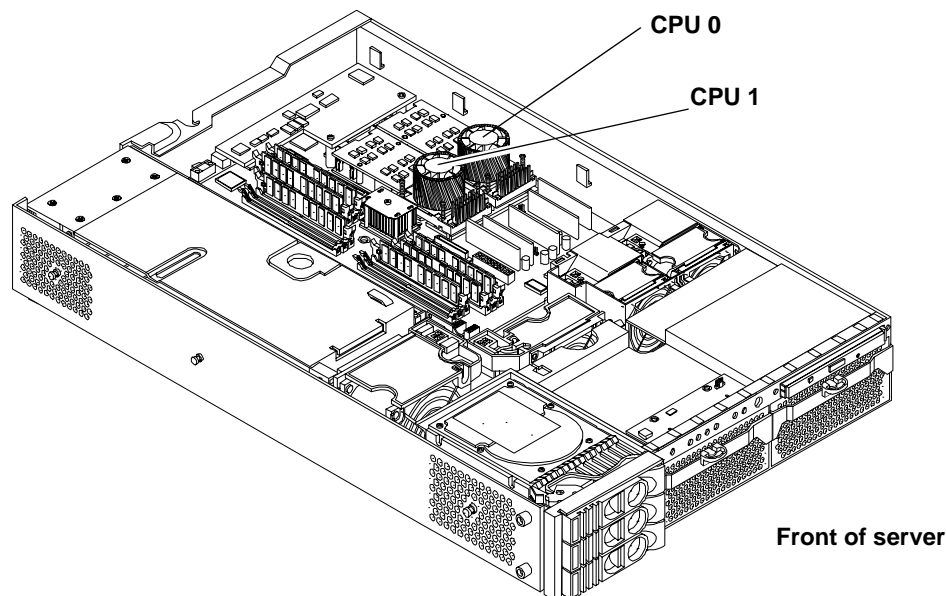
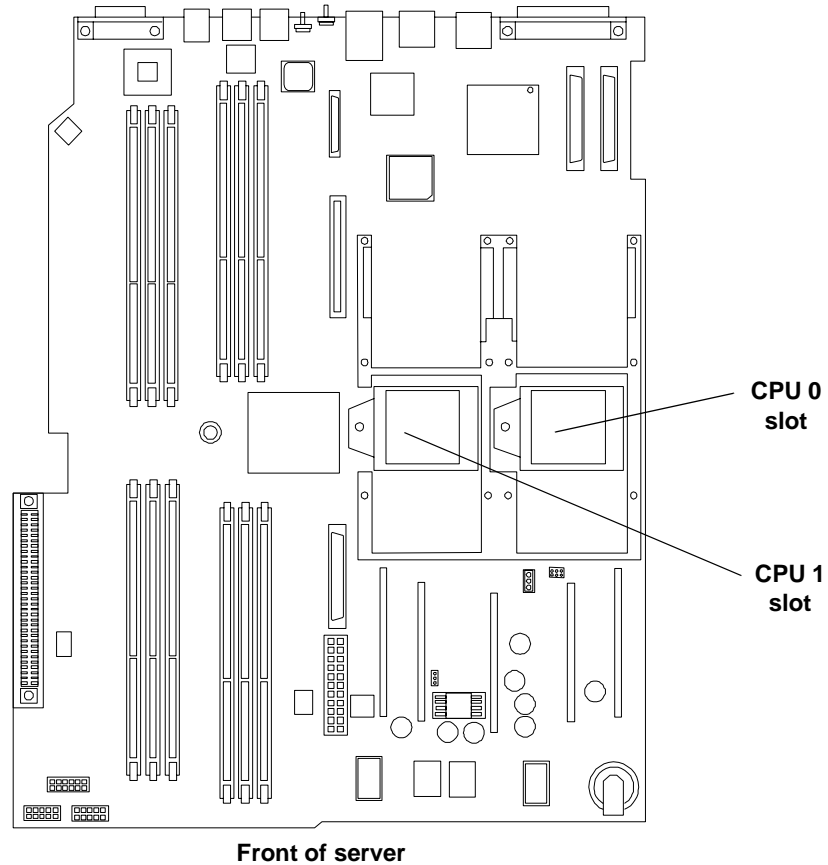


Figure 3-18 Processor Location on System Board



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

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

Valid processors are identified in the Parts Information chapter of the *HP Integrity rx2620 Maintenance Guide*.

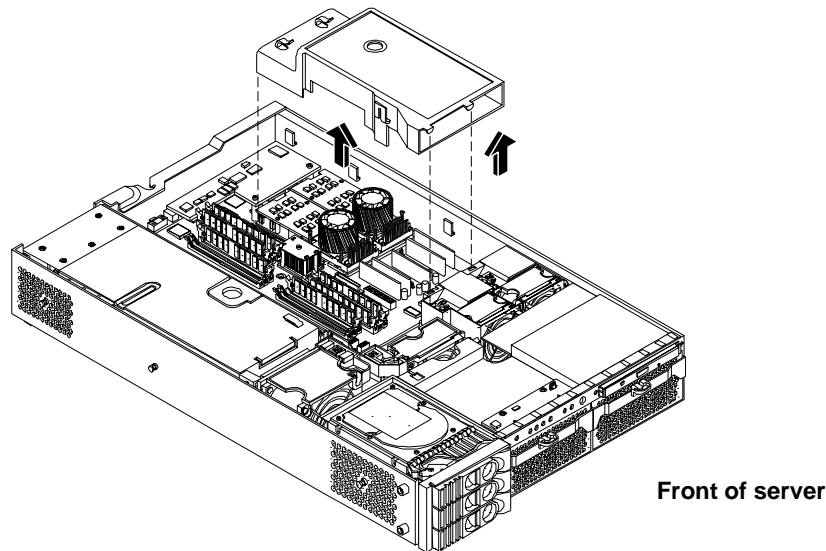
- Step 7.** Remove the top metal cover if not already removed. See “Removing the Top Metal Cover” on page 35.
- Step 8.** Remove the processor airflow guide. Figure 3-19 shows how to remove the processor airflow guide.
- a. Remove the IDE cable and power module cables from the processor airflow guide cable clips.

CAUTION Record the cable routing of these cables to ensure the cables are returned to their correct routes.

- b. Hold the guide using the opening on top of the guide.

- c. At the same time, grasp the back end of the airflow guide and lift the guide out of the system.

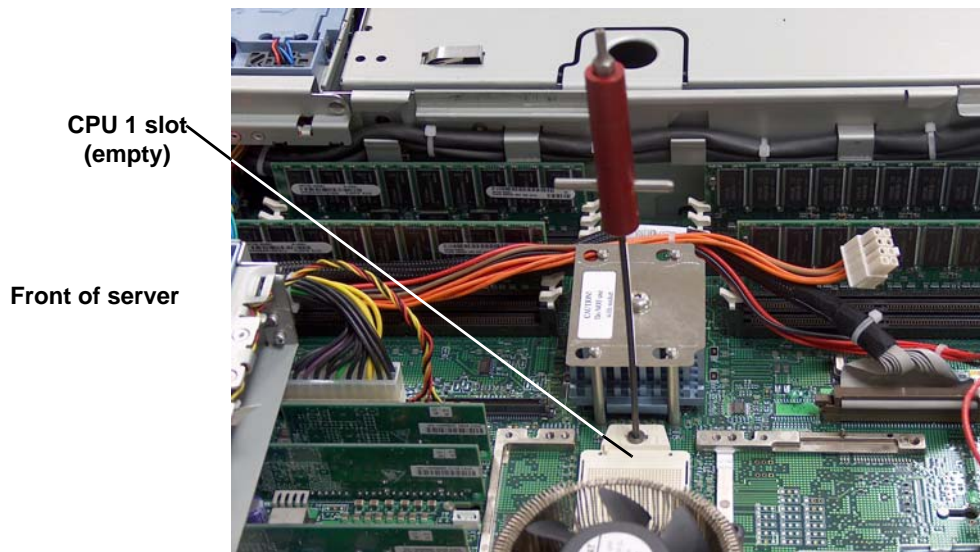
Figure 3-19 Removing the Processor Airflow Guide



- Step 9.** Unlock the zero insertion force (ZIF) socket processor locking mechanism using the special processor tool (P/N 5069-5441) or equivalent 2.5 mm hex tool. Insert the tool into the lock and rotate the special processor tool 180 degrees counterclockwise. Verify that the processor-locking mechanism is rotated into the unlocked position. Figure 3-20 shows how to unlock the ZIF socket.

CAUTION The ZIF socket for the processor is locked and unlocked by 1/2 of a full turn of the 2.5 mm hex tool. The counterclockwise 180 degree rotation (1/2 turn) unlocks the socket. A clockwise 180 degree rotation locks the socket. Attempting to turn the locking mechanism more than 180 degrees will severely damage the socket.

Figure 3-20 Unlocking the Processor Module Locking Mechanism



Step 10. Use the two alignment pins on the processor to properly align the processor on the system board. The two alignment pins fit in the alignment holes on the system board processor mount. The turbo fan power cable must be positioned so that it is located on the side of the heatsink that faces the front of the server. Figure 3-21 shows the alignment pins on the processor.

Figure 3-21 Alignment Pins on Processor

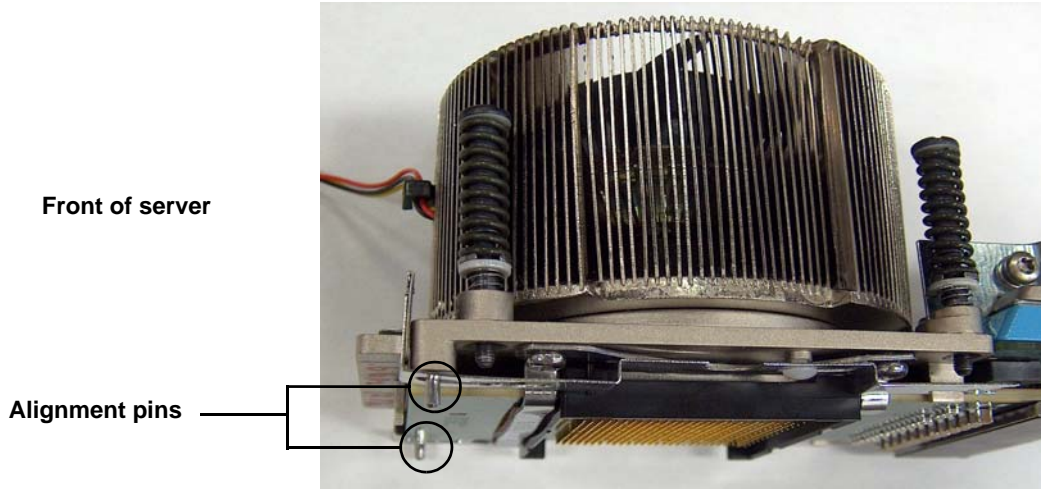
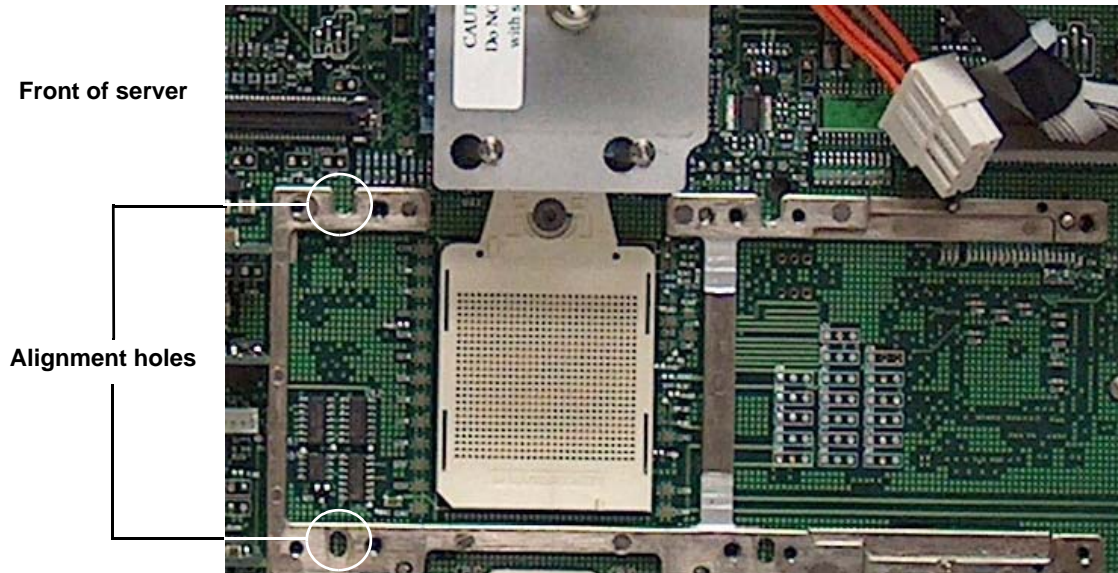


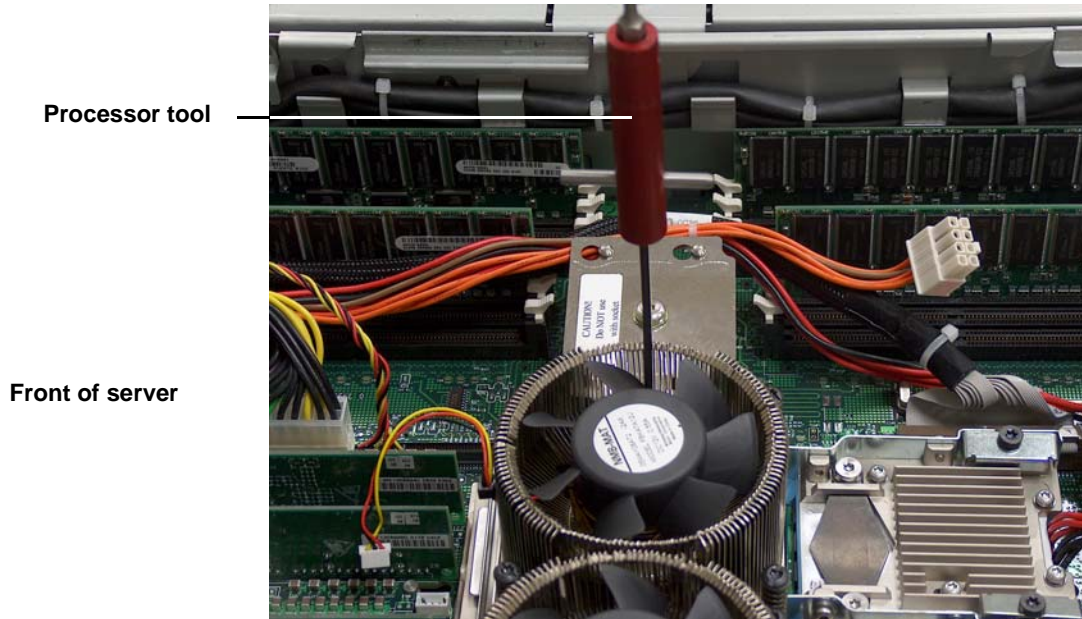
Figure 3-22 shows the alignment holes on the system board for the CPU 1 slot.

Figure 3-22 Aligning the Processor



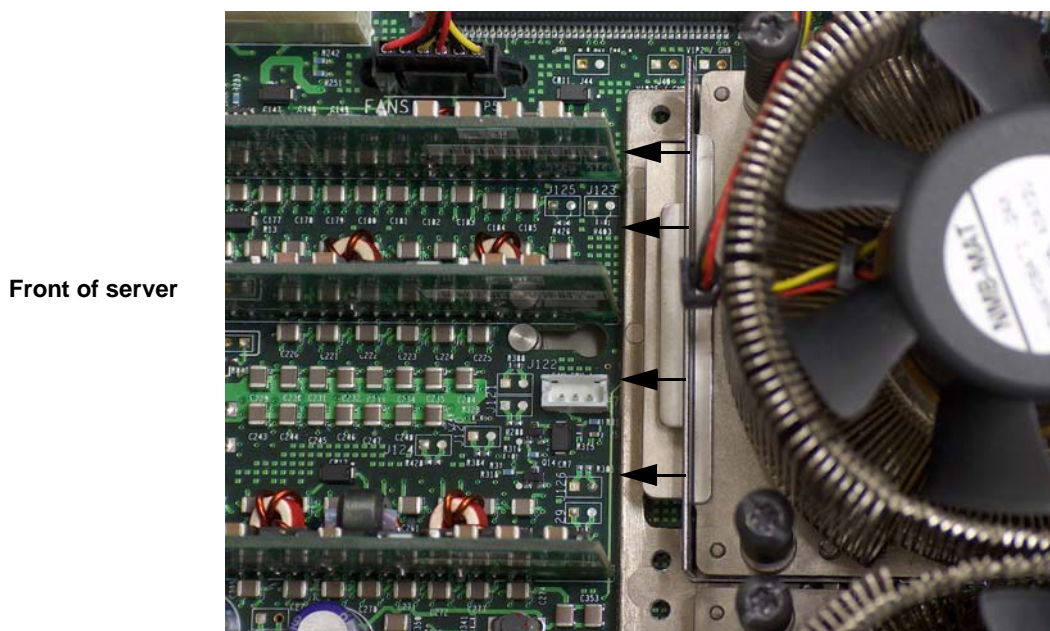
- Step 11.** Use the special processor tool (P/N 5069-5441) shipped with your replacement processor assembly to lock the processor in place on the system board. To do this, insert the special processor tool through the turbofan blades into the lock, and rotate it clockwise 180 degrees. Figure 3-23 shows how to lock the processor in place.

Figure 3-23 Locking the Processor Module in Place



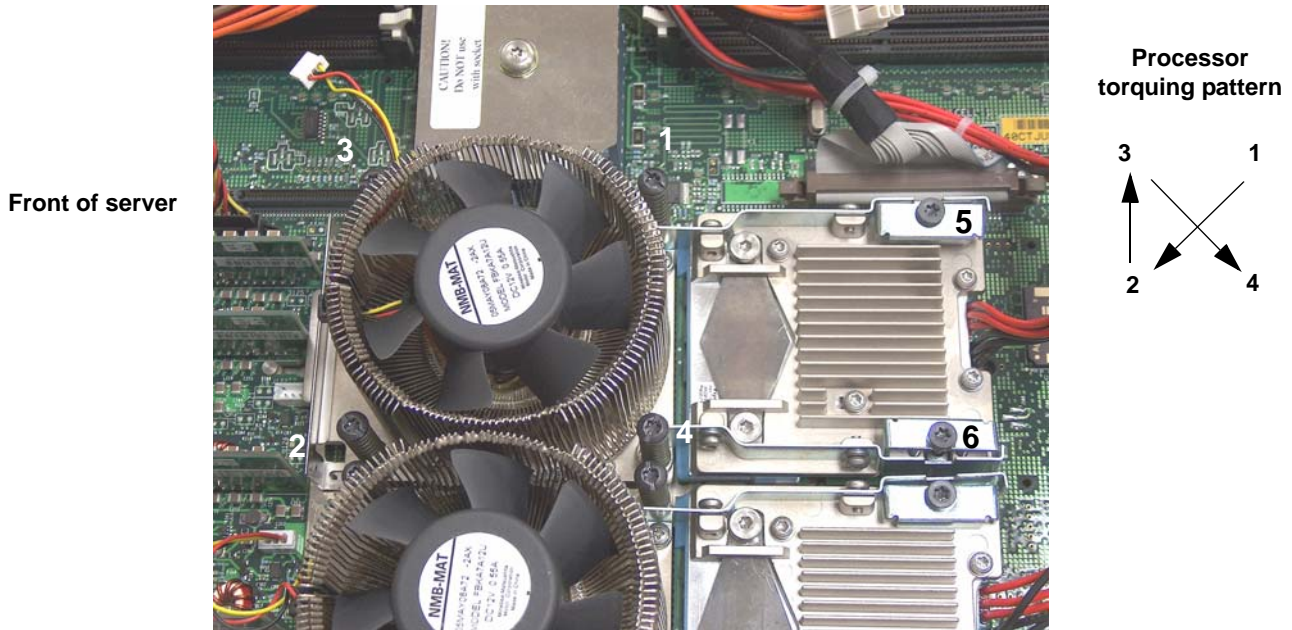
- Step 12.** Slide the sequencing retainer plate toward the front of the system. Figure 3-24 shows how to slide the sequencing retainer plate into place.

Figure 3-24 Slide the Sequencing Retainer Plate



Step 13. Screw in the four processor captive screws, and the two heat sink captive screws. Refer to Figure 3-25 for the screw locations.

Figure 3-25 Secure the Captive Screws



Step 14. Connect the processor power cable to the server power cable.

Step 15. Connect the fan power cable to the system board.

Step 16. Replace the processor airflow guide, and route the IDE and power cables as previously recorded.

Step 17. Install the top metal cover, unless you are installing more components. See “Replacing the Top Metal Cover” on page 36.

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 56
- “Install the Server into a Tower Mount” on page 56

Install the Server into a Rack

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

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 58
- “LAN” on page 60

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 system 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 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 bulk power supplies (BPS) in the server. Installing two BPSs in the server provides n+1 redundancy, meaning that if one BPS fails, there is another power supply to power the server. You must promptly replace the failed BPS to restore n+1 functionality.

A minimum of one BPS 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 PC Command; or Front Panel Power Button Activated?	AC Voltage Applied?	DC Voltage Applied?
Standby power	Yes	No	Yes	No
Full power	Yes	Yes	Yes	Yes
Off	No	No	No	No

NOTE If the power restore feature is set to **Always On** through the 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.

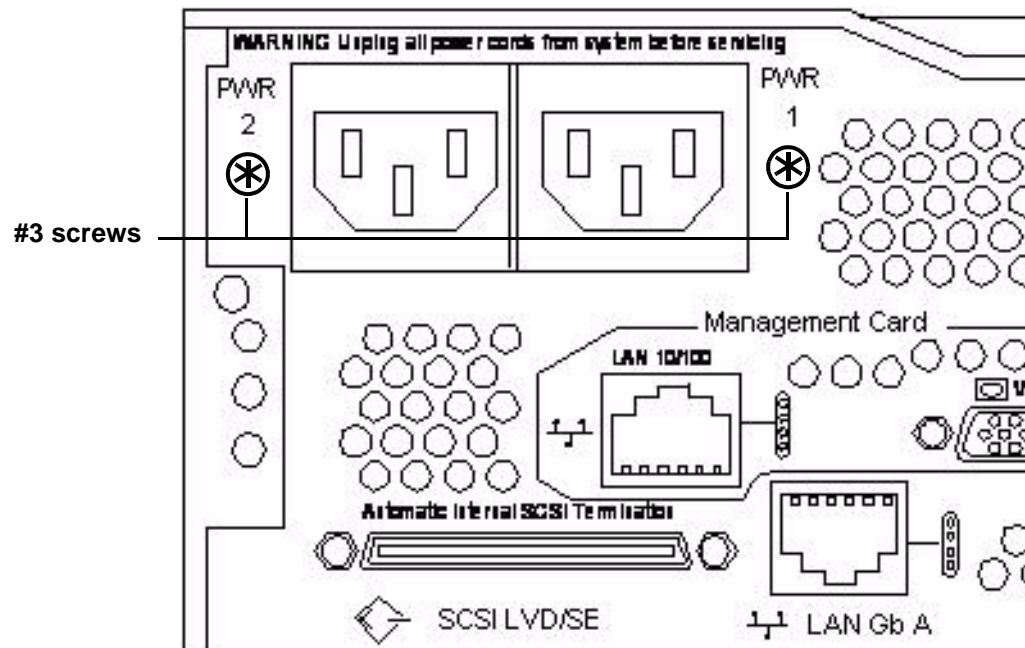
Interval Two Approximately 30 seconds later, the bulk power supplies flash green and the amber light is still present on the hard disk drives. Standby power is on at this point.

Power Cord Retention

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

- Step 1.** Unscrew the two #3 screws on the server AC area. See Figure 5-1 for the screw locations.

Figure 5-1 Installing the Power Cord Retention Bracket



LAN

Step 2. Install the plastic clip through the rectangular slot on the power retention bracket, and pull it through until the clip clicks into place. See Figure 5-2.

Figure 5-2 Power Retention Clip and Tie Wrap



Step 3. Install the power cord bracket onto the server using the screws you just removed.

Step 4. Take the AC cord tie wrap and wrap it around the circumference of the AC cord and through the hole in the tie wrap, near the connector.

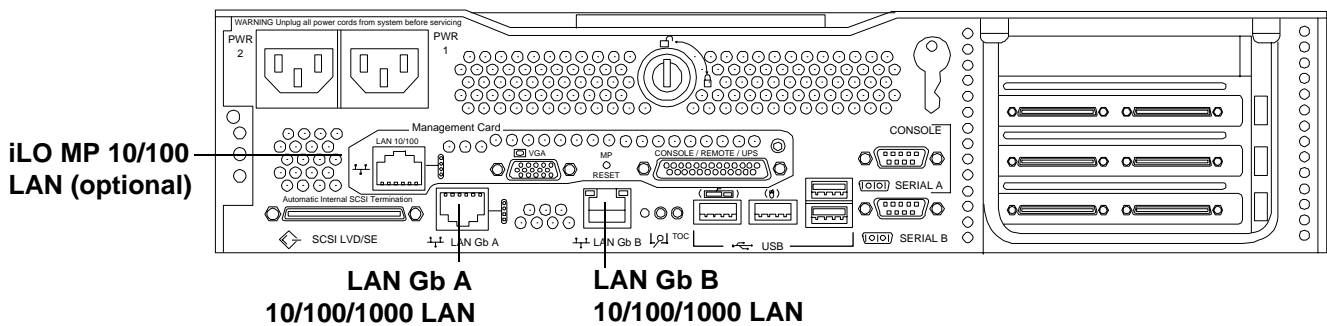
Step 5. Insert the tie wrap into the plastic clip. See Figure 5-2.

Step 6. Repeat steps 2 through 5 (skip step 3) to secure the second power supply power cord (if necessary).

LAN

The server has two LAN ports that can provide network connectivity. 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 62
- “Setup Flowchart” on page 63
- “Preparation” on page 64
- “Configuring the iLO MP LAN Using DHCP and DNS” on page 66
- “Configuring the iLO MP LAN Using ARP Ping” on page 67
- “Configuring the iLO MP LAN Using the RS-232 Serial Port” on page 68
- “Logging In to the iLO MP” on page 70
- “Additional Setup” on page 70

Setup Checklist

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

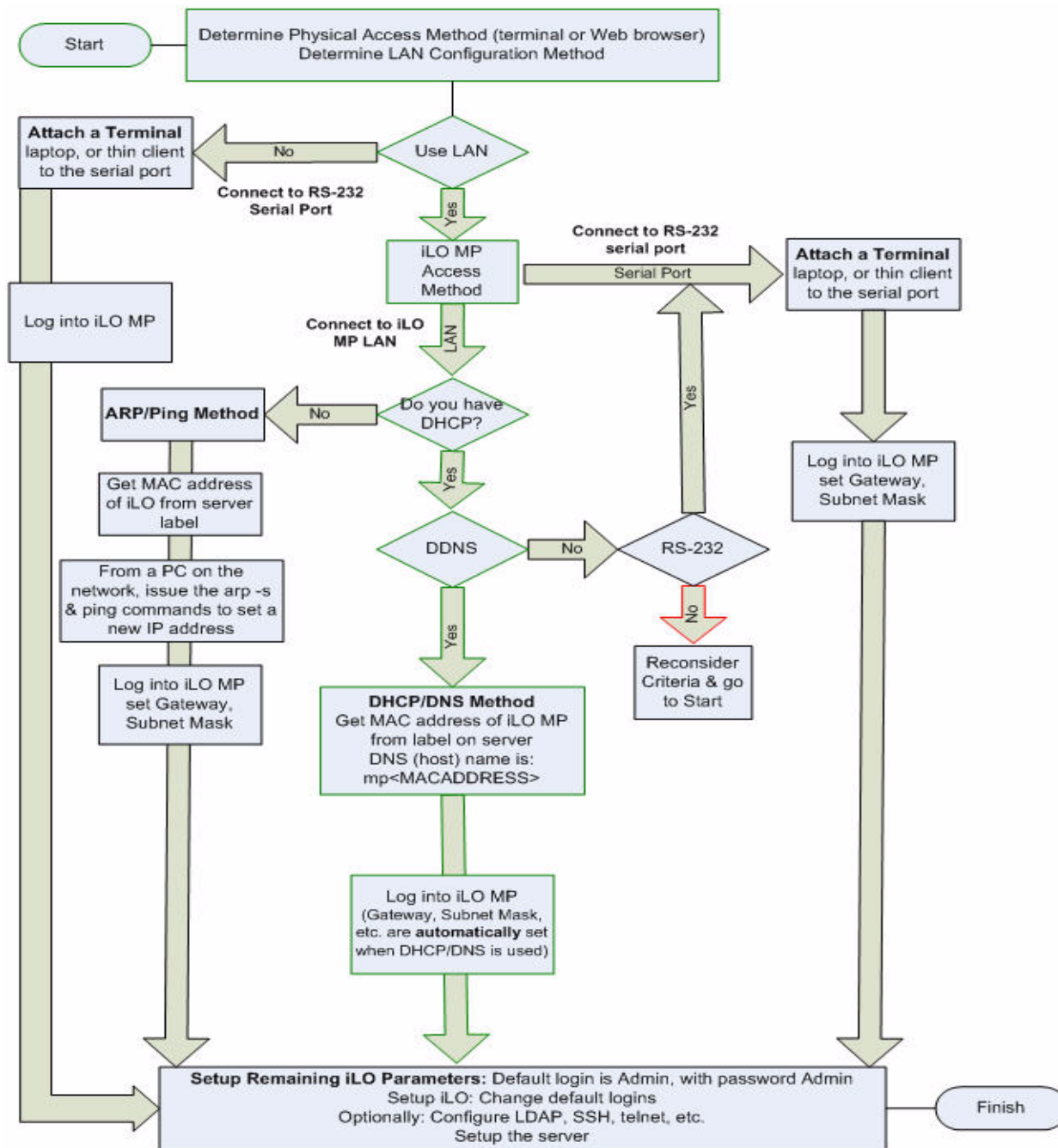
Table 6-1 **Setup Checklist**

	Step	Action	X
	<i>Standard and Advanced</i>		
1	Preparation	<ol style="list-style-type: none">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">• DHCP with DNS• ARP Ping• RS-232 serial port	
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	<ol style="list-style-type: none"> 1. M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> • Console • Remote • UPS 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	<ol style="list-style-type: none"> 1. M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> • Console • Remote • UPS 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"> M-cable: DB25 connector on one end, and three DB-9F connectors on the other end: <ul style="list-style-type: none"> • Console • Remote • UPS RS-232 DB-9F to DB-9F cable Console device (for example, a laptop or ASCII terminal)
	LAN Port	10/100 LAN cable
Windows	VGA Port (no iLO MP access; EFI only)	<ol style="list-style-type: none"> Monitor (VGA) Keyboard (USB) Mouse (USB)
	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 70.
- 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 70.

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 70.

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 70).
- 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 74

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 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 79 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 79, 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 76
- “Interacting with the iLO MP Using the Web GUI” on page 76
- “Accessing the Graphic Console Using VGA” on page 78

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 is displayed.
- 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.

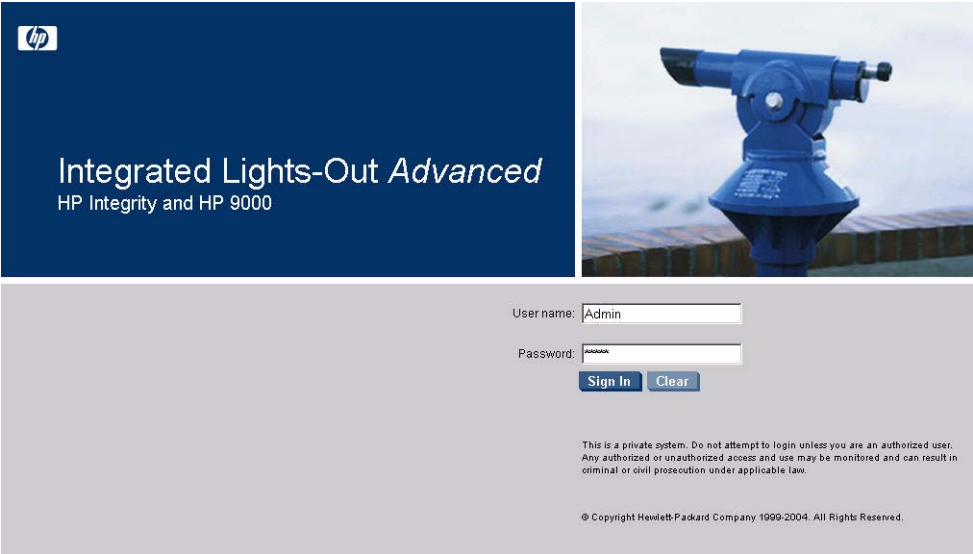
Before starting this procedure, you must have the following information:

- 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:

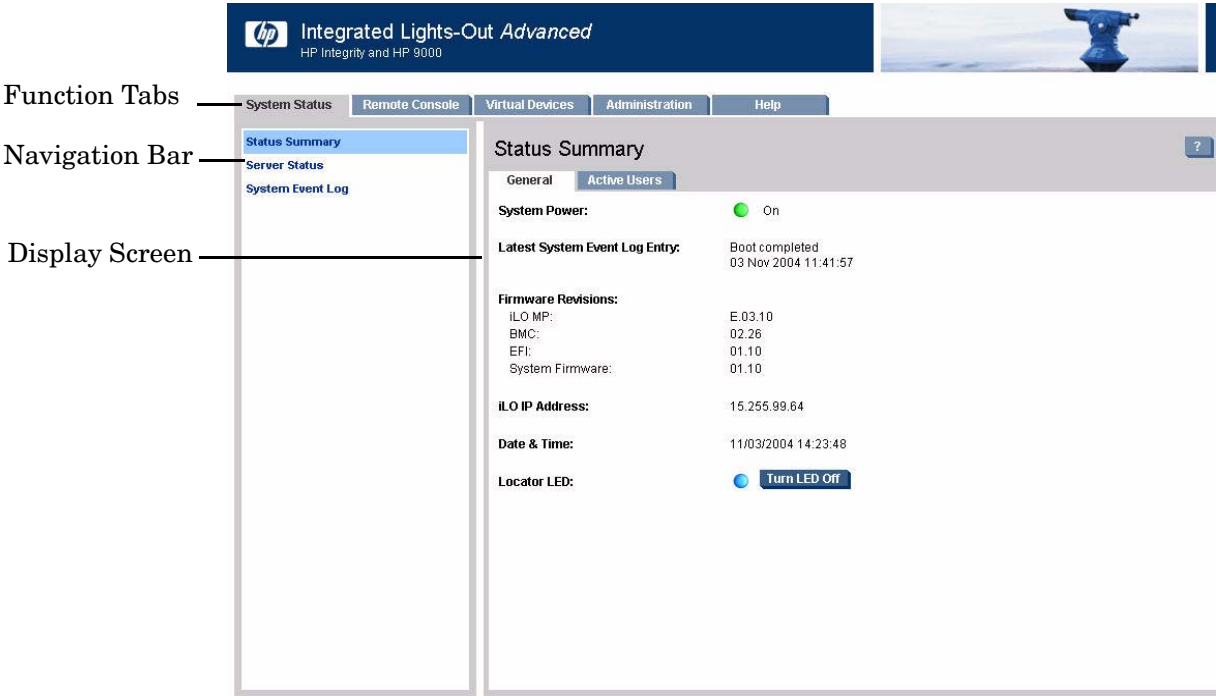
- Step 1.** Open a Web browser and enter the host name or the IP address for the iLO MP.
- Step 2.** Log in using your user account name and password at the login page. (Figure 8-1).

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 (XREF [Configuring the iLO MP LAN Using the RS-232 Serial Port](#) chapter).

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 rx2620 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 80
- “Configuring System Boot Options” on page 80
- “Booting and Shutting Down HP-UX” on page 82
- “Booting and Shutting Down HP OpenVMS” on page 88
- “Booting and Shutting Down Microsoft Windows” on page 92
- “Booting and Shutting Down Linux” on page 95

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 82.
- **HP OpenVMS I64**
For details refer to “Booting and Shutting Down HP OpenVMS” on page 88.
- **Microsoft® Windows® Server 2003**
For details refer to “Booting and Shutting Down Microsoft Windows” on page 92.
- **Red Hat Enterprise Linux 4**
For details refer to “Booting and Shutting Down Linux” on page 95.
- **SuSE Linux Enterprise Server 10**
For details refer to “Booting and Shutting Down Linux” on page 95.

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 system 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 system, 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 systems with Windows installed, the `\MSUtil\nvrboot.efi` utility is provided for managing Windows boot options from the EFI Shell. For HP Integrity systems 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 82)
- Setting OpenVMS boot options (refer to “Adding HP OpenVMS to the Boot Options List” on page 88)
- Setting Windows boot options (refer to “Adding Microsoft Windows to the Boot Options List” on page 92)
- Setting Linux boot options (refer to “Adding Linux to the Boot Options List” on page 96)

- **Autoboot Setting**

The `autoboot` setting determines, at startup, whether a system 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 system 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 83 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 85 describes how to boot HP-UX in single-user mode.
 - “LVM Maintenance Mode HP-UX Booting” on page 86 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 87.

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 system.
- `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 MP Main Menu. To exit the 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 system on which you want to boot HP-UX.” on page 83
- “Access the EFI Shell environment for the system on which you want to boot HP-UX.” on page 84

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 system 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 MP Main Menu. To exit the 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 system 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.

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

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

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

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

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

Step 4. When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to initiate the HP-UX 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. Pressing any key during this 10-second period stops the HP-UX boot process and enables you to interact with the HP-UX 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 HP-UX 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 MP Main Menu. To exit the 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 system 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 `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`) enter the `boot -is vmunix` command to boot HP-UX (the `/stand/vmunix` kernel) in single-user (`-is`) mode.

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

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

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

Press **Ctrl-B** to exit the system console and return to the MP Main Menu. To exit the 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 HPUX.EFI interface (the HP-UX Boot Loader prompt, HPUX>) and entering the `boot -lm vmunix` command.

Step 1. Access the EFI Shell environment for the system 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 **HPUX** command to initiate the `\EFI\HPUX\HPUX.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 HPUX.EFI interface (the HP-UX Boot Loader prompt, HPUX>).

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

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

Press **Ctrl-B** to exit the system console and return to the MP Main Menu. To exit the MP, type **x** at the Main Menu.

Shutting Down HP-UX

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

- To shut down and reboot an HP-UX system, use the **`shutdown -r`** command.
- To shut down and halt (power off) an HP-UX system, 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 system 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 system 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 system is rebooted.

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

- To shut down HP-UX and halt (power off) the system, issue the **`shutdown -h`** command.
To reboot a halted system you must power on the system using the `PC` command at the MP Command menu.
- To shut down HP-UX and reboot the system, 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 88.
- To boot HP OpenVMS on an entry-class HP Integrity server, refer to “Booting HP OpenVMS” on page 89.
- To shut down HP OpenVMS, refer to “Shutting Down HP OpenVMS” on page 91.

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 system.
- `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 MP Main Menu. To exit the 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 89
- “Booting HP OpenVMS (EFI Shell)” on page 90

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 system 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 MP Main Menu. To exit the 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 system 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 system boots, or when the `map -r` command is issued).

- Step 4.** When accessing the EFI System Partition for the desired boot device, issue the `\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 MP Main Menu. To exit the 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 system 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 system 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 92
- “Booting the Microsoft Windows Operating System” on page 93
- “Shutting Down Microsoft Windows” on page 94

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 the iLO MP interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the MP Main Menu. To exit the 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 94 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 system 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 the iLO MP interfaces when finished using them.

Press **Ctrl+B** to exit the console and return to the MP Main menu. To exit the 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 system 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 system. The **Shut down** menu item shuts down the system.

You can use this method when using a graphical interface to the system.

- Issue the **shutdown** command from the Windows command line.

Refer to “Log in to Windows running on the system that you want to shut down.” on page 95 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 system. This is the equivalent of **Start—>Shut Down, Shut down**. To power on the system, use the iLO MP PC command.
- /r Shuts down and restarts the system. This is the equivalent of **Start—>Shut Down, Restart**.
- /a Aborts a system 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 system 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 system.

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 system.

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 system you must power on the system 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 system 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 system.

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 96.
- 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 97 for details on Red Hat Enterprise Linux.
 - Refer to “Booting the SuSE Linux Enterprise Server Operating System” on page 98 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 99.

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 system.
- `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 the iLO MP interfaces if you are finished using them.

Press **Ctrl+B** to exit the system console and return to the MP Main Menu. To exit the 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 97 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 98 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 system 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 system in twenty minutes.

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 rx2620 User Service Guide*.

This chapter addresses the following topics:

- “Troubleshooting Methodology” on page 102
- “Server Does Not Power On” on page 102
- “Server Does Not Power Off” on page 103
- “EFI Menu is Not Available” on page 104
- “Operating System Does Not Boot” on page 104
- “Operating System Boots with Problems” on page 104
- “Intermittent Server Problems” on page 105
- “DVD Problems Occur” on page 105
- “Hard Drive Problems Occur” on page 105
- “Console Problems Occur” on page 106
- “Downloading and Installing the Latest Version of the Firmware” on page 106

Troubleshooting Methodology

WARNING Always disconnect the power cords and unplug telephone cables before removing the server cover. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. 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 30 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 system components can result due to overheating.

You can safely remove the front grill 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. Error messages are displayed on local and remote consoles. System 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 rx2620 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>.

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 system is doing when the button is pressed. You must be aware of its uses to properly troubleshoot the system.

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, replace the power supply or the power supply interface board.
- 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 system board. If the problem persists, replace the power supply interface board, the MP board, or the system board.

See the *HP Integrity rx2620 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 system is doing when the button is pressed. You must be aware of its uses to properly troubleshoot the system.

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	System power turns off immediately (hard power off).
5 seconds or longer	System 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	System power turns off (software controlled power off).
5 seconds or longer	System 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	System 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
- iLO MP
 - Console messages
 - System event logs (SEL)

See the *HP Integrity rx2620 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 rx2620 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 rx2620 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 rx2620 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 61.

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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