

Installation Guide

HP Integrity rx8640 Server, HP 9000 rp8440 Server

Third Edition



Manufacturing Part Number : AB297-9001C-en
January 2007

Printed in the U.S.A.

© Copyright 2007

Legal Notices

© Copyright 2007 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. Linux is a U.S. registered trademark of Linus Torvalds. Intel is a trademark or registered trademark of Intel Corporation or its subsidiaries in the United States and other countries.

1. HP Integrity rx8640 and HP 9000 rp8440 Server Overview

Detailed Server Description	17
Dimensions and Components.....	18
Front Panel	21
Cell Board	22
Cells and nPartitions	27
Internal Disk Devices	29
System Backplane.....	31
I/O Subsystem.....	32

2. Installing the System

Receiving and Inspecting the Server Cabinet	38
Unpacking the Server Cabinet.....	38
Securing the Cabinet	42
Standalone and To-Be-Racked Systems	43
Rack-Mount System Installation	43
Lifting the Server Cabinet Manually	44
Using the RonI Model 17000 SP 400 Lifting Device	45
Installing the Wheel Kit	48
Installing the Top and Side Covers	56
Removing the Top Cover.....	56
Installing the Top Cover.....	57
Removing the Side Cover	57
Installing the Side Cover	58
Installing the Power Distribution Unit.....	59
Installing Additional Cards and Storage	60
Installing an Additional Hard Disk Drive	60
Removable Media Drive Installation.....	61
HP Integrity rx8640 Supported PCI/PCI-X I/O Cards	63
HP 9000 rp8440 Supported PCI/PCI-X I/O Cards	65
Installing an Additional PCI-X I/O Card.....	67
Installing an A6869B VGA/USB PCI Card in a Server	69
Troubleshooting the A6869B VGA/USB PCI Card	70
System Console Selection	72
VGA Consoles	73
Interface Differences Between Itanium-based Systems.....	73
Other Console Types.....	73
Additional Notes on Console Selection	73
Cabling and Powering On the Server	74
Checking the Voltage	74
Voltage Check (Additional Procedure).....	78
Connecting AC Input Power.....	79
Installing The Line Cord Anchor (rack mounted servers)	82
MP Core I/O Connections.....	84
Setting Up the Customer Engineer Tool (PC)	84
Turning On Housekeeping Power and Logging In to the MP	86

Contents

Configuring LAN Information for the MP..... 89
Accessing the Management Processor via a Web Browser..... 91
Verifying the Presence of the Cell Boards..... 93
Configuring AC Line Status..... 94
Booting the Server 94
Adding Processors for HP Integrity rx8640 with Instant Capacity..... 97
Installation Checklist..... 97

Index101

Table 1-1. Cell Board CPU Module Load Order	24
Table 1-2. DIMM Sizes Supported.	26
Table 1-3. DIMM Load Order	27
Table 1-4. Removable Media Drive Path.	29
Table 1-5. Hard Disk Drive Path.	29
Table 1-6. PCI-X Slot Boot Paths Cell 0	33
Table 1-7. PCI-X Slot Boot Paths Cell 1	34
Table 1-8. PCI-X Slot Types.	35
Table 2-1. Wheel Kit Packing List.	48
Table 2-2. HP Integrity rx8640 Server PCI-X I/O Cards	63
Table 2-3. HP 9000 rp8440 Server PCI-X I/O Cards	65
Table 2-4. Single Phase Voltage Examples	75
Table 2-5. BPS-to-Cell Board Configuration to Maintain N+1	81
Table 2-6. Factory-Integrated Installation Checklist.	98

Figure 1-1. 16-Socket Server Block Diagram	17
Figure 1-2. Server (Front View With Bezel)	18
Figure 1-3. Server (Front View Without Bezel)	19
Figure 1-4. Server (Rear View)	20
Figure 1-5. Front Panel LEDs and Power Switch	21
Figure 1-6. Cell Board	22
Figure 1-7. Socket Locations on Cell Board	24
Figure 1-8. Memory Subsystem.	25
Figure 1-9. DIMM Slot Layout	27
Figure 1-10. Internal Disks Locations	29
Figure 1-11. System Backplane Block Diagram.	31
Figure 1-12. PCI-X Board to Cell Board Block Diagram	33
Figure 1-13. Mass Storage Block Diagram	36
Figure 2-1. Removing the Polystraps and Cardboard.	39
Figure 2-2. Removing the Shipping Bolts and Plastic Cover	40
Figure 2-3. Preparing to Roll Off the Pallet.	41
Figure 2-4. Securing the Cabinet	42
Figure 2-5. Positioning the Lifter to the Pallet	46
Figure 2-6. Raising the Server Off the Pallet Cushions	47
Figure 2-7. Server on Shipping Pallet.	49
Figure 2-8. Removing Cushion from Front Edge of Server	50
Figure 2-9. Attaching a Caster Wheel to the Server	51
Figure 2-10. Attaching the Ramp to the Pallet.	52
Figure 2-11. Removing Side Cushion from Server	53
Figure 2-12. Securing Each Caster Cover to the Server	54
Figure 2-13. Completed Wheel Kit Installation	55
Figure 2-14. Cover Locations.	56
Figure 2-15. Top Cover Detail	57
Figure 2-16. Side Cover Detail	58
Figure 2-17. Disk Drive Location	60
Figure 2-18. Removable Media Drive Location	61
Figure 2-19. PCI I/O Slot Details	68
Figure 2-20. PCI/PCI-X Card Location	70
Figure 2-21. Console Output Device menu	72
Figure 2-22. Voltage Reference Points for IEC-320 C19 Plug	74
Figure 2-23. Safety Ground Reference Check — Single Power Source	75
Figure 2-24. Safety Ground Reference Check — Dual Power Source	76
Figure 2-25. Wall Receptacle Pinouts.	78
Figure 2-26. AC Power Input Labeling	79
Figure 2-27. Distribution of Input Power for Each Bulk Power Supply	80
Figure 2-28. Four Cell Line Cord Anchor (rp8400, rp8420, rp8440, rx8620, rx8640)	82
Figure 2-29. Line Cord Anchor and Velcro straps	83
Figure 2-30. LAN and RS-232 Connectors on the Core I/O Board	86

Figures

Figure 2-31. Front Panel Display	87
Figure 2-32. BPS LED Location	88
Figure 2-33. MP Main Menu	89
Figure 2-34. The lc Command Screen	90
Figure 2-35. The ls Command Screen	91
Figure 2-36. Example sa Command	92
Figure 2-37. Browser Window	92
Figure 2-38. The du Command Screen	93
Figure 2-39. The pwrgrd Command Screen	94

About This Document

This document covers the HP Integrity rx8640 and the HP 9000 rp8440 Server systems.

This document does not describe system software or partition configuration in any detail. For detailed information concerning those topics, refer to the HP System Partitions Guide: Administration for nPartitions.

Book Layout

This document contains the following chapters and appendices:

- Chapter 1 - Overview
- Chapter 2 - Installing the Server
- Index

Intended Audience

This document is intended to be used by customer engineers assigned to support the HP Integrity rx8640 and HP 9000 rp8440 servers.

Publishing History

The following publishing history identifies the editions and release dates of this document. Updates are made to this document on an unscheduled, as needed, basis. The updates will consist of a new release of this document and pertinent online or CD-ROM documentation.

First Edition	March 2006
Second Edition	September 2006
Third Edition	January 2007

Related Information

You can access other information on HP server hardware management, Microsoft® Windows® administration, and diagnostic support tools at the following Web sites:

<http://docs.hp.com>

The main Web site for HP technical documentation is <http://docs.hp.com>.

Server Hardware Information:
<http://docs.hp.com/hpux/hw/>

The <http://docs.hp.com/hpux/hw/> Web site is the systems hardware portion of docs.hp.com. It provides HP nPartition server hardware management information, including site preparation, installation, and more.

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 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>

HP IT resource center Web site at <http://us-support2.external.hp.com/> provides comprehensive support information for IT professionals on a wide variety of topics, including software, hardware, and networking.

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 and Toolkit*
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.

Typographic Conventions

The following notational conventions are used in this publication.

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.

- Commands and options are represented using this font.
- **Text that you type exactly as shown** is represented using **this font**.
- *Text to be replaced with text that you supply* is represented using *this font*.

Example:

“Enter the `ls -l filename` command” means you must replace *filename* with your own text.

- **Keyboard keys and graphical interface items (such as buttons, tabs, and menu items)** are represented using **this font**.

Examples:

The **Control** key, the **OK** button, the **General** tab, the **Options** menu.

- **Menu → Submenu** represents a menu selection you can perform.

Example:

“Select the **Partition → Create Partition** action” means you must select the **Create Partition** menu item from the **Partition** menu.

- Example screen output is represented using this font.

HP Encourages Your Comments

Hewlett-Packard welcomes your feedback on this publication. Please address your comments to **edit@presskit.rsn.hp.com** and note that you will not receive an immediate reply. All comments are appreciated.

1 HP Integrity rx8640 and HP 9000 rp8440 Server Overview

The HP Integrity rx8640 server and the HP 9000 rp8440 server are members of the HP business-critical computing platform family of mid-range, mid-volume servers, positioned between the HP Integrity rx7640, HP 9000 rp7440 and HP Integrity Superdome servers.

IMPORTANT The HP Integrity rx8640 and the HP 9000 rp8440 servers are both sx2000-based systems and share common hardware and technology throughout.

The server is a 17U¹ high, 16-socket symmetric multiprocessor (SMP) rack-mount or standalone server.

Features of the server include:

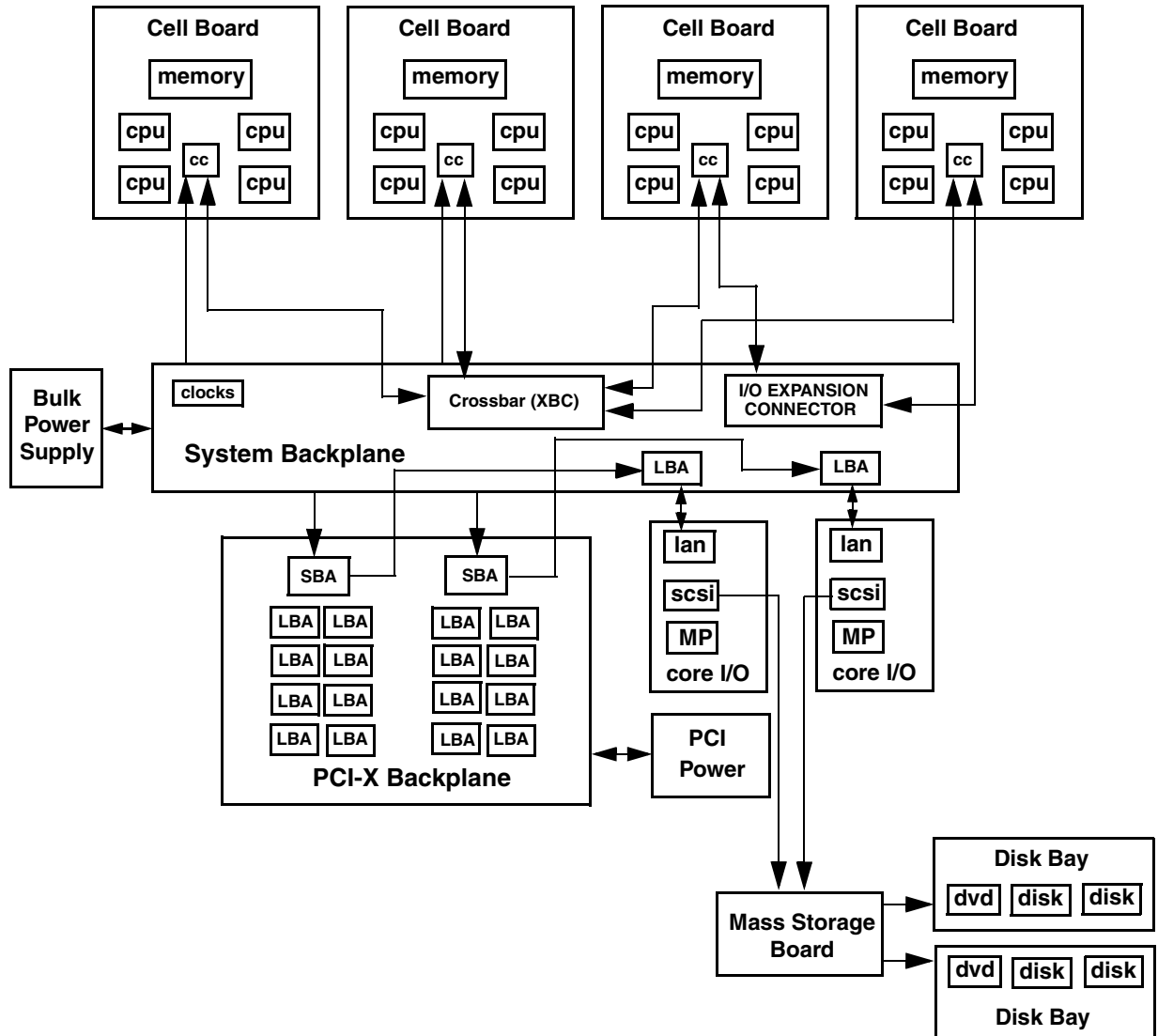
- Up to 512 GB of physical memory provided by dual inline memory modules (DIMMs).
- Up to 32 processors with a maximum of 4 processor modules per cell board and a maximum of 4 cell boards. Supports dual-core processors.
- One cell controller (CC) per cell board.
- Turbo fans to cool CPUs and CCs on the cell boards.
- Up to four embedded hard disk drives.
- Up to two internal DVD drives or one DVD drive and one DDS-4 DAT drive.
- Nine front chassis mounted N+1 fans.
- Twelve rear chassis mounted N+1 fans.
- Six N+1 PCI-X card cage fans.
- Up to six N+1 bulk power supplies.
- Two N+1 PCI-X power supplies
- N+1 hot-swappable system clock oscillators.
- Sixteen PCI-X slots divided into two partitions. Each partition can accommodate up to eight PCI/PCI-X/PCI-X 2.0 cards.
- Up to two core I/O cards.
- One failover service processor per core I/O card.
- Four 220 V AC power plugs. Two are required and the other two provide power source redundancy.

1. The U is a unit of measurement specifying product height. One U is equal to 1.75 inches.

Detailed Server Description

The following section provides detailed information about the server components.

Figure 1-1 16-Socket Server Block Diagram



Dimensions and Components

The following section describes server dimensions and components.

Figure 1-2 Server (Front View With Bezel)

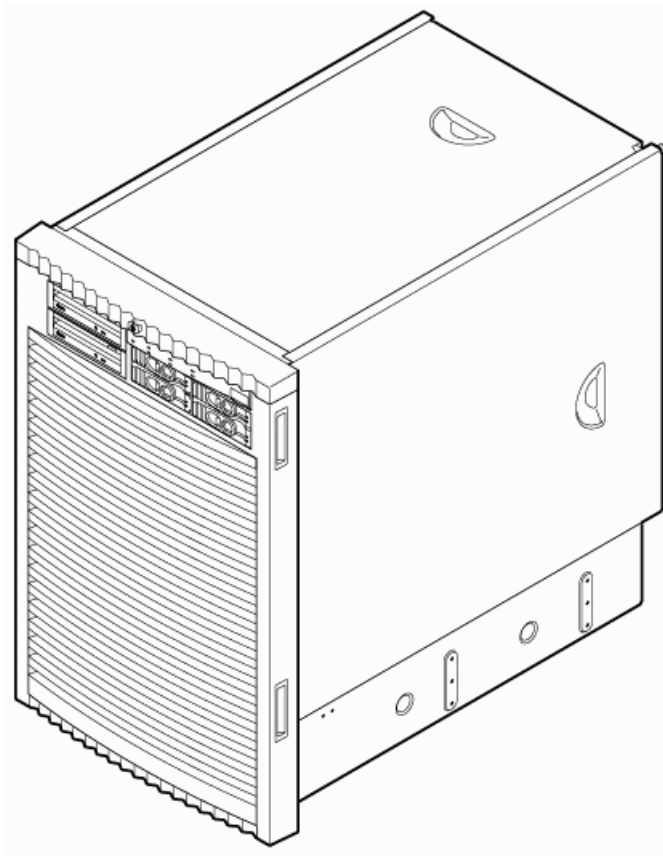
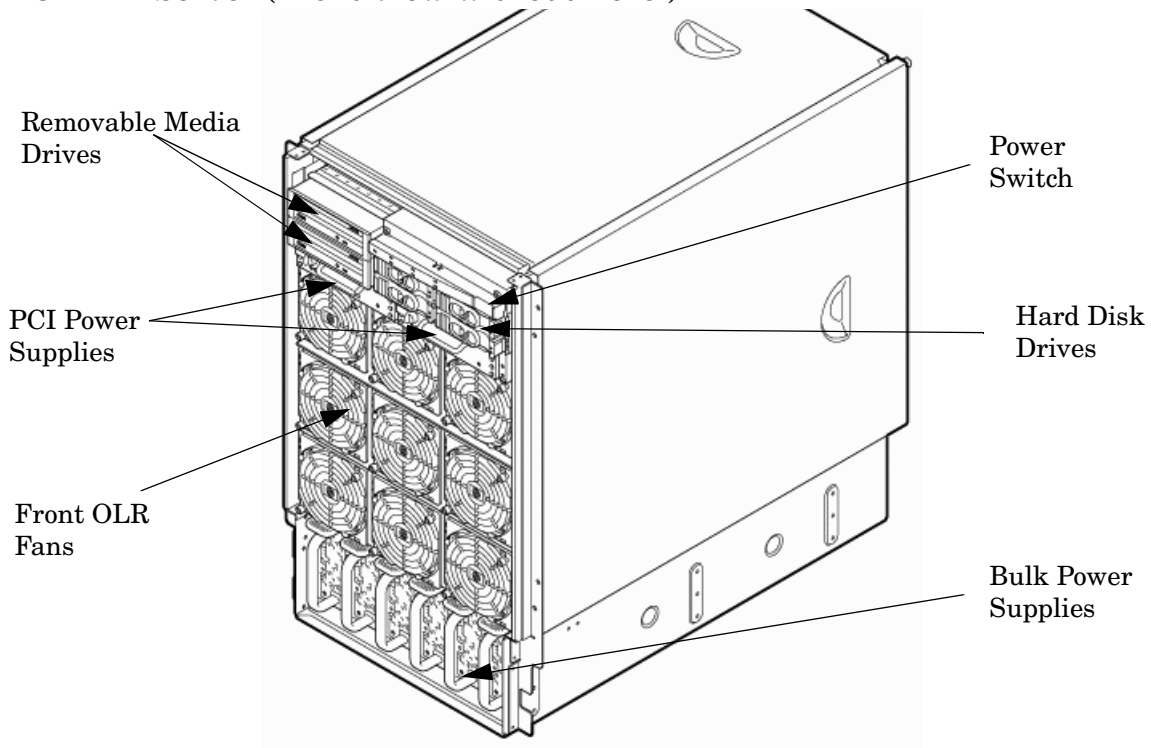


Figure 1-3 Server (Front View Without Bezel)



The server has the following dimensions:

- Depth: Defined by cable management constraints to fit into a standard 36-inch deep rack:
 - 25.5 inches from front rack column to PCI connector surface
 - 26.7 inches from front rack column to core I/O card connector surface
 - 30 inches overall package dimension, including 2.7 inches protruding in front of the front rack columns
- Width: 17.5 inches, constrained by EIA standard 19-inch racks
- Height: 17 U (29.55 inches), constrained by package density

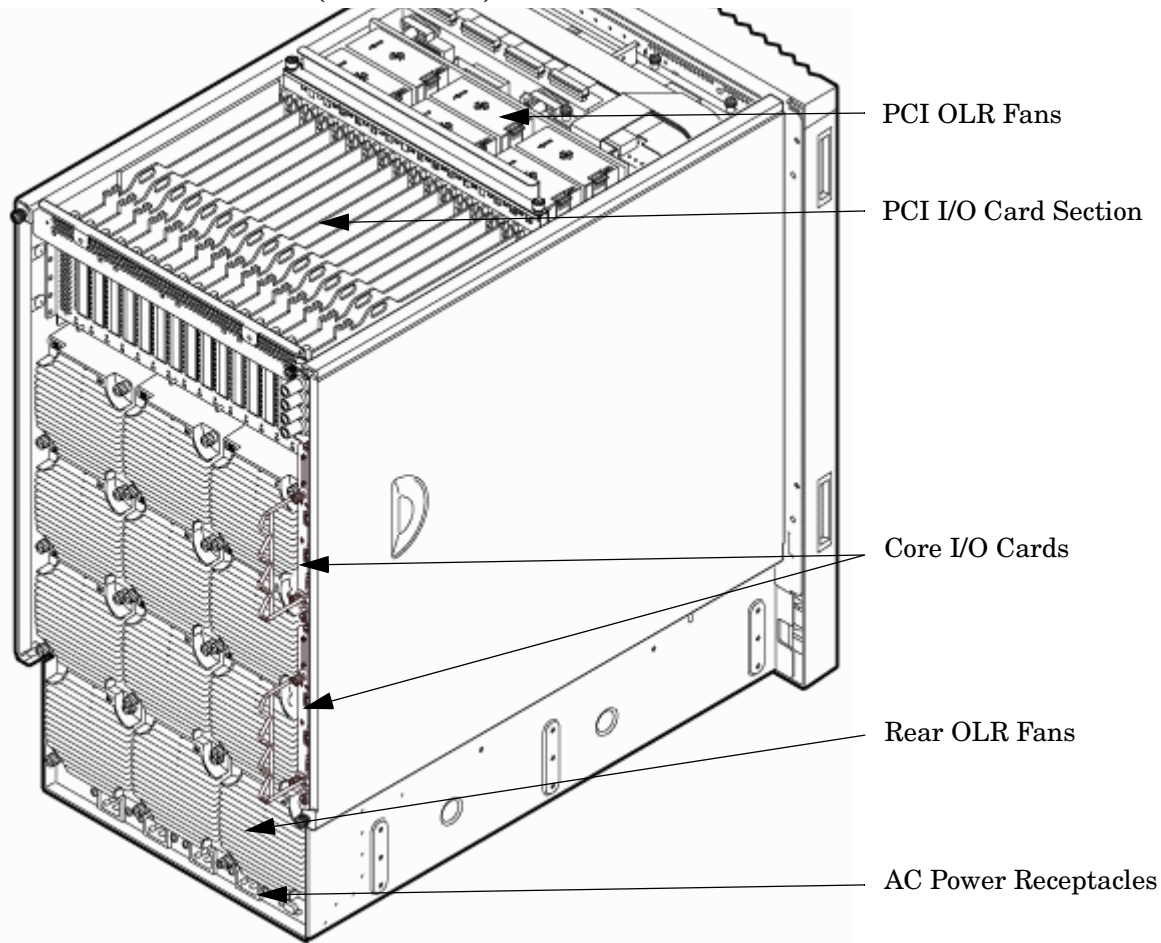
The mass storage section located in the front enables access to removable media drives without removal of the bezel. The mass storage bay accommodates two 5.25-inch removable media drives and up to four 3.5-inch hard disk drives. The front panel display, containing LEDs and the system power switch, is located directly above the hard drive media bays.

Below the mass storage section and behind a removable bezel are two PCI-X power supplies. Each PCI-X power supply powers both I/O partitions. Two PCI-X power supplies offer a N+1 configuration.

Enclosed with protective finger guards are nine front online replace (OLR) fan modules.

The bulk power supply is partitioned by a sealed metallic enclosure located in the bottom of the server. This enclosure houses the N+1 fully redundant bulk power supplies. Install these power supplies from the front of the server after removing the front bezel. The power supply is 2.45 X 5.625 X 20.0 inches.

Figure 1-4 Server (Rear View)



Access the PCI-X I/O card section, located toward the rear by removing the top cover.

The PCI card bulkhead connectors are located at the rear top.

The PCI OLR fan modules are located in front of the PCI cards. They are housed in plastic carriers.

The 12 rear OLR fans attached outside the chassis house 120-mm exhaust fans.

The cell boards are located on the right side of the server behind a removable side cover. For rack mounted servers on slides, the rack front door requires removal *if* it is hinged on the right side of the rack. Removal will allow unrestricted access to server sides after sliding server out for service.

The two redundant core I/O cards are positioned vertically end-to-end at the rear of the chassis.

Redundant line cords attach to the AC power receptacles at the bottom rear. Two 20-amp cords are required to power the server. Two additional line cords provide redundancy.

Access the system backplane by removing the left side cover. The system backplane hinges from the lower edge and is anchored at the top with a single large jack screw assembly.

The SCSI ribbon cable assembly also routes across and fastens to the backside of the system backplane near the connectors that attach the core I/O boards.

The blue deployment handles hinge outward for manual lift. When server is slide mounted, they retract against chassis to enable slide action without obstruction.

Front Panel

Front Panel Indicators and Controls

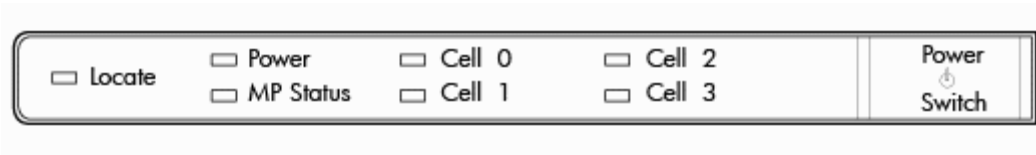
The front panel, located on the front of the server, includes the power switch. Refer to Figure 1-5.

Enclosure Status LEDs

The following status LEDs are on the front panel:

- Locate LED (blue)
- Power LED (tricolor)
- Management processor (MP) status LED (tricolor)
- Cell 0, 1, 2, 3 status (tricolor) LEDs

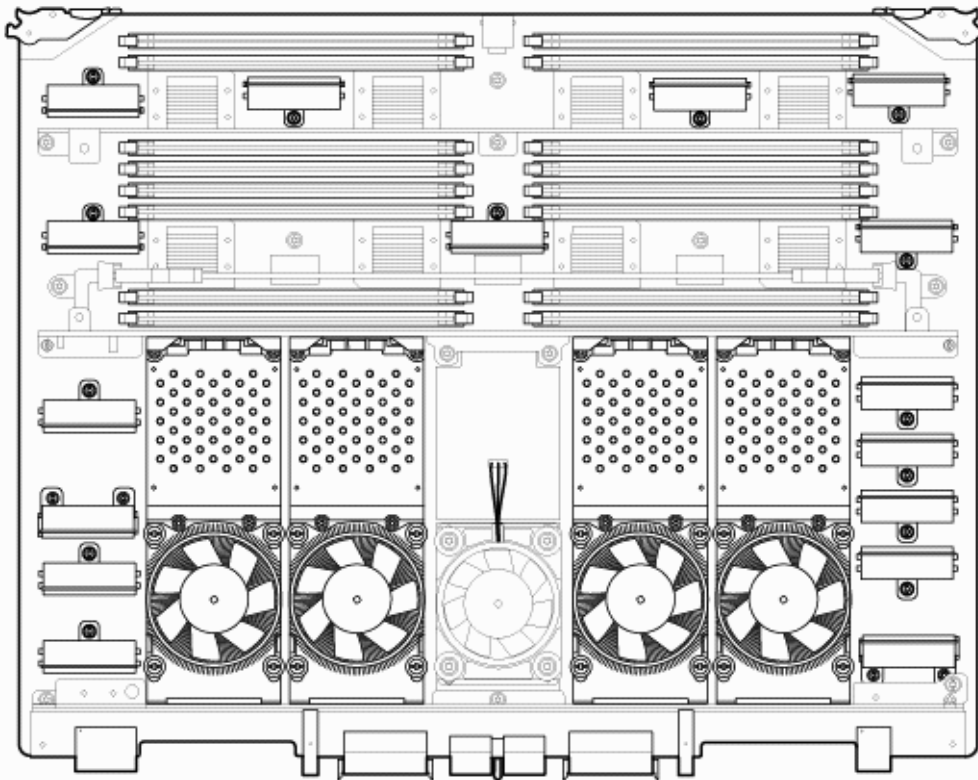
Figure 1-5 Front Panel LEDs and Power Switch



Cell Board

The cell board, illustrated in Figure 1-6, contains the processors, main memory, and the CC application specific integrated circuit (ASIC) which interfaces the processors and memory with the I/O. The CC is the heart of the cell board, providing a crossbar connection that enables communication with other cell boards in the system. It connects to the processor dependent hardware (PDH) and microcontroller hardware. Each cell board holds up to four processor modules and 16 memory DIMMs. One to four cell boards can be installed in the server. A cell board can be selectively powered off for adding processors, memory or maintenance of the cell board, without affecting cells in other configured partitions.

Figure 1-6 Cell Board



The server has a 48 V distributed power system and receives the 48 V power from the system backplane board. The cell board contains DC-to-DC converters to generate the required voltage rails. The DC-to-DC converters on the cell board do not provide N+1 redundancy.

The cell board contains the following major buses:

- Front side buses (FSB) for each of the four processors
- Four memory buses (one going to each memory quad)
- Incoming and outgoing I/O bus that goes off board to an SBA chip
- Incoming and outgoing crossbar busses that communicate to the crossbar chips on the system backplane
- PDH bus that goes to the PDH and microcontroller circuitry

All of these buses come together at the CC chip.

Because of space limitations on the cell board, the PDH and microcontroller circuitry reside on a riser board that plugs at a right angle into the cell board. The cell board also includes clock circuits, test circuits, and decoupling capacitors.

PDH Riser Board

The server PDH riser board is a small card that plugs into the cell board at a right angle. The PDH riser interface contains the following components:

- Microprocessor memory interface microcircuit
- Hardware including the processor dependant code (PDH) flash memory
- Manageability microcontroller with associated circuitry

The PDH obtains cell board configuration information from cell board signals and from the cell board local power module (LPM).

Central Processor Units

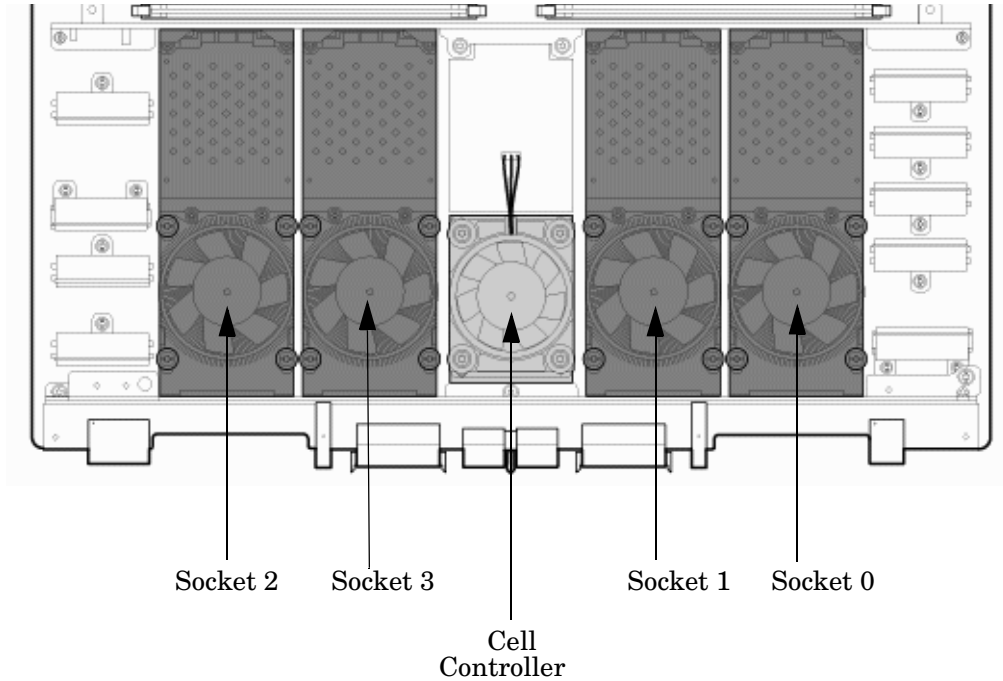
The cell board can hold up to four CPU modules. Each CPU module can contain up to two CPU cores on a single socket. Modules are populated in increments of one. On a cell board, the processor modules must be the same family, type, and clock frequencies. Mixing of different processors on a cell or a partition is not supported. See Table 1-1 on page 24 for the load order that must be maintained when adding processor modules to the cell board. See Figure 1-7 on page 24 for the locations on the cell board for installing processor modules.

NOTE Unlike previous HP cell based systems, the server cell board does not require that a termination module be installed at the end of an unused FSB. System firmware is allowed to disable an unused FSB in the CC. This enables both sockets of the unused bus to remain unpopulated.

Table 1-1 Cell Board CPU Module Load Order

Number of CPU Modules Installed	Socket 2	Socket 3	Socket 1	Socket 0
1	Empty slot	Empty slot	Empty slot	CPU installed
2	CPU installed	Empty slot	Empty slot	CPU installed
3	CPU installed	Empty slot	CPU installed	CPU installed
4	CPU installed	CPU installed	CPU installed	CPU installed

Figure 1-7 Socket Locations on Cell Board

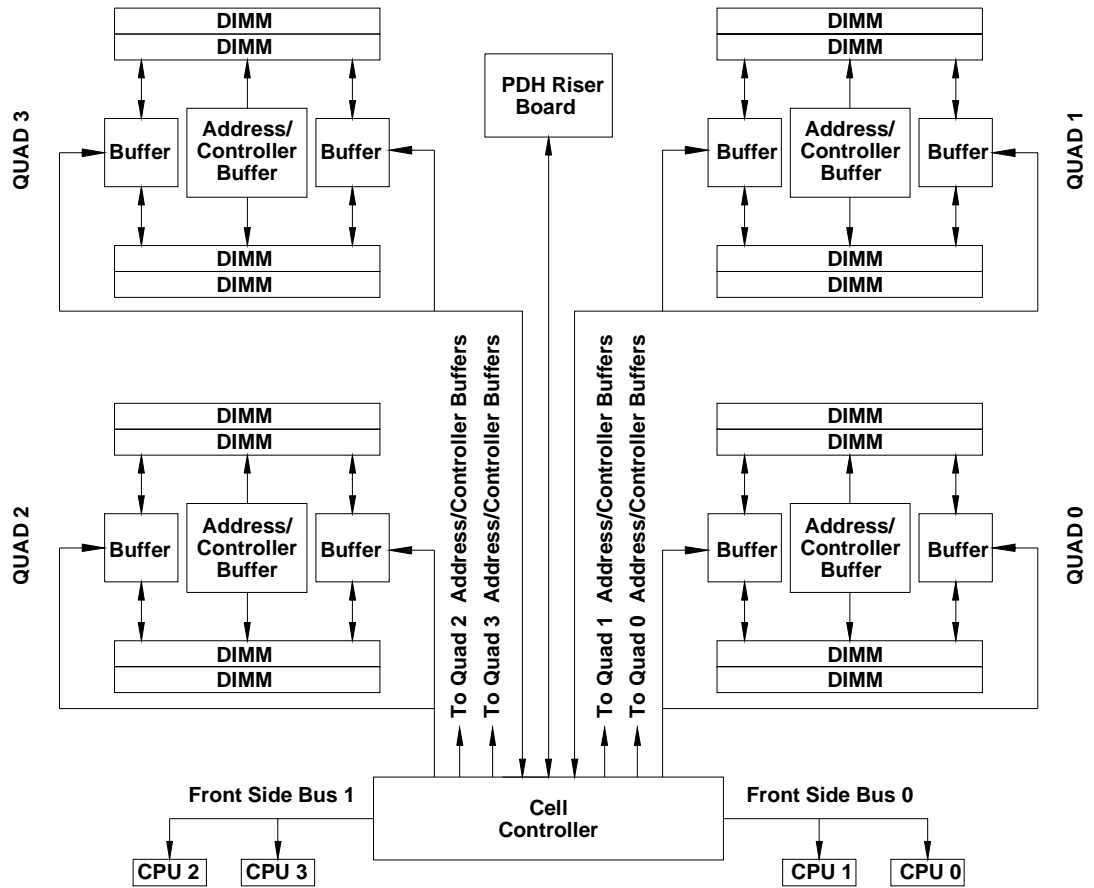


Memory Subsystem

Figure 1-8 on page 25 shows a simplified view of the memory subsystem. It consists of four independent access paths, each path having its own address bus, control bus, data bus, and DIMMs. Address and control signals are fanned out through register ports to the synchronous dynamic random access memory (SDRAM) on the DIMMs.

The memory subsystem comprises four independent quadrants. Each quadrant has its own memory data bus connected from the cell controller to the two buffers for the memory quadrant. Each quadrant also has two memory control buses: one for each buffer.

Figure 1-8 Memory Subsystem



DIMMs

The memory DIMMs used by the server are custom designed by HP. Each DIMM contains DDR-II SDRAM memory that operates at 533 MT/s. Industry standard DIMM modules do not support the high availability and shared memory features of the server. Therefore, industry standard DIMM modules are not supported.

The server supports DIMMs with densities of 1, 2, 4, and 8 GB. Table 1-2 on page 26 lists each supported DIMM size, the resulting total server capacity, and the memory component density. Each DIMM is connected to two buffer chips on the cell board.

Table 1-2 DIMM Sizes Supported

DIMM Size	Total Capacity	Memory Component Density
1 GB	64 GB	256 Mb
2 GB	128 GB	512 Mb
4 GB	256 GB	1024 Mb
8 GB	512 GB	2048 Mb

Valid Memory Configurations

The first cell must have one DIMM pair loaded in slots 0A/0B. The server can support as little as 2 GB of main memory using two 1 GB DIMMs installed on one of the cell boards and as much as 512 GB by filling all 16 DIMM slots on all four cell boards with 8 GB DIMMs.

The following rules explain the memory configuration:

1. DIMMs must be loaded in pairs (same size within a pair).
2. DIMM pairs must be loaded in slot order (0A/0B, 1A/1B, 2A/2B, ...)
3. Largest DIMMs must be loaded first followed by progressively smaller DIMM module sizes.

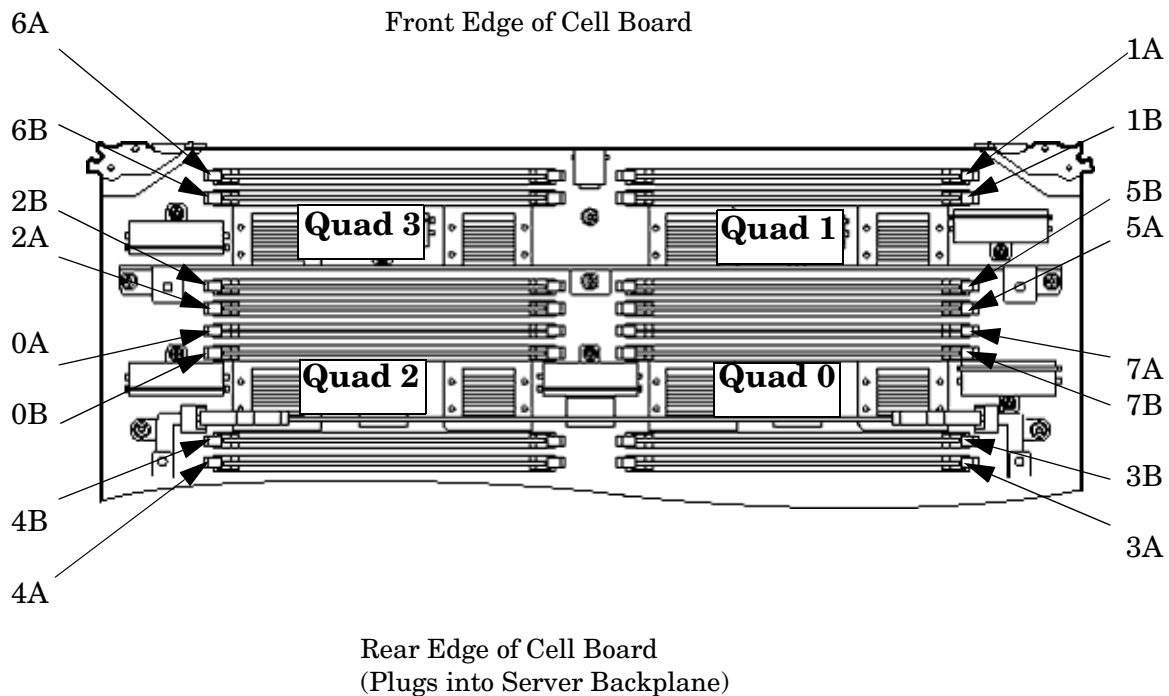
A paired set of DIMMs is called a rank. DIMMs in a rank must be of the same capacity. See Table 1-3 on page 27 and Figure 1-9 on page 27 for DIMM load order and layout on the cell board.

A quad is a grouping of four DIMMs (Figure 1-9). Configurations with 8 or 16 DIMM slots loaded are recommended. Adding a rank enables a dedicated DDR-II bus on a cell to increase the amount of usable memory bandwidth available. Available memory is proportional to the amount of memory installed.

Table 1-3 DIMM Load Order

Number of DIMMs Installed	Action Taken	DIMM Location on Cell Board	Quad Location
2 DIMMs = 1 rank	Install first	0A and 0B	Quad 2
4 DIMMs = 2 rank	Add second	1A and 1B	Quad 1
6 DIMMs = 3 rank	Add third	2A and 2B	Quad 3
8 DIMMs = 4 rank	Add fourth	3A and 3B	Quad 0
10 DIMMs = 5 rank	Add fifth	4A and 4B	Quad 2
12 DIMMs = 6 rank	Add sixth	5A and 5B	Quad 1
14 DIMMs = 7 rank	Add seventh	6A and 6B	Quad 3
16 DIMMs = 8 rank	Add last	7A and 7B	Quad 0

Figure 1-9 DIMM Slot Layout



Cells and nPartitions

An nPartition comprises one or more cells working as a single system. Any I/O chassis that is attached to a cell belonging to an nPartition is also assigned to the nPartition. Each I/O chassis has PCI card slots, I/O cards, attached devices, and a core I/O card assigned to the I/O chassis.

Detailed Server Description

On the server, each nPartition has its own dedicated portion of the server hardware which can run a single instance of the operating system. Each nPartition can boot, reboot, and operate independently of any other nPartitions and hardware within the same server complex.

The server complex includes all hardware within an nPartition server: all cabinets, cells, I/O chassis, I/O devices and racks, management and interconnecting hardware, power supplies, and fans.

A server complex can contain one or more nPartitions, enabling the hardware to function as a single system or as multiple systems.

NOTE Partition configuration information is available on the Web at:

<http://docs.hp.com>

Refer to *HP System Partitions Guide: Administration for nPartitions* for details.

Internal Disk Devices

Figure 1-10 shows the top internal disk drives connect to cell 0 through the core I/O for cell 0, in a server cabinet. The bottom internal disk drives connect to cell 1 through the core I/O for cell 1.

The upper removable media drive connects to cell 0 through the core I/O card for cell 0 and the lower removable media drive connects to cell 1 through the core I/O card for cell 1.

A list of replacement disk drives for the server is in Appendix A. The list contains both removable media disk drives and hard disk drives.

Figure 1-10 Internal Disks Locations

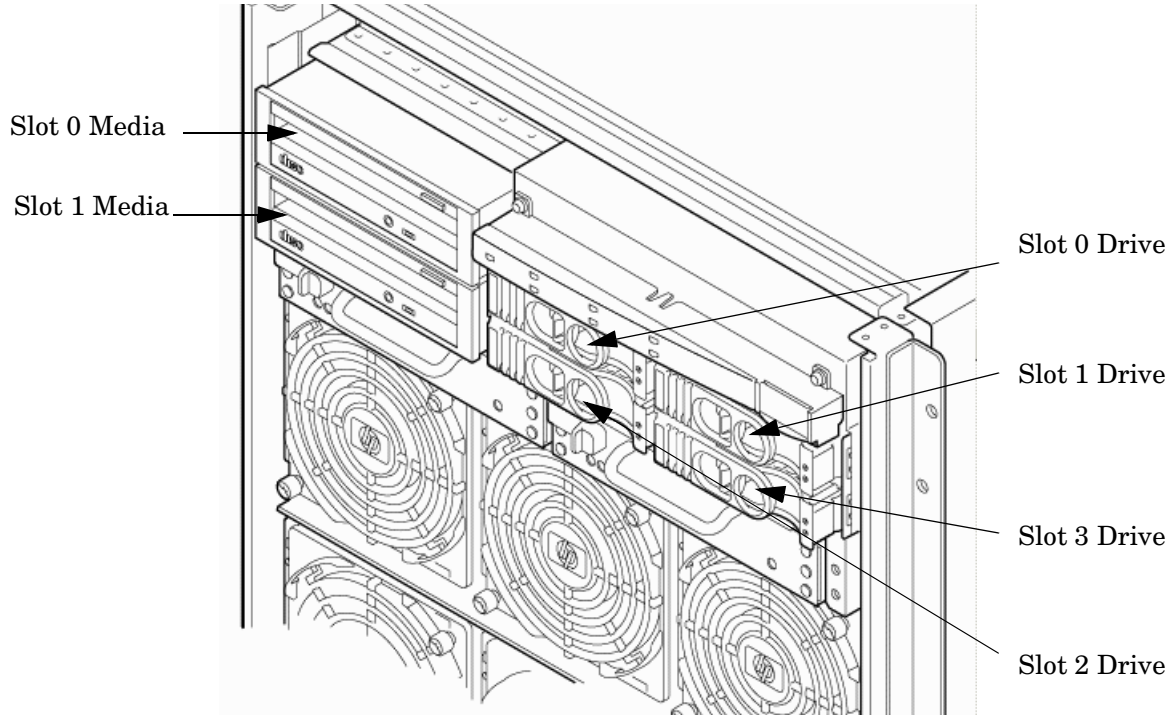


Table 1-4 Removable Media Drive Path

Removable Media	Path
Slot 0 media	0/0/0/2/1.x ^a .0
Slot 1 media	1/0/0/2/1.x ^a .0

a. X equals 2 for a DVD drive while X equals 3 for a DDS-4 DAT drive.

Table 1-5 Hard Disk Drive Path

Hard Drive	Path
Slot 0 drive	0/0/0/2/0.6.0
Slot 1 drive	0/0/0/3/0.6.0

Table 1-5 Hard Disk Drive Path (Continued)

Hard Drive	Path
Slot 2 drive	1/0/0/2/0.6.0
Slot 3 drive	1/0/0/3/0.6.0

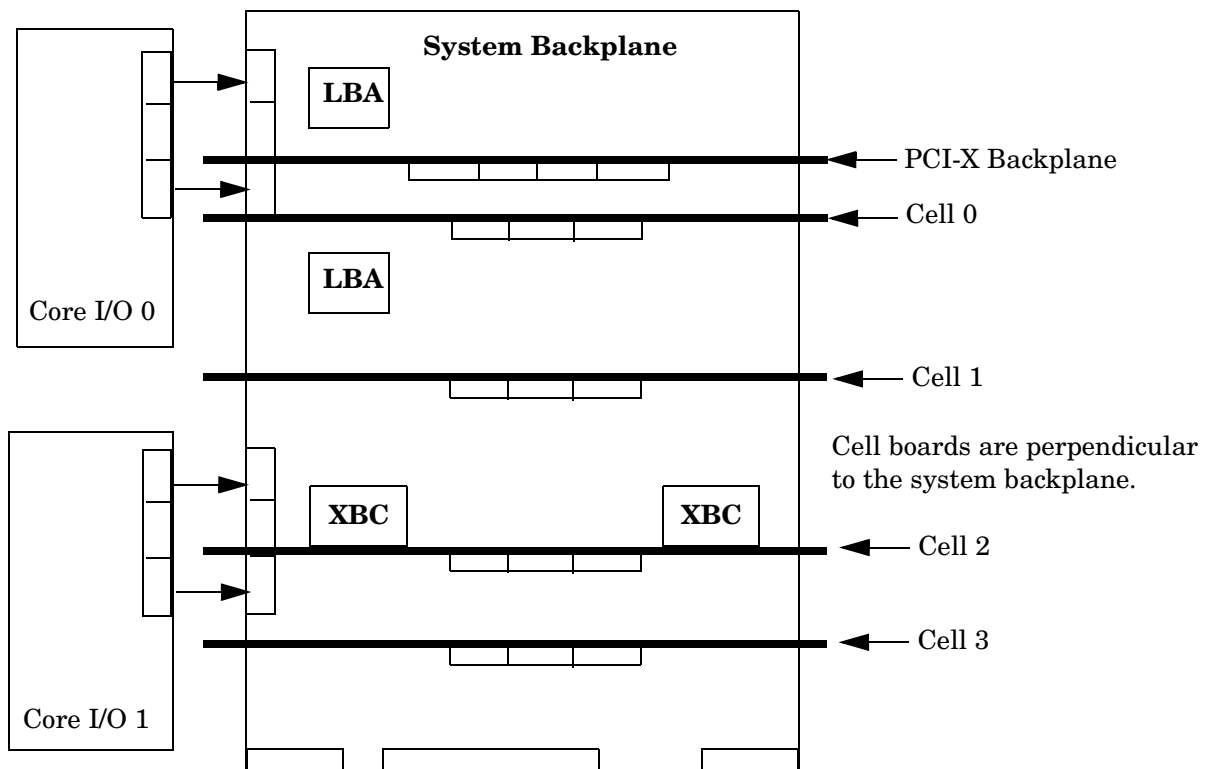
System Backplane

The system backplane board contains the following components:

- Two crossbar chips (XBC)
- Clock generation logic
- Preset generation logic
- Power regulators
- Two local bus adapter (LBA) chips that create internal PCI buses for communicating with the core I/O card.

The backplane also contains connectors for attaching the cell boards, PCI-X backplane, MP core I/O cards SCSI cables, bulk power, chassis fans, front panel display, intrusion switches, and external system bus adapters (SBA) link connectors.

Figure 1-11 System Backplane Block Diagram



The two LBA PCI bus controllers on the system backplane create the PCI bus for the core I/O cards. You must shut down the partition for the core I/O card before removing the card.

Having the SCSI connectors on the system backplane allows replacement of the core I/O card without having to remove cables in the process.

System Backplane to Cell Board Connectivity

The system backplane provides four sets of connectors, one set for each cell board.

The system backplane routes the signals from the cell boards to the communication crossbars. Cell boards 0 and 1 are directly connected to the I/O backplane found in the server. Cell boards 2 and 3 can be connected to a separate I/O expansion chassis connected to the system backplane.

System Backplane to Core I/O Card Connectivity

The core I/O cards connect to the system backplane through two connectors found at the rear of the system. SCSI and LAN on a core I/O are accessed via a PCI-X 66 MHz bus. Two LBA bus controllers located on the system backplane allow communication to the I/O devices. The LBAs are connected to the SBA on the PCI-X backplane by single ropes.

The system backplane routes the signals to the various components in the system. The core I/O signals include the SCSI bus for the system hard drives and the bus for the removable media devices. Each core I/O card provides SCSI buses for the mass storage devices.

The management processor for the chassis resides on the core I/O card, so the system backplane also provides interfaces required for management of the system. These interfaces and the manageability circuitry run on standby power.

You can remove the core I/O cards from the system as long as you shut down the partition for the core I/O card before removing the card. The hot-plug circuitry that enables this feature is located on the system backplane near the core I/O sockets.

System Backplane to PCI-X Backplane Connectivity

The PCI-X backplane uses two connectors for the SBA link bus and two connectors for the high-speed data signals and the manageability signals.

SBA link bus signals are routed through the system backplane to the cell controller on each corresponding cell board.

The high-speed data signals are routed from the SBA chips on the PCI-X backplane to the two LBA PCI bus controllers on the system backplane.

Clocks and Reset

The system backplane contains reset and clock circuitry that propagates through the whole system. The system backplane central clocks drive all major chip set clocks. The system central clock circuitry features redundant, hot-swappable oscillators.

I/O Subsystem

The cell board to the PCI-X board path runs from the CC to the SBA, from the SBA to the ropes, from the ropes to the LBA, and from the LBA to the PCI slots as shown in Figure 1-12 on page 33. The CC on cell board 0 and cell board 1 communicates through an SBA over the SBA link. The SBA link consists of both an inbound and an outbound link with a peak bandwidth of approximately 11.5 GB/s at 3.2 GT/s. The SBA converts the

SBA link protocol into “ropes.” A rope is defined as a high-speed, point-to-point data bus. The SBA can support up to 16 of these high-speed bidirectional rope links for a total aggregate bandwidth of approximately 11.5 GB/s.

There are LBA chips on the PCI-X backplane that act as a bus bridge, supporting either one or two ropes for PCI-X 133 MHz slots and the equivalent bandwidth of four ropes for PCI-X 266 MHz slots. Each LBA acts as a bus bridge, supporting one or two ropes and capable of driving 33 MHz or 66 MHz for PCI cards. The LBAs can also drive at 66 MHz or 133 MHz for PCI-X mode 1 cards, and at 266 MHz for PCI-X mode 2 cards installed in mode 2 capable slots. When cell board 2 and cell board 3 are present, the cell boards attach to their own associated SBA and LBA chips on the PCI-X board in the Server Expansion Unit.

Figure 1-12 PCI-X Board to Cell Board Block Diagram

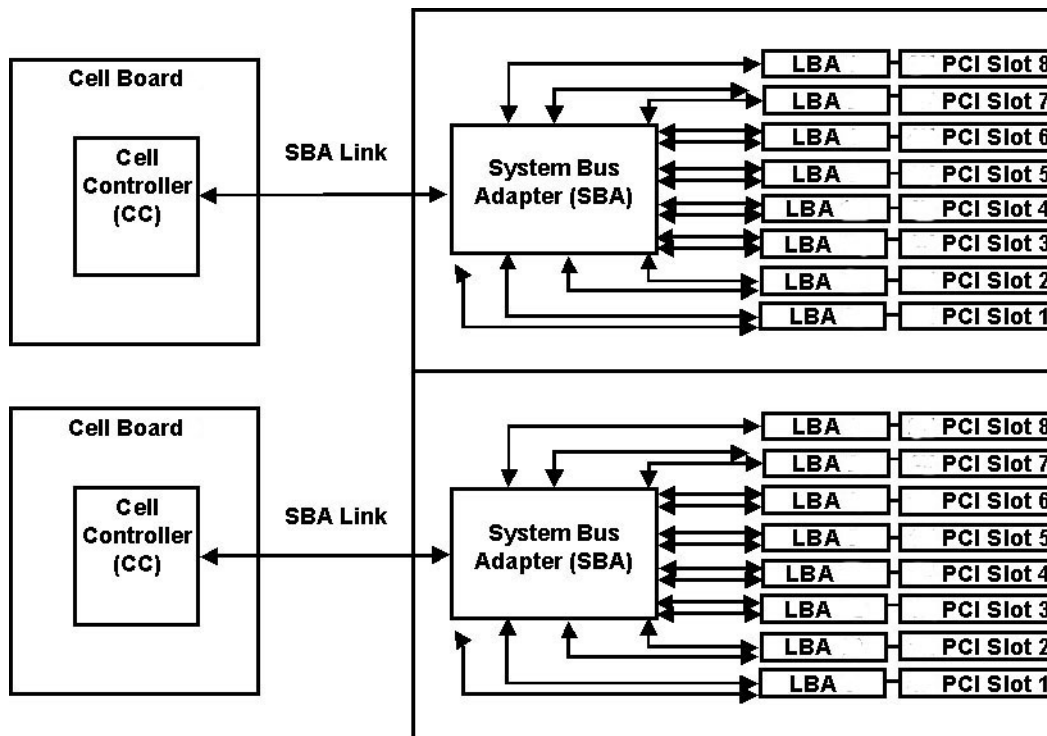


Table 1-6 and Table 1-7 on page 34 list the mapping of PCI-X slots to boot paths. The cell column refers to the cell boards installed in the server.

Table 1-6 PCI-X Slot Boot Paths Cell 0

Cell	PCI Slot	Ropes	Path
0	1	8/9	0/0/8/1/0
0	2	10/11	0/0/10/1/0
0	3	12/13	0/0/12/1/0
0	4	14/15	0/0/14/1/0
0	5	6/7	0/0/6/1/0
0	6	4/5	0/0/4/1/0

Table 1-6 PCI-X Slot Boot Paths Cell 0 (Continued)

Cell	PCI Slot	Ropes	Path
0	7	2/3	0/0/2/1/0
0	8	1	0/0/1/1/0

Table 1-7 PCI-X Slot Boot Paths Cell 1

Cell	PCI Slot	Ropes	Path
1	1	8/9	1/0/8/1/0
1	2	10/11	1/0/10/1/0
1	3	12/13	1/0/12/1/0
1	4	14/15	1/0/14/1/0
1	5	6/7	1/0/6/1/0
1	6	4/5	1/0/4/1/0
1	7	2/3	1/0/2/1/0
1	8	1	1/0/1/1/0

The server supports two internal SBAs. Each SBA provides the control and interfaces for eight PCI-X slots. The interface is through the rope bus (16 ropes per SBA). For each SBA, the ropes are divided in the following manner:

- A single rope is routed to support the core I/O boards through LBAs located on the system backplane.
- A single rope is routed to an LBA on the PCI backplane to support a slot for PCI and PCI-X cards (slot 8).
- Six ropes are bundled into double ropes to three (3) LBAs. They support slots 1, 2, and 7 for PCI and PCI-X mode 1 cards.
- Eight fat ropes are bundled into quad ropes to four (4) LBAs. They support slots 3, 4, 5, and 6 for PCI and PCI-X mode 2 cards.

NOTE PCI-X slots 1-7 are dual rope slots while slot 8 is a single rope slot. A rope is defined as a high-speed, point-to-point data bus.

Each of the 16 slots is capable of 33 MHz/66 MHz PCI or 66 MHz/133 MHz PCI-X. Four slots in PCI-X support 266 MHz. All 16 PCI slots are keyed for 3.3 V connectors (accepting both Universal and 3.3 V cards). The PCI-X backplane does not provide any 5 V slots for the I/O cards. Table 1-8 on page 35 summarizes the PCI-X slot types.

The PCI-X backplane is physically one board, yet it behaves like two independent partitions. SBA 0 and its associated LBAs and eight PCI-X slots form one I/O partition. SBA 1 and its associated LBAs and eight PCI-X slots form the other I/O partition. One I/O partition can be reset separately from the other I/O partition but cannot be powered down independently.

IMPORTANT Always refer to the PCI card's manufacturer for the specific PCI card performance specifications. PCI, PCI-X mode 1, and PCI-X mode 2 cards are supported at different clock speeds. Select the appropriate PCI-X I/O slot for best performance.

Table 1-8 PCI-X Slot Types

I/O Partition	Slot ^a	Maximum MHz	Maximum Peak Bandwidth	Ropes	Supported Cards	PCI Mode Supported
0	8	133	533 MB/s	001	3.3 V	PCI or PCI-X Mode 1
	7	133	1.06 GB/s	002/003	3.3 V	PCI or PCI-X Mode 1
	6	266	2.13 GB/s	004/005	3.3 V or 1.5 V	PCI-X Mode 2
	5	266	2.13 GB/s	006/007	3.3 V or 1.5 V	PCI-X Mode 2
	4	266	2.13 GB/s	014/015	3.3 V or 1.5 V	PCI-X Mode 2
	3	266	2.13 GB/s	012/013	3.3 V or 1.5 V	PCI-X Mode 2
	2	133	1.06 GB/s	010/011	3.3 V	PCI or PCI-X Mode 1
	1	133	1.06 GB/s	008/009	3.3 V	PCI or PCI-X Mode 1
1	8	133	533 MB/s	001	3.3 V	PCI or PCI-X Mode 1
	7	133	1.06 GB/s	002/003	3.3 V	PCI or PCI-X Mode 1
	6	266	2.13 GB/s	004/005	3.3 V or 1.5 V	PCI-X Mode 2
	5	266	2.13 GB/s	006/007	3.3 V or 1.5 V	PCI-X Mode 2
	4	266	2.13 GB/s	014/015	3.3 V or 1.5 V	PCI-X Mode 2
	3	266	2.13 GB/s	012/013	3.3 V or 1.5 V	PCI-X Mode 2
	2	133	1.06 GB/s	010/011	3.3 V	PCI or PCI-X Mode 1
	1	133	1.06 GB/s	008/009	3.3 V	PCI or PCI-X Mode 1

a. Each slot will auto select the proper speed for the card installed up to the maximum speed for the slot. Placing high speed cards into slow speed slots will cause the card to be driven at the slow speed.

Core I/O Card

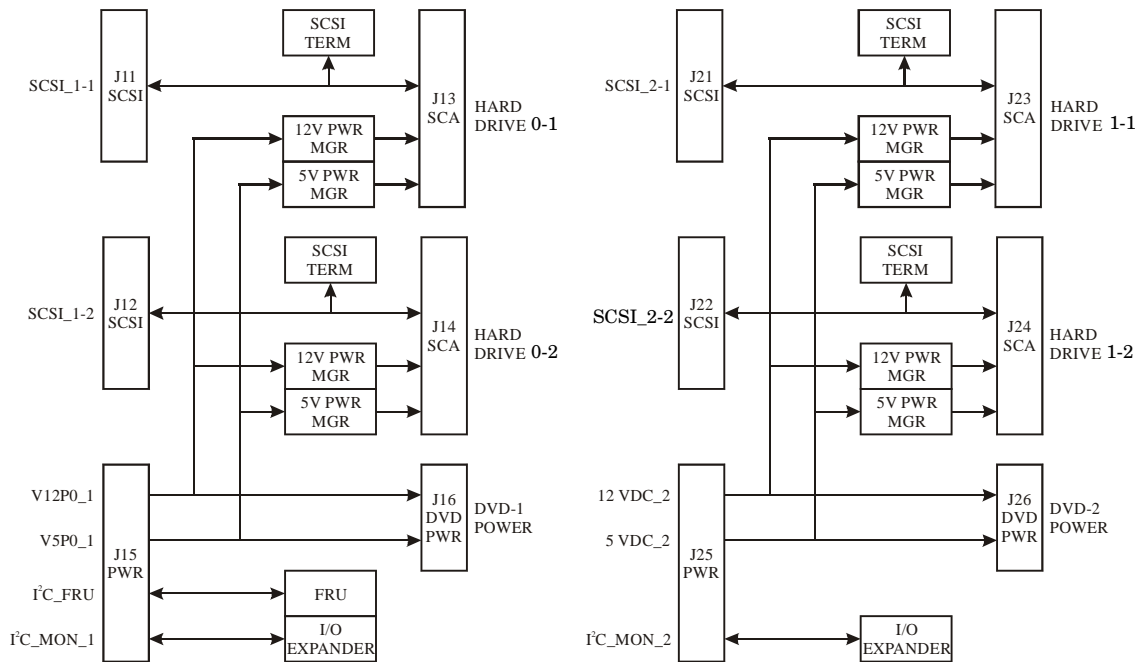
Up to two core I/O cards can be plugged into the server. Two core I/O cards enable two I/O partitions to exist in the server. The server can have up to two partitions. When a Server Expansion Unit with two core I/O cards is attached to the server, two additional partitions can be configured.

A core I/O card can be replaced with standby power applied. The system power to the core I/O is handled in the hardware the same way a hot-plug PCI/PCI-X card is handled. Standby power to core I/O is handled by power manager devices to limit inrush current during insertion.

Mass Storage (Disk) Backplane

Internal mass storage connections to disks are routed on the mass storage backplane, which has connectors and termination logic. All hard disks are hot-plug but removable media disks are not hot-plug. The server accommodates two internal, removable media devices. Power connectors for removable media devices are on the mass storage backplane. For more information, refer to Figure 1-13.

Figure 1-13 Mass Storage Block Diagram



2 Installing the System

Inspect shipping containers when the equipment arrives at the site. Check equipment after the packing has been removed. This chapter discusses how to receive, inspect and install the server.

Receiving and Inspecting the Server Cabinet

This section contains information about receiving, unpacking and inspecting the server cabinet.

NOTE The server will ship in one of three different configurations. The configurations are:

- On a pallet installed in a server cabinet
 - On a pallet for rack mount into an existing cabinet on the customer site
 - On a pallet with a wheel kit for installation as a standalone server
-

HP shipping containers are designed to protect their contents under normal shipping conditions. A tilt indicator is installed on each carton shipped. The tilt indicator has two windows, and each window under normal conditions will show four beads present. If a carton has been mishandled, accidentally dropped, or knocked against something, the tilt indicator will indicate missing beads. If the container has been tilted to an angle that could cause equipment damage, the beads in the indicator will roll to the upper position.

After the equipment arrives at the customer site, carefully inspect each carton for signs of shipping damage. If the container is damaged, document the damage with photographs and contact the transport carrier immediately.

NOTE The factory provides an installation warranty that is effective from the time the customer receives the shipment until Field Services turns the system over to the customer.

Upon inspection of a received system and during installation of the system, if any parts or accessories are missing or defective, they will be replaced directly from the factory by a priority process. To request replacement parts, the HP Installation Specialist must contact the local Order Fulfillment group which will coordinate the replacement with the factory.

Unpacking the Server Cabinet

This section contains information about unpacking the server cabinet.

WARNING **Wear protective glasses while cutting the plastic bands around the shipping container. These bands are under tension. When cut, they can spring back and cause serious eye injury.**

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

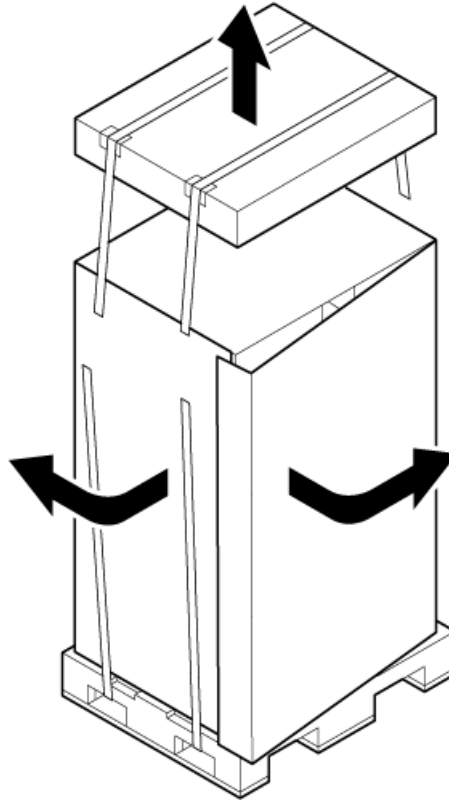
NOTE Position the pallet to allow enough space to roll the cabinet off the pallet before starting.

Remove the server cabinet using the following steps:

Step 1. Cut the polystrap bands around the shipping container.

Step 2. Lift the cardboard top cap from the shipping box. Refer to Figure 2-1,

Figure 2-1 Removing the Polystraps and Cardboard



Step 3. Remove the corrugated wrap from the pallet.

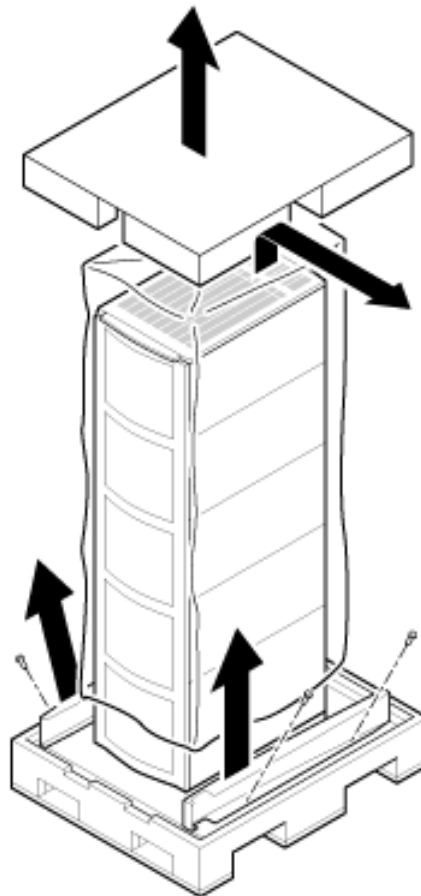
Step 4. Remove the packing materials.

CAUTION Cut the plastic wrapping material off rather than pull it off. Pulling the plastic covering off represents an electrostatic discharge (ESD) hazard to the hardware.

Step 5. Remove the four bolts holding down the ramps, and remove the ramps.

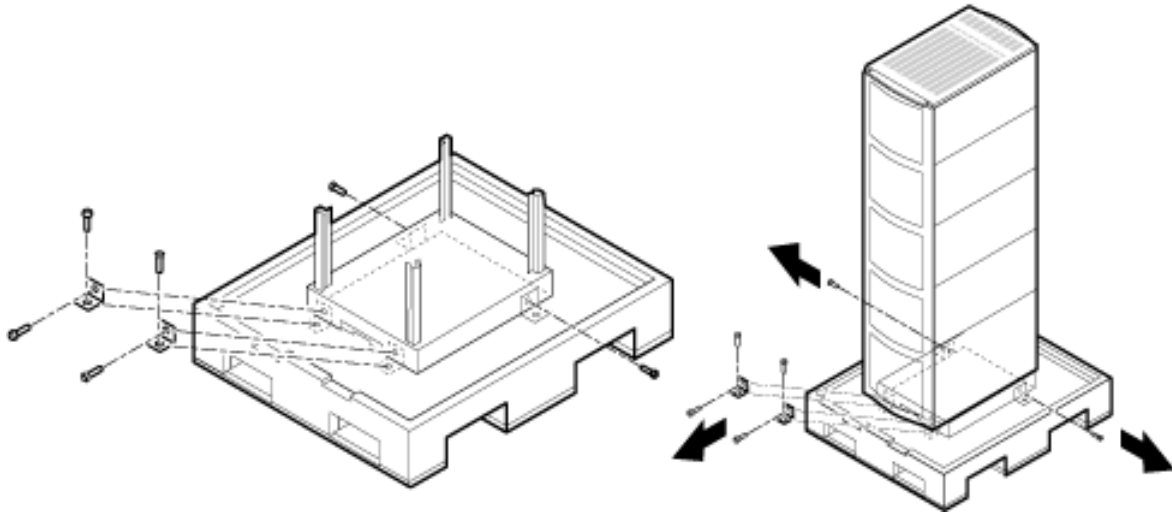
NOTE Figure 2-2 shows one ramp attached to the pallet on either side of the cabinet with each ramp secured to the pallet using two bolts. In an alternate configuration, the ramps are secured together on one side of the cabinet with one bolt.

Figure 2-2 Removing the Shipping Bolts and Plastic Cover



Step 6. Remove the six bolts from the base that attaches the rack to the pallet.

Figure 2-3 Preparing to Roll Off the Pallet



WARNING Be sure that the leveling feet on the rack are raised before you roll the rack down the ramp, and any time you roll the rack on the casters. Use caution when rolling the cabinet off the ramp. A single server in the cabinet weighs approximately 508 lb. It is strongly recommended that two people roll the cabinet off the pallet.

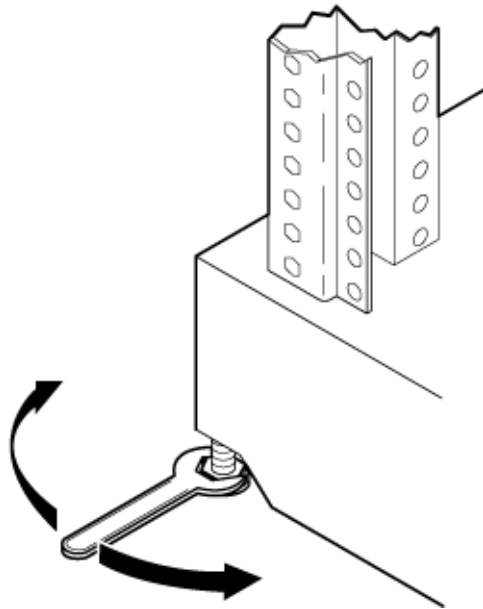
After unpacking the cabinet, examine it for damage that might have been obscured by the shipping container. If you discover damage, document the damage with photographs and contact the transport carrier immediately.

If the equipment has any damage, the customer must obtain a damage claim form from the shipping representative. The customer must complete the form and return it to the shipping representative.

Securing the Cabinet

When in position, secure and stabilize the cabinet using the leveling feet at the corners of the base (Figure 2-4). Install the anti-tip mechanisms on the bottom front and rear of the rack.

Figure 2-4 **Securing the Cabinet**



Standalone and To-Be-Racked Systems

Servers shipped in a stand-alone or to-be-racked configuration must have the core I/O handles and the PCI towel bars attached at system installation. Obtain and install the core I/O handles and PCI towel bars from the accessory kit A6093-04046. The towel bars and handles are the same part. Refer to service note A6093A-11. This is the same accessory kit used for the HP 9000 rp8400 server.

Rack-Mount System Installation

Information is available to help with rack-mounting the server. This list is intended to guide the HP Installation Specialist to the documentation that has been written by the Rack and Power team.

The external Web site is: <http://www.hp.com/racksolutions>

The internal Web site is:

<http://h18004.www1.hp.com/products/servers/proliantstorage/bcs-rackandpower/index.html>

The web site is organized into the following topics:

Racks & Accessories

- Rack System/E
- Rack accessories
- Universal mounting kits

Power Management

- PDUs
- Cordsets
- Rackmounted UPS

System Management

- Console switches
- Flat panel/keyboards

Data cables

- CAT 5 cables
- Fibre optic cables
- SCSI cables
- SCSI terminators

Lifting the Server Cabinet Manually

Use this procedure only if no HP approved lift is available.

CAUTION This procedure must only be performed by four qualified HP Service Personnel utilizing proper lifting techniques and procedures.

Step 1. Follow the instructions on the outside of the service packaging to remove the banding and cardboard top from the server pallet.

Step 2. Reduce the weight by removing all bulk power supplies and cell boards. Place each on an ESD approved surface.

CAUTION System damage can occur through improper removal and reinstallation of bulk power supplies and cell boards. Refer to Chapter 6, “Removal and Replacement” for the correct procedures to remove and reinstall these components.

Step 3. Locate the four positioning handles on the sides of the system. They are colored blue and located close to each base corner of the unit.

Step 4. Ensure that the vertical support brackets are in the position so that they rest on the slides when the server is lowered to the rack slides. There are two brackets on each side of the server chassis.

Step 5. Unfold the handles so that they are extended out from the unit. The server is now ready for manual lifting by the four qualified HP Service Personnel.

Step 6. Lift the server into place and secure as required.

Step 7. After the server is secured, reinstall the previously removed cell boards and bulk power supplies.

Using the RonI Model 17000 SP 400 Lifting Device

Use the lifter designed by the RonI company to rack-mount the server. The lifter can raise 400 lb/182 kg to a height of 5 feet. The lifter can be broken down into several components. When completely broken down, no single component weighs more than 25 lb/12 kg. The ability to break the lifter down makes it easy to transport from the office to the car and then to the customer site.

Documentation for the RonI lifter has been written by RonI and is available on the HP Cybrary: <http://cybrary.inet.cpqcorp.net/ARCHIVE/PUBS/USERS/LIFTOFLEX-17000.pdf>. Complete details on how to assemble the lifter, troubleshoot the lifter, and maintain the lifter are provided by RonI.

Use the following procedure to unload the server from the pallet after the lifter is assembled.

WARNING Use caution when using the lifter. To avoid injury, because of the weight of the server, center the server on the lifter forks before raising it off the pallet.

Always rack the server in the bottom of a cabinet for safety reasons. Never extend more than one server from the same cabinet while installing or servicing another server product. Failure to follow these instructions could result in the cabinet tipping over.

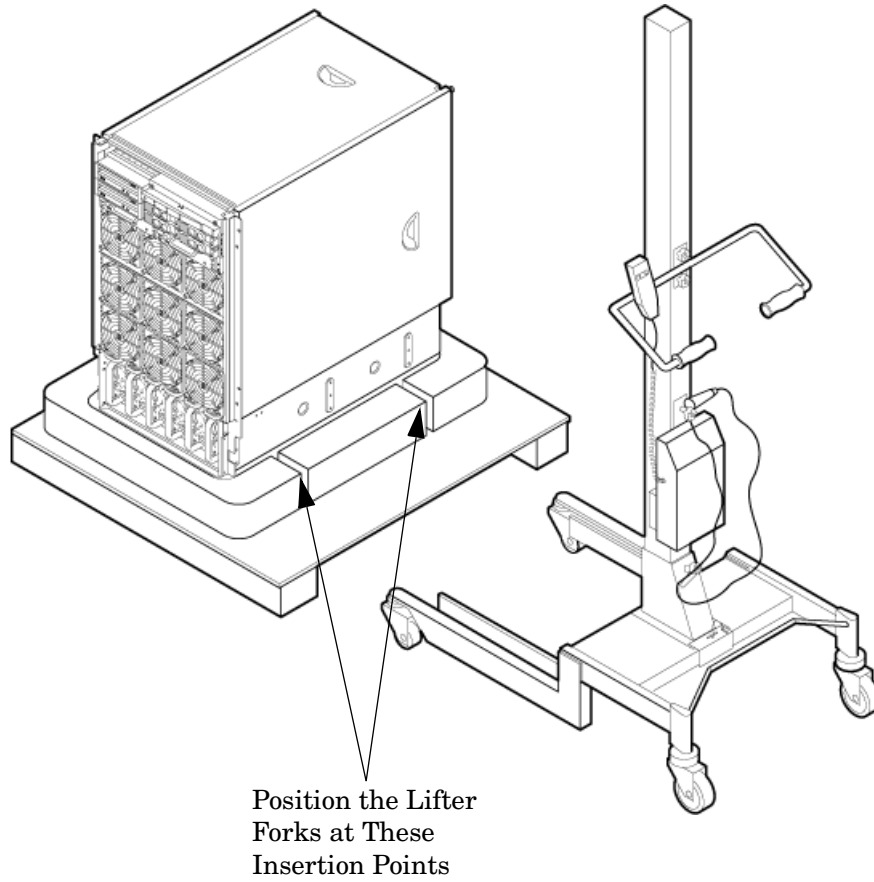
Step 1. Obtain the *HP J1528B Rack Integration Kit Installation Guide* before proceeding with the rack-mount procedure. This guide covers these important steps:

- Installing the anti-tip stabilizer kit (A5540A)
- Installing the ballast kit (J1479A)
- Installing the barrel nuts on the front and rear columns
- Installing the slides

Step 2. Follow the instructions on the outside of the server packaging to remove the banding and carton top from the server pallet.

Step 3. Insert the lifter forks between the cushions (Figure 2-5).

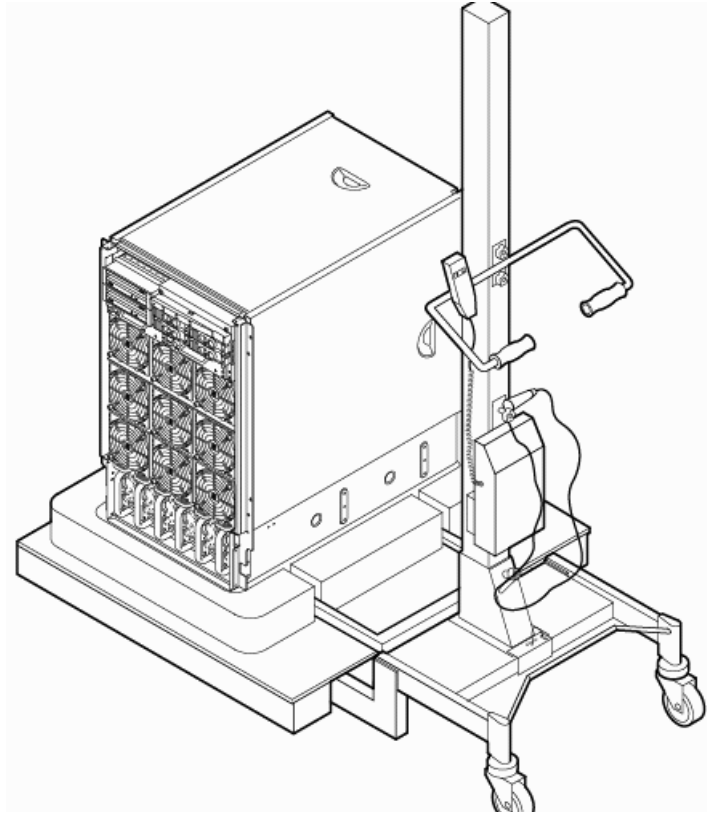
Figure 2-5 Positioning the Lifter to the Pallet



Step 4. Carefully roll the lift forward until it is fully positioned against the side of the server.

Step 5. Slowly raise the server off the pallet until it clears the pallet cushions (Figure 2-6).

Figure 2-6 Raising the Server Off the Pallet Cushions



Step 6. 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.

Step 7. Follow the *HP J1528B Rack Integration Kit Installation Guide* to complete these steps:

- Mounting the server to the slides
- Installing the cable management arm (CMA)
- Installing the interlock device assembly (if two servers are in the same cabinet)

Installing the Wheel Kit

Compare the packing list (Table 2-1) with the contents of the wheel kit before beginning the installation. For a more updated list of part numbers, go to the HP Part Surfer web site at: <http://www.partsurfer.hp.com>.

Table 2-1 Wheel Kit Packing List

Part Number	Description	Quantity
A9904-04002	Caster cover	2
A9904-04007	Right side cover	1
A9904-04008	Left side cover	1
A9904-04009	Top cover	1
A6093-04082	Right front caster assembly	1
A6093-04083	Right rear caster assembly	1
A6093-04084	Left front caster assembly	1
A6093-04085	Left rear caster assembly	1
0515-2478	M4 x 0.7 8mm T15 steel zinc machine screw (used to attach each caster to the chassis)	8
A6093-44013	Plywood unloading ramp	1
Not Applicable	Phillips head wood screw (used to attach the ramp to the pallet)	2

Tools Required for Installation

Use the following tools to perform the wheel kit installation:

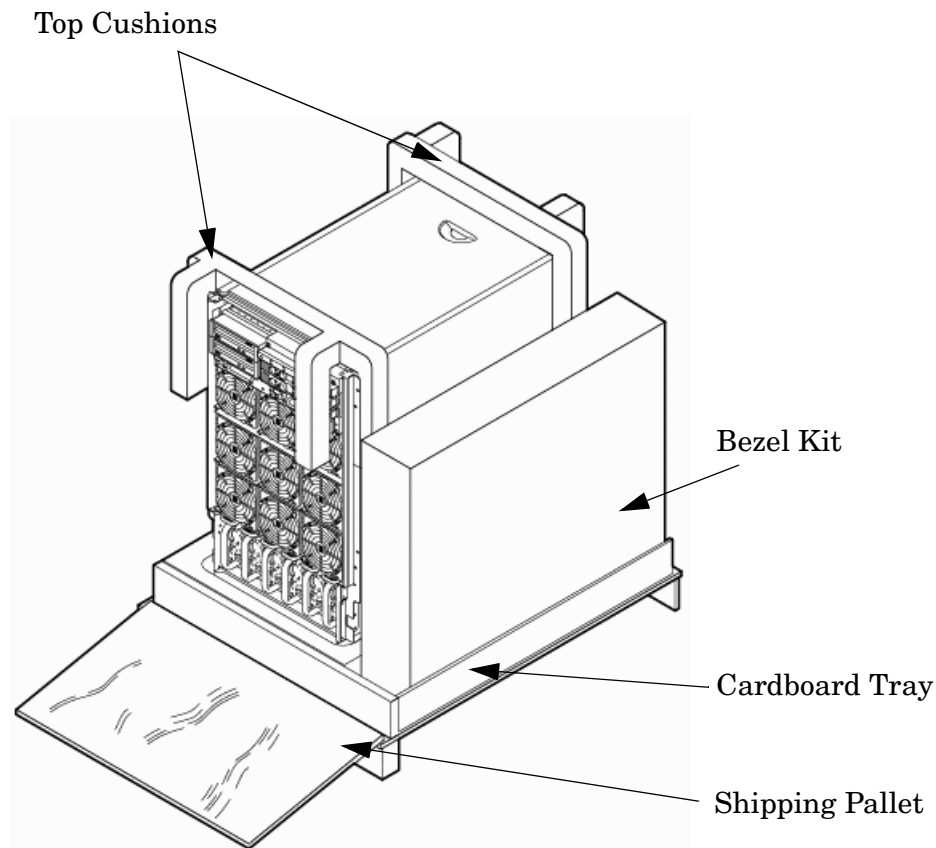
- Diagonal side cutters
- Safety glasses
- Torx screwdriver with T-15 bit
- Phillips head screwdriver

WARNING **Wear protective glasses while cutting the plastic bands around the shipping container. These bands are under tension. When cut, they can spring back and cause serious eye injury.**

Use the following procedure to install the wheel kit.

- Step 1.** Cut and remove the polystrap bands securing the server to the pallet.
- Step 2.** Lift the carton top from the cardboard tray resting on the pallet.
- Step 3.** Remove the bezel kit carton and top cushions (Figure 2-7) from the pallet.

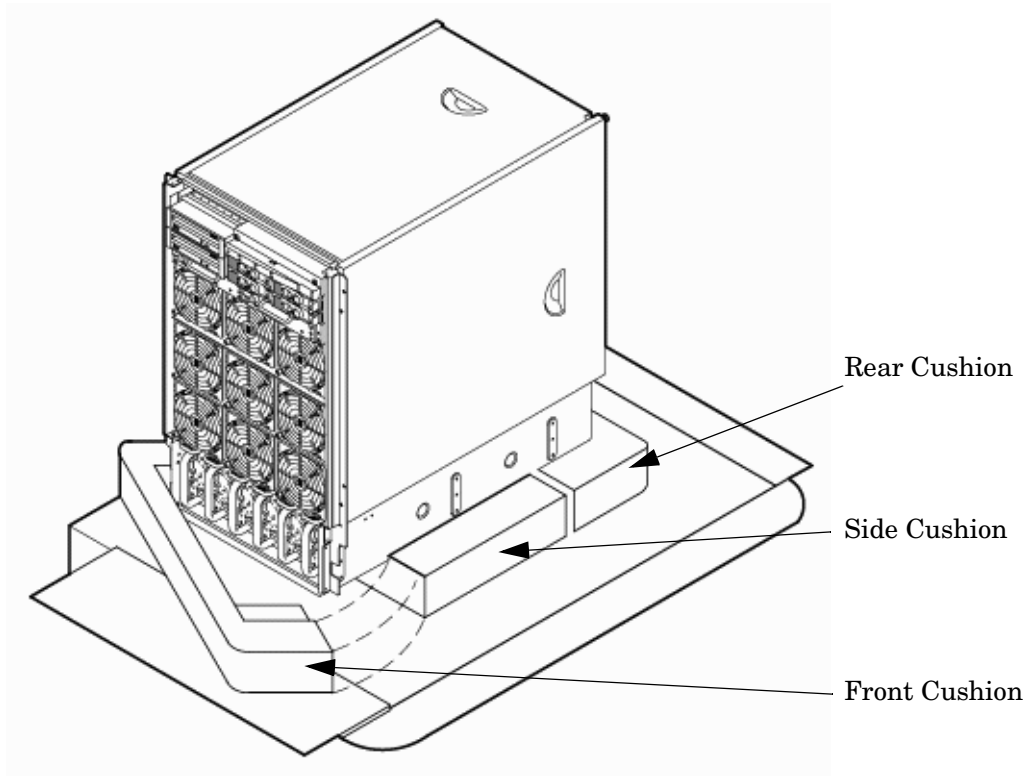
Figure 2-7 Server on Shipping Pallet



- Step 4.** Unfold bottom cardboard tray.

Step 5. Remove the front cushion only (Figure 2-8). Do not remove any other cushions until further instructed.

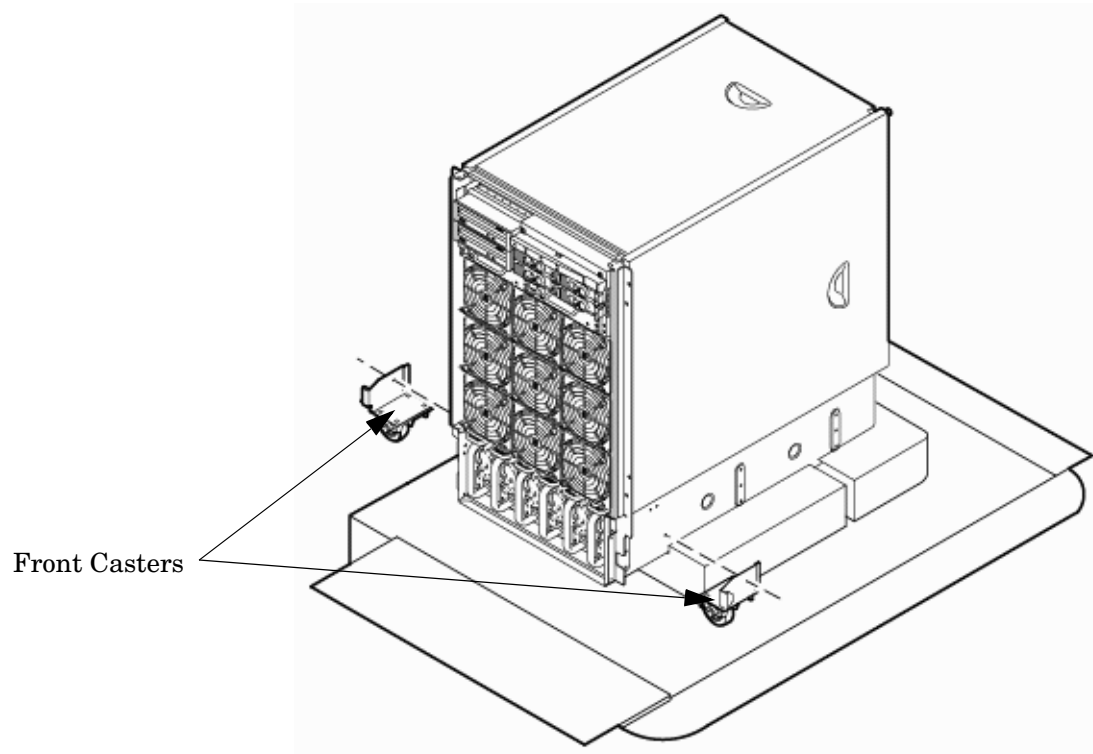
Figure 2-8 Removing Cushion from Front Edge of Server



Step 6. Open the wheel kit box and locate the two front casters. The front casters are shorter in length than the two rear casters. Each front caster is designed to fit only on one corner of the server (right front caster and left front caster).

- Step 7.** Remove two of the eight screws from the plastic pouch. Attach one wheel caster to the front of the server (Figure 2-9).

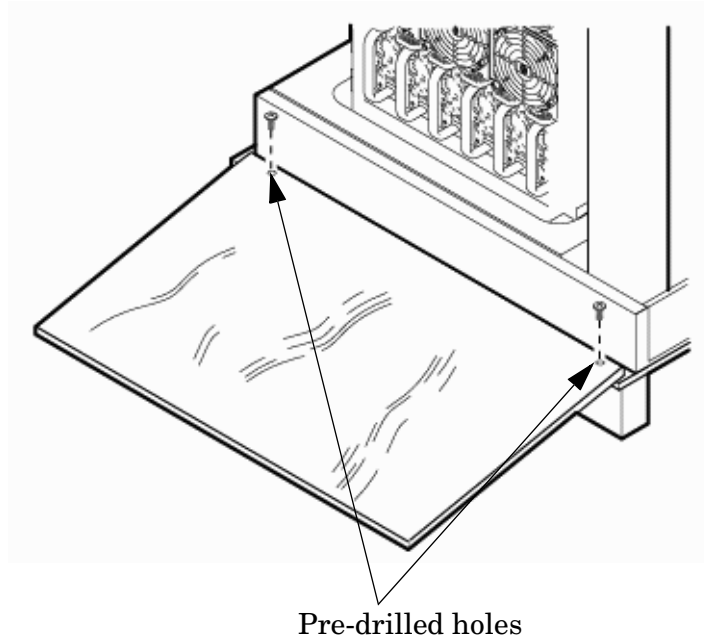
Figure 2-9 Attaching a Caster Wheel to the Server



- Step 8.** Attach the remaining front caster to the server using two more screws supplied in the plastic pouch.
- Step 9.** Remove the rear cushion at the rear of the server. Do not remove the remaining cushions.
- Step 10.** Mount the two rear casters to the server using the remaining four screws.
- Step 11.** Obtain the plywood ramp from the wheel kit.

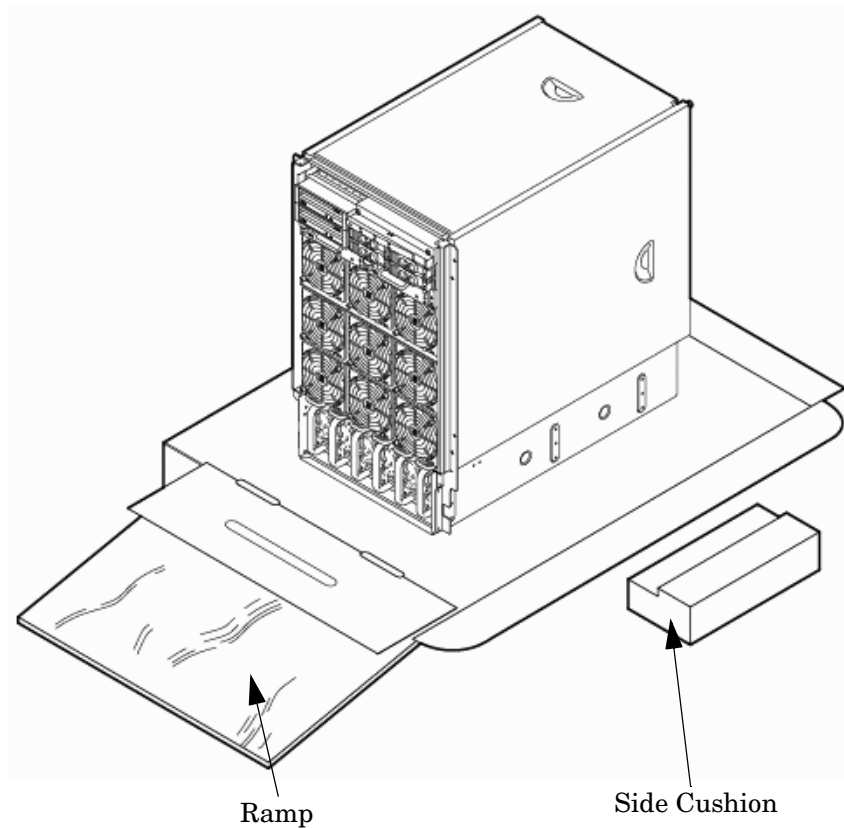
Step 12. The ramp has two ppredrilled holes (Figure 2-10). Attach the ramp to the edge of the pallet using the two screws taped to the ramp.

Figure 2-10Attaching the Ramp to the Pallet



Step 13. Remove the two side cushions from the server, (Figure 2-11) and unfold the cardboard tray so that it lays flat on the pallet.

Figure 2-11 Removing Side Cushion from Server

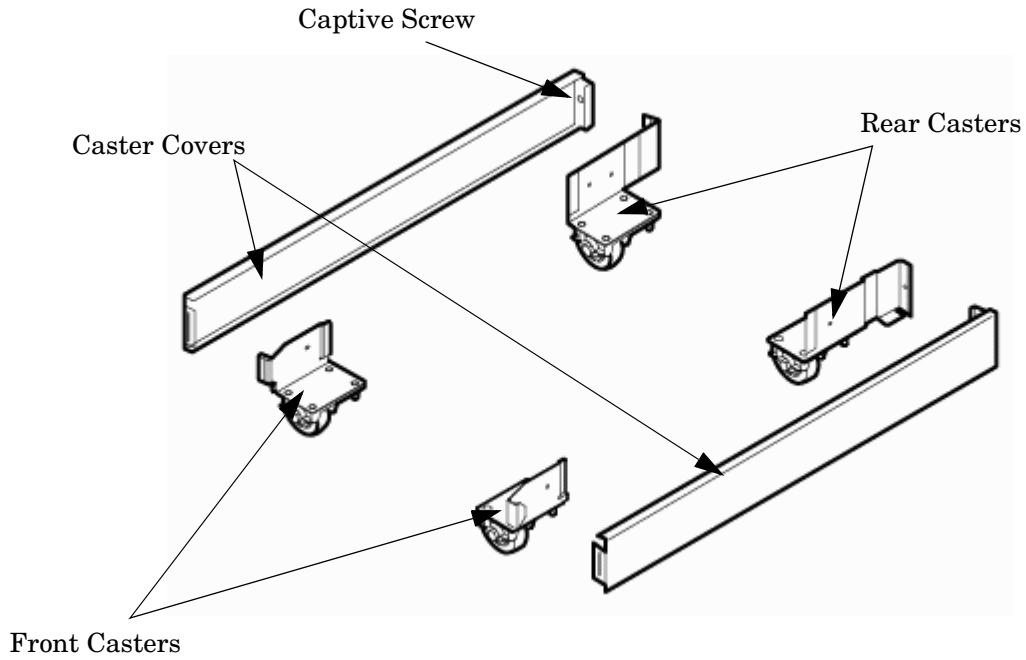


Step 14. Carefully roll the server off the pallet and down the ramp.

Step 15. Obtain the caster covers from the wheel kit. Note that the caster covers are designed to fit on either side of the server.

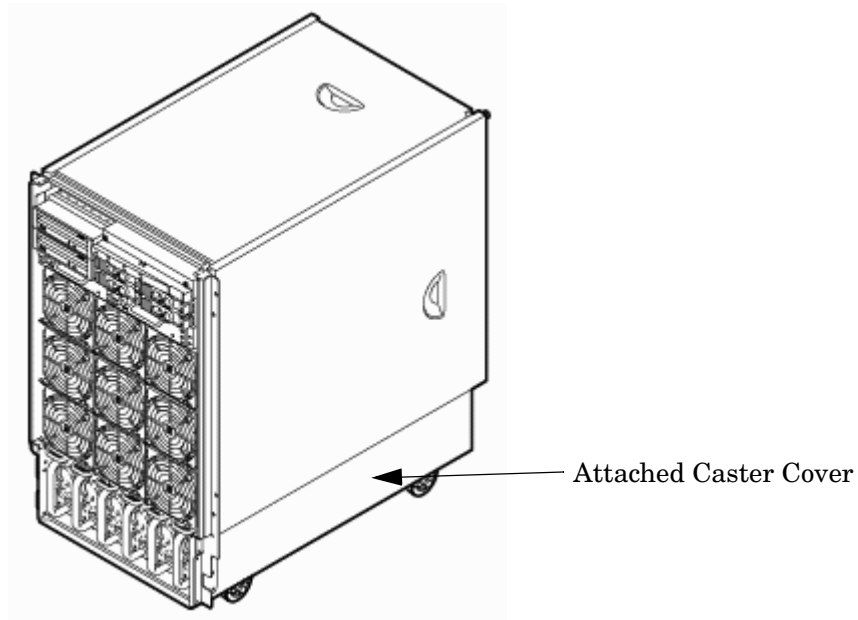
Step 16. Insert the slot on the caster cover into the front caster (Figure 2-12). Secure the caster cover to the server by tightening the captive screw on the cover at the rear of the server. Repeat for the second caster cover.

Figure 2-12 Securing Each Caster Cover to the Server



Step 17. Snap the bezel cover into place on the front of the server. Figure 2-13 shows the server cabinet with the wheel kit installed.

Figure 2-13 Completed Wheel Kit Installation

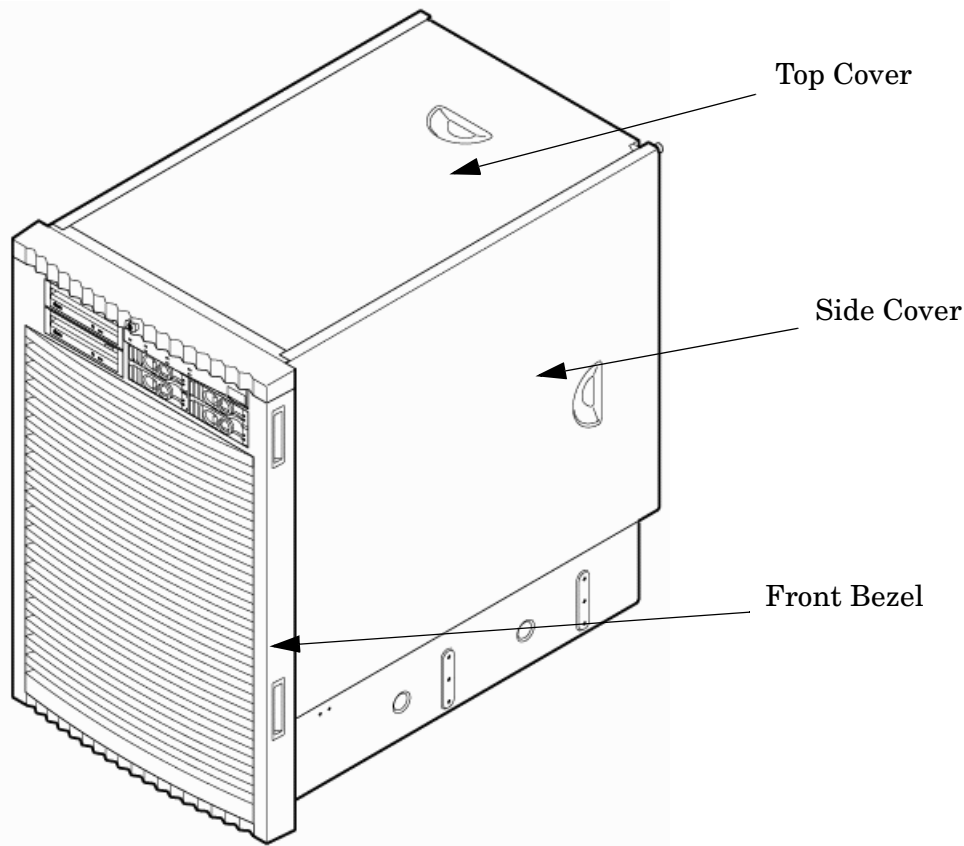


Installing the Top and Side Covers

This section describes the procedures for installing the top and side server covers.

NOTE You may need to remove existing top and side covers installed on the server before installing the covers shipped with the wheel kit. If cover removal is not needed, go directly to the sections for installing the top and side cover.

Figure 2-14 Cover Locations



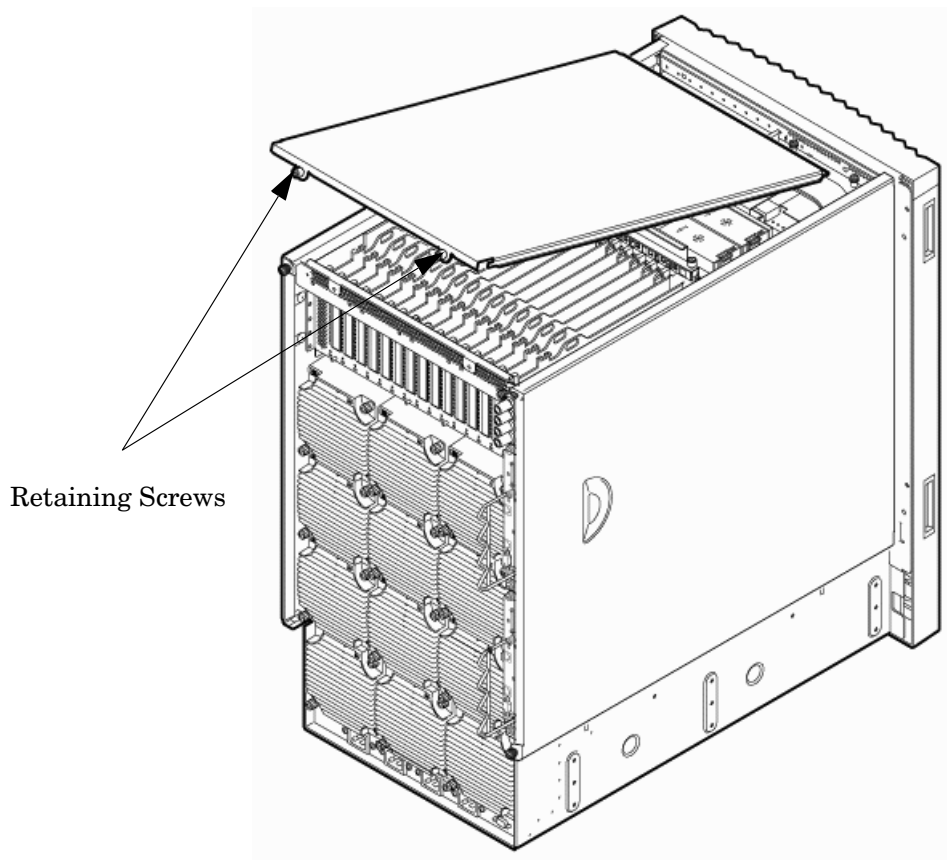
Removing the Top Cover

The following section describes the procedure for removing the top cover.

- Step 1.** Connect to ground with a wrist strap.
- Step 2.** Loosen the blue retaining screws securing the cover to the chassis (Figure 2-15 on page 57).
- Step 3.** Slide the cover toward the rear of the chassis.
- Step 4.** Lift the cover up and away from the chassis.

Step 5. Place the cover in a safe location.

Figure 2-15 **Top Cover Detail**



Installing the Top Cover

The following section describes the procedure for installing the top cover.

- Step 1.** Orient the cover according to its position on the chassis.
- Step 2.** Slide the cover into position using a slow, firm pressure to properly seat the cover.
- Step 3.** Tighten the blue retaining screws securing the cover to the chassis.

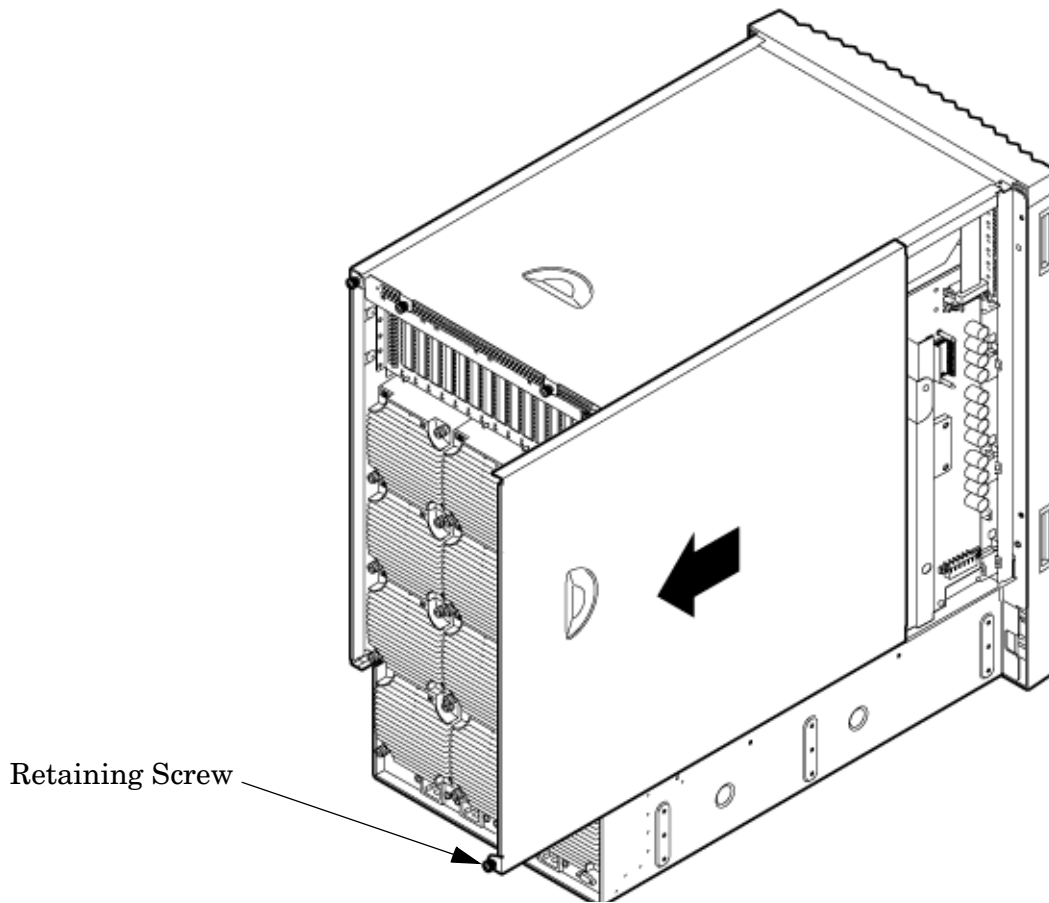
Removing the Side Cover

The following section describes the procedure for removing the side cover.

- Step 1.** Connect to ground with a wrist strap.

Step 2. Loosen the blue retaining screw securing the cover to the chassis (Figure 2-16).

Figure 2-16 Side Cover Detail



Step 3. Slide the cover from the chassis toward the rear of the system.

Step 4. Place the cover in a safe location.

Installing the Side Cover

The following section describes the procedure for installing the side cover.

Step 1. Orient the cover according to its position on the chassis.

Step 2. Slide the cover into position using a slow, firm pressure to properly seat the cover.

Step 3. Tighten the blue retaining screw securing the cover to the chassis.

Installing the Power Distribution Unit

The server may ship with a power distribution unit (PDU). Two 60 A PDUs are available for the server. Each PDU is 3 U high and is mounted horizontally between the rear columns of the server cabinet. The 60 A PDUs are delivered with an IEC-309 60 A plug.

The 60 A NEMA¹ PDU has four 20 A circuit breakers and is constructed for North American use. Each of the four circuit breakers has two IEC²-320 C19 outlets providing a total of eight IEC-320 C19 outlets.

The 60A IEC PDU has four 16A circuit breakers and is constructed for International use. Each of the four circuit breakers has two IEC-320 C19 outlets providing a total of eight IEC-320 C19 outlets.

Each PDU is 3U high and is rack-mounted in the server cabinet.

Documentation for installation will accompany the PDU. The documentation can also be found at the external Rack Solutions Web site at:

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

This PDU might be referred to as a Relocatable Power Tap outside HP.

The PDU installation kit contains the following:

- PDU with cord and plug
- Mounting hardware
- Installation instructions

1. NEMA: National Electrical Manufacturers Association

2. IEC: International Electrotechnical Commission

Installing Additional Cards and Storage

This section provides information on additional products ordered after installation and any dependencies for these add-on products.

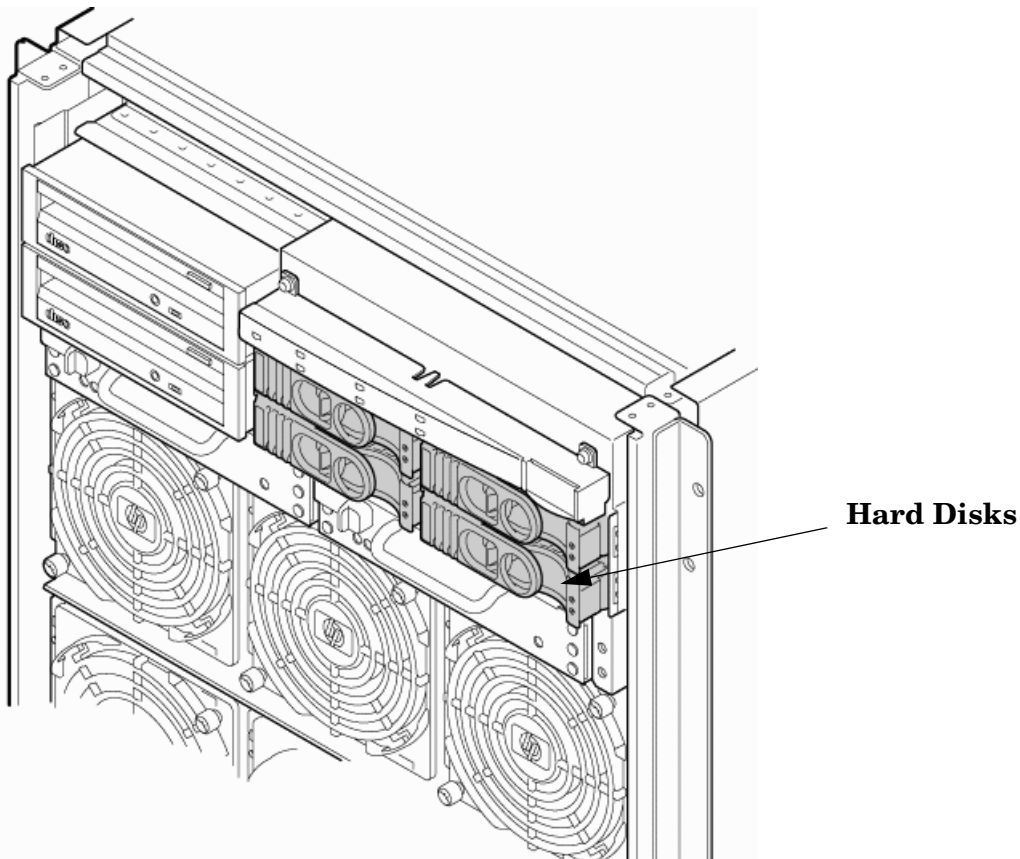
The following options can be installed in the server:

- Hard disk drive storage
- Removable media device storage
- PCI/PCI-X I/O cards

Installing an Additional Hard Disk Drive

The disk drives are located in the front of the chassis (Figure 2-17). The hard disk drives are hot-plug drives. A list of replacement disk drives for the server is in Appendix A of the HP Service Guide. The list contains both removable media disk drives and hard disk drives.

Figure 2-17 Disk Drive Location



Use the following procedure to install the disk drives:

- Step 1.** Be sure the front locking latch is open, then position the disk drive in the chassis.
- Step 2.** Slide the disk drive into the chassis; apply a slow, firm pressure to properly seat the connector.

Step 3. Press the front locking latch to secure the disk drive in the chassis.

Step 4. If the server OS is running, spin up the disk by entering one of the following commands:

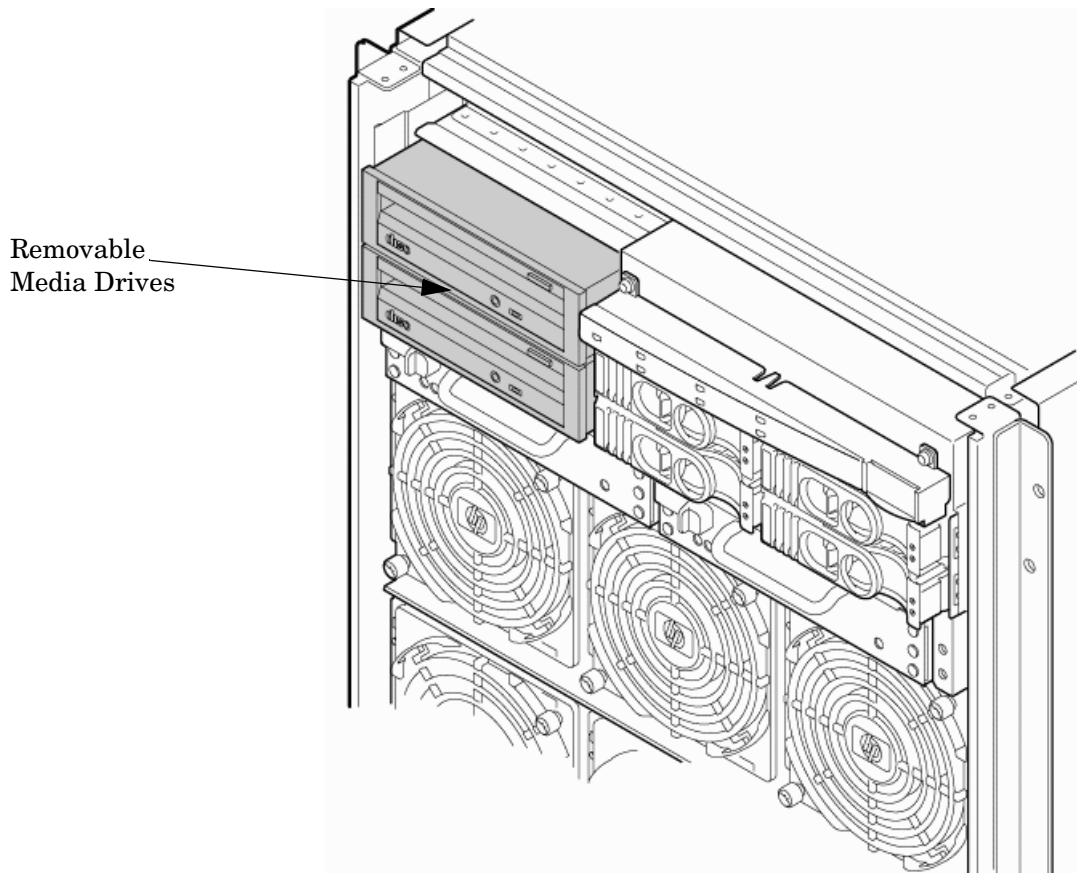
```
#diskinfo -v /dev/rdisk/cxtxdx
```

```
#ioscan -f
```

Removable Media Drive Installation

The DVD drive or DDS-4 tape drives are located in the front of the chassis.

Figure 2-18 Removable Media Drive Location



If an upper drive is installed, remove it before installing a lower drive.

Step 1. Remove the filler panel.

Step 2. Connect the cables to the rear of the drive.

Step 3. Install left and right media rails and clips.

Step 4. Slide the drive in the chassis. Fold the cables out of the way.

Step 5. Apply a slow, firm pressure to properly seat the drive in the chassis.

Step 6. Latch the front locking tab to secure the drive in the chassis.

HP Integrity rx8640 Supported PCI/PCI-X I/O Cards

The rx8640 server supports a number of PCI and PCI-X I/O cards. Table 2-2 lists the cards currently supported on the server. For a more updated list of part numbers, go to the HP Part Surfer web site at: <http://www.partsurfer.hp.com>.

Table 2-2 HP Integrity rx8640 Server PCI-X I/O Cards

Part Number	Card Description	HP-UX 11i V2	Windows®	Linux®	VMS
A4926A	Gigabit Ethernet (1000b-SX)				
A4929A	Gigabit Ethernet (1000b-T)				
A5158A	FCMS - Tachlite				
A5230A	10/100b-TX (RJ45)				
A5506B	4-port 10/100b-TX				
A5838A	2-port Ultra2 SCSI/2-Port 100b-T Combo				
A6386A	Hyperfabric II				
A6749A	64-port Terminal MUX				
A6795A	2G FC Tachlite	B			
A6825A	Next Gen 1000b-T	b	b		
A6826A ¹	2-port 2Gb FC	B			B
A6828A	1-port U160 SCSI	B	B		
A6829A	2-port U160 SCSI	B	B		
A6847A	Next Gen 1000b-SX	b	b		
A6869B ²	Obsidian 2 VGA/USB	B			B
A7011A	1000b-SX Dual Port	b	b	b	
A7012A	1000b-T Dual Port	b	b	b	
A7173A	2-port U320 SCSI	B	B	B	B
A9782A ¹	1000b-T GigE/2G FC Combo	Bb			B
A9784A ¹	PCI-X 1000b-T GigE/2G FC Combo	Bb			B
A9890A	2-port Smart Array 6402 (U320)	B	B	B	B
A9891A	4-port Smart Array 6402 (U320)	B	B		B
AB232A ¹	Emulex 9802 Fibre Channel		B		
AB286A	PCI-X 2-port 4X InfiniBand HCA (HPC)				

Table 2-2 HP Integrity rx8640 Server PCI-X I/O Cards (Continued)

Part Number	Card Description	HP-UX 11i V2	Windows®	Linux®	VMS
AB286C	PCI-X 2-Port 4X InfiniBand HCA (HPC)-RoHS				
AB287A	10 GbE - Fiber (PCI-X 133)	b	b	b	
AB290A	U320 SCSI/GigE Combo Card	Bb	Bb	Bb	B
AB345A	PCI-X 2-port 4X InfiniBand HCA				
AB345C	PCI-X 2-port 4X InfiniBand HCA-RoHS				
AB378A ¹	QLogic 1-port 4Gb FC card (PCI-X 266)	B			B
AB379A ¹	QLogic 2-port 4Gb FC card (PCI-X 266)	B	B	B	B
AB429A ¹	1-Port 4Gb FC QLogic – AB378A equivalent		B	B	
AB465A ¹	2-port 1000b-T 2Gb FC Combo	Bb			B
AB466A ¹	Emulex 1050DC Fibre Channel		B		
AB467A ¹	Emulex 1050D Fibre Channel		B		
AB545A	4-Port 1000b-T Ethernet	b			
AD167A ¹	Emulex 4Gb/s		B	B	
AD168A ¹	Emulex 4Gb/s DC		B	B	
AD278A	8-Port Terminal MUX				
AD279A	64-Port Terminal MUX				
J3525A	2-port Serial				
337972-B21	SA P600 (Redstone)		B	B	

B- Supports Mass Storage Boot

b- Supports LAN Boot

Bb- Support Mass Storage and LAN Boot

1. Factory integration (software load) of the OpenVMS, Windows, and Linux operating systems via Fibre Channel is NOT supported.
2. Boot support is limited to OS installation, updating, and repairing media.

HP 9000 rp8440 Supported PCI/PCI-X I/O Cards

Table 2-3 lists the PCI/PCI-X cards supported in the rp8440 server.

Several cards lose boot functionality when upgrading the server. The customer must use another I/O card to retain boot functionality if the customer's card is not supported in the server.

Table 2-3 HP 9000 rp8440 Server PCI-X I/O Cards

Part Number	Card Description	HP-UX 11i V1	n/a	n/a	n/a
A4926A	Gigabit Ethernet (1000b-SX)				
A4929A	Gigabit Ethernet (1000b-T)				
A5158A	FCMS - Tachlite				
A5159B	2-port FWD SCSI	B			
A5230A	10/100b-TX (RJ45)				
A5506B	4-port 10/100b-TX				
A5838A	2-port Ultra2 SCSI/2-Port 100b-T Combo	B			
A6386A ¹	Hyperfabric II				
A6749A	64-port Terminal MUX				
A6795A ¹	2G FC Tachlite	B			
A6825A ¹	Next Gen 1000b-T	b			
A6826A ¹	2-port 2Gb FC	B			
A6828A	1-port U160 SCSI	B			
A6829A	2-port U160 SCSI	B			
A6847A ¹	Next Gen 1000b-SX	b			
A7011A ¹	1000b-SX Dual Port	b			
A7012A ¹	1000b-T Dual Port	b			
A7143A	U160 RAID - SmartArray 5304	B			
A7173A ¹	2-port U320 SCSI	B			
A9782A ¹	1000b-T GigE/2G FC Combo	Bb			

Table 2-3 HP 9000 rp8440 Server PCI-X I/O Cards (Continued)

Part Number	Card Description	HP-UX 11i V1	n/a	n/a	n/a
A9784A ¹	PCI-X 1000b-T GigE/2G FC Combo	Bb			
A9890A ¹	2-port Smart Array 6402 (U320)	B			
A9891A ¹	4-port Smart Array 6402 (U320)	B			
AB287A ¹	10 GbE - Fiber (PCI-X 133)				
AB290A ¹	U320 SCSI/GigE Combo Card	Bb			
AB378A ¹	QLogic 1-port 4Gb FC card (PCI-X 266)	B			
AB378B ¹	QLogic 1-port 4Gb FC card (PCI-X 266)	B			
AB379A ¹	QLogic 2-port 4Gb FC card (PCI-X 266)	B			
AB379B ¹	QLogic 2-port 4Gb FC card (PCI-X 266)	B			
AB465A ¹	2-port 1000b-T 2Gb FC Combo	Bb			
AB545A ¹	4-Port 1000b-T Ethernet	b			
AD193A ¹	1-port 4Gb FC & 1-port GigE HBA PCI-X RoHS	Bb			
AD194A ¹	2-port 4Gb FC & 2-port GigE HBA PCI-X RoHS	Bb			
AD278A ¹	8-Port Terminal MUX				
AD279A ¹	64-Port Terminal MUX				
AD331A ¹	PCI/PCI-X 1-Port 1000b-T Adapter	b			
AD332A ¹	PCI/PCI-X 1-Port 1000b-SX Adapter	b			
J3525A ¹	2-port Serial (X25/FR/SDLC)				

B- Supports Mass Storage Boot

b- Supports LAN Boot

Bb- Supports Mass Storage and LAN Boot

1. Available with Factory Integration

IMPORTANT The above list of part numbers is current and correct as of December 2006. Part numbers change often. Check the following website to ensure you have the latest part numbers associated with this server:

<http://partsurfer.hp.com/cgi-bin/spi/main>

Installing an Additional PCI-X I/O Card

IMPORTANT The installation process varies depending on what method for installing the PCI card is selected. Download PCI I/O card installation procedures from the <http://docs.hp.com/> Web site. Background information and procedures for adding a new PCI I/O card using online addition are described in the *Interface Card OL* Support Guide*.

Downloading Drivers

The following website contains technical support for a wide range of HP Integrity servers, including the capture of the latest drivers required for various hardware components. Refer to this site regarding necessary drivers for supported PCI cards.

See: <http://www.hp.com/support/itaniumservers>

PCI I/O OL* Card Methods

The following are three methods for performing OL* operations on PCI I/O cards:

<code>pdweb</code>	The Peripheral Device Tool (<code>pdweb</code>) Web-based method of performing OL*.
<code>olrad</code>	The command-line method of performing OL*.
Attention button	The hardware system slot based method of performing OL*.

Adding a PCI I/O Card Using the Attention Button

The following prerequisites for this procedure:

- Drivers for the card have already been installed.
- No drivers are associated with the slot.
- The green power LED is steady **OFF**. If the empty slot is in the **ON** state, use the `olrad` command or the `pdweb` tool to power the slot **OFF**.
- The yellow attention LED is steady **OFF** or is blinking if a user has requested the slot location.
- Refer to the host bus adapter (HBA) documentation for details on card installation.
- Run the `olrad -q` command to determine the status of all the PCI I/O slots.
- Obtain a copy of the interface card guide for instructions on preparing the operating system for the online addition of the PCI I/O card before attempting to insert a PCI I/O card into the PCI-X card cage assembly backplane slot.

This procedure describes how to perform an online addition of a PCI card using the attention button for cards whose drivers support online addition or replacement (OLAR). The attention button is also referred to as the doorbell.

Step 1. Remove the top cover.

Step 2. Remove the PCI bulkhead filler panel.

Step 3. Flip the PCI manual release latch (MRL) for the card slot to the open position. Refer to Figure 2-19.

Step 4. Install the new PCI card in the slot.

NOTE Apply a slow, firm pressure to properly seat the card into the backplane.

Step 5. Flip the PCI MRL for the card slot to the closed position.

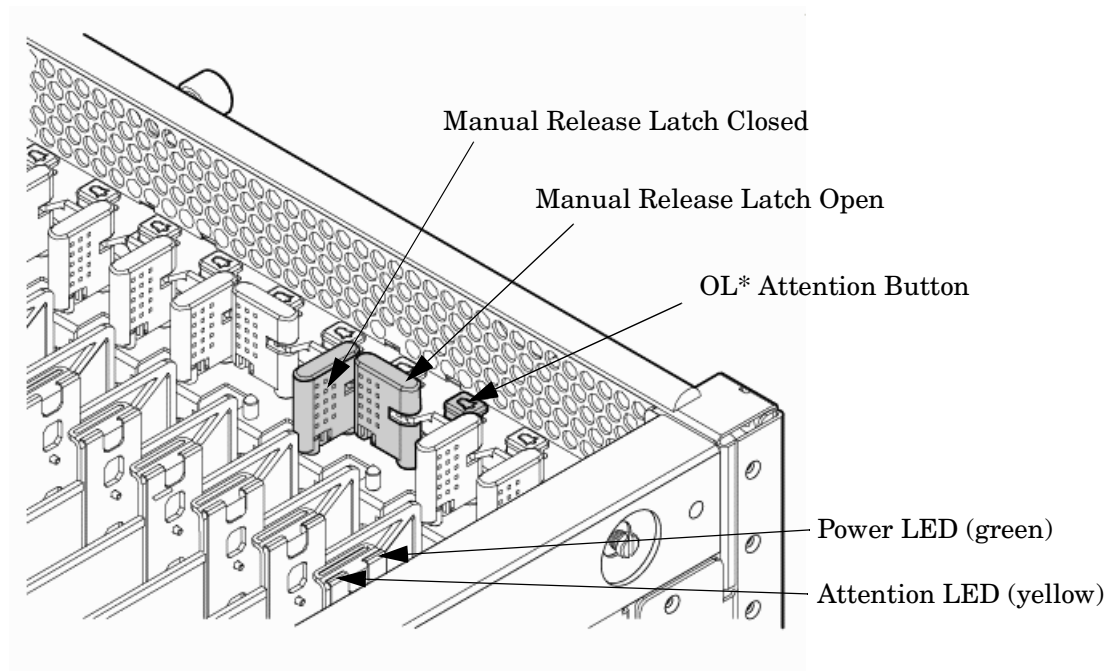
CAUTION Working out of sequence or not completing the actions within each step could cause the system to crash.

Do not press the attention button until the latch is locked.

Step 6. Press the attention button.

The green power LED will start to blink.

Figure 2-19 PCI I/O Slot Details



Step 7. Wait for the green power LED to stop blinking and turn on solid.

Step 8. Check for errors in the `hotplugd` daemon log file (default: `/var/adm/hotplugd.log`).

The critical resource analysis (CRA) performed while doing an attention button-initiated add action is restrictive, and the action will not complete and will fail to protect critical resources from being impacted.

For finer control over CRA actions, use the `pdweb` or the `olrad` command. Refer to the *Interface Card OL* Support Guide* located on the Web at <http://docs.hp.com>, for details.

Step 9. Replace the top cover.

Step 10. Connect all cables to the installed PCI card.

Installing an A6869B VGA/USB PCI Card in a Server

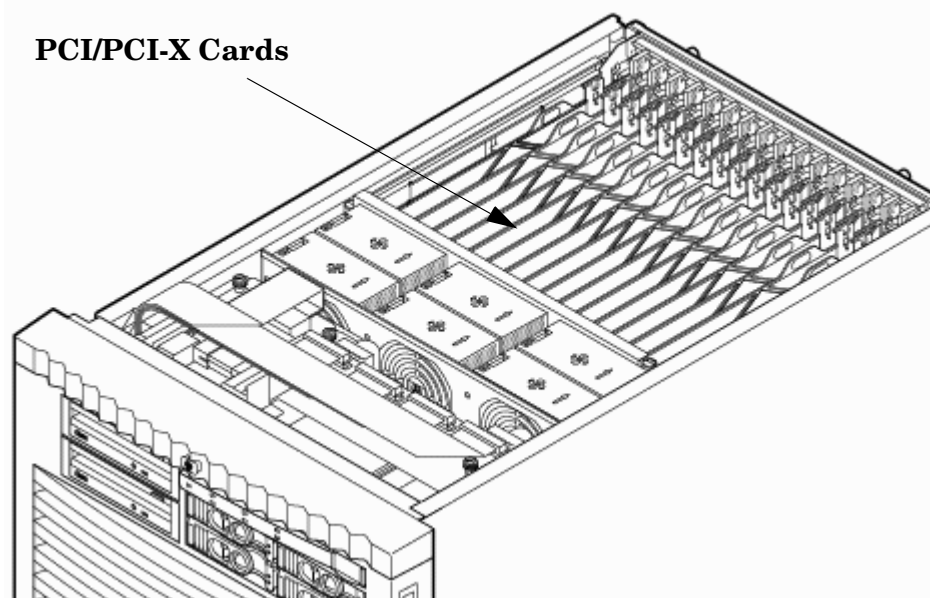
The A6869B VGA/USB PCI card is a dual function combo card, hosting VGA and universal serial bus (USB) controllers. Both of these devices sit behind a PCI-PCI bridge. The A6869B VGA/USB PCI card operates at the conventional 66MHz/64 bit PCI rate and is universally keyed. All signalling and form factors conform to the *PCI Local Bus Specification 2.3*. The VGA controller has 128Mbits of DDR-1 RAM for use as a frame buffer.

The A6869B VGA/USB PCI card can be installed into any slot in a PCI/PCI-X backplane.

IMPORTANT If you are installing the A6869B in HP servers based on the sx1000 chipset, such as HP Superdome, rx7620 or rx8620, the system firmware must be updated to a minimum revision of 3.88.

IMPORTANT Search for available PCI slots that support the conventional clock speed to conserve availability of higher speed PCI-X card slots to PCI-X cards that use the higher bandwidth. This applies to mid-range as well as high-end HP server I/O PCI-X backplanes.

Figure 2-20 PCI/PCI-X Card Location



IMPORTANT Some PCI I/O cards, such as the A6869B VGA/USB PCI card, cannot be added or replaced online (while Windows remains running). For these cards, you must shut down Windows on the nPartition before performing the card replacement or addition. See the section on Shutting Down nPartitions and Powering off Hardware Components in the appropriate service guide.

1. If the A6869B VGA/USB PCI card is currently not installed, follow proper procedures to shut down the nPartition and power-off the appropriate PCI power domain.
2. Locate a vacant conventional clock speed PCI slot where the A6869B VGA/USB PCI card will reside.
3. Position the PCI card over the empty slot, observing that edge connector keyways match on the PCI backplane connector.
4. Using a slow firm pressure, seat the card down into the slot.
5. Connect the monitor, mouse, and keyboard cables to the card.
6. Connect power, and turn on the monitor.
7. Follow proper procedures to power-on the PCI power domain and boot the Windows nPartition.

Once Windows has completely booted, the video, keyboard and mouse are ready for use.

Troubleshooting the A6869B VGA/USB PCI Card

The following provides some troubleshooting solutions and a URL to a useful reference site.

No Console Display

Black Screen. No text displayed.

Hardware problem.

- * Must have supported power enabled.
- * Must have a functional VGA/USB PCI card.
- * Must have a functional PCI slot. Select another slot on same partition/backplane.
- * Must have the VGA/USB PCI card firmly seated in PCI backplane slot.
- * Must have a supported monitor.
- * Must have verified cable connections to VGA/USB PCI card.

Display unreadable.

- * Ensure system FW supports the VGA/USB PCI card.
- * Ensure graphics resolution is compatible and set correctly.

Reference URL

There are many features available for HP Servers at this website including links to download Windows Drivers.

HP Servers Technical Support

<http://www.hp.com/support/itaniumservers>

System Console Selection

Each operating system requires that the correct console type be selected from the firmware selection menu. The following section describes how to determine the correct console device.

If an operating system is being installed or the system configuration is being changed the system console setting must be checked to ensure it matches the hardware and OS. Not checking the console selection can result in the system using an unexpected device as a console, which can appear as a system hang when booting.

Step 1. Determine the console you want to use.

Depending on your operating system and your hardware you can select one of two possible devices as your system console. The possibilities are:

- Management Processor (MP) Serial Port
- VGA device

Step 2. Select the appropriate console device (deselect unused devices):

- a. Choose the “Boot option maintenance menu” choice from the main Boot Manager Menu.
- b. Select the Console Output, Input or Error devices menu item for the device type you are modifying:
 - “Select Active Console Output Devices”
 - “Select Active Console Input Devices”
 - “Select Active Console Error Devices”
- c. Available devices will be displayed for each menu selection. Figure 2-21 shows a typical output of selecting the Console Output Devices menu.

Figure 2-21 Console Output Device menu

EFI Boot Maintenance Manager ver 1.10 [14.61]

Select the Console Output Device(s)

```
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(PcAnsi)
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100)
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(VtUtf8)
Acpi(HWP0002,700)/Pci(0|1)/Uart(9600 N81)/VenMsg(PcAnsi)
Acpi(HWP0002,700)/Pci(0|1)/Uart(9600 N81)/VenMsg(Vt100)
Acpi(HWP0002,700)/Pci(0|1)/Uart(9600 N81)/VenMsg(Vt100+)
Acpi(HWP0002,700)/Pci(0|1)/Uart(9600 N81)/VenMsg(VtUtf8)
* Acpi(HWP0003,400)/Pci(0|0)
Save Settings to NVRAM
Exit
```


- d. Choose the correct device for your system and deselect others. See “Interface Differences Between Itanium-based Systems” for details about choosing the appropriate device.
- e. Select “Save Settings to NVRAM” and then “Exit” to complete the change.
- f. A system reset is required for the changes to take effect.

VGA Consoles

Any device that has a PCI section in its path and does not have a UART section will be a VGA device. If you require a VGA console, choose the device and unmark all others. Figure 2-21 shows that a VGA device is selected as the console.

Interface Differences Between Itanium-based Systems

Each Itanium-based system has a similar interface with minor differences. Some devices may not be available on all systems depending on system design or installed options.

Other Console Types

Any device that has a Uart section but no Pci section is a system serial port. To use the system serial port (if available) as your console device, select the system serial device entry that matches your console type (PcAnsi, Vt100, Vt100+, VtUtf8) and deselect everything else.

If you choose either a system or MP serial port HP recommends that you use a vt100+ capable terminal device.

Additional Notes on Console Selection

Each Operating System makes decisions based on the EFI Boot Maintenance Manager menu’s Select Active Console selections to determine where to send its output. If incorrect console devices are chosen the OS may fail to boot or will boot with output directed to the wrong location. Therefore, any time new potential console devices are added to the system or anytime NVRAM on the system is cleared console selections should be reviewed to ensure that they are correct.

Cabling and Powering On the Server

After the system has been unpacked and moved into position, it must be connected to a source of AC power. The AC power must be checked for the proper voltage before the system is powered up. This chapter describes these activities.

Checking the Voltage

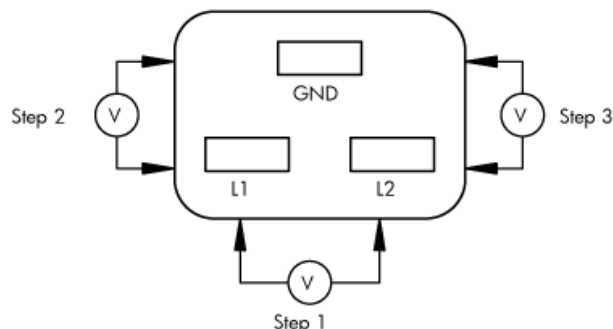
This section provides voltage check information for use on the customer site. The emphasis is on measuring the voltages at the power cord plug end specified as an IEC-320 C19 type plug. This is the end that plugs directly into the back of the server cabinet.

NOTE Perform these procedures for each power cord that will be plugged directly into the back of the server cabinet. If you do not obtain the expected results from this procedure during the voltage check, refer to the section titled “Voltage Check (Additional Procedure)” on page 78.

Verifying the Voltage Range of the Receptacle

Use this procedure to measure the voltage between L1 and L2, L1 to ground, and L2 to ground. Refer to Figure 2-22 for voltage reference points when performing the following measurements.

Figure 2-22 Voltage Reference Points for IEC-320 C19 Plug



IMPORTANT Perform these measurements for every power cord that plugs into the server.

- Step 1.** Measure the voltage between L1 and L2. This is considered to be a phase-to-phase measurement in North America. In Europe and certain parts of Asia-Pacific, this measurement is referred to as a phase-to-neutral measurement. The expected voltage should be between 200–240 V AC regardless of the geographic region.
- Step 2.** Measure the voltage between L1 and ground. In North America, verify that this voltage is between 100–120 V AC. In Europe and certain parts of Asia-Pacific, verify that this voltage is between 200–240 V AC.
- Step 3.** Measure the voltage between L2 and ground. In North America, verify that this voltage is between 100–120 V AC. In Europe and certain parts of Asia-Pacific, verify that this voltage is 0 (zero) V AC.

Table 2-4 provides single phase voltage measurement examples specific to the geographic region where these measurements are taken.

Table 2-4 Single Phase Voltage Examples

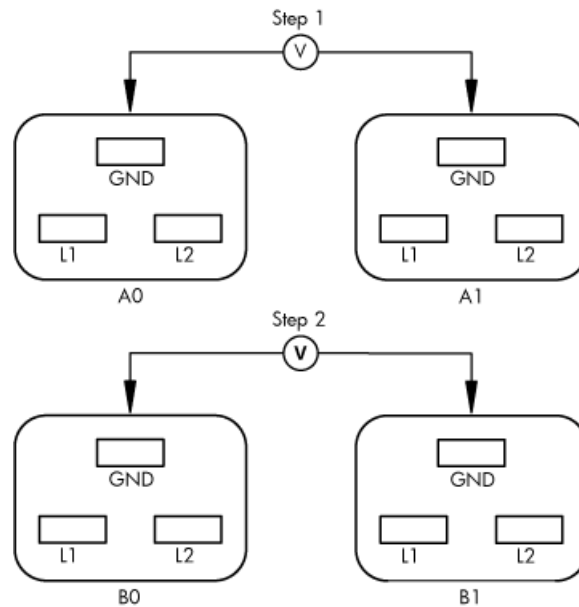
	Japan	North America	Europe ^a
L1 to L2	210 V	208 V or 240 V	230 V
L1 to ground	105 V	120 V	230 V
L2 to ground	105 V	120 V	0 V

a. In some European countries, there might not be a polarization.

Verifying the Safety Ground (Single Power Source)

Use this procedure to measure the voltage level between A0 and A1. It also verifies the voltage level between B0 and B1. Take measurements between ground pins. Refer to Figure 2-23 for ground reference points when performing these measurements.

Figure 2-23 Safety Ground Reference Check — Single Power Source



WARNING SHOCK HAZARD
Risk of shock hazard while testing primary power.
Use properly insulated probes.
Be sure to replace access cover when finished testing primary power.

Step 1. Measure the voltage between A0 and A1 as follows:

1. Take the AC voltage down to the lowest scale on the volt meter.

2. Insert the probe into the ground pin for A0.
3. Insert the other probe into the ground pin for A1.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Step 2. Measure the voltage between B0 and B1 as follows:

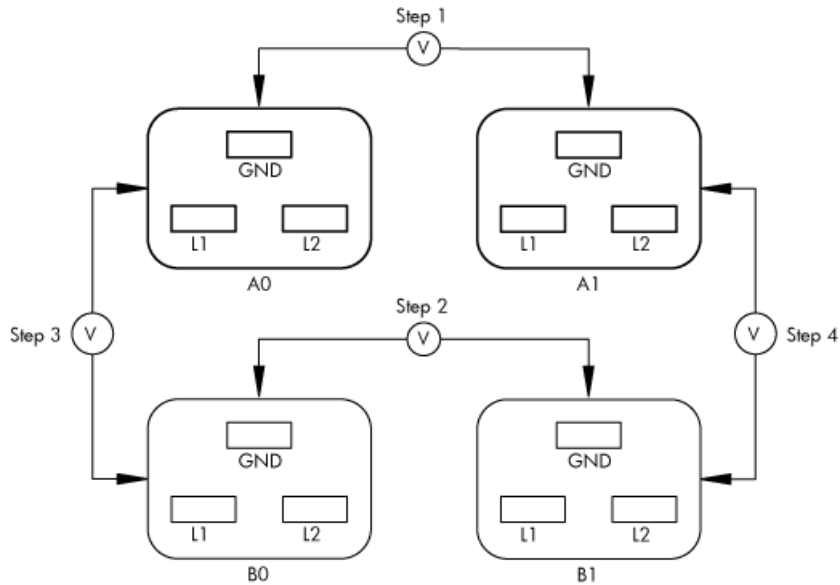
1. Take the AC voltage down to the lowest scale on the volt meter.
2. Insert the probe into the ground pin for B0.
3. Insert the other probe into the ground pin for B1.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Verifying the Safety Ground (Dual Power Source)

Use this procedure to measure the voltage level between A0 and A1, between B0 and B1, between A0 and B0, and between A1 and B1. Take all measurements between ground pins. Refer to Figure 2-24 for ground reference points when performing these measurements.

Figure 2-24 Safety Ground Reference Check — Dual Power Source



WARNING SHOCK HAZARD
Risk of shock hazard while testing primary power.
Use properly insulated probes.
Be sure to replace access cover when finished testing primary power.

Step 1. Measure the voltage between A0 and A1 as follows:

1. Take the AC voltage down to the lowest scale on the volt meter.
2. Insert the probe into the ground pin for A0.
3. Insert the other probe into the ground pin for A1.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Step 2. Measure the voltage between B0 and B1 as follows:

1. Take the AC voltage down to the lowest scale on the volt meter.
2. Insert the probe into the ground pin for B0.
3. Insert the other probe into the ground pin for B1.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Step 3. Measure the voltage between A0 and B0 as follows:

1. Take the AC voltage down to the lowest scale on the volt meter.
2. Insert the probe into the ground pin for A0.
3. Insert the other probe into the ground pin for B0.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Step 4. Measure the voltage between A1 and B1 as follows:

1. Take the AC voltage down to the lowest scale on the volt meter.
2. Insert the probe into the ground pin for A1.
3. Insert the other probe into the ground pin for B1.
4. Verify that the measurement is between 0-5 V AC.

If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cord into the server cabinet.

Voltage Check (Additional Procedure)

The voltage check ensures that all phases (and neutral, for international systems) are connected correctly to the cabinet and that the AC input voltage is within limits.

Perform this procedure if the previous voltage check procedure did not yield the expected results.

NOTE If you use an uninterruptible power supply (UPS), refer to applicable UPS documentation for information on connecting the server and checking the UPS output voltage. UPS user documentation is shipped with the UPS. Documentation is also available at:

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

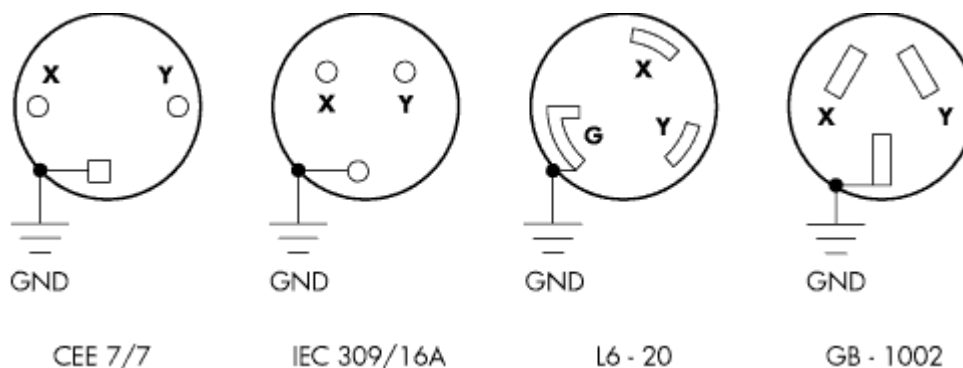
Step 1. Verify that site power is **OFF**.

Step 2. Open the site circuit breakers.

Step 3. Verify that the receptacle ground connector is connected to ground. Refer to Figure 2-25 for connector details.

Step 4. Set the site power circuit breaker to **ON**.

Figure 2-25 Wall Receptacle Pinouts



Step 5. Verify that the voltage between receptacle pins X and Y is between 200–240 V AC.

WARNING SHOCK HAZARD
Risk of shock hazard while testing primary power.
Use properly insulated probes.
Be sure to replace access cover when finished testing primary power.

Step 6. Set the site power circuit breaker to **OFF**.

Step 7. Route and connect the server power connector to the site power receptacle.

1. For locking type receptacles, line up the key on the plug with the groove in the receptacle.
2. Push the plug into the receptacle and rotate to lock the connector in place.

WARNING Do not set site AC circuit breakers serving the processor cabinets to **ON** before verifying that the cabinet has been wired into the site AC power supply correctly. Failure to do so can result in injury to personnel or damage to equipment when AC power is applied to the cabinet.

Step 8. Set the site AC circuit breaker to **ON**.

Step 9. Set the server power to **ON**.

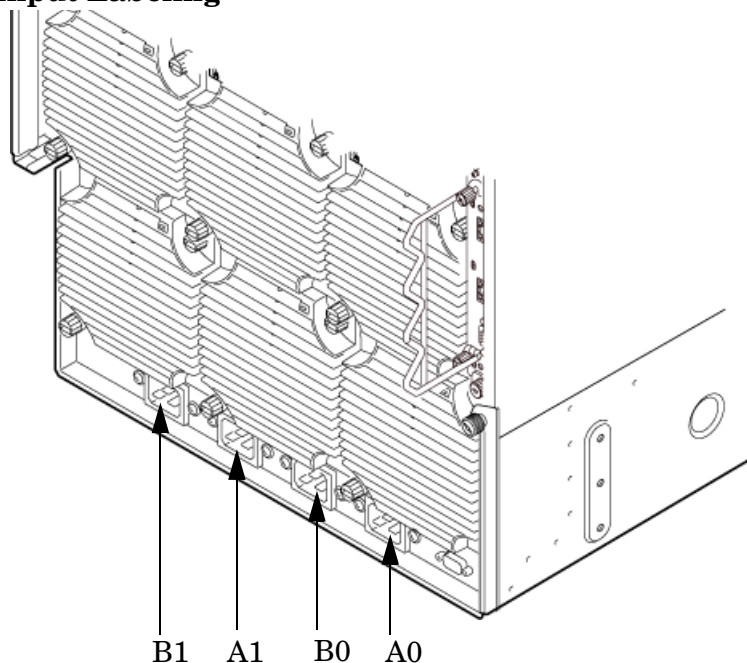
Step 10. Check that the indicator light on each power supply is lit.

Connecting AC Input Power

The server can receive AC input from two different AC power sources. If two separate power sources are available, the server can be plugged into the separate power sources, increasing system reliability if one power source fails. The main power source is defined to be A0 and A1. The redundant power source is defined to be B0 and B1. See Figure 2-26 for the AC power input label scheme.

NOTE When running the server with a single power source, use either A0 and A1 or B0 and B1. All other combinations are not supported. Either combination requires two power cords.

Figure 2-26 AC Power Input Labeling



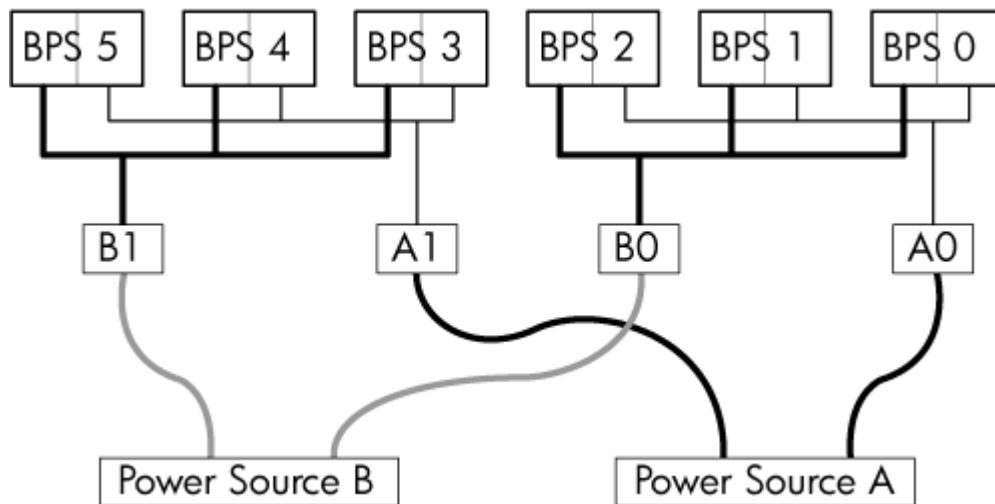
The power distribution for the bulk power supplies is as follows:

- A0 input provides power to BPS 0, BPS 1, and BPS 2
- A1 input provides power to BPS 3, BPS 4, and BPS 5
- B0 input provides power to BPS 0, BPS 1, and BPS 2

- B1 input provides power to BPS 3, BPS 4, and BPS 5

For information on how input power cords supply power to each BPS, refer to Figure 2-27.

Figure 2-27 Distribution of Input Power for Each Bulk Power Supply



WARNING Voltage is present at various locations within the server whenever a power source is connected. This voltage is present even when the main power switch is in the off position. To completely remove power, all power cords must be removed from the server. Failure to observe this warning could result in personal injury or damage to equipment.

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

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

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

NOTE Label the AC power cords during the installation. One suggestion is to use tie wraps that have the flag molded into the tie wrap. The flag can be labeled using the appropriate two characters to represent the particular AC power input (for example, A0). Another suggestion would be to use color coded plastic bands. Use one color to represent the first pair A0/A1 and another color to represent the second pair B0/B1 (provided a second power source is available at the customer site).

The server can accommodate a total of six BPSs. N+1 capability means that the server has an adequate number of BPS installed. If one BPS fails, enough power will still be supplied to the cell boards to keep the server partitions operational. Replace the failed BPS promptly to restore N+1 functionality.

A minimum of two BPS are required to bring up a single cell board installed in the server. There is no N+1 capability in this case. Refer to Table 2-5 for configurations of multiple cell boards using N+1.

Table 2-5 BPS-to-Cell Board Configuration to Maintain N+1

Number of Cell Boards Installed in the Server	Number of Operational BPS Installed to Maintain N+1 Functionality
1	3
2	4
3	5
4	6

Applying Power to the Server

Observe the functionality of the server before attaching any LAN or serial cables, the system console, or any peripherals to the server. Then, after applying an active AC power source to the server, make the following observations at three different intervals, or points in time.

Interval One

The power has just been applied to the server, but the front panel **ON/OFF** switch is **OFF**. The front air intake fans will flash a dim red color, the bulk power supplies will flash amber and an amber light is present on the hard disk drives.

Interval Two

After the power has been plugged into the server for about 30 seconds, the standby power turns on and the front intake fan LED indicators turn solid green. The BPS will flash green and the amber light is still present on the hard disk drives. The front panel **ON/OFF** switch is **OFF** at this interval. Housekeeping power is up at this point.

Interval Three

With the **ON/OFF** switch on the front of the server set to **ON**, the intake fans spin up and become noticeably audible, while the fan LED indicator remains solid green. The BPS LED indicator turns a solid green, and the PCI backplane power supply LED indicators turn solid green. The hard disk drive LED turns green briefly and then the LED turns **OFF**.

Installing The Line Cord Anchor (rack mounted servers)

The line cord anchor is attached to the rear of the server when rack mounted. It provides a method to secure the line cords to the server preventing accidental removal of the cords from the server.

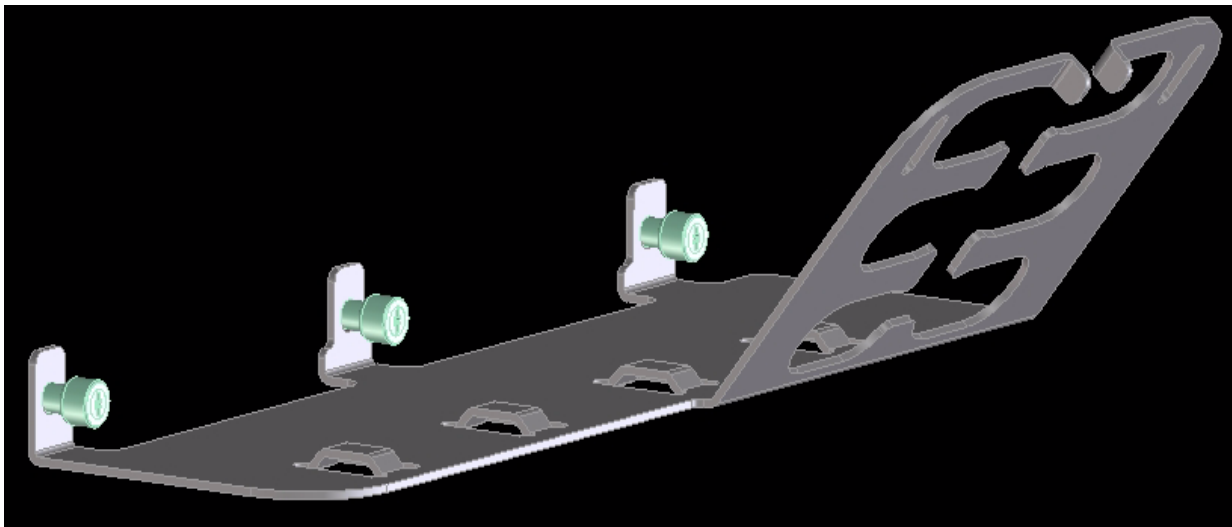
Four Cell Server Installation (rp8400, rp8420, rp8440, rx8620, rx8640)

There are pre-drilled holes and pre-installed captive nuts in the server chassis.

To install the line cord anchor

1. Align the line cord anchor thumbscrews with the corresponding captive nuts at the rear of the chassis. Refer to Figure 2-28, “Four Cell Line Cord Anchor (rp8400, rp8420, rp8440, rx8620, rx8640),”

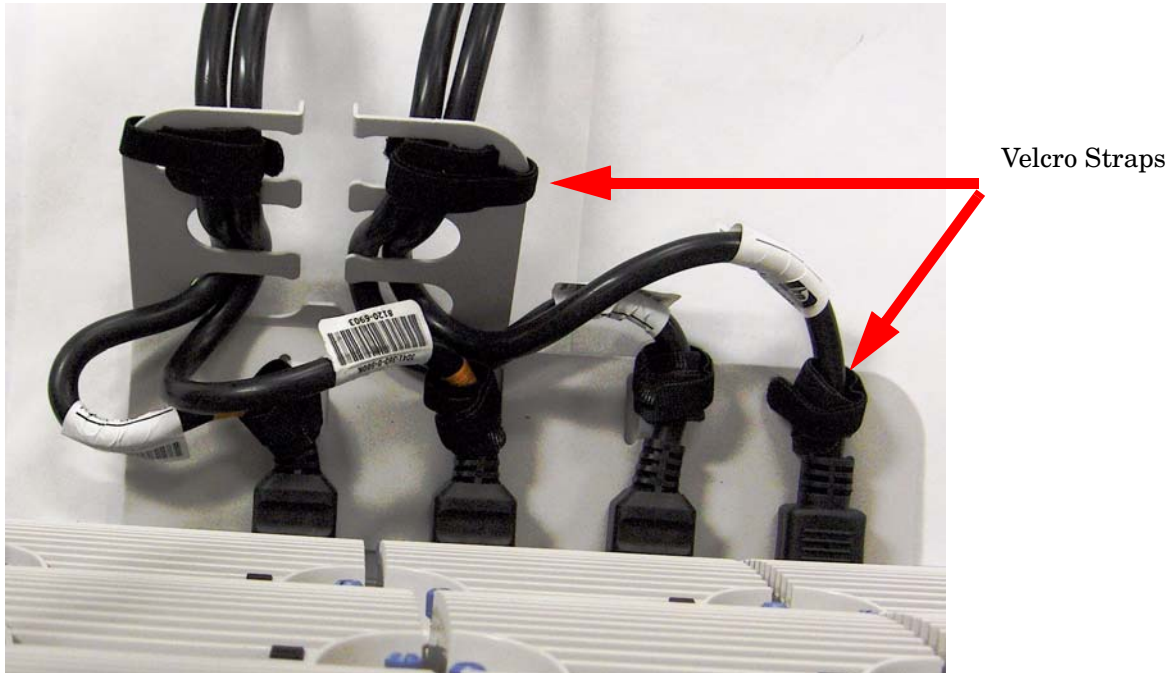
Figure 2-28 Four Cell Line Cord Anchor (rp8400, rp8420, rp8440, rx8620, rx8640)



2. Tighten the captive thumbscrews to secure the line cord anchor to the chassis.
3. Weave the power cables through the line cord anchor. Leave enough slack that the plugs can be disconnected from the receptacles without removing the cords from the line cord anchor

4. Use the supplied Velcro straps to attach the cords to the anchor. Refer to Figure 2-29, “Line Cord Anchor and Velcro straps,”

Figure 2-29 Line Cord Anchor and Velcro straps



MP Core I/O Connections

Each HP server has at least one core I/O card installed. Each core I/O card has a management processor (MP). If two core I/O cards are installed, this allows for two partitions to be configured or enables core I/O redundancy in a single partition configuration. Each core I/O card is oriented vertically and accessed from the back of the server.

Use the core I/O board to update firmware, access the console, turn partition power on and off, and utilize other features of the system.

External connections to the core I/O board include the following:

- One Ultra 320 (320 MB/sec) 68-pin SCSI port for connection to external SCSI devices by a high-density cable interconnect (VHDCI) connector.
- One RJ-45 style 10Base-T/100Base-T/1000Base-T system LAN connector. This LAN uses standby power and is active when AC is present and the front panel power switch is OFF.
- One RJ-45 style 10Base-T/100Base-T MP LAN connector. This LAN uses standby power and is active when AC is present and the front panel power switch is OFF. This LAN is also active when the front power switch is ON.
- One DB-9 RS-232 connector which provides local console.

Internal connections for the core I/O board include the following:

- Two low voltage differential (LVD) internal SCSI buses for internal drives
- One single-ended (SE) internal SCSI bus for internal media.

Setting Up the Customer Engineer Tool (PC)

The CE Tool is usually a laptop. It allows communication with the management processor (MP) in the server. The MP monitors the activity of either a one-partition or a multiple-partition configuration.

During installation, communicating with the MP enables such tasks as:

- Verifying that the components are present and installed correctly
- Setting LAN IP addresses
- Shutting down cell board power

Establish communication with the MP by connecting the CE Tool to the local RS-232 port on the core I/O card.

Setting CE Tool Parameters

After powering on the CE Tool, ensure that the communications settings are as follows:

- 8/none (parity)
- 9600 baud
- None (Receive)
- None (Transmit)

If the CE Tool is a laptop using Reflection 1, check or change these communications settings using the following procedure:

Step 1. From the Reflection 1 Main screen, pull down the **Connection** menu and select **Connection Setup**.

Step 2. Select **Serial Port**.

Step 3. Select **Com1**.

Step 4. Check the settings and change, if required.

Go to **More Settings** to set Xon/Xoff. Click **OK** to close the More Settings window.

Step 5. Click **OK** to close the Connection Setup window.

Step 6. Pull down the **Setup** menu and select **Terminal** (under the **Emulation** tab).

Step 7. Select the VT100 HP terminal type.

Step 8. Click **Apply**.

This option is not highlighted if the terminal type you want is already selected.

Step 9. Click **OK**.

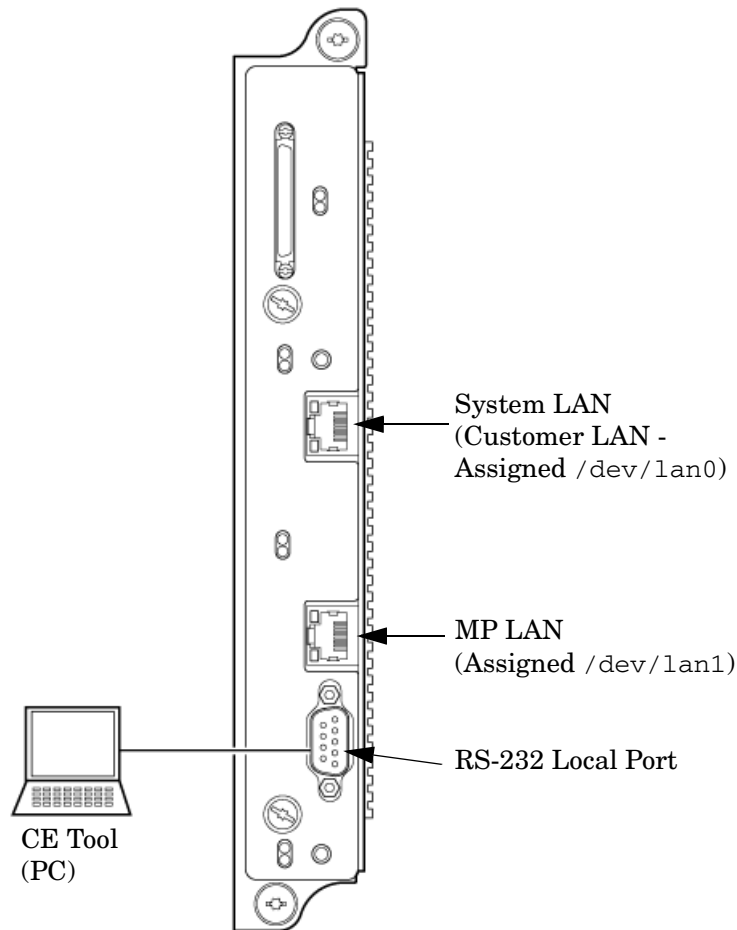
Connecting the CE Tool to the Local RS-232 Port on the MP

This connection enables direct communications with the MP. **Only one window can be created** on the CE Tool to monitor the MP. When enabled, it provides direct access to the MP and to any partition.

Use the following procedure to connect the CE Tool to the RS-232 Local port on the MP:

- Step 1.** Connect one end of a null modem cable (9-pin to 9-pin) (Part Number 5182-4794) to the **RS-232 Local** port on the core I/O card (the DB9 connector located at the bottom of the core I/O card). Refer to Figure 2-30.

Figure 2-30 LAN and RS-232 Connectors on the Core I/O Board



NOTE The ability to telnet to the MP LAN port is available once the MP is configured via the RS-232 Local port.

- Step 2.** Connect the other end of the RS-232 cable to the CE Tool.

Turning On Housekeeping Power and Logging In to the MP

After connecting the serial display device, the power to the server cabinet is ready to be supplied to get a login prompt for the management processor (MP). Connecting the power cords allows power to flow to the bulk power supplies (BPS) located at the front of the server cabinet, which in turn provides housekeeping power (HKP).

Before powering up the server cabinet for the first time:

Step 1. Verify that the AC voltage at the input source is within specifications for each server cabinet being installed.

Step 2. If not already done, power on the serial display device.

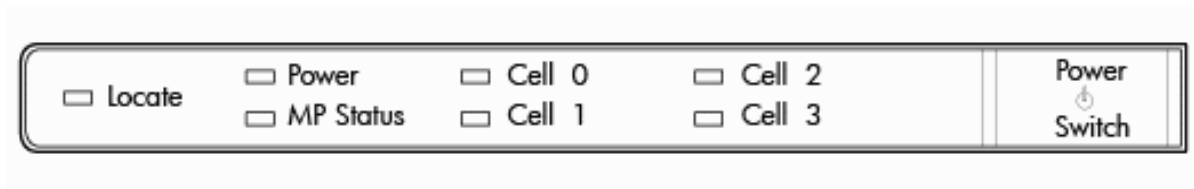
The preferred tool is the CE Tool running Reflection 1.

To power on the MP, set up a communications link, and log in to the MP:

Step 1. Apply power to the server cabinet.

On the front of the server, the MP Status LED will illuminate yellow until the MP is booted successfully. Once the MP is booted successfully, and no other cabinet faults exist, the LED will change to solid green. Refer to Figure 2-31.

Figure 2-31 Front Panel Display

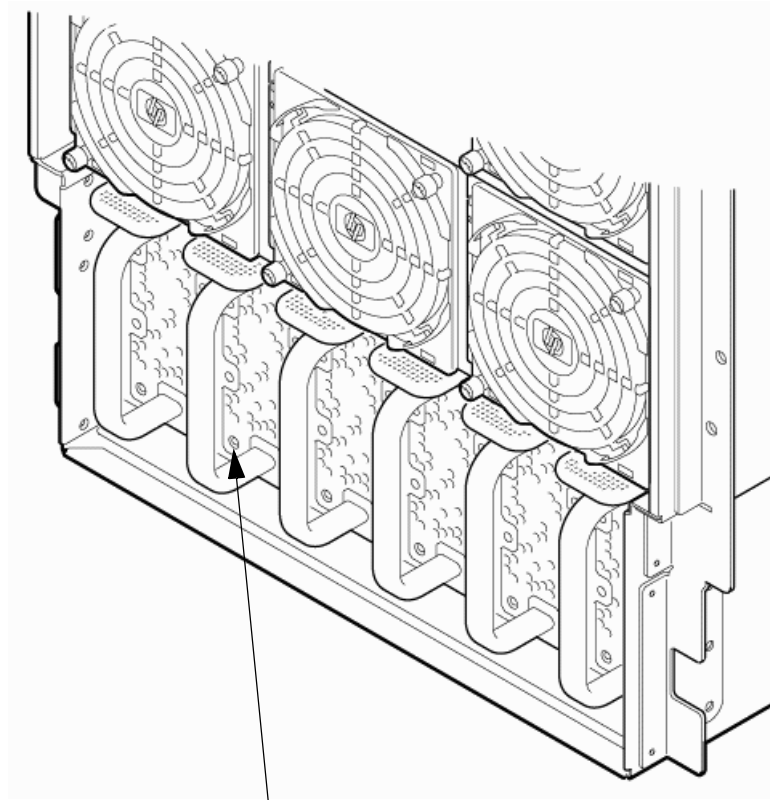


Step 2. Check the bulk power supply (BPS) LED for each BPS. Refer to Figure 2-32 for the LED location.

When on, the breakers distribute power to the BPS. AC power is present at the BPS:

- When power is first applied. The BPS LEDs will flash amber.
- After 30 seconds have elapsed. The flashing amber BPS LED for each BPS becomes a flashing green LED.

Figure 2-32 BPS LED Location



BPS LED Location

Step 3. Log in to the MP:

1. Enter `Admin` at the login prompt. (This term is case-sensitive.)

It takes a few moments for the `MP>` prompt to appear. If the `MP>` prompt does not appear, verify that the laptop serial device settings are correct: 8 bits, no parity, 9600 baud, and None for both Receive and Transmit. Then try again.

2. Enter `Admin` at the password prompt. (This term is case-sensitive.)

The MP Main Menu is displayed:

Figure 2-33 MP Main Menu

```
                Welcome to
            rx8640's Management Processor

MP MAIN MENU:

    CO: Consoles
    VFP: Virtual Front Panel
    CM: Command Menu
    CL: Console Logs
    SL: Show Event Logs
    FW: Firmware Update
    HE: Help
    X: Exit Connection

[metro-s] MP>
```

Configuring LAN Information for the MP

This section describes how to set and verify the server management processor (MP) LAN port information. LAN information includes the MP network name, the MP IP address, the subnet mask, and gateway address. This information is provided by the customer.

To set the MP LAN IP address:

Step 1. At the MP Main Menu prompt (MP>), enter `cm`.

NOTE If the Command Menu does not appear, enter `q` to return to the MP Main Menu, then enter `cm`.

Step 2. From the MP Command Menu prompt (*MP>CM:*), enter `lc` (for LAN configuration).

The screen displays the default values and asks if you want to modify them. It is a good idea to write down the information or log it to a file, because it may be required for future troubleshooting.

Enter `lc` and press the **Return** key. The `lc` command is displayed as shown in Figure 2-34.

Figure 2-34 The `lc` Command Screen

```
MP:CM> lc
```

This command modifies the LAN parameters.

Current configuration of MP customer LAN interface

```
MAC address   : 00:12:79:b4:03:1c
IP address    : 15.11.134.222    0x0f0b86de
Hostname      : metro-s
Subnet mask   : 255.255.248.0    0xffffffff800
Gateway      : 15.11.128.1      0x0f0b8001
Status       : UP and RUNNING
Link         : Connected 100Mb Half Duplex
```

```
Do you want to modify the configuration for the MP LAN? (Y/[N]) q
```

NOTE The value in the IP address field has been set at the factory. Obtain the LAN IP address from the customer.

Step 3. At the prompt, *Do you want to modify the configuration for the customer LAN?*, enter `Y`.

The current IP address is shown; then the following prompt is displayed: *Do you want to modify it? (Y/[N])*

Step 4. Enter `Y`.

Step 5. Enter the new IP address.

The customer provides this address.

Step 6. Confirm the new address.

Step 7. Enter the MP host name.

This is the host name for the MP customer LAN. The name can be up to 64 characters long and can include alpha numerics, -dash (-), under score (_), period (.), or a space (). HP recommends that the name be a derivative of the complex name, for example, `Acme.com_MP`.

Step 8. Enter the LAN parameters for Subnet mask and Gateway address.

This information comes from the customer.

When this step is completed, the system will indicate that the parameters have been updated and return to the MP Command Menu prompt (`MP:CM>`)

Step 9. To check the LAN parameters and status, enter the `ls` command at the MP Command Menu prompt (`MP:CM>`).

Step 10. A screen similar to Figure 2-35 will display allowing verification of the settings.

Figure 2-35The ls Command Screen

```
[metro-s] MP:CM> ls

Current configuration of MP customer LAN interface
MAC address   : 00:12:79:b4:03:02
IP address    : 15.99.49.26      0x0f63311a
Hostname      : metro-s
Subnet mask   : 255.255.248.0   0xfffff800
Gateway       : 15.99.49.254   0x0f6331fe
Status        : UP and RUNNING
```

To return to the MP Main menu, enter `ma`.

To exit the MP, enter `x` at the MP Main Menu.

Accessing the Management Processor via a Web Browser

Web browser access is an embedded feature of the management processor (MP). The Web browser enables access to the server via the LAN port on the core I/O card. MP configuration must be done from an ASCII console.

NOTE The 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 HP-UX.

Before starting this procedure, gather the following information:

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

To configure the LAN port for a Web browser, perform the following steps:

Step 1. Connect to the MP using a serial connection.

Step 2. Configure the MP LAN. Refer to “Configuring LAN Information for the MP”.

Step 3. Type `CM` to enter the Command Menu.

Step 4. Type `sa` at the `MP:CM>` prompt to display and set MP remote access.

Figure 2-36 Example sa Command

```
[metro-s] MP:CM> sa
```

This command displays and allows modification of access parameters.

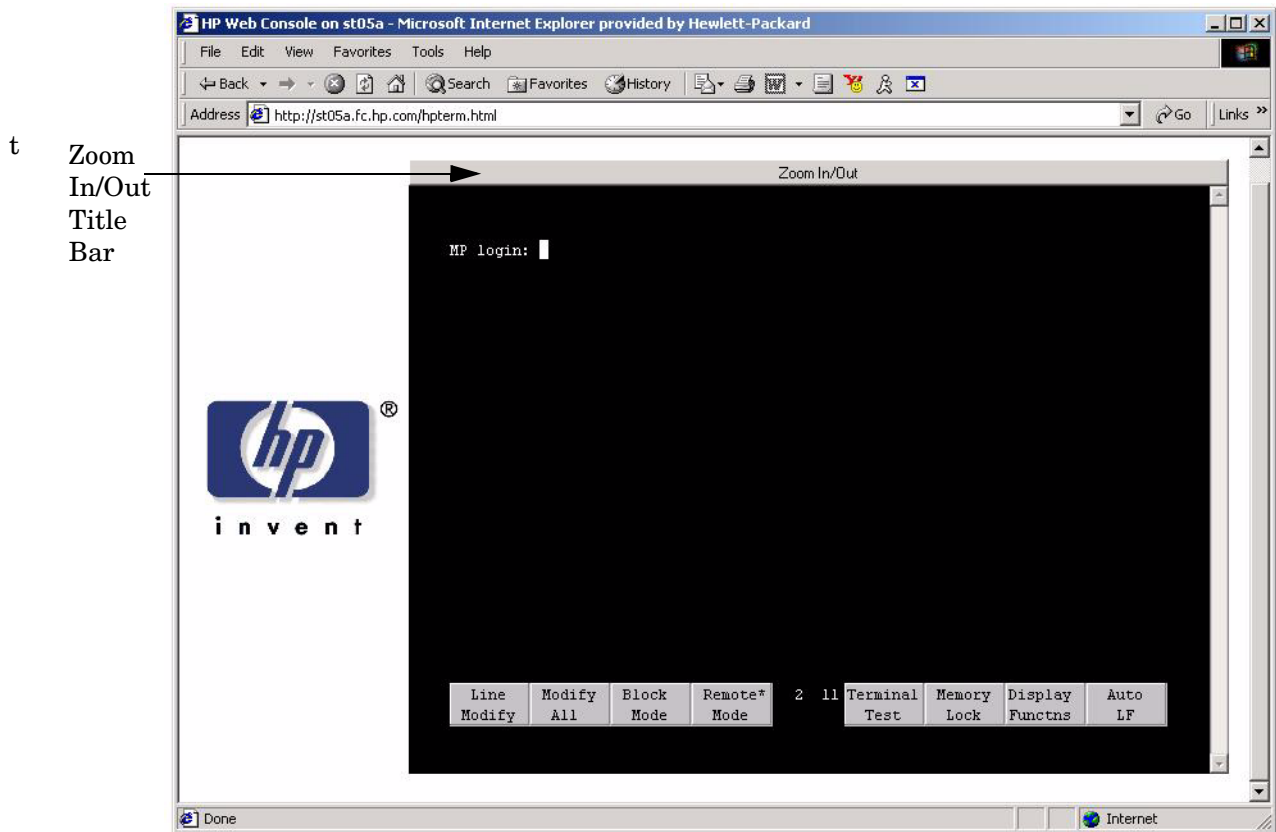
```
T - Telnet access           : Enabled.  
H - SSH access             : Enabled.  
W - Web Console           : Enabled (SSL NOT active).  
N - Network Diagnostics   : Disabled.  
I - IPMI Lan access       : Disabled.  
S - SNMP                  : Enabled.
```

```
Select access mode to change (q to quit) : q
```

Step 5. Launch a Web browser on the same subnet using the IP address for the MP LAN port.

Step 6. Click anywhere on the Zoom In/Out title bar (Figure 2-37) to generate a full screen MP window.

Figure 2-37 Browser Window



Step 7. Select the emulation type you want to use.

Step 8. Log in to the MP when the login window appears.

Access to the MP via a Web browser is now possible.

Verifying the Presence of the Cell Boards

To perform this activity, either connect to the management processor (MP) over the customer console or connect the CE Tool (laptop) to the RS-232 Local port on the MP.

After logging in to the MP, verify that the MP detects the presence of all the cells installed in the server cabinet. It is important for the MP to detect the cell boards. If it does not, the partitions will not boot.

To determine if the MP detects the cell boards:

Step 1. At the MP prompt, enter `cm`.

This displays the Command Menu. Among other things, the Command Menu enables you to view or modify the configuration and to look at utilities controlled by the MP.

To look at a list of the commands available, enter `he..` You might have to press **Enter** to see more than one screen of commands. Use the Pg Up and Pg Down keys to view the previous or next screen of commands. To exit the Help Menu, enter `q`.

Step 2. From the command prompt (`MP:CM>`), enter `du`.

The `du` command displays the MP Bus topology. A screen similar to the one in Figure 2-38 is displayed.

Figure 2-38The `du` Command Screen

```
MP:CM> du
The following MP bus devices were found:
+-----+-----+-----+-----+-----+
|Cab| MP | Sys |      | IO  | Bulk Pwr |
| # | M | S | Cells | Chassis | Supplies |
| 0 | * | * | * * * * | *   * | * * * * * |
+-----+-----+-----+-----+-----+
MP:CM> _
```

The column marked MP will contain an asterisk (*).

Step 3. Verify that there is an asterisk (*) for each of the cells installed in the server cabinet by comparing what is in the Cells column with the cells physically located inside the server cabinet.

Figure 2-38 shows that cells are installed in all the slots in cabinet 0, indicating that the server cabinet, contains cells physically located in all the slots.

Configuring AC Line Status

The MP utilities can detect if power is applied to each of the AC input cords for the server, by sampling the status of the bulk power supplies. During installation, use the following procedure to check the configuration for the AC line status and configure it to match the customer's environment.

- Step 1.** At the MP prompt, enter `cm`. This will display the Command Menu and enable you to view and configure various utilities controlled by the MP.
- Step 2.** From the command prompt (`MP:CM>`), enter `pwrgrd`. The `pwrgrd` command displays the current power configuration. This command can also be used to change the power grid configuration. A screen similar to the one in Figure 2-39 is displayed.

Figure 2-39 The `pwrgrd` Command Screen

```
[metro-s] MP:CM> pwrgrd

The current power configuration is: Single grid

Power grid configuration preference.

    1. Single grid
    2. Dual grid

    Select Option: 1

Power grid configuration set to single grid
```

- Step 3.** Verify that the power grid configuration is correct by examining the output from the `pwrgrd` command. The preceding power configuration indicates that both grid A and grid B have been configured.
- Step 4.** To change the configuration, select the proper response and enter the appropriate numeric value when `Select Option:` displays on the screen. If no change is desired, enter `q` and press the **Enter** key. After the value has been entered, the MP will respond and indicate that the change has taken effect.

Booting the Server

Power on the server either by pressing the power switch on the front panel or by using the `pe` command to power on the cabinet or complex at the management processor Command Menu.

If you are using a LAN crossover cable with the laptop, review server activity for each partition configured while the server powers on and boots. You can open Windows for the complex and for each partition. HP recommends that at least two windows be opened:

- Step 1.** A window showing all activity in the complex. Following the installation procedure in this document causes a window to be open at startup.

To display activity for the complex:

1. Open a separate Reflection window and connect to the MP.
2. From the MP Main Menu, select the VFP command with the s option.

Step 2. A window showing activity for a single partition.

To display activity for each partition as it powers on:

Step 1. Open a separate Reflection window and connect to the MP.

Step 2. Select the VFP command and select the desired partition to view.

There should be no activity on the screen at this point in the installation process.

NOTE You cannot open more than one window using a serial display device.

To power on the server:

Step 1. If a Server Expansion Unit is attached to the server, press both the server power switch and the SEU power switch. Alternatively, at the MP:CM> prompt, use the PE x command to power on the complex, or the PE t command for each cabinet. The following events occur:

- Power is applied to the server.
- Processor-dependent code (PDC) starts to run on each cell.
- The cell self-test executes.
- Hardware initializes for the server.
- Console communication is established.

Step 2. After the cell has joined the partition or after boot is blocked (BIB) is displayed at the Virtual Front Panel (VFP), return to the MP Main Menu by pressing **Ctrl+B**.

Step 3. Enter co to enter console mode.

Step 4. Enter the partition number of the partition to boot.

Step 5. Press **Enter**.

Selecting a Boot Partition Using the MP

At this point in the installation process, the hardware is set up, the MP is connected to the LAN, the AC and DC power have been turned on, and the self-test is completed. Now the configuration can be verified.

After the DC power on and the self-test is complete, use the MP to select a boot partition.

- Step 1.** From the MP Main Menu, enter `cm`.
- Step 2.** From the MP Command Menu, enter `bo`.
- Step 3.** Select the partition to boot. Partitions can be booted in any order.
- Step 4.** Return to the MP Main Menu by entering `ma` from the MP Command Menu.
- Step 5.** Enter the console by typing `co` at the MP Main Menu.

Exit the MP to return automatically to the Extensible Firmware Interface (EFI) Shell menu.

Verifying the System Configuration Using the EFI Shell

From the EFI main menu, enter the POSSE shell by entering `co`. Typing `help` will list all the command categories available in the shell:

- `configuration --` goes to the configuration menu, where system configuration can be reset, configured or viewed.
- `memory --` memory related commands.

Once the parameters have been verified, enter `x` to return to the EFI Main Menu.

Booting HP-UX Using the EFI Shell

If the Instant Ignition was ordered, HP-UX will have been installed in the factory at the Primary Path address. If HP-UX is at a path other than the Primary Path, do the following:

- Step 1.** Type `cm` to enter the Command Menu from the Main Menu.
- Step 2.** `MP:CM> bo` This command boots the selected partition.
Select a partition to boot:
- Step 3.** Return to the Main Menu: `MP:CM> ma`
- Step 4.** From the Main Menu, go to the Consoles Menu: `MP> co`
Select a partition number.
- Step 5.** Return to the Main Menu by pressing **Ctrl+B**.
- Step 6.** At the EFI Shell prompt, select the file system to boot. Generally this is `fs0`.
`Shell> fs0:`
- Step 7.** At the `fs0` prompt, type `hpux` to boot the HP-UX operating system:
`fs0:\> hpux`

NOTE If the partition fails to boot or if the server was shipped without Instant Ignition, booting from a DVD that contains the operating system and other necessary software might be required.

Adding Processors for HP Integrity rx8640 with Instant Capacity

The Instant Capacity program provides access to additional CPU resources beyond the amount that was purchased for the server. This provides the ability to activate additional CPU power for unexpected growth and unexpected spikes in workloads.

Internally, Instant Capacity systems physically have more CPUs, called Instant Capacity CPUs, than the number of CPUs actually purchased. These Instant Capacity CPUs reside in the purchased system, but they belong to HP and therefore are HP assets. A nominal “Right-To-Access Fee” is paid to HP for each Instant Capacity processor in the system. At any time, any number of Instant Capacity CPUs can be “activated.” Activating an Instant Capacity CPU automatically and instantaneously transforms the Instant Capacity CPU into an instantly ordered and fulfilled CPU upgrade that requires payment. After the Instant Capacity CPU is activated and paid for, it is no longer an Instant Capacity CPU, but is now an ordered and delivered CPU upgrade for the system.

The following list offers information needed to update to iCAP version 8.x:

- HP-UX HWEEnable11i – Hardware Enablement Patches for HP-UX11i v2, June 2006
- B9073BA – B.11.23.08.00.00.95 – HP-UX iCOD Instant Capacity (iCAP)
- Kernel entry – `diag2` – module `diag2` best [413F2ED6]
- B8465BA – A.02.00.04 – HP WBEM Services for HP-UX
- NParProvider – B.11.23.01.03.00.06 – nPartition Provider

Current information on installing, configuring, and troubleshooting iCAP version 8.x is available at: <http://docs.hp.com/en/B9073-90129/index.html>.

Information on the latest release notes for iCAP version 8.x can be found at: <http://docs.hp.com/en/B9073-90134/index.html>.

NOTE Ensure that the customer is aware of the Instant Capacity email requirements. Refer to <http://docs.hp.com> for further details.

Installation Checklist

The checklist in Table 2-6 is an installation aid. Use it only after you have installed several systems by following the detailed procedures described in the body of this document. This checklist is a compilation of the tasks described in this document, and is organized as follows:

- | | |
|------------|---|
| Procedures | The procedures outlined in this document in order. |
| In-process | The portion of the checklist that allows you to comment on the current status of a procedure. |
| Completed | The final check to ensure that a step has been completed and comments. |

Major tasks are in **bold type**, subtasks are indented.

Table 2-6 Factory-Integrated Installation Checklist

Procedure		In-process		Completed	
		Initials	Comments	Initials	Comments
Obtain LAN information					
Verify site preparation					
	Site grounding verified				
	Power requirements verified				
Check inventory					
Inspect shipping containers for damage					
Unpack cabinet					
	Allow proper clearance				
	Cut polystrap bands				
	Remove cardboard top cap				
	Remove corrugated wrap from the pallet				
	Remove four bolts holding down the ramps and remove the ramps				
	Remove antistatic bag				
	Check for damage (exterior and interior)				
	Position ramps				
	Roll cabinet off ramp				
Unpack the peripheral cabinet (if ordered)					
Unpack other equipment					
Remove and dispose of packaging material					
Move cabinet and equipment to computer room					
Move cabinet into final position					
	Position cabinet next to each other (approx. 1/2 inch)				

Table 2-6 Factory-Integrated Installation Checklist (Continued) (Continued)

Procedure		In-process		Completed	
	Adjust leveling feet				
	Install anti tip plates				
	Inspect cables for proper installation				
Set up CE tool and connect to Remote RS-232 port on MP					
Apply power to cabinet (Housekeeping)					
Check power to BPSs					
Log in to MP					
Set LAN IP address on MP					
Connect customer console					
Set up network on customer console					
Verify LAN connection					
Verify presence of cells					
Power on cabinet (48 V)					
Verify system configuration and set boot parameters					
Set automatic system restart					
Boot partitions					
Configure remote login (if required).					
Verify remote link (if required).					
Install non-factory, integrated I/O cards (if required)					
	Select PCI card slot				
	Install PCI card				
	Verify installation				
Route cables using the cable management arm					
Install other peripherals (if required)					
Perform visual inspection and complete installation					

Table 2-6 Factory-Integrated Installation Checklist (Continued) (Continued)

Procedure	In-process		Completed	
Set up network services (if required)				
Enable Instant Capacity (if available)				
Final inspection of circuit boards				
Final inspection of cabling				
Area cleaned and debris and packing materials disposed of				
Tools accounted for				
Parts and other items disposed of				
Make entry in Gold Book (recommended)				
Customer acceptance and signoff (if required)				

A

ac power
 input, 79
 voltage check, 78
AC power inputs
 A0, 79
 A1, 79
 B0, 79
 B1, 79
ASIC, 16

B

backplane
 mass storage, 36
 system, 34, 36
BPS (Bulk Power Supply), 87
Bulk Power Supplies
 BPS, 80

C

cell board, 33, 81, 94
 verifying presence, 93
cell controller, 16
checklist
 installation, 97
cm (Command Menu) command, 93
co (Console) command, 95
command
 cm (Command Menu), 93
 co (Console), 95
 CTRL-B, 95
 di (Display), 96
 du (display MP bus topology), 93
 lc (LAN configuration), 90
 ls (LAN status), 90
 pwrgrd (Power Grid), 94
 vfp (Virtual Front Panel), 94
controls, 21
core I/O, 16, 36

D

DAT, 16
di (Display) command, 96
DIMMs, 24
 memory, 24
disk
 internal, 36, 60, 84
disk drive, 16
du (display MP bus topology) command, 93
DVD/CD, 16

F

fans, 16
front panel, 21

G

gateway address, 90

H

housekeeping power, 86

I

I/O Subsystem, 32, 33
iCOD
 definition, 97
 email requirements, 97
initial observations
 interval one, 81
 interval three, 81
 interval two, 81
inspecting for damage, 38
installation
 checklist, 97
 warranty, 38
IP address
 default, 89
 lc Comand Screen, 90

L

LAN status, 90
lc (LAN configuration) command, 90
LED
 Attention, 87
 Bulk Power Supply, 87
 management processor, 21
 MP Present, 87
 remote port, 21
 Standby Power, 87
 traffic light, 21
login name
 MP, 88
ls (LAN Status) command, 90

M

MAC address, 90
Management Processor (MP), 84
mass storage backplane, 36
memory, 16
 subsystem, 23
MP
 login name, 88
 password, 88
MP (Management Processor)
 logging in, 86
 powering on, 86
MP core I/O, 29, 60
MP network name, 90
MP/SCSI, 84

N

N+1, 16
N+1 capability, 81
null modem cable
 connectivity, 85
 part number, 85

Index

P

- password
 - MP, 88
- PCI, 16
- PDC
 - Processor Dependent Code, 95
- power
 - applying cabinet, 94
 - cabinet switch, 95
 - housekeeping, 86, 94
 - plugs, 16
 - requirement, 16
 - sources, 79
- power supplies, 16
- processor
 - service, 16
- Processor Dependent Code
 - PDC, 95
- processors, 16
- pwrgrd (Power Grid) command, 94

R

- rank, 26
- Reflection 1, 85, 94

S

- serial display device
 - connecting, 84, 85
 - recommended windows, 94
 - setting parameters, 84
- server
 - block diagram, 17
 - front panel, 21
- service processor, 16
- Standby power LED, 21
- status LEDs, 21
- subnet mask, 90
- system backplane, 34, 36
- system configuration, verifying, 96

T

- turbocoolers, 16

U

- unpacking
 - inspecting for damage, 38

V

- verifying system configuration, 96
- voltage check, 78

W

- warranty, 38