HP Integrity rx8620 Server User Service Guide

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http://h20341.www2.hp.com/integrity/w1/en/resources/warranty-information.html

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About This Document

This document provides information and instructions on servicing and troubleshooting the HP Integrity rx8620 server.

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

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

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

http://h20000.www2.hp.com/bizsupport/TechSupport/Home.jsp

Intended Audience

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

This document is not a tutorial.

New and Changed Information in This Edition

This guide has been updated for greater usability.

Publishing History

The publishing history below identifies the edition dates of this manual. Updates are made to this publication on an unscheduled, *as needed*, basis.

Table 1 Publishing History Details

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
A7026-96003	HP-UX, Windows, Linux, OpenVMS	rx8620	September 2003
A7026-96009	HP-UX, Windows, Linux, OpenVMS	rx8620	November 2003
A7026-96018	HP-UX, Windows, Linux, OpenVMS	rx8620	May 2004
A7026-96026	HP-UX, Windows, Linux, OpenVMS	rx8620	October 2006
A7026-96036	HP-UX, Windows, Linux, OpenVMS	rx8620	May 2007
A7026-96036–ed6	HP-UX, Windows, Linux, OpenVMS	rx8620	October 2009
A7026–96036_ed7	HP-UX, Windows, Linux, OpenVMS	rx8620	September 2010

Related Information

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

Documentation: The main Web site for HP technical documentation is http://www.hp.com/go/bizsupport.

Server Hardware Information: The following website offers more system information: http://www.hp.com/go/integrity_servers-docs. 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 `www.hp.com/go/bizsupport` Web site. This site has manuals, tutorials, FAQs, and other reference material.

Web Site for HP Technical Support: HP IT resource center located at the following website:

http://www13.itrc.hp.com/service/home/home.do?admit

It provides comprehensive support information for IT professionals on a wide variety of topics, including software, hardware, and networking.

Document Organization

This guide is divided into the following chapters.

Chapter 1	*Overview* Use this chapter to learn about the features and specifications of the HP Integrity rx8620 server.
Chapter 2	*Installation* Use this chapter to learn how to unpack and install the server.
Chapter 3	*Installing Accessories* Use this chapter to learn how to install add-on products.
Chapter 4	*Cabling and Powering On* Use this chapter to learn how to connect the cables and power the server on.
Chapter 5	*Troubleshooting* Use this chapter to learn about troubleshooting problems you may encounter with the server.
Chapter 6	*Removal and Replacement* Use this chapter to learn how to remove and replace the various components of the server
Appendix A	*Parts Information* This appendix provides server part number information.
Appendix B	*System Specifications* This appendix provides physical dimensions and the electrical specifications for the server.
Appendix C	*MP Commands* This appendix provides the MP commands available for use on the HP Integrity rx 8620 server.
Appendix D	*Templates* This appendix provides templates for installing the server into a data center.
Appendix E	*Operating System Boot and Shutdown* Use this appendix to learn about booting and shutting down the operating system on the server.

Typographic Conventions

This document uses the following conventions.

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

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

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

Book Title	The title of a book. On the Web and on the Instant Information CD, it may be a hot link to the book itself.
KeyCap	The name of a keyboard key or graphical interface item (such as buttons, tabs, and menu items). Note that **Return** and **Enter** both refer to the same key.
Emphasis	Text that is emphasized.
Bold	Text that is strongly emphasized.
Bold	The defined use of an important word or phrase.
`ComputerOut`	Text displayed by the computer.
`UserInput`	Commands and other text that you type.
`Command`	A command name or qualified command phrase.
`Option`	An available option.
`Screen Output`	Example of computer screen output.
[ ]	The contents are optional in formats and command descriptions. If the contents are a list separated by `|`, you must select one of the items.
{ }	The contents are required in formats and command descriptions. If the contents are a list separated by `|`, you must select one of the items.
...	The preceding element may be repeated an arbitrary number of times.
`|`	Separates items in a list of choices.

HP-UX Release Name and Release Identifier

Each HP-UX 11i release has an associated release name and release identifier. The *uname*(1) command with the `-r` option returns the release identifier. Table 2 shows the releases available for HP-UX 11i.

Table 2 HP-UX 11i Releases

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

HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, see the HP US service locator webpage (http://welcome.hp.com/country/us/en/wwcontact.html.)
- In other locations, see the Contact HP worldwide (in English) webpage:

  http://welcome.hp.com/country/us/en/wwcontact.html.

For HP technical support:

- In the United States, for contact options see the Contact HP United States webpage: (http://welcome.hp.com/country/us/en/contact_us.html)

  To contact HP by phone:
  - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
  - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, see the HP website: (http://www.hp.com/hps).
- In other locations, see the Contact HP worldwide (in English) webpage (http://welcome.hp.com/country/us/en/wwcontact.html)

Documentation feedback

HP welcomes your feedback. To make comments and suggestions about product documentation, send a message to **docsfeedback@hp.com**.

Include the document title and manufacturing part number. All submissions become the property of HP

1 Overview

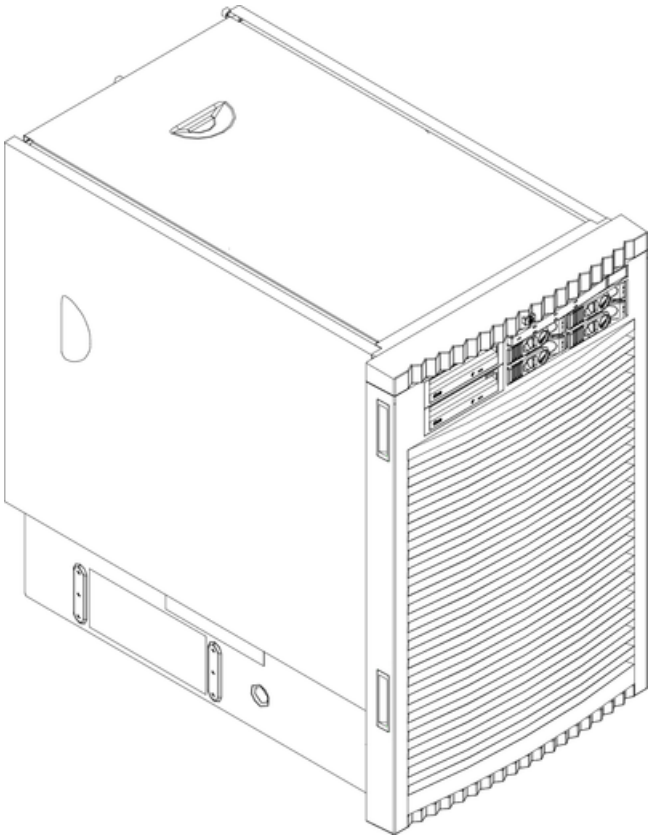
The HP Integrity rx8620 server is a member of the HP business-critical computing platform family mid-range, mid-volume servers positioned between the HP Integrity rx7620 and HP Integrity Superdome servers.

Introduction

The HP Integrity rx8620 server is 17U[1] high, 16-socket symmetric multiprocessor (SMP) rack-mount or standalone servers that accommodate up to 128 GB of memory, PCI-X I/O, and internal peripherals including disks and DVD or tape drives. High-availability features include N+1 hot-swap fans and power, redundant power cords, and hot-pluggable PCI cards and hard disk drives. Features of the server include:

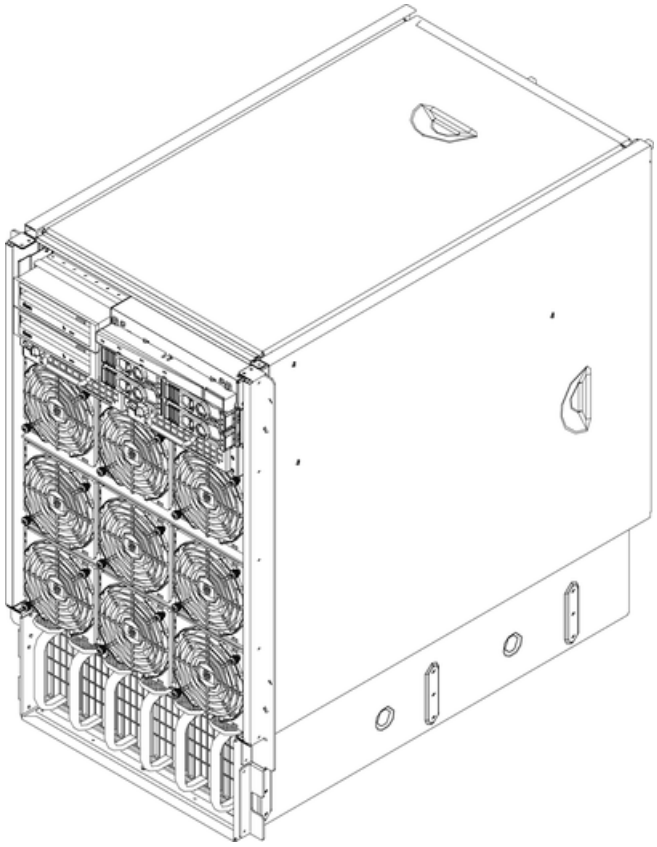
- Up to 128 GB of physical memory provided by dual in-line memory modules (DIMMs).
- Up to 32 processors with a maximum of four processor modules per cell board and a maximum of four cell boards.
- One cell controller (CC) per cell board
- All CPUs and cell controllers on the cell boards are cooled with turbo cooler fans
- Four embedded hard disk drives. Available sizes are 36 GB, 73 GB, and 146 GB drives
- Two internal DVD drives or one DVD drive and one 40 GB 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
- Six N+1 bulk power supplies
- Two PCI power supplies.
- Sixteen PCI-X slots divided into two partitions. Each partition can accommodate up to eight PCI cards
- Two core I/O cards
- Four 220 VAC power plugs. Two are required and the other two provide power source redundancy

Figure 1-1 HP Integrity rx8620 Server (front view)



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

Figure 1-2 HP Integrity rx8620 Server (front view without bezel)



Front Panel

Front Panel Indicators and Controls

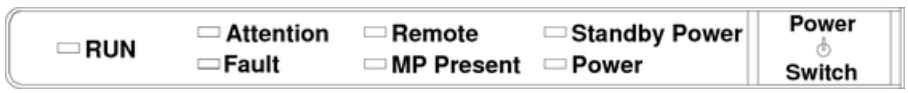
The front panel, located on the front of the server, includes a power switch. See "Front Panel LEDs" (page 82).

Enclosure Status LEDs

The following status LEDs are on the front panel:

- Standby power status LED (green)
- Management processor (MP) status LED (green)
- Enclosure status run (green), fault (red), and attention (yellow), and power (green) LEDs
- Remote port status LED (green)

Figure 1-3 Front Panel LEDs and Power Switch



System Backplane

The server backplane board contains a pair of crossbar chips (XBC), the clock generation logic, the reset generation logic, some power regulators, and two local bus adapter (LBA) chips that create internal PCI buses for communicating with the core I/O cards. The backplane also contains connectors for attaching the cell boards, PCI-X backplane, management processor (MP) core I/O cards, SCSI cables, bulk power, chassis fans, front panel display, intrusion switches, external system bus adaptor (SBA) link connectors, and the system scan card.

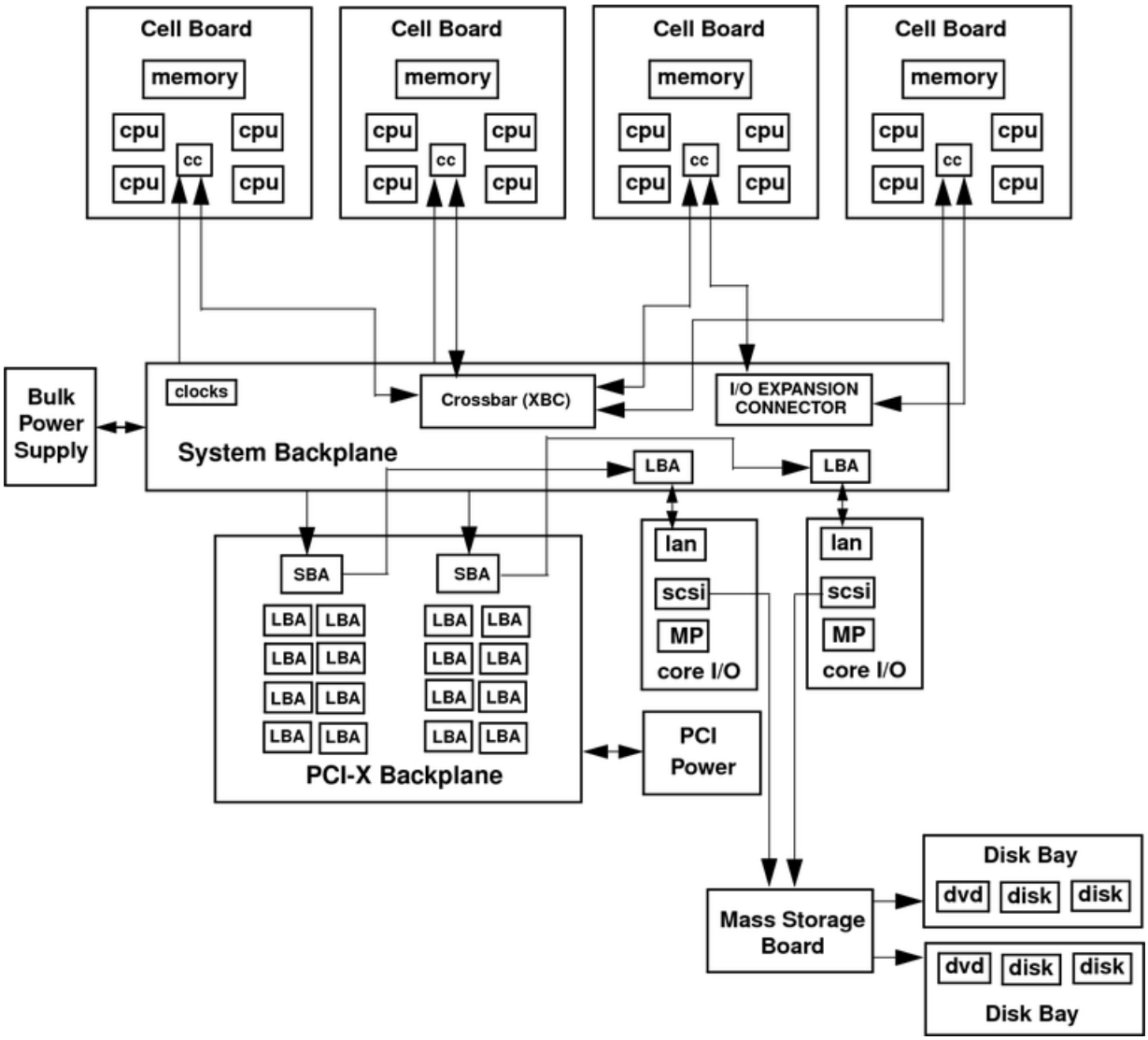
I/O Subsystem

All of the I/O is integrated into the system by way of the PCI busses. The CC on each cell board communicates with one SBA over the SBA link. The SBA link consists of both an inbound and an outbound link with an effective bandwidth of approximately 1 GB per second. 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 bi-directional links for a total aggregate bandwidth of approximately 4 GB per second. The server supports a maximum of two SBAs with the capability of supporting an additional two SBAs in an externally connected I/O cabinet known as the HP Server Expansion Unit.

There are LBA chips on the PCI-X backplane that act as a bus bridge, supporting either 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 cards.

HP Integrity rx8620 Server Block Diagram

Figure 1-4 HP Integrity rx8620 Server 16-Socket Block Diagram

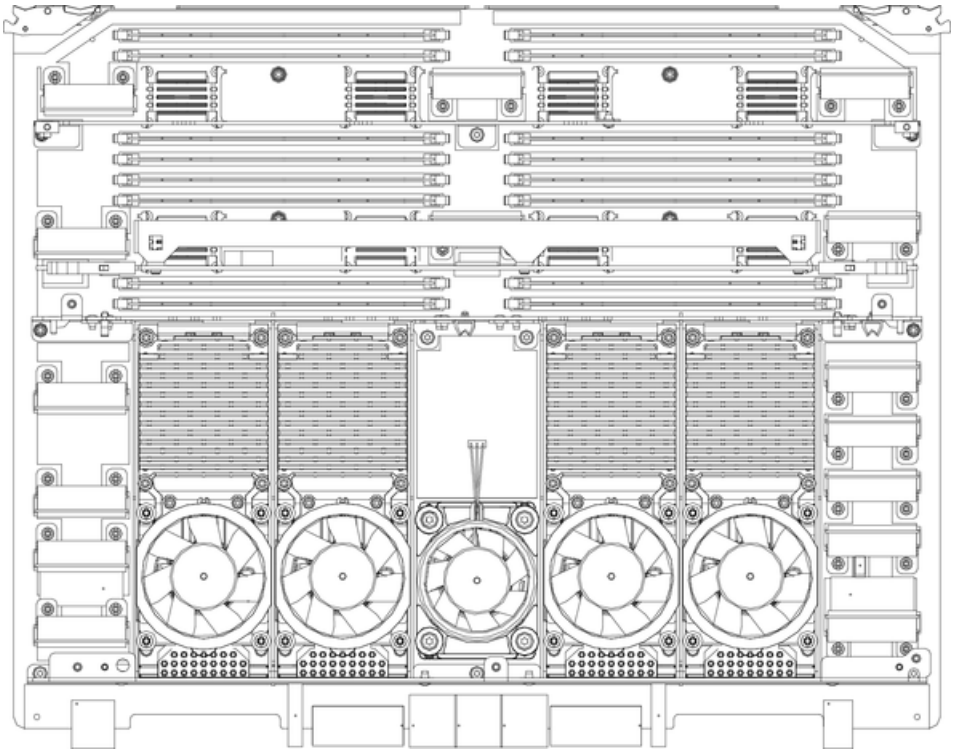


Cell Board

The cell board contains the processors, main memory, and the CC ASIC that interfaces the processors and memory to the I/O. The cell board is shown in Figure 1-5. It 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 micro controller hardware. Each cell board holds up to 16 DIMMS. Between one to four cell boards can be installed in the server. A cell board can be selectively powered off for cell replacement without affecting cells in other configured partitions.

Figure 1-5 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 several major buses including:

- Front side buses (FSB) for each of the four processors
- Two memory buses (one going to each half of the main memory array)
- Incoming and outgoing I/O bus that goes off board to a SBA chip
- Incoming and outgoing crossbar bus that goes off board to the other cell board
- PDH bus that goes to the PDH and micro controller circuitry

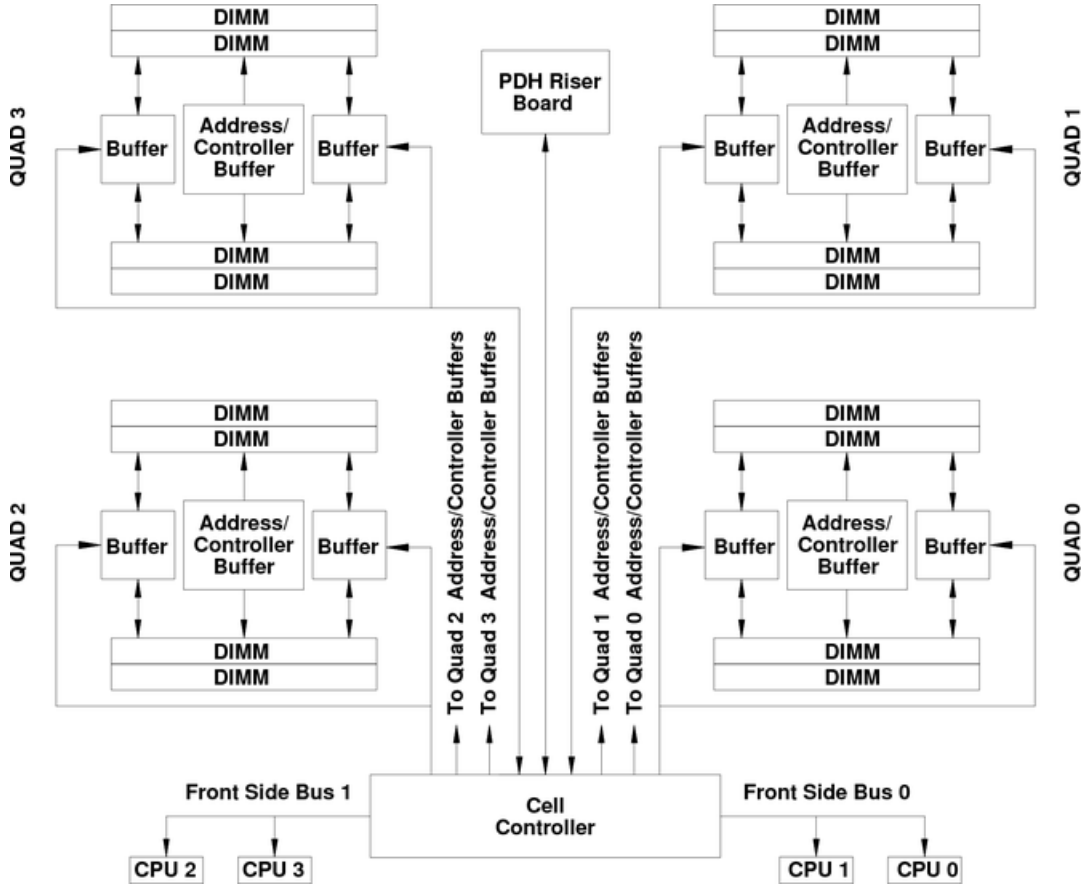
All of these buses come together at the CC chip.

Because of space limitations on the cell board, the PDH and micro controller 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 de-coupling capacitors.

Figure 1-6 shows a simplified view of the memory subsystem. It consists of two independent access paths, each path having its own address bus, control bus, data bus, and DIMMs . In practice, the CC runs the two paths 180 degrees out of phase with respect to each other to facilitate pipelining in the CC. Address and control signals are fanned out through register ports to the synchronous dynamic random access memory (SDRAM) on the DIMMs.

The memory subsystem is composed of four independent quadrants. Each quadrant has its own memory data bus connecting 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 1-6 Memory Subsystem



PDH Riser Board

The HP Integrity rx8620 Server PDH riser board is a small card that plugs into the cell board at a right angle. The PDH riser interface contains a microprocessor memory interface microcircuit, hardware including the processor dependant code (PDC) flash memory, and a 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

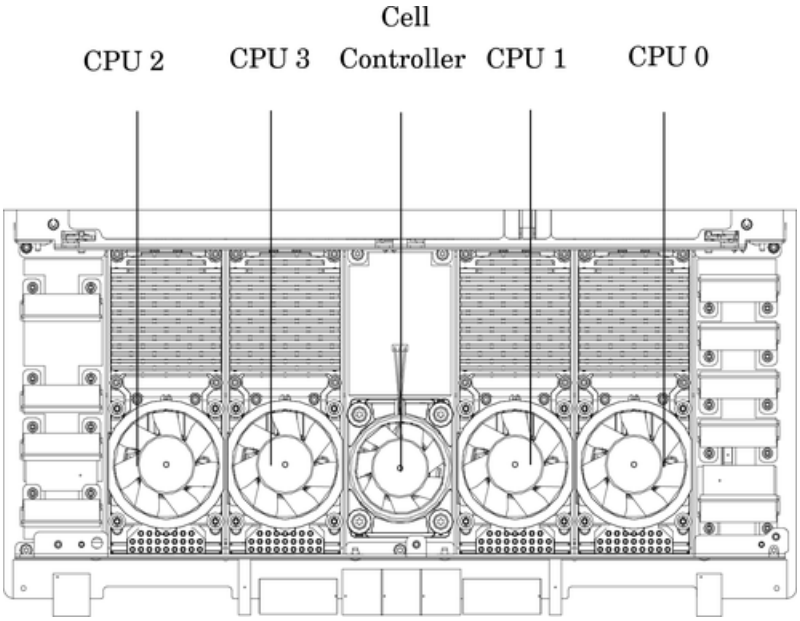
The cell board can hold up to four CPU modules and can be populated with modules in increments of one after meeting the minimum of two CPUs installed on the cell board. On a cell board, the processors must be the same type and speed. For the CPU load order that must be maintained when adding CPUs to the cell board, see Table 1-1. For the locations on the cell board for installing CPUs, seeFigure 1-7. A single CPU configuration is not available for the cell board.

NOTE: When installing dual-core CPUs, if only one CPU module is installed on the cell board, a terminator must be installed in CPU socket 2.

Table 1-1 Cell Board CPU Load Order

Number of CPUs Installed	CPU 2 Location	CPU 3 Location	CPU 1 Location	CPU 0 Location
Two	Terminator	Empty slot	Empty slot	CPU installed
Four	CPU installed	Empty slot	Empty slot	CPU installed
Six	CPU installed	Empty slot	CPU installed	CPU installed
Eight	CPU installed	CPU installed	CPU installed	CPU installed

Figure 1-7 CPU Locations on Cell Board



DIMMS

The memory DIMMs used by the server are custom designed by HP and are identical to those used in the Superdome servers. Each DIMM contains SDRAM memory components and is qualified to run at 125 MHz. The CPU chip set does not support traditional DRAMs.

The server supports DIMMs with densities of 64, 128, 256, and 512 Mb for the SDRAM devices. Table 1-2 shows 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 HP Integrity rx8620 Server DIMMs

DIMM Size	Total HP Integrity rx8620 Server Capacity	Memory Component Density
256 MB	16 GB	64 Mb
512 MB	32 GB	128 Mb
1 GB	64 GB	256 Mb
2 GB	128 GB	512 Mb
4 GB	256 GB	1024 Mb

Main Memory Performance

Latency to main memory is an important parameter in determining overall system performance. For a server with memory busses at 125 MHz, the latency for a page hit is 8.5 cycles (68 ns), the latency for a page closed is 11.5 cycles (92 ns), and the latency for a page miss is 14.5 cycles (116 ns).

Valid Memory Configurations

The server is capable of supporting as little as 0.5 GB of main memory using two 256 MB DIMMs installed on one of the cell boards and as much as 128 GB by filling all 16 DIMM slots on all four cell boards with 2 GB DIMMs.

DIMMs must be loaded in sets of two at specified locations on the cell board. Two DIMMs are called an “echelon”, so two echelons would be equivalent to four DIMMs, three echelons would be equivalent to six DIMMs and so on. The DIMMs must be the same size in an echelon. The

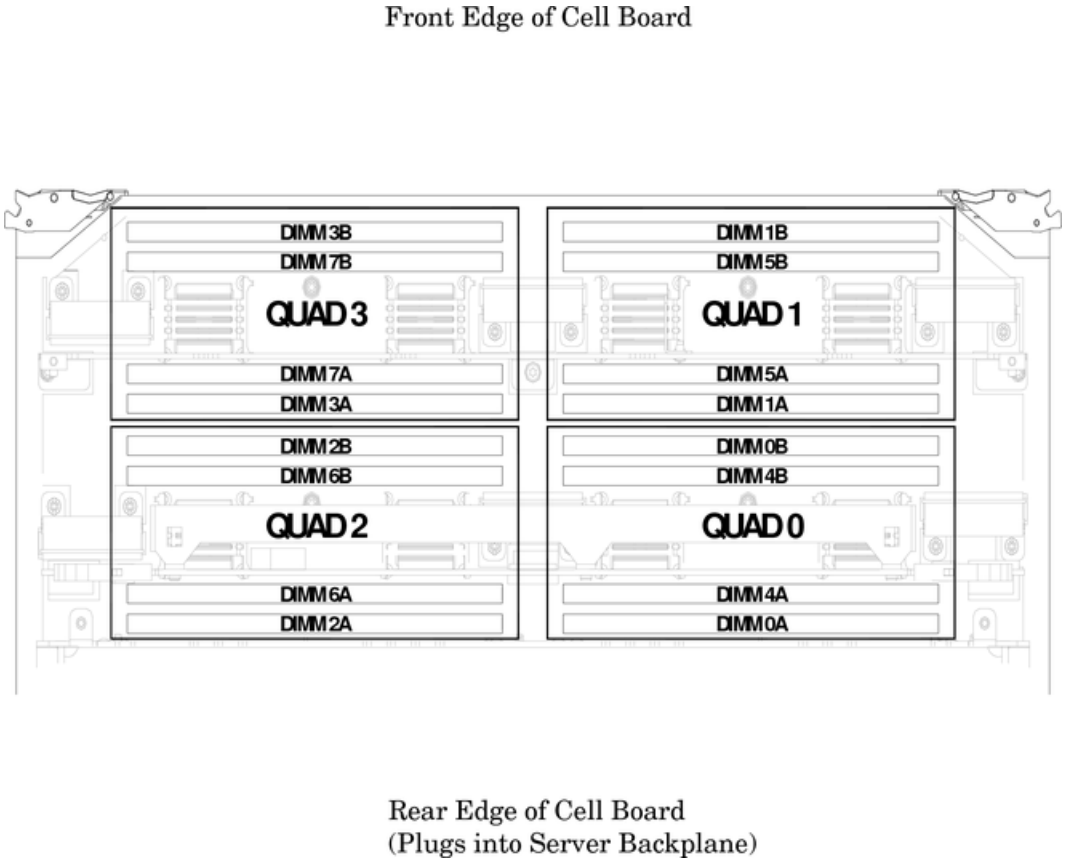
DIMMs across all cells in a partition should have identical memory loaded. Figure 1-8 shows the DIMM slot layout on the cell board. For DIMM load order and the DIMM layout on the cell board, see Table 1-3 and Figure 1-8.

A quad, as seen in Figure 1-8, is a grouping of four DIMMs. Configurations with 8 or 16 DIMM slots loaded are recommended. The DIMM sizes in a quad can be different, but the DIMMs in an echelon must be the same size.

Table 1-3 DIMM Load Order

Number of DIMMs Installed	Action Taken	DIMM Location on Cell Board	Quad Location
2 DIMMs = 1 Echelon	Install First	0A and 0B	Quad 0
4 DIMMs = 2 Echelons	Add Second	1A and 1B	Quad 1
6 DIMMs = 3 Echelons	Add Third	2A and 2B	Quad 2
8 DIMMs = 4 Echelons	Add Fourth	3A and 3B	Quad 3
10 DIMMs = 5 Echelons	Add Fifth	4A and 4B	Quad 0
12 DIMMs = 6 Echelons	Add Sixth	5A and 5B	Quad 1
14 DIMMs = 7 Echelons	Add Seventh	6A and 6B	Quad 2
16 DIMMs = 8 Echelons	Add Last	7A and 7B	Quad 3

Figure 1-8 DIMM Slot Layout



Cells and nPartitions

An nPartition has one or more cells (containing processors and memory) that are assigned to the nPartition for its exclusive use. Any I/O chassis that is attached to a cell belonging to an nPartition

also is assigned to the nPartition. Each I/O chassis has PCI card slots plus any I/O cards and attached devices, and has a core I/O card assigned to the I/O chassis.

On the HP Integrity rx8620 Server, each nPartition has its own dedicated portion of the server hardware that 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.

One or more nPartitions may be configured within a server complex, enabling the hardware to function as a single operating system or as many systems.

NOTE: Partition configuration information is available on the HP website at **http://hp.com**

For details, see *HP System Partitions Guide: Administration for nPartitions*.

Internal Disk Devices for the Server

As Figure 1-9 shows, in the server cabinet, the top internal disk drives connect to cell 0 through the core I/O for cell 0. 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.

Figure 1-9 Internal Disks

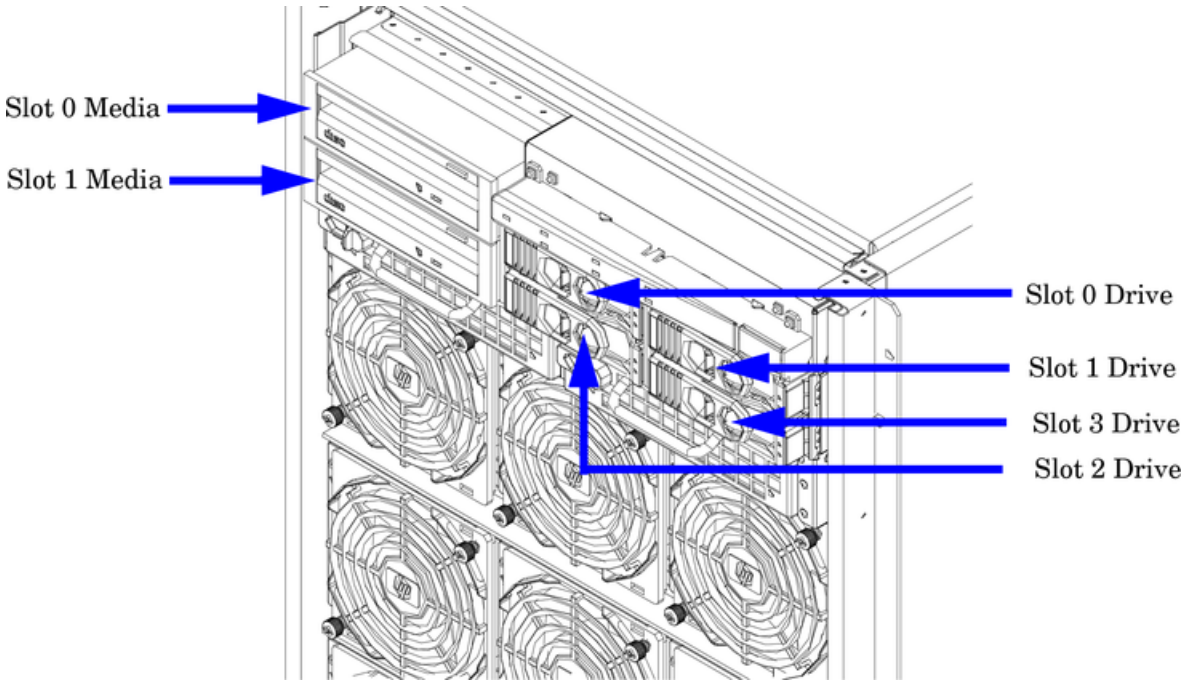


Table 1-4 Removable Media Drive Path

Removable Media	Path
Slot 0 Media	0/0/0/2/1.x[1].0
Slot 1 Media	1/0/0/2/1.x[1].0

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

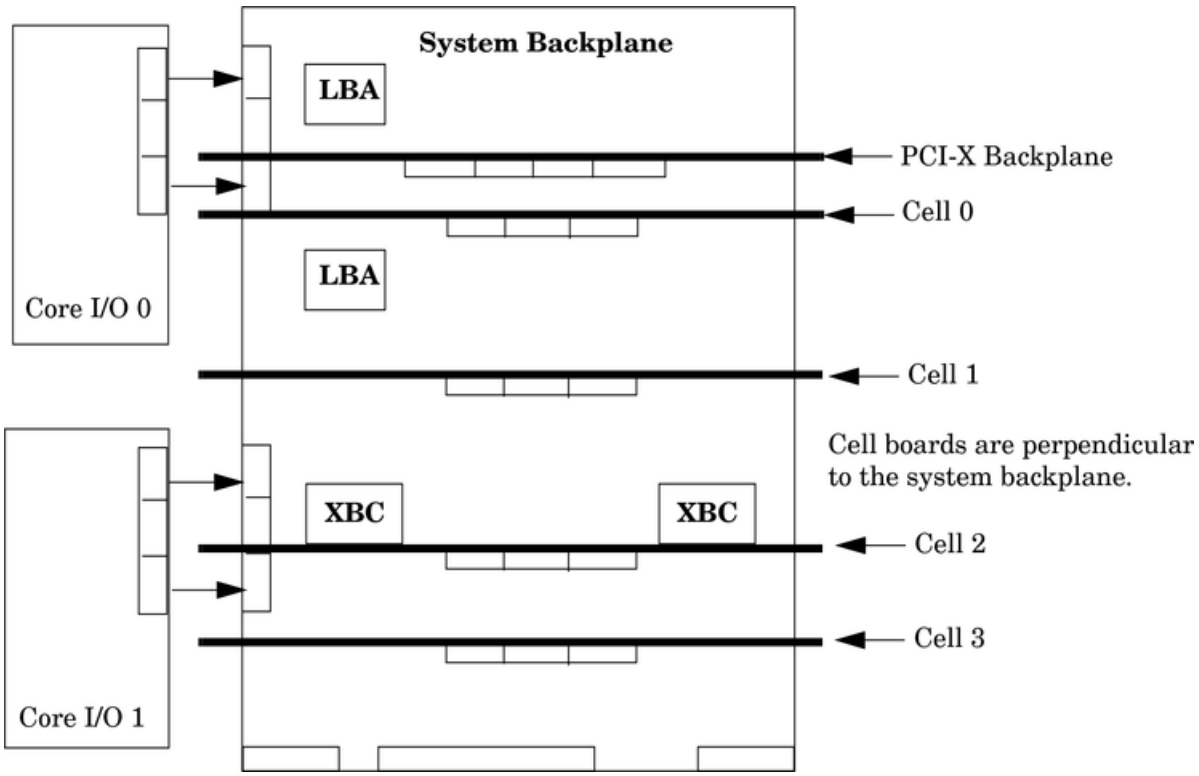
Table 1-5 Hard Disk Drive Path

Hard Drive	Path
Slot 0 Drive	0/0/0/2/0.6.0
Slot 1 Drive	0/0/0/3/0.6.0
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 houses the system clock generation logic, the system reset generation logic, DC-to-DC converters, power monitor logic, and two LBA link-to-PCI converter ASICs. It is the point of connection for the cell boards, PCI-X backplane, core I/O cards, SCSI cables, bulk power, chassis fans, front panel display, intrusion switches, and the system scan card.

Figure 1-10 System Backplane Block Diagram



The LBA PCI bus controllers are placed on the system backplane to facilitate hot-plug capability for the core I/O cards. The partition for the core I/O card must be shut down before removing the card.

Having the SCSI connectors on the system backplane enables hot-plug for the core I/O card without having to remove cables in the process. Hot-plug circuitry is located near the system backplane/core I/O card mating area.

System Backplane to Cell Board Connectivity

Four sets of vertical connectors serve as the point of connection for the cell boards. In addition, two vertical connectors per cell board carry signals from the CC on the cell board to the SBA chip on the PCI-X backplane, or an external I/O chassis PCI-X backplane, and back through the system backplane.

System Backplane to Core I/O Card Connectivity

The core I/O card connectors are right-angle connectors that mate with the system backplane. Three connectors per core I/O card carry one PCI bus from the system to the core I/O board and three single-ended SCSI busses from the core I/O to the system backplane. The system backplane contains two LBA PCI bus controllers, one per core I/O board, and six 68-pin SCSI connectors (three per core I/O board).

The LBA PCI bus controllers are placed on the system backplane to facilitate removal of the core I/O cards when standby power is on. The partition for the core I/O card must be shut down before removing the card.

Placement of the SCSI connectors on the system backplane also permits removal of a core I/O card without having to remove cables in the process. Hot-plug circuitry is located near the system backplane/core I/O card mating area.

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.

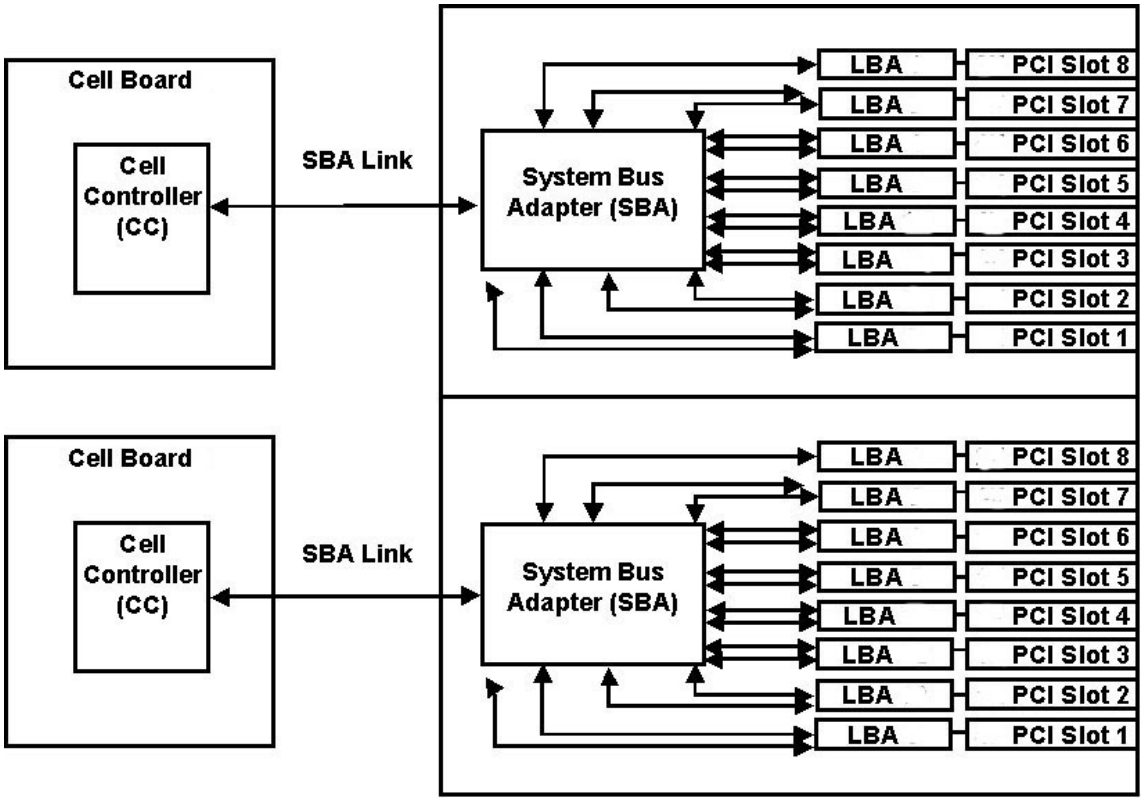
Clocks and Reset

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.

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 seen in Figure 1-11. 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 an effective bandwidth of approximately 1 GB per second. 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 bi-directional rope links for a total aggregate bandwidth of approximately 4 GB per second. Each LBA acts as a bus bridge, supporting either 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 cards. 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 1-11 PCI-X Board to Cell Board Block Diagram



The server supports two internal SBAs. The SBAs generate 32 rope buses (16 per SBA). The 32 available internal rope buses are divided in the following manner:

- Two ropes are routed as single rope bundles to support the core I/O boards through LBAs located on the core I/O backplane.
- Two ropes are routed as single rope bundles to two LBAs to support two slots for PCI and PCI-X cards.
- Twenty eight ropes are bundled in two rope pairs to 14 LBAs to support 14 slots for PCI and PCI-X 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.

The PCI-X backplane is the primary I/O interface for the server. It provides 16 64-bit, hot-plug PCI/PCI-X slots. Fourteen of the slots have dual ropes connected to the LBA chips. The remaining two slots have a single rope connected to each LBA chip. Each of the 16 slots is capable of 66 MHz/33 MHz PCI or 133 MHz/66 MHz PCI-X. 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.

The PCI-X backplane is physically one board but 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 powered down separate from the other I/O partition.

Table 1-6 PCI-X Slot Types

I/O Partition	Slot	Device[1]
0	8[2]	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	7	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.

Table 1-6 PCI-X Slot Types *(continued)*

I/O Partition	Slot	Device[1]
0	6	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	5	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	4	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	3	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	2	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
0	1	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	8[2]	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	7	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	6	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	5	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	4	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	3	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	2	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.
1	1	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot.

1 If the slot is used as a PCI slot, either the 33 MHz or 66 MHz PCI frequency is supported.
If the slot is used as a PCI-X slot, either the 66 MHz or 133 MHz PCI-X frequency is supported.

2 This is a single rope between the SBA and LBA and not a dual rope like ropes 1–7.

Core I/O Card

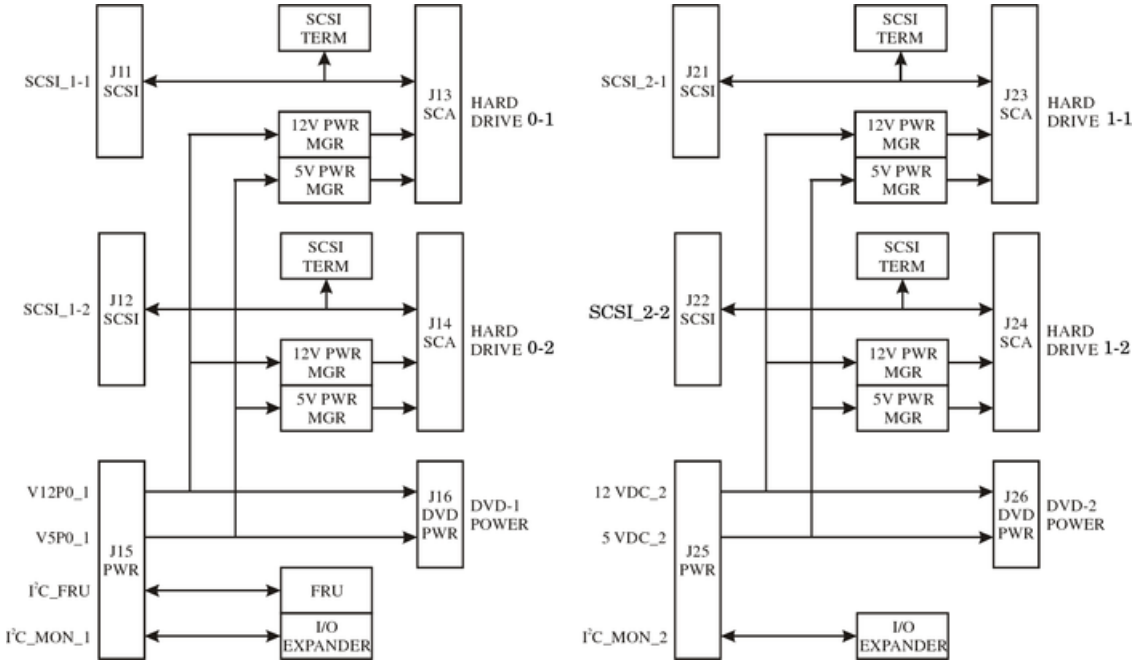
Up to two core I/O cards can be plugged into the server. Two core I/O cards allows for two I/O partitions to exist in the server. The server can have up to two partitions but the total number of partitions possible in a server with the Server Expansion Unit attached is four.

The 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, having connectors and termination logic. All hard disks are hot-plug while removable media disks are not hot-plug. The server accommodates two internal, removable media devices. Therefore, power connectors for a removable media device are required on the mass storage backplane. For more information, see Figure 1-12.

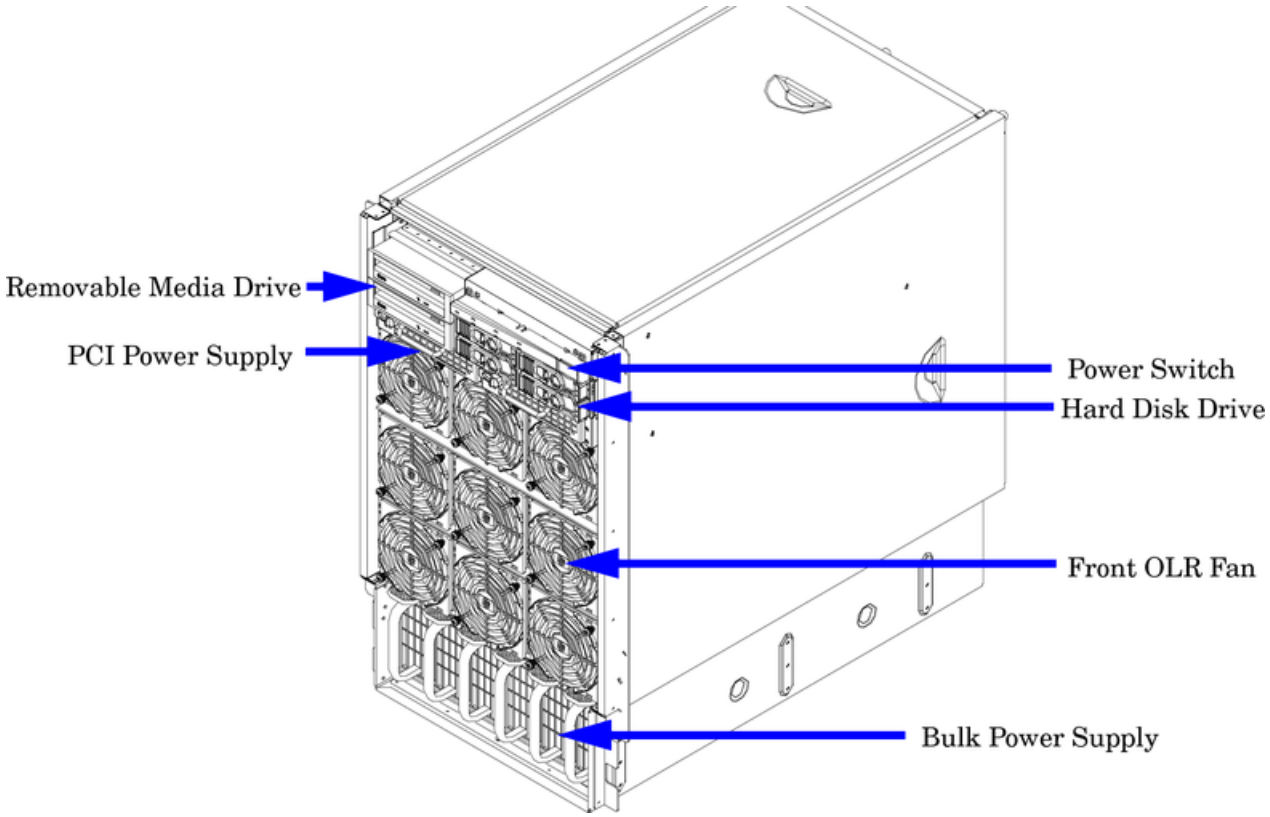
Figure 1-12 Mass Storage Block Diagram



HP Integrity rx8620 Server Description

Dimensions and Components

Figure 1-13 HP Integrity rx8620 Server (Front View)



- 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*: 17U (29.55 inches), constrained by package density

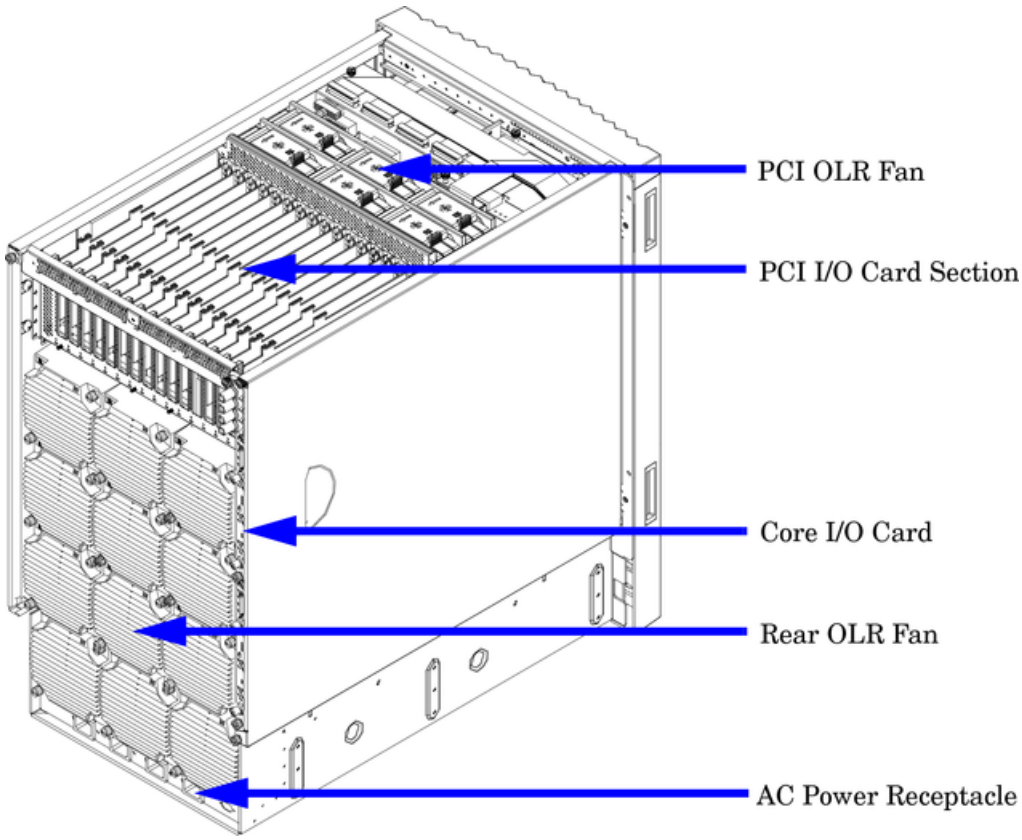
The mass storage section located in the front allows access to removable media drives without removal of the bezel (bezel not shown in figure). The mass storage bay accommodates two 5.25-inch removable media drives and up to four 3.5-inch hard disk drives. The front panel display, containing LEDs and 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 DC-to-DC power supplies. Each PCI power supply powers only one I/O partition.

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

The bulk power supply is partitioned through the use of a sealed metallic enclosure located in the bottom of the server. This enclosure houses the N+1 fully redundant bulk power supplies. These power supplies are installed 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 1-14 HP Integrity rx8620 Server (Rear View)



The PCI I/O card section, located toward the rear, is accessed by removing the top cover.

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

The cell boards are located on the right side of the product behind a removable side cover. Rack front doors are more often hinged on the left, which restricts the large cell board to slide out from the right.

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

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

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

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 to help lift and move the server into a rack.

2 Installation

Inspect shipping containers when the equipment arrives at the site. Check equipment after the packing has been removed. This chapter discusses how to inspect and receive the HP Integrity rx8620 Server.

Inspecting the Server Cabinet

NOTE: The server ships in one of three different configurations. The configurations are as follows:

- 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. After the equipment arrives at the customer site, carefully inspect each carton for signs of shipping damage. A tilt indicator is installed on each carton shipped. The beads in the indicator roll to the upper position if the container has been tilted to an angle that could cause equipment damage. The tilt indicator has two windows, and each window under normal conditions shows four beads. If a carton has been mishandled, accidentally dropped, or knocked against something, beads would be missing from the tilt indicator. If damage is found, document the damage with photographs and contact the transport carrier immediately.

Examine the server cabinet for visible shipping damage. After unpacking the cabinet, check for damage that may have been obscured by the shipping container. If damage is found after visual inspection, document the damage with photographs and contact the transport carrier immediately.

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

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.

Receiving the Server Cabinet

This section contains information about unpacking the server cabinet.

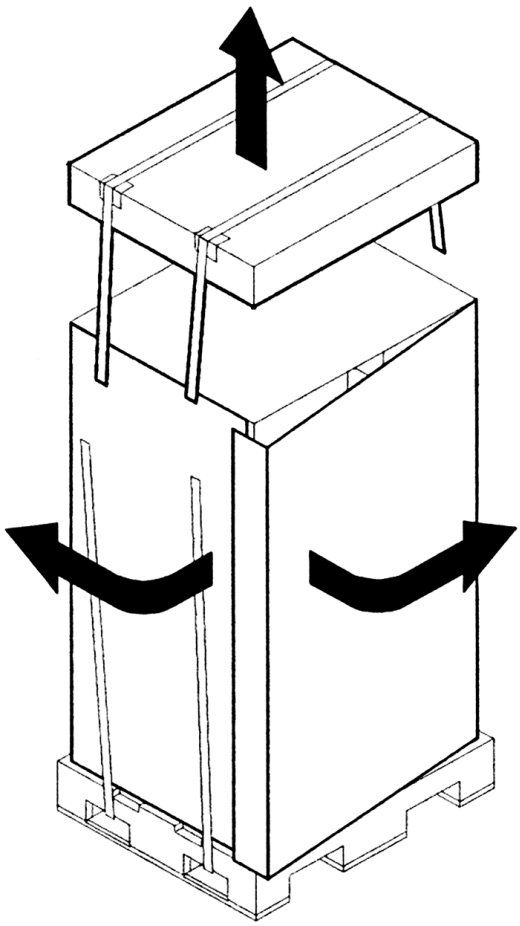
WARNING! Wear protective glasses while cutting the plastic bands around the shipping container. These bands are under tension. When cut, they can spring back and cause serious eye injury.

NOTE: Position the pallet, allowing for enough space to roll the cabinet off the pallet before starting.

To remove the server cabinet from the shipping container, follow these steps:

1. Cut the polystrap bands around the shipping container.
2. Lift the cardboard top cap from the shipping box.

Figure 2-1 Removing the Polystraps and Cardboard



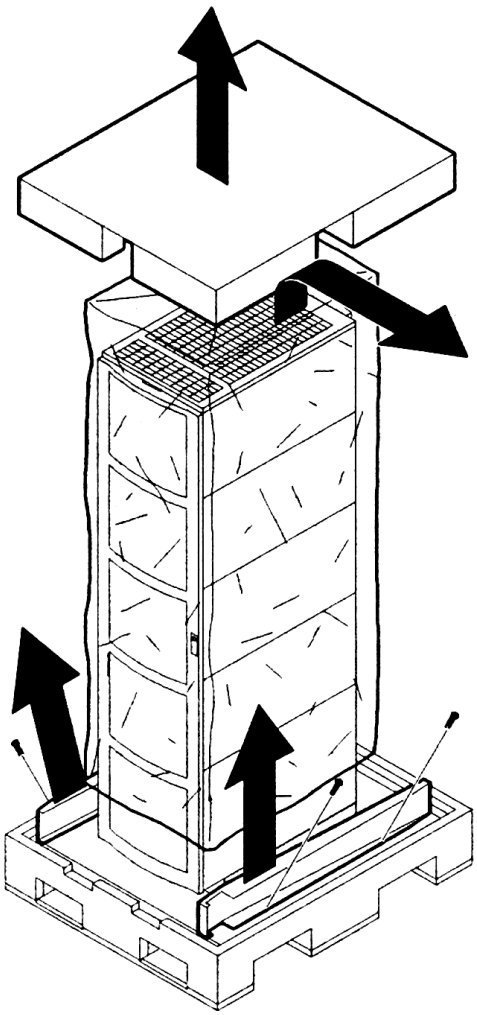
3. Remove the corrugated wrap from the pallet.
4. Remove the packing materials.

△ **CAUTION:** The plastic wrapping material should be cut off rather than pulled off. Pulling off the plastic covering represents an ESD hazard.

5. Remove the four bolts that hold down the ramps and remove the ramps.

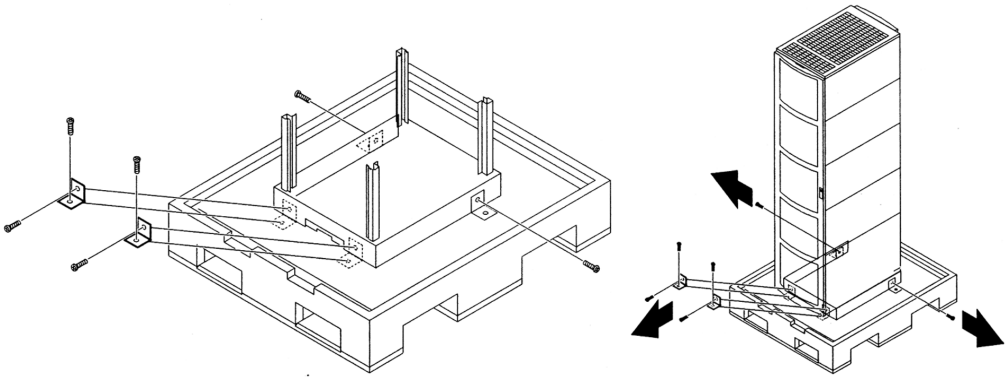
NOTE: Figure 2-2 shows one ramp attached to the pallet on either side of the cabinet with each ramp secured to the pallet using two bolts. There is another configuration where the ramps are secured together on one side of the cabinet with one bolt.

Figure 2-2 Removing the Shipping Bolts and Plastic Cover



6. Remove the six bolts from the base attaching the rack to the pallet.

Figure 2-3 Preparing to Roll Off the Pallet

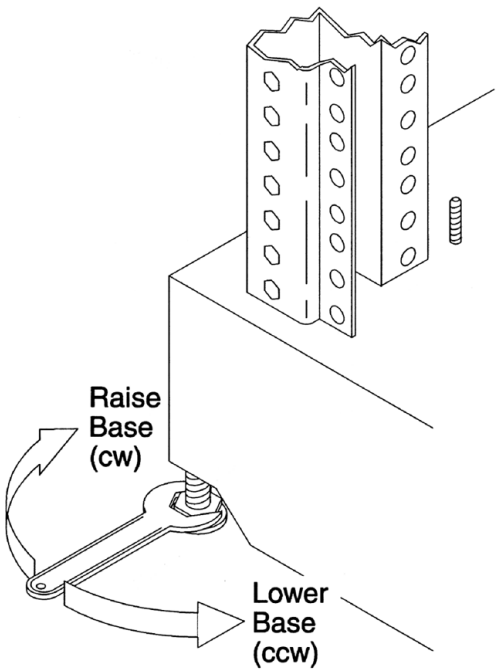


WARNING! Be sure that the leveling feet on the rack are raised before you roll the rack down the ramp, and any time you roll the rack on the casters. Use caution when rolling the cabinet off the ramp. A single server in the cabinet weighs approximately 508 lb. It is strongly recommended that two people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

Securing the Cabinet

When in position, secure and stabilize the cabinet using the leveling feet at the corners of the base and install the anti-tip mechanisms on the bottom front and rear of the rack.

Figure 2-4 Securing the Cabinet



Rack Mount System Installation

Servers shipped as a standalone or in the 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. See service note A6093A-11.

There are several documents written 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 Solutions team.

Rack System/E

Detailed rack information for the rack system/E covers the following topics:

- Safety and Regulatory Information
- Description of the Standard Racks and Physical Specifications
- Installation Guidelines
- Procedures

Rack System/E Stabilizer Feet

The stabilizer installation guide for the rack system/E covers the following topics:

- How to Install the Stabilizers
- Moving the Rack

HP J1528A Rack Integration Kit

The rack integration kit information covers installing the following products:

- Ballast Kit (J1479A)
- Anti-Tip Stabilizer Kit (A5540A)
- Slide Rails
- CMA (Cable Management Arm)
- Interlock Device Assembly

This installation guide provides a complete parts list of the hardware and tools required to perform the installation of the products mentioned. Installation of the products is illustrated in this guide.

Manual Lifting

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

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

System damage can occur through improper removal and re-installation of devices. This task must be performed by trained personnel only. Instructions for removing and re-installing these components can be found in Chapter 6 (page 105).

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

To manually lift the server, follow these steps:

1. Reduce the weight by removing all bulk power supplies and cell boards.
2. Locate the four (4) positioning handles on the sides of the system. They are color coded blue and located close to each base corner of the unit.
3. Ensure the vertical support brackets are in the down position so 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.
4. Unfold the handles so they are extended out from the unit. The server is now ready for manual lifting by the four qualified HP Service Personnel.

5. After the server is secured, re-install the previously removed cell boards and bulk power supplies.

Using the RonI Model 17000 SP 400 Lifting Device

A lifter designed by the RonI company is used to rack mount the server. The lifter can raise 400 lb. to a height of five feet. The lifter can be broken down into several components. When completely broken down, no single component weighs more than 25 lb. 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 on the HP intranet at the Cybrary website. Complete details on how to assemble the lifter, troubleshoot the lifter, and maintain the lifter are provided in the RonI documentation.

To unload the server from the pallet after the lifter is assembled, follow these steps:

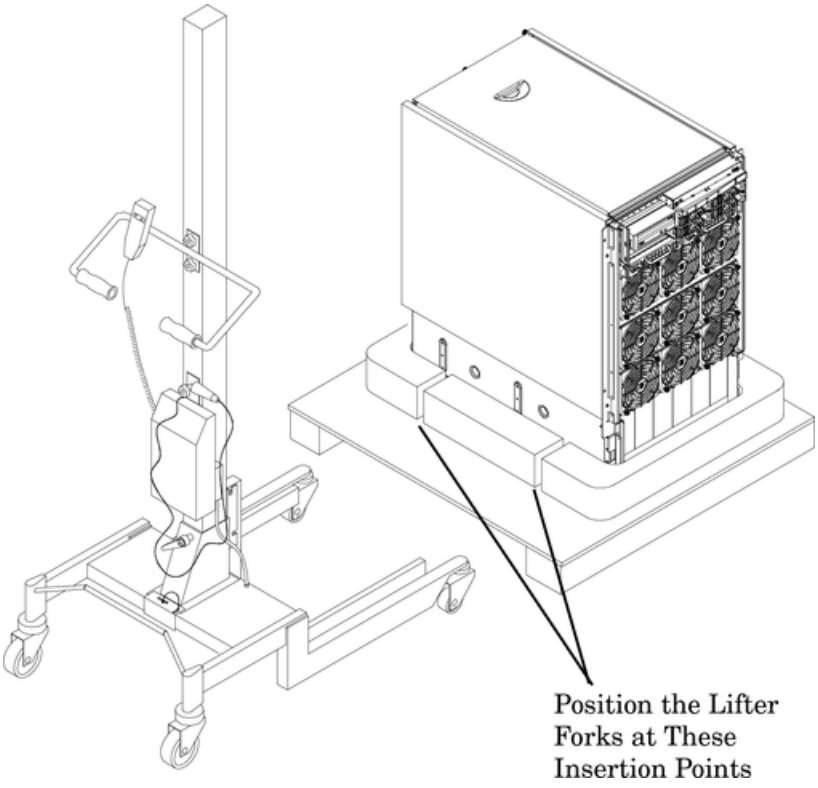
⚠ **WARNING!** Use caution when using the lifter. Because of the weight of the server, it must be centered on the lifter forks before raising it off the pallet to avoid injury.

The server must be racked in the bottom of a cabinet for safety reasons. Never extend more than one server from the same cabinet while installing or servicing either an HP Integrity rx8620 Server or another server product. Failure to follow these instructions can result in the cabinet tipping over.

---

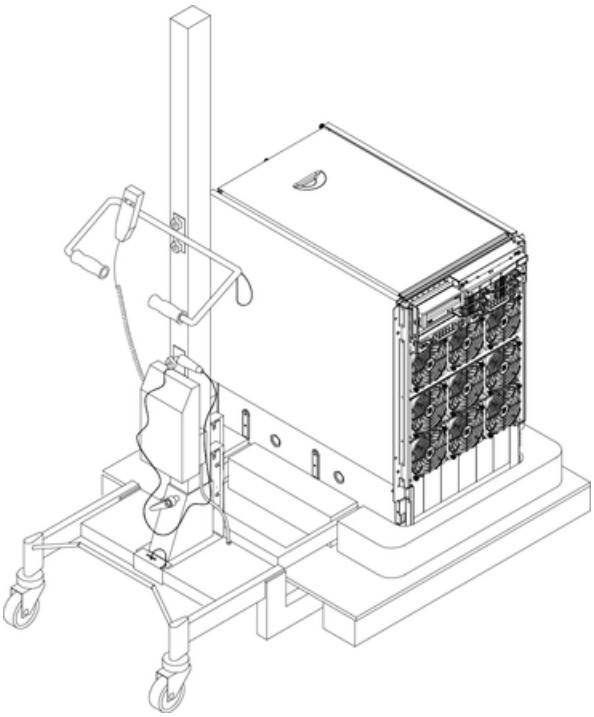
1. Obtain the *HP J1528A Rack Integration Kit Installation Guide* before proceeding with the rack mount procedure. This guide covers these important steps:
   - Installing the anti-tip stabilizer kit (A5540A)
   - Installing the ballast kit (J1479A)
   - Installing the barrel nuts on the front and rear columns
   - Installing the slides
2. To remove the banding and carton top from the server pallet, follow the instructions on the outside of the server packaging.
3. Insert the lifter forks between the cushions.

Figure 2-5 Positioning the Lifter to the Pallet



4. Carefully roll the lift forward until it is fully positioned against the side of the server.
5. Slowly raise the server off the pallet until it clears the pallet cushions.

Figure 2-6 Raising the Server Off the Pallet Cushions



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.

7. Follow the HP J1528A 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)

Wheel Kit Installation

Compare the packing list with the contents of the wheel kit before beginning the installation.

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

The following list provides the installer with the recommended tools to perform the wheel kit installation.

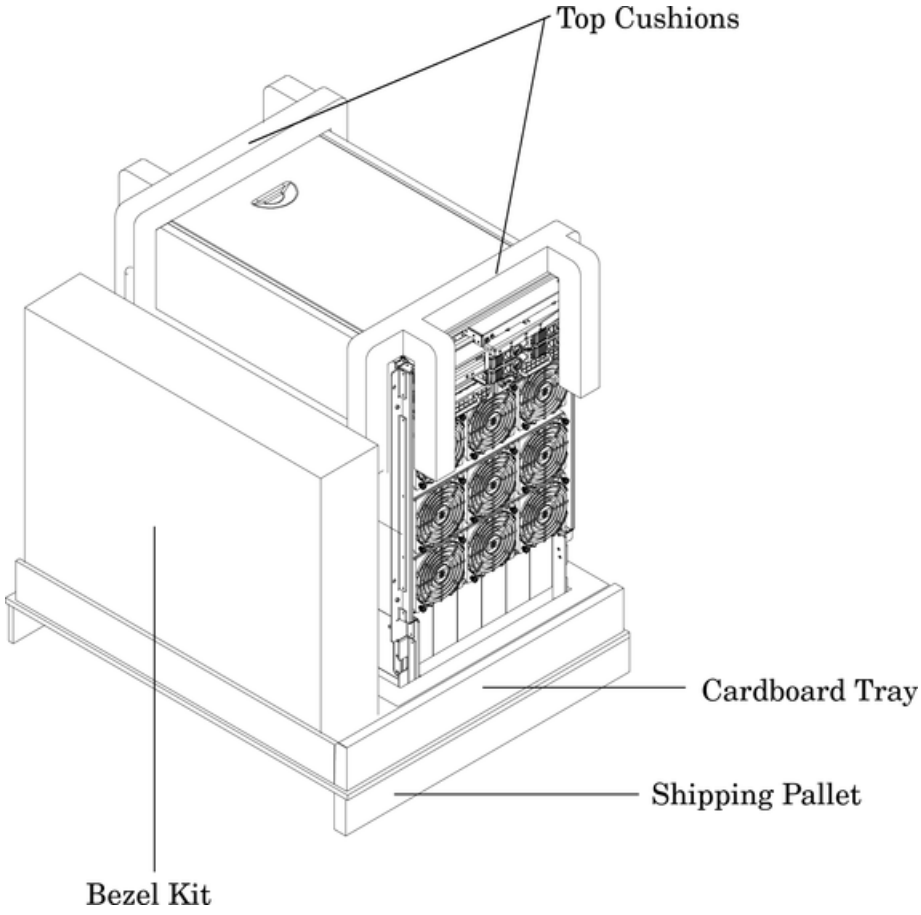
- Diagonal side cutters
- Safety glasses
- Torx driver with T-15 bit
- Phillips head screwdriver

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.

To install the wheel kit, follow these steps:

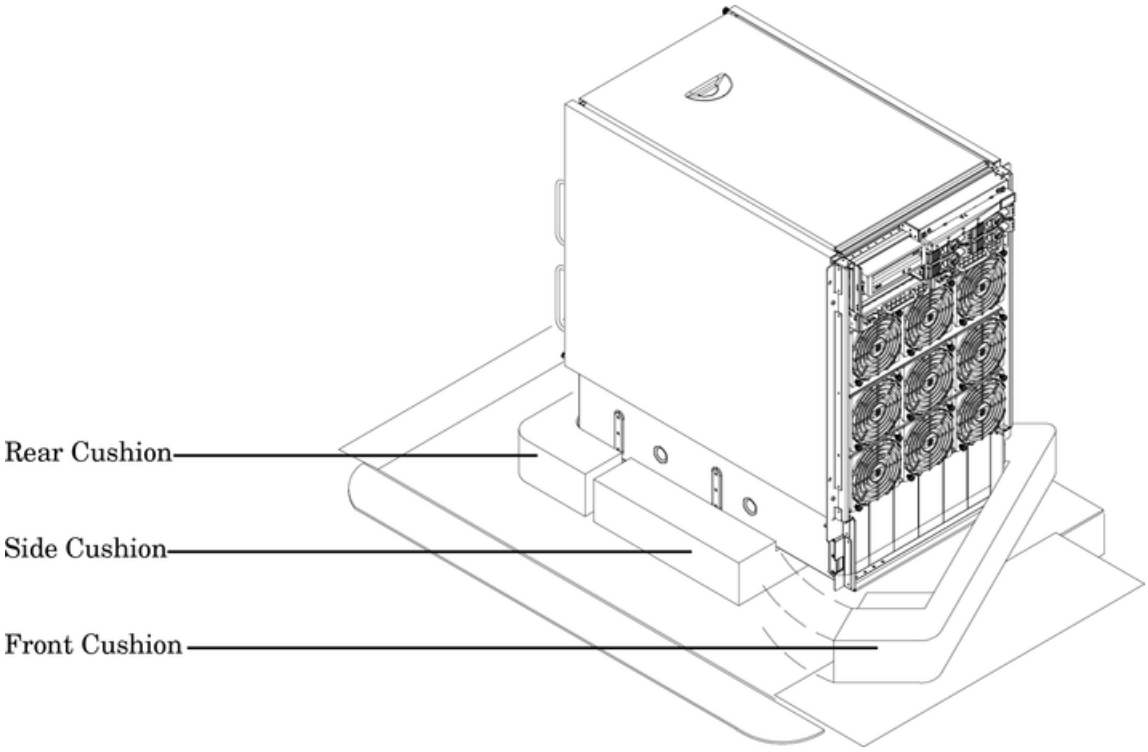
1. Cut and remove the polystrap bands securing the server to the pallet.
2. Lift the carton top from the cardboard tray resting on the pallet.
3. Remove the bezel kit carton and top cushion from the pallet.

Figure 2-7 Server on Shipping Pallet



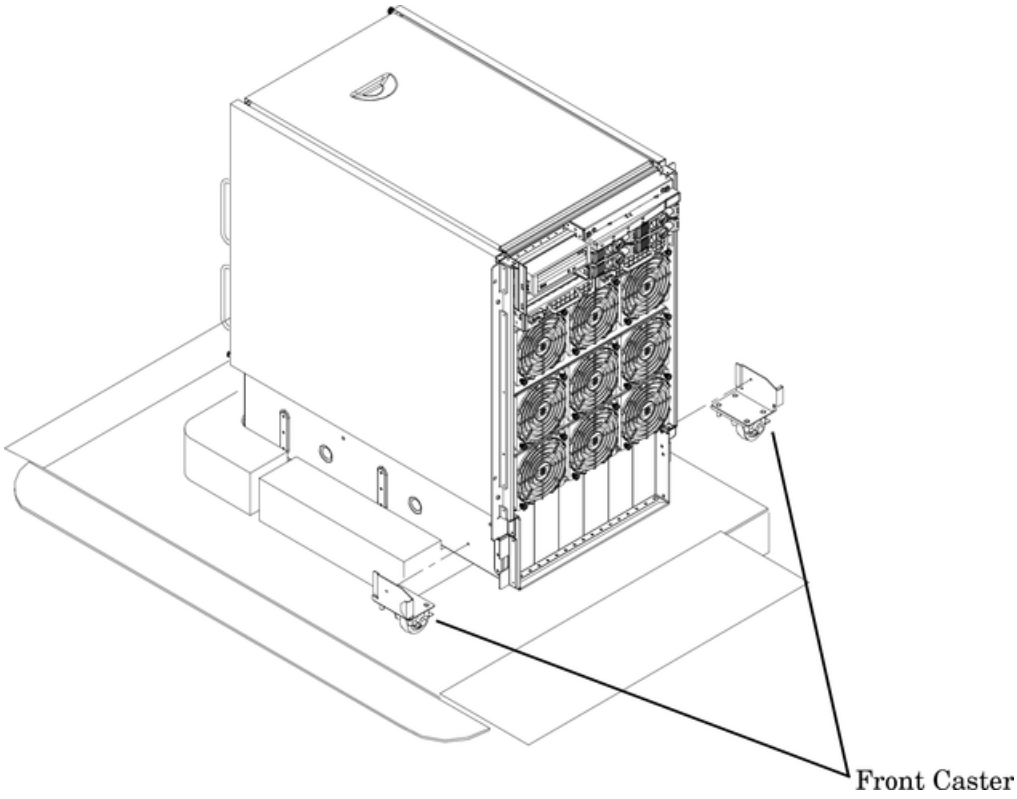
4. Unfold bottom cardboard tray.
5. Remove the front cushion only. Do not remove any other cushions until further instructed.

Figure 2-8 Removal of Cushion from Front Edge of Server



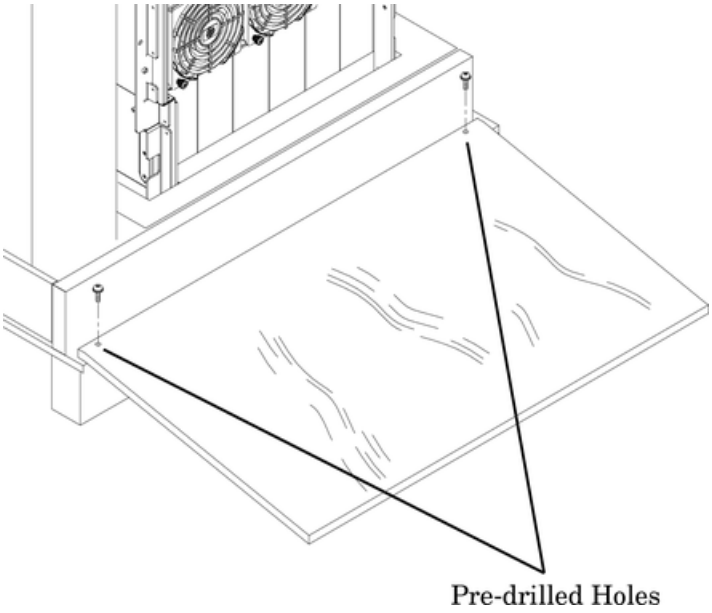
6. Open the wheel kit box and locate the two front casters. The front casters are shorter in length than the two rear casters. Each front caster is designed to fit only on one corner of the server. There is a right front caster and a left front caster.
7. Remove two of the eight screws from the plastic pouch. Attach one wheel caster to the front of the server.

Figure 2-9 Attaching a Caster Wheel to the Server



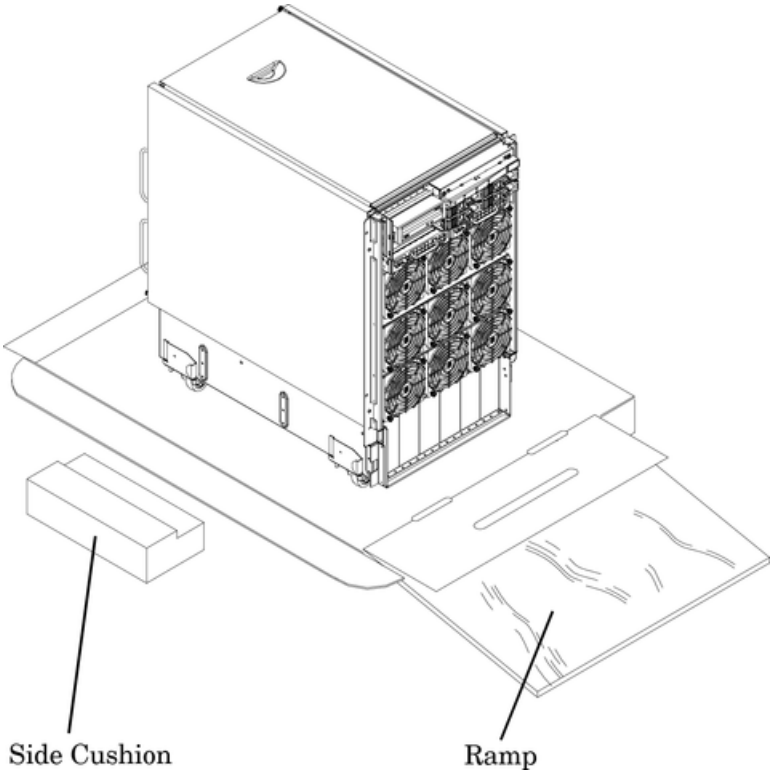
8. Attach the remaining front caster to the server using two more screws supplied in the plastic pouch.
9. Remove the rear cushion at the rear of the server. Do not remove the remaining cushions.
10. Mount the two rear casters to the server using the remaining four screws.
11. Obtain the plywood ramp from the wheel kit.
12. Attach the ramp to the edge of the pallet. Note there are two pre-drilled holes in the ramp. Use the two screws taped to the ramp and attach it to the pallet.

Figure 2-10 Attaching the Ramp to the Pallet



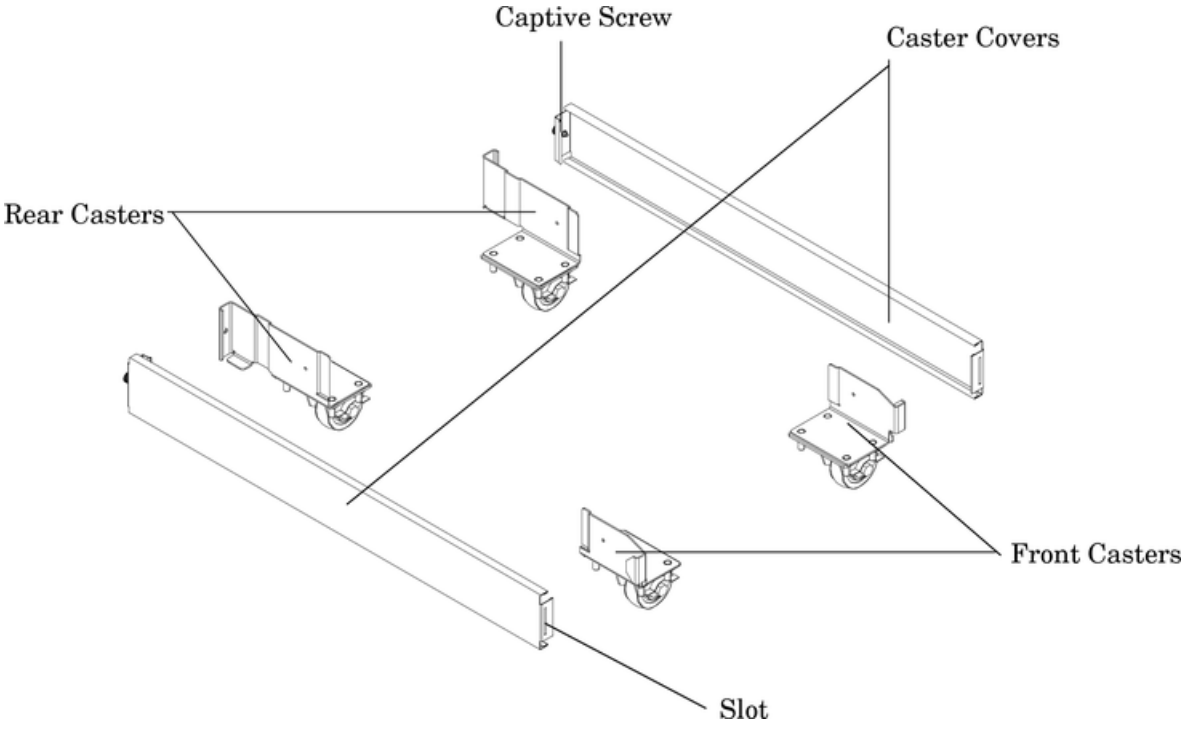
13. Remove the two side cushions from the server and unfold the cardboard tray so that it lays flat on the pallet.

Figure 2-11 Side Cushion Removal From the Server



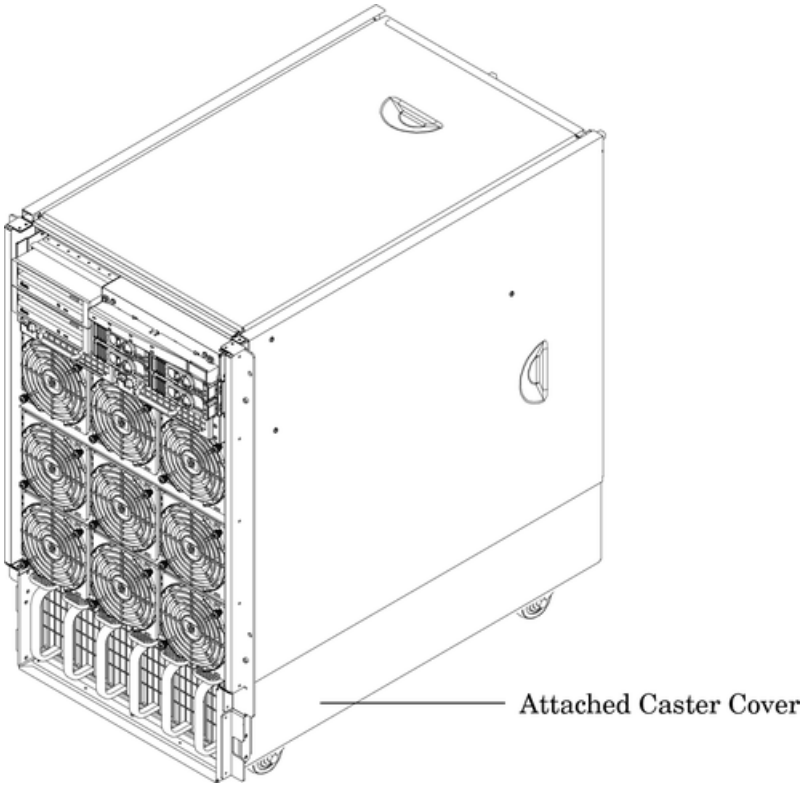
14. Carefully roll the server off the pallet and down the ramp.
15. Obtain the caster covers from the wheel kit. Note that the caster covers are designed to fit on either side of the server.
16. Insert the slot on the caster cover into the front caster. Secure the caster cover to the server by tightening the captive screw on the cover at the rear of the server.

Figure 2-12 Securing Each Caster Cover to the Server



17. Wheel kit installation is complete after both caster covers are attached to the server and the bezel cover is snapped into place on the front of the server.

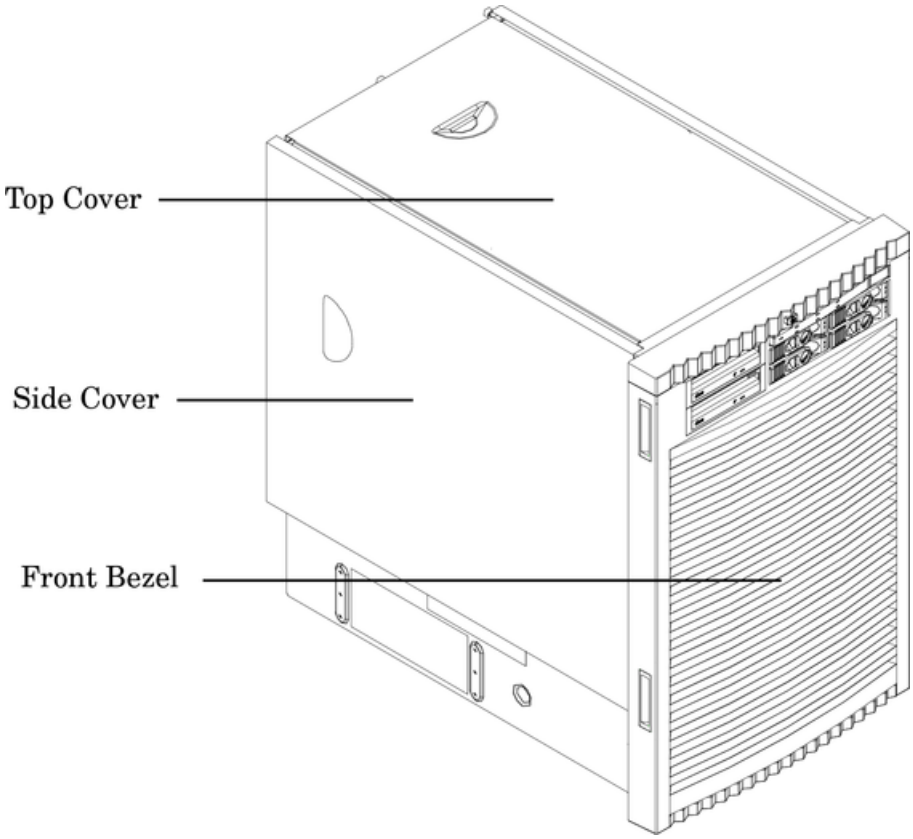
Figure 2-13 Completed Wheel Kit Installation



Top and Side Cover Installation

NOTE: It may be necessary 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



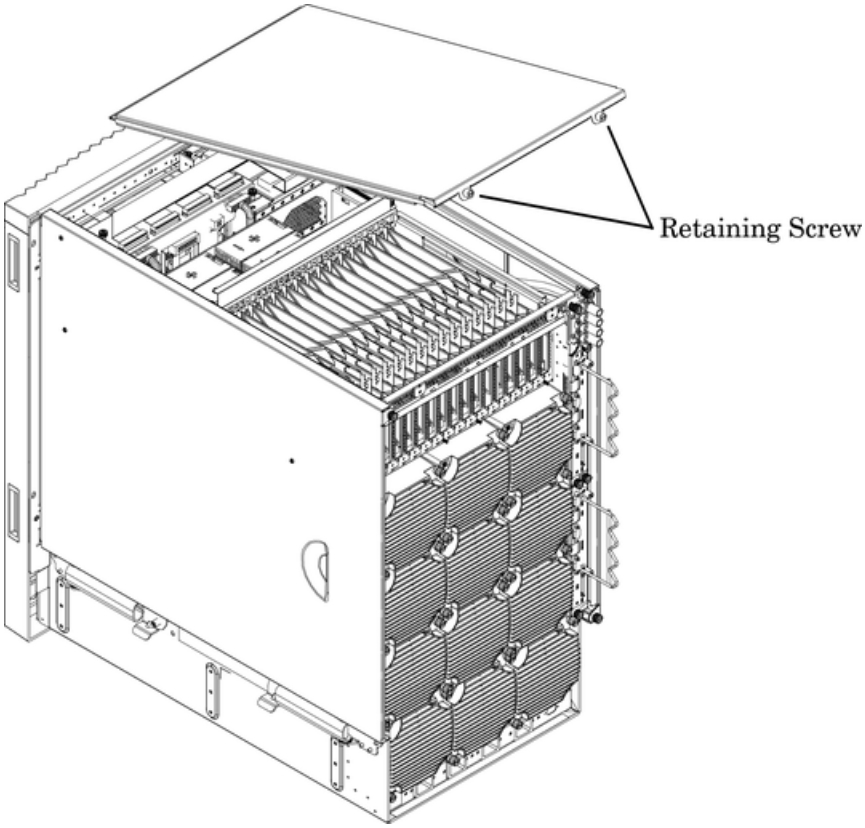
CAUTION: Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions can result in damage to the server.

Removing the Top Cover

To remove the top cover, follow these steps:

1. Connect to ground with a wrist strap.
2. Loosen the blue retaining screws securing the cover to the chassis.
3. Slide the cover toward the rear of the chassis.
4. Lift the cover up and away from the chassis.
5. Place the cover in a safe location.

Figure 2-15 Top Cover Detail



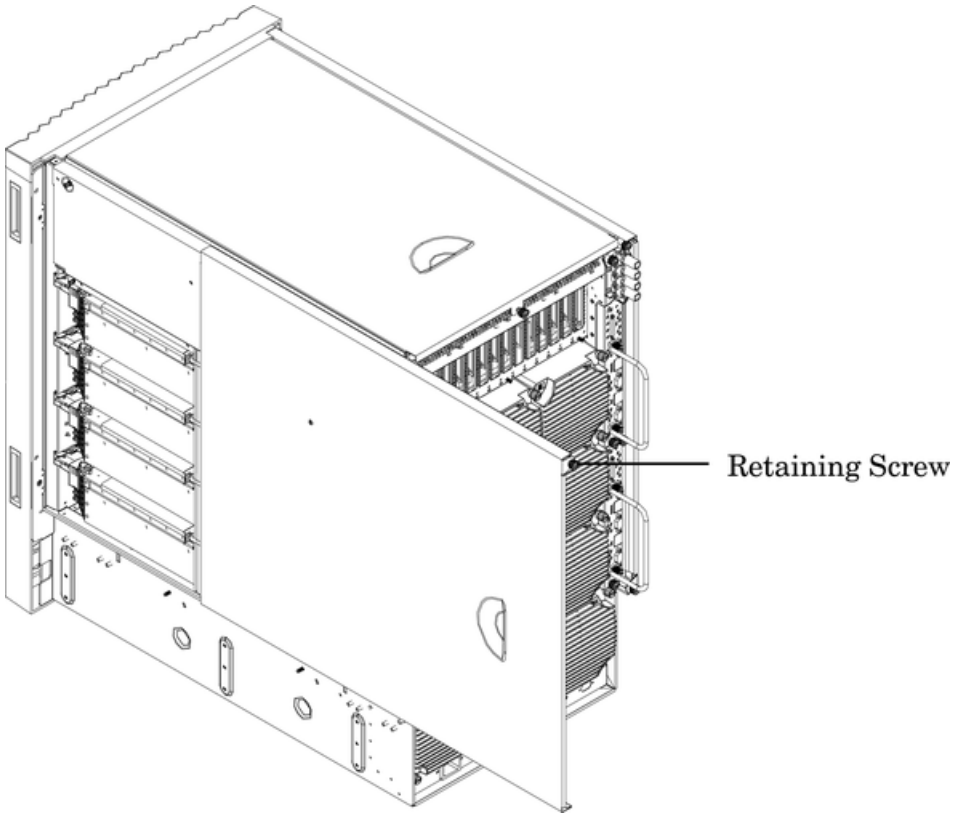
Installing the Top Cover

To install the top cover, follow these steps:

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

Removing the Side Cover

Figure 2-16 Side Cover Detail



To remove the side cover, follow these steps:

1. Connect to ground with a wrist strap.
2. Loosen the blue retaining screw securing the cover to the chassis. See Figure 2-16.
3. Slide the cover from the chassis toward the rear of the system.
4. Place the cover in a safe location.

Installing the Side Cover

To install the side cover, follow these steps:

1. Orient the cover according to its position on the chassis.
2. To properly seat the cover, slide the cover into position using a slow, firm pressure.
3. Tighten the blue retaining screw securing the cover to the chassis.

Power Distribution Unit

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

The 60A NEMA[2] PDU has four 20A circuit breakers and is constructed for North American use. Each of the four circuit breakers has two IEC[3]-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.

2. NEMA — National Electrical Manufacturers Association
3. IEC — International Electrotechnical Commission

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

3 Installing Accessories

The following options can be installed in the HP Integrity rx8620 Server:

- PCI I/O cards
- Additional hard disk drive storage
- Additional removable media device storage

Installing Add-On Products

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

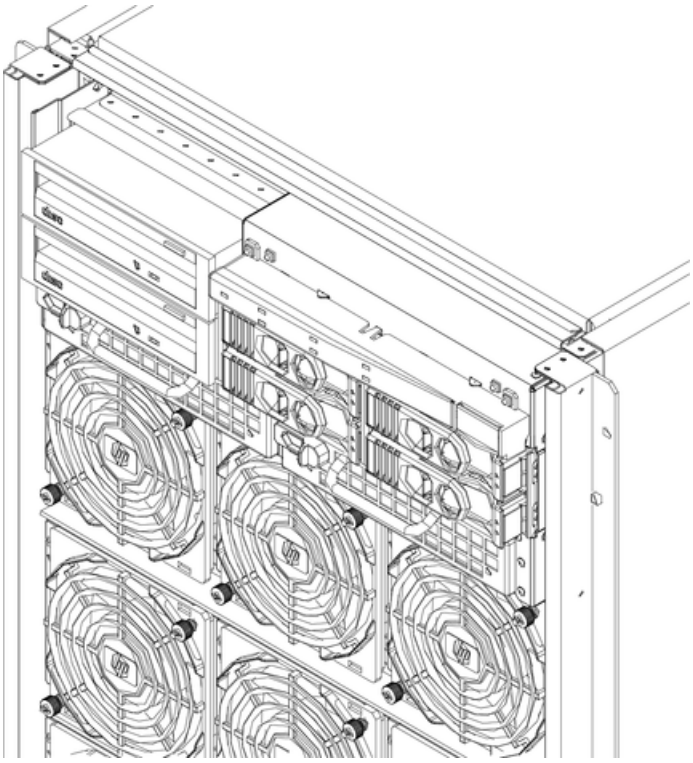
This section provides information on additional products ordered after installation and any dependencies for these add-on products.

Embedded Disks

When disks are installed, the top two hard disk drives are driven by cell 0 located in the server. The bottom two hard disk drives are driven by cell 1 located in the server.

A list of replacement disk drives for the server is in Appendix A (page 183). The list contains both removable media disk drives and hard disk drives.

Figure 3-1 Embedded Disks



Hard Disk Drive Installation

The disk drives are located in the front of the chassis. The hard disk drives are hot-pluggable drives.

To install the hard disk drives, follow these steps:

1. Be sure the front locking latch is open, then position the disk drive in the chassis.

2. Slide the disk drive into the chassis; a slow, firm pressure is needed to properly seat the connector.
3. To secure the disk drive in the chassis, press the front locking latch.
4. Spin up the disk by entering one of the following commands:

```
#diskinfo -v /dev/rdsk/cxtxdx
#ioscan -f
```

Removable Media Drive Installation

The DVD drive or DDS-4 tape drive is located in the front of the chassis. You must turn off the server power before attempting to install it. For more information , see ."Powering Off Hardware Components and Powering On the Server" (page 106)

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

To remove the media drive, follow these steps:

1. Remove filler panel.
2. Connect the cables to the rear of the drive.
3. Install left and right media rails and clips.
4. Slide the drive in the chassis. Fold the cables out of the way.
5. The drive easily slides into the chassis; however, a slow, firm pressure is needed for proper seating.
6. The front locking tab latches to secure the drive in the chassis.

PCI-X Card Cage Assembly I/O Cards

A number of PCI and PCI-X I/O cards are supported in the server. Known supported cards at the release of this manual are shown in Tables 3-1 through 3-4.

Table 3-1 HP Integrity rx8620 Server I/O Cards - HP-UX

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A3739B	FDDI Dual Attach	16
A4926A	Gigabit Ethernet (1000B-SX)	16
A4929A	Gigabit Ethernet (1000B-T)	16
A6847A	Next Generation 1000B-SX	16[1]
A6825A	Next Generation 1000B-T	16???
A6826A	PCI-X Dual Channel 2 GB Fibre Channel HBA	16???
A5149A	Ultra2 SCSI	16
A5150A	2-port Ultra2 SCSI	16
A5158A	Fibre Channel PCI Adapter	16[2]
A5230A	10/100B-TX (RJ45)	16
A5506B	4-port 10/100B-TX	16
A5513A	ATM 155 (MMF connector)	16
A5783A	Token Ring (4/16/100 Mb/s)	16
A5838A	2-port Ultra2-SCSI + 2-port 100T	16
A6386A	Hyperfabric II	8
A6826A	PCI-X Dual Channel 2Gb Fibre Channel HBA	16???

Table 3-1 HP Integrity rx8620 Server I/O Cards - HP-UX *(continued)*

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A6748A	8-port Terminal MUX	16
A6749A	64-port Terminal MUX	16
A6794AX	Procurium GigE LAN/SCSI combo card	2B
A6795A	2G FC Tachlite	16???
A6828A	1-port U160 SCSI	16???
A6829A	2-port U160 SCSI	16???
A6869A	Obsidian USB/VGA PCI card	1
A6869B	Obsidian USB/VGA PCI card	1
A7011A	PCI-X 2 port 1000BaseSX Dual Port (Intel chip)	16
A7012A	PCI-X 2 port 1000BaseT Dual Port (Intel chip)	16
A7173A	2 port U320 SCSI	16B
A9782A	PCI-X 1000B-T GB FC GigE-SX	16???
A9784A	PCI-X 1000B-T GigE/2 G FC combo	16???
A9890A	SmartArray 6402 2-channel RAID	8B
A9891A	SmartArray 6404 4-channel RAID	8B
AB286A	PCI-X 2 port 4X InfiniBand HCA (HPC)	2
AB287A	10G Ethernet	2
AB286C	PCI-X 2-Port 4X InfiniBand HCA (HPC), RoHS	1
AB290A	U320 SCSI/GigE Combo Card	16B
AB345C	PCI-X 2-Port 4X InfiniBand HCA w/ HA and Database Support, RoHS	1
AB378A	1-port 4Gb FC card PCI-X	16B
AB379A	2-port 4Gb FC card PCI-X	16
AB545A	4-port 1000B-T Ethernet	16
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	16B
AD278A	8-port Terminal MUX	15
AD279A	64-port Terminal MUX	15
J3525A	2-port serial (X25/FR/SDLC)	16
Z7340A	8-port PCI ACC	16

1 Supports a pre-OS network boot (IODC or EFI) for the purpose of OS installation (ignite, RIS).

2 This I/O card is supported at the first update of the HP-UX B.11.23 release.

Table 3-2 HP Integrity rx8620 Server I/O Cards - Windows

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A7059A	SCSI adapter	8B
A7060A	SCSI adapter	8B

Table 3-2 HP Integrity rx8620 Server I/O Cards - Windows *(continued)*

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A6869A	Obsidian VGA/USB card	1
A6869B	Obsidian 2 VGA/USB card	1
A7173A	SCSI adapter	8B
A9825A	Smart Array 5302 SCSI controller	8B
A9826A	Smart Array 5304 SCSI controller	8B
A9890A	Smart Array 6402 SCSI controller	8B
A9891A	Smart Array 6404 SCSI controller	8
337972-B21	Smart Array P600 SCSI controller	8
AB232A	FC Emulex 9802	12B
AB466A	FC Emulex 1050DC	8B
AB467A	FC Emulex 1050	12B
AD167A	Emulex 4GB	12
AD168	Exulex 4GB DC	8
A7061A	NIC Broadcom Cu	12
A7073A	NIC Broadcom FC	12
A9900A	NIC Intel Dual Cu	12B
A9899A	NIC Intel Dual FC	12B
AB287A	10G NIC	4

Table 3-3 HP Integrity rx8620 Server - Linux Supported I/O Cards

Part Number	Card Description	Number of Cards Supported
A7173A	PCI-X Dual-Channel Ultra320 SCSI	8
A7059A	PCI Windows and Linux Ultra160 SCSI	8
A7060A	PCI Windows and Linux 2 channel Ultra160 SCSI	5
A9890A	PCI-X SmartArray 6402/128 MB	8
337972-B21	PCI-X Smart Array P600 serial attached SCSI (SAS) controller	8
A9825A	2 channel Smart Array 5302 / 128 MB	8
A9826A	4 channel Smart Array 6404 / 256 MB	8
A6826A	PCI X 2 channel 2 Gb /s Fibre Channel	8
A7538A	PCI-X 1-port 2Gb Fibre Channel	15
A7061A	PCI 1 port 1000Base T	8
A7073A	PCI 1 port 1000Base SX	8
A5506B	PCI 4-port 100Base-TX	2
A9899A	PCI 2-port 1000Base-SX	8
A9900A	PCI 2-port 1000Base-T	8

Table 3-3 HP Integrity rx8620 Server - Linux Supported I/O Cards *(continued)*

Part Number	Card Description	Number of Cards Supported
AD144A	PCI 1-port 10GbE SR (133Mhz)	2
AD145A	PCI 4-port 1000Base-T	4

Table 3-4 HP Integrity rx8620 Server - Open VMS Supported I/O Cards

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A6826A	PCI X 2 channel 2 Gb /s Fibre Channel	8B
A7173A	PCI 2 channel Ultra320 SCSI Adapter	2B
AB378A	PCI 1 port 4 Gb Fibre Channel	8B
AB379A	PCI 2 port 4 Gb Fibre Channel	8B
AB545A	PCI X 4 port 1000Base T Gigabit Adapter	3
A6847A	PCI 1 port 1000Base SX	8
A6825A	PCI 1 port 1000Base T	8
A7011A	PCI X 2 port 1000Base SX	8
A7012A	PCI X 2 port 1000Base T	8
A9782A	PCI X 2 Gb Fibre Channel, 1000Base SX	4B
A9784A	PCI X 2 Gb Fibre Channel, 1000Base T	4B
AB465A	PCI X 2 port 2 Gb FC/2 port 1 Gb Ethernet	2B
AB290A	PCI X 2 port 1000Base T/2 port Ultra320 SCSI	2B

PCI I/O Card Installation

IMPORTANT: The installation process varies depending on what method for installing the PCI card you select. PCI I/O card installation procedures should be downloaded from the HP website at **http://hp.com**. Background information and procedures for adding a new PCI I/O card using online addition are found in the Interface Card OL* Support Guide.

PCI I/O OL* Card Methods

There are three methods for performing OL* operations on PCI I/O cards.

`pdweb`	The Peripheral Device Tool (pdweb) Web-based method of performing OL*.
`olrad`	The command line method of performing OL*.
Attention Button	The hardware system slot based method of performing OL*.

Prerequisites for Adding a PCI I/O Card Using the Attention Button The prerequisites for this procedure are as follows:

- Drivers for the card have already been installed.
- There are no drivers associated with the slot.
- The green power LED is steady Off. Should the empty slot be on, 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.
- For details on card installation, see the host bus adapter (HBA) documentation.

- To determine the status of all the PCI I/O slots, run the `olrad -q` command.
- 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, obtain a copy of the interface card guide.

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

To install a PCI I/O card, follow these procedures:

1. Remove the top cover.
2. Remove the PCI bulkhead filler panel.
3. Flip the PCI gate for the card slot to the open position. See Figure 3-2.
4. Install the new PCI card in the slot.

NOTE: To properly seat the card into the backplane, use a slow, firm pressure.

5. Flip the PCI gate for the card slot to the closed position.

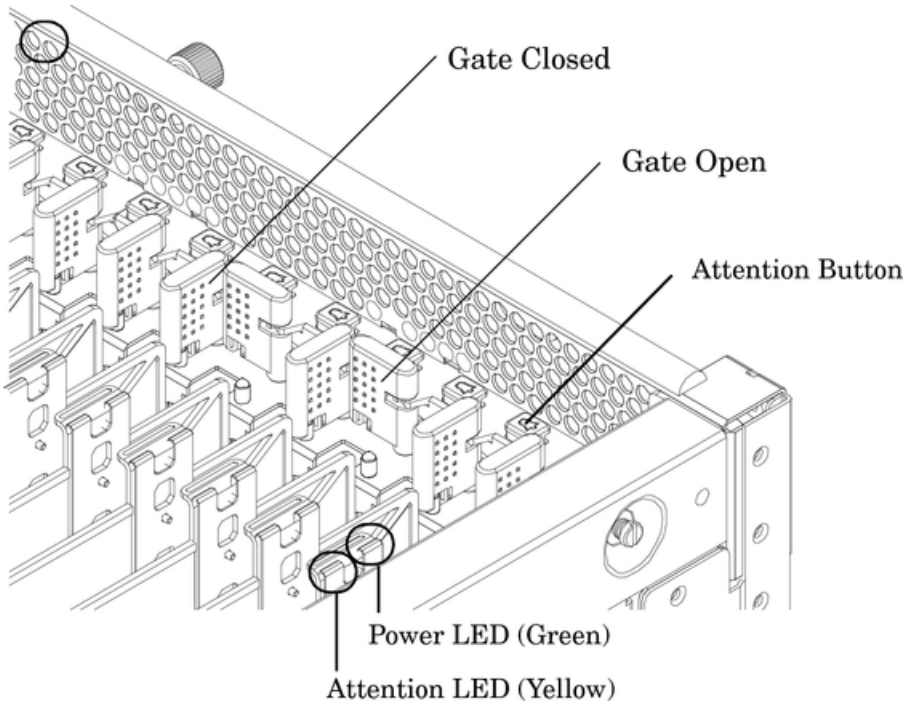
CAUTION: Working out of sequence or not completing the actions within each step could cause the system to crash.

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

6. Press the attention button.

   The green power LED starts to blink.

Figure 3-2 PCI I/O Slot Details



7. Wait for the green power LED to stop blinking and turn on solid.
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 very restrictive and the action will not complete–it will fail–to protect critical resources from being impacted. For finer control over CRA actions use `pdweb` or the `olrad`

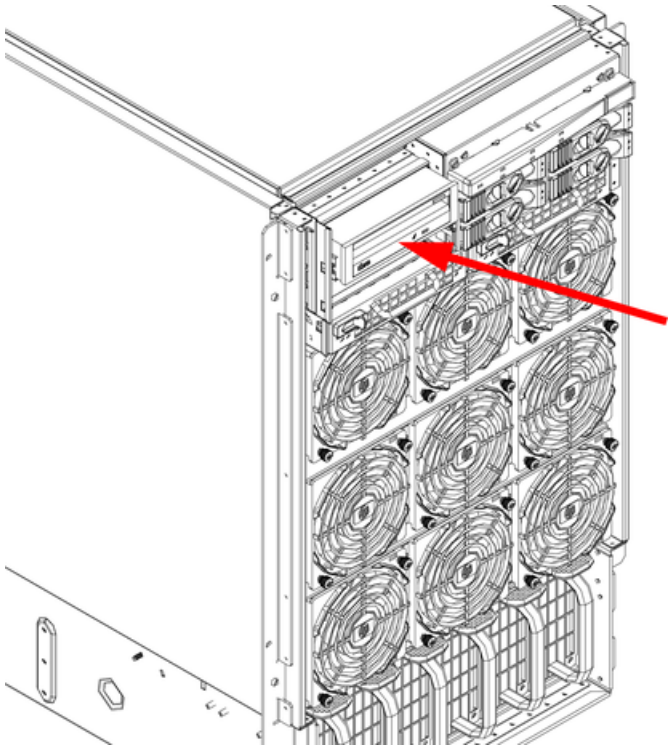
command. For details, see the Interface Card OL* Support Guide located on the HP website at **http://hp.com**.

9. Replace the top cover.
10. Connect all cables to the installed PCI card.

DVD+RW Installation Instructions

The CD/DVD/DAT is located in the front of the chassis. The system power to this component must be removed before attempting to remove or replace it.

Figure 3-3 Removable Media Bay Location



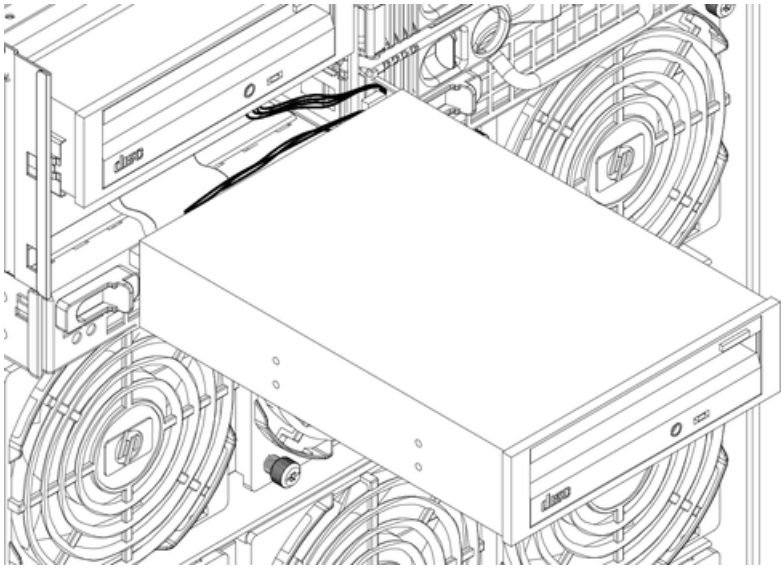
To install the DVD+RW drive, follow these steps:

1. Remove the front bezel and top cover. See "Removing the Front Bezel" (page 111), and "Removing the Top Cover" (page 45).
2. Remove the drive bay blank or removable media drive.

NOTE: You must remove the upper removable media drive to access the lower removable media drive.

3. Remove the DVD+RW drive from package.
4. Install the side rails onto the drive.
5. Connect the removable media bay power cable to the loose end of the Y power cable on the DVD+RW assembly. Ensure that the mating connector pair passes through the ruggedizer.
6. Route the removable media bay power cable into the ruggedizer cable clip.
7. Connect the SCSI cable to the DVD+RW dive. Ensure that the power cable passes over the top of the SCSI cable.
8. Slide the DVD+RW drive and cable into the removable media drive bay. Push the drive until it is fully seated in the bay.

Figure 3-4 Positioning DVD+RW drive in media bay



9. Replace the front bezel and top cover. See "Replacing the Front Bezel" (page 111), and "Installing the Top Cover" (page 46).
10. Power on the server.
11. Boot the operating system. See "Powering On the System" (page 107).
12. Install the appropriate device drivers. Use the installation instructions that come packaged with the drive to install device drivers.

4 Cabling and Power Up

After the server has been unpacked and moved into position, you must connect it to an AC power source. Before the server is powered on, you must check the AC power for the proper voltage.

Voltage Check

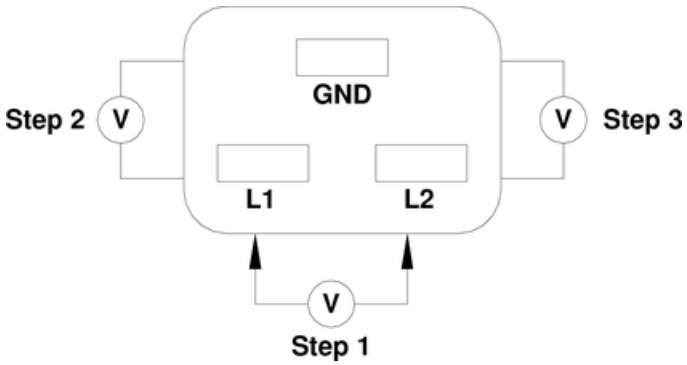
This section provides voltage check information for use on the customer site. The emphasis is on measuring the voltages at the power cord plug end specified as an IEC-320 C19 type plug. This is the end that plugs directly into the back of the server cabinet.

NOTE: You need to perform these procedures for each power cord to be plugged into the back of the server cabinet. If the expected results from this procedure are not observed during the voltage check, see "Voltage Check (Additional Procedure)" (page 59).

Voltage Range Verification of Receptacle

This measures the voltage between L1 and L2, L1 to ground, and L2 to ground. Three separate measurements are performed during this procedure. For voltage reference points when performing the following measurements, see Figure 4-1.

Figure 4-1 Voltage Reference Points for IEC-320 C19 Plug



IMPORTANT: These measurements must be performed for every power cord that plugs into the server.

To check the voltage, follow these steps:

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 VAC regardless of the geographic region.
2. Measure the voltage between L1 and ground. In North America, verify this voltage is between 100–120 VAC. In Europe and certain parts of Asia-Pacific, verify this voltage is between 200–240 VAC.
3. Measure the voltage between L2 and ground. In North America, verify this voltage is between 100–120 VAC. In Europe and certain parts of Asia-Pacific, verify this voltage is 0 (zero) VAC.

Table 4-1 provides single phase voltage measurement examples dependent on the geographic region where these measurements are taken.

Table 4-1 Single Phase Voltage Examples

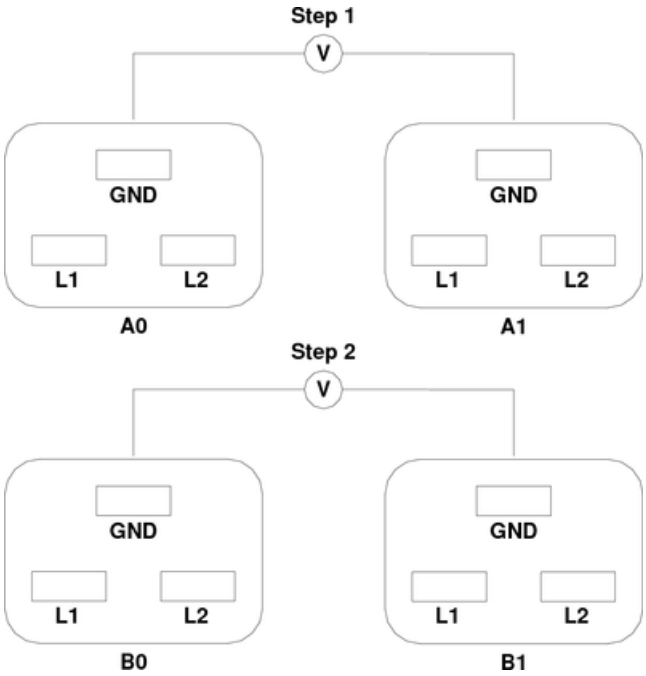
	Japan	North America	Europe[1]
L1-L2	210V	208V or 240V	230V
L1-GND	105V	120V	230V
L2-GND	105V	120V	0V

1 In some European countries there may not be a polarization.

Safety Ground Verification (Single Power Source)

This procedure measures the voltage level between A0 and A1. The voltage level between B0 and B1 will also be verified. All measurements will be taken between ground pins. For ground reference points when performing these measurements, see Figure 4-2.

Figure 4-2 Safety Ground Reference Check - Single Power Source



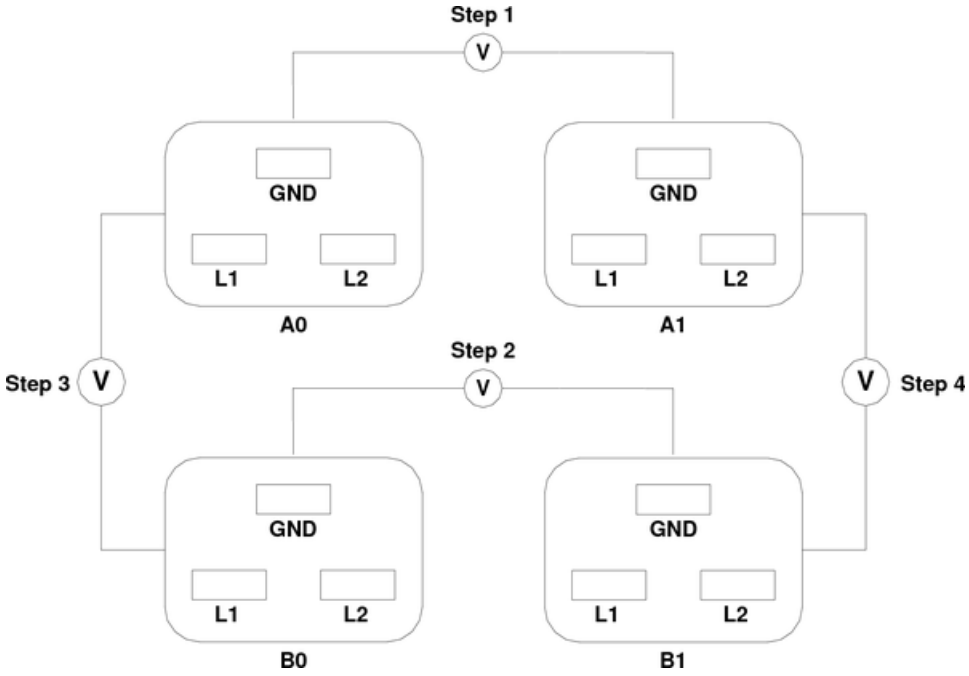
To verify single power source safety ground voltage levels, follow these steps:

1. Measure the voltage between A0 and A1. Take the AC voltage down to the lowest scale on the volt meter. Insert one probe into the ground pin for A0. Insert the other probe into the ground pin for A1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the server cabinet.
2. Measure the voltage between B0 and B1. Take the AC voltage down to the lowest scale on the volt meter. One probe will be inserted into the ground pin for B0. The other probe will be inserted into the ground pin for B1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the server cabinet.

Safety Ground Verification (Dual Power Source)

This procedure measures the voltage level between A0 and A1, between B0 and B1, between A0 and B0, and between A1 and B1. All measurements will be taken between ground pins. For ground reference points when performing these measurements, see Figure 4-3.

Figure 4-3 Safety Ground Reference Check - Dual Power Source



To verify dual power source safety ground voltage levels, follow these steps:

1. Measure the voltage between A0 and A1. Take the AC voltage down to the lowest scale on the volt meter. Insert one probe into the ground pin for A0. Insert the other probe into the ground pin for A1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the server cabinet.
2. Measure the voltage between B0 and B1. Take the AC voltage down to the lowest scale on the volt meter. Insert one probe into the ground pin for B0. Insert the other probe into the ground pin for B1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the server cabinet.
3. Measure the voltage between A0 and B0. Take the AC voltage down to the lowest scale on the volt meter. Insert one probe into the ground pin for A0. Insert the other probe into the ground pin for B0. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the server cabinet.
4. Measure the voltage between A1 and B1. Take the AC voltage down to the lowest scale on the volt meter. Insert one probe into the ground pin for A1. Insert the other probe into the ground pin for B1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords 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.

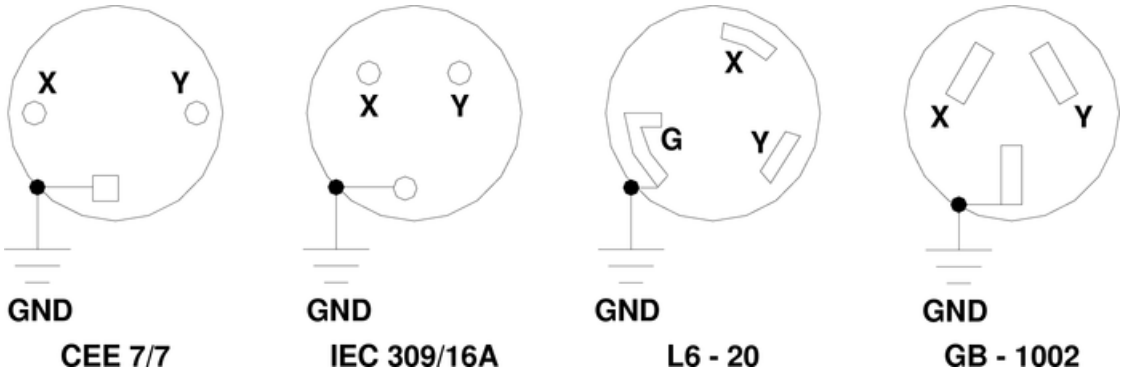
Perform this procedure if the previous voltage check procedure did not yield the expected results as previously outlined.

NOTE: If a UPS is used, refer to applicable UPS documentation for information on connecting the server and checking the UPS output voltage. UPS User Manual documentation is shipped with the UPS. Documentation may also be found at http://www.hp.com/racksolutions

To check the voltage, follow these steps:

1. Verify that site power is off.
2. Open the site circuit breakers.
3. Verify that the receptacle ground connector is connected to ground. Refer to Figure 4-4 for connector details.
4. Set the site power circuit breaker to on.

Figure 4-4 Wall Receptacle Pinouts



5. Verify that the voltage between receptacle pins x and y is between 200–240 VAC.
6. Set the site power circuit breaker to off.
7. Ensure that power is removed from the server.
8. Route and connect the server power connector to the site power receptacle.
   - For locking type receptacles, line up the key on the plug with the groove in the receptacle.
   - 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.

9. Set the site power circuit breaker to on.

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.

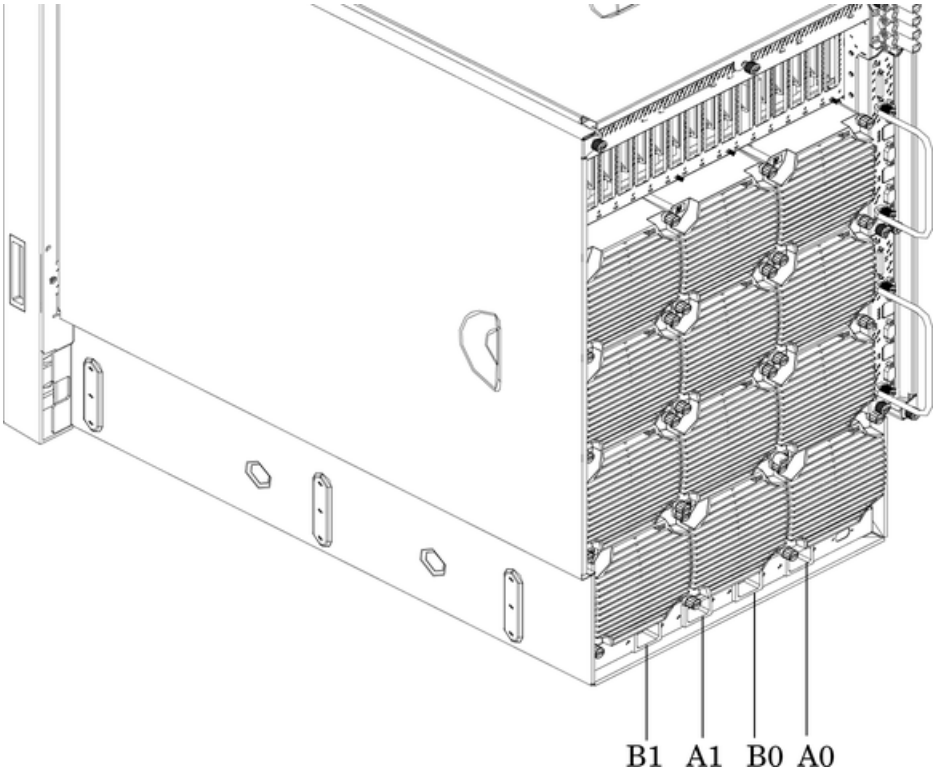
10. Set the server power to on.
11. Check that the indicator light on each power supply is lit.

Connecting AC Input Power

The server can receive AC input from two different AC power sources. If two separate power sources are available, each source can be plugged into the server, 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. For the AC power input label scheme, see Figure 4-5.

IMPORTANT: When running the server with a single power source, you must use A0 and A1. Selecting redundant power requires all four power cords to be connected to A0-A1-B0-B1.

Figure 4-5 AC Power Input Labeling

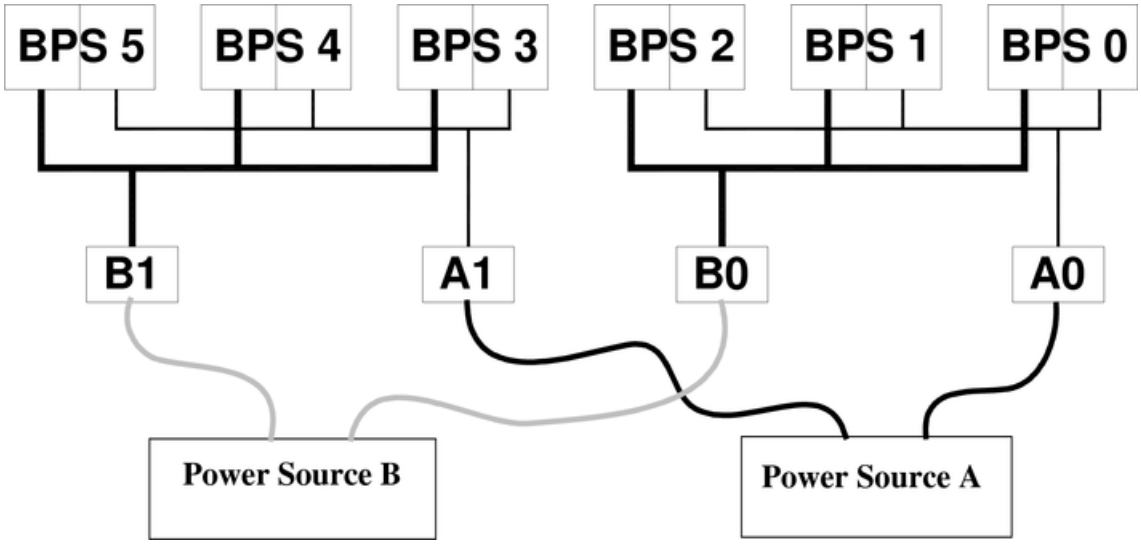


The power distribution for the Bulk Power Supplies is as follows:

- 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, see Figure 4-6.

Figure 4-6 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, you must remove all power cords from the server. Failure to can 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 that the data and power cables should be apart 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 exist, which can cause data corruption.

The server can accommodate a total of six BPSs. N+1 BPS capability describes the server having adequate BPSs plus one additional module installed. If one BPS fails, adequate power will still be supplied to the cell board(s) to keep the server partition(s) 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. This minimum configuration is not N+1 capable. For BPS-to-cell-board N+1 configurations, see Table 4-2.

IMPORTANT: The minimum supported N+1 BPS configuration for one cell board must have BPS slots 0, 1, and 3 populated. When selecting a single power source, the power cords are connected into A0 and A1.

Table 4-2 BPS to Cell Board Configuration to Achieve N+1

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

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).

Applying Power to the Server

Initial observations can be made as to the functionality of the server before attaching any LAN or serial cables, the system console, or any peripherals to the server. When an active AC power source is first applied to the server, the following observations can be made 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 flash a dim red color, the bulk power supplies 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 bulk power supplies (BPS) 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 on 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 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.

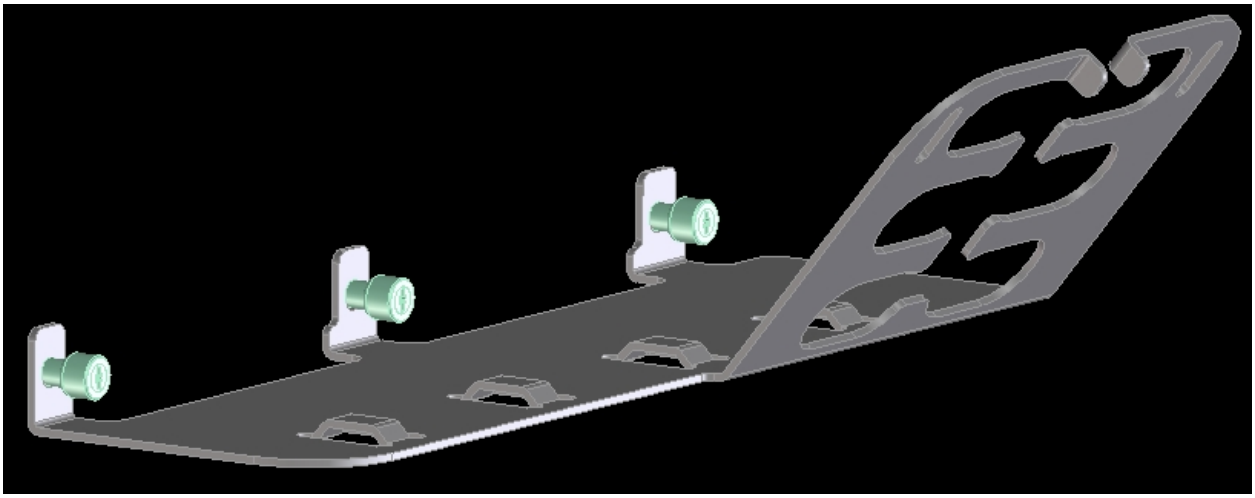
Four Cell Server Installation

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

To install the line cord anchor, follow these steps:

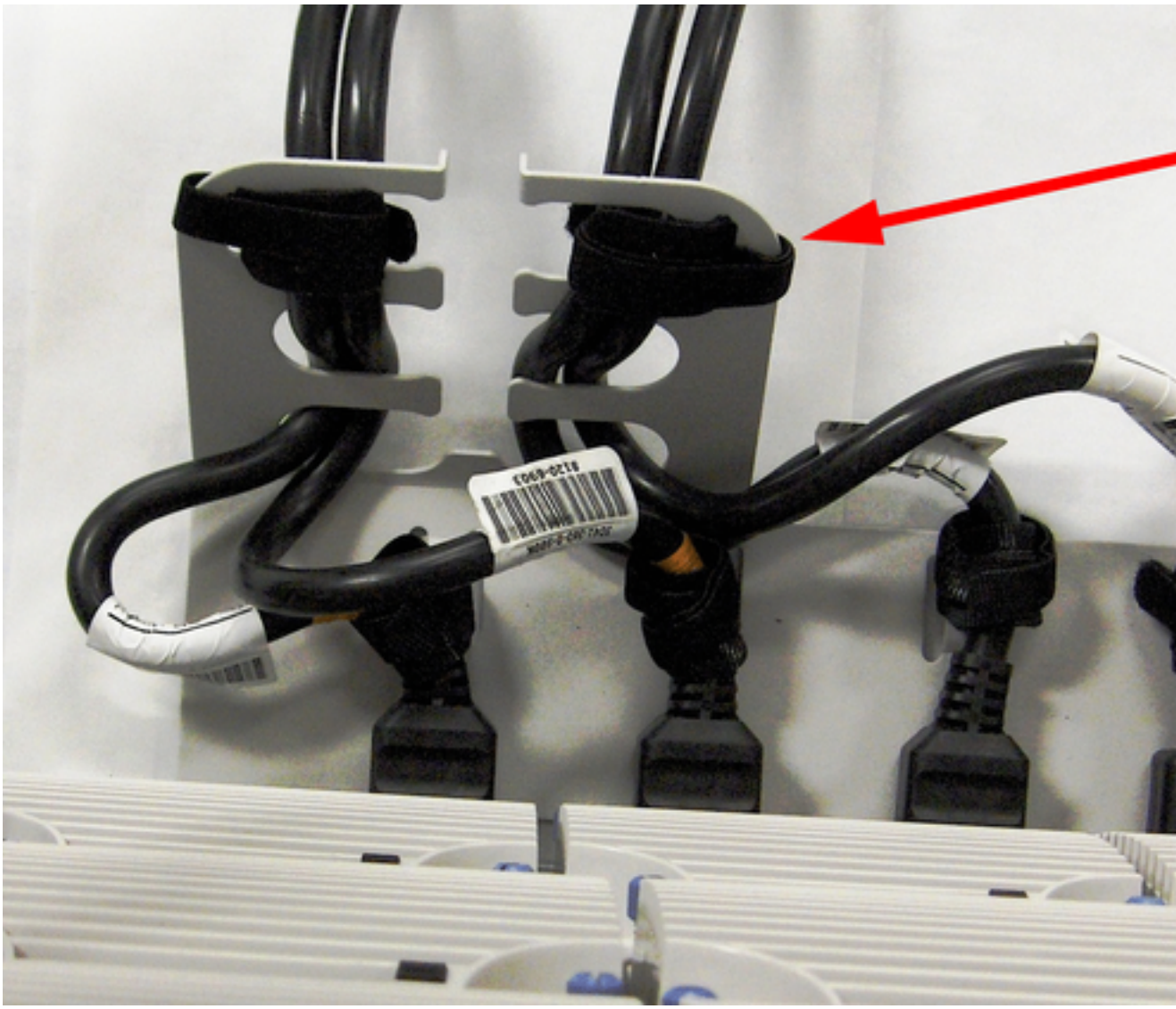
1. Align the line cord anchor thumbscrews with the corresponding captive nuts at the rear of the chassis. See Figure 4-7: “Four Cell Line Cord Anchor ”,

Figure 4-7 Four Cell Line Cord Anchor



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 hook-and-loop straps to attach the cords to the anchor. See Figure 4-8: “Line Cord Anchor and Hook-and-Loop Straps”,

Figure 4-8 Line Cord Anchor and Hook-and-Loop Straps



MP Core I/O Connections

Each HP Integrity rx8620 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 allows for 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.

The core I/O board is used 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 Ultra3 (160MB/sec) 68-pin SCSI port for connection to external SCSI devices by a very 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.
- Three RS-232 connectors provide connections for a local console, remote console, and a UPS.

  UPS port—A system serial port for connection to a UPS or another system application. The port is located near the top of the core I/O card near the external SCSI connector when the card is installed in the server chassis.

  Remote console port—A remote serial port for connection to a modem. The port is located in the middle of the three RS-232 connectors.

  Local console port—A local serial port for connection to a terminal. The port is located at the bottom of the core I/O card when the card is installed in the server chassis.

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

- Three single ended (SE) internal SCSI buses for internal devices. These buses are routed to the system board where they are cabled to a mass storage backplane.

Setting Up the CE Tool (PC)

The CE Tool is usually on a laptop. It enables 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

Communication with the MP is established 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 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:

1. From the Reflection 1 Main screen, pull down the **Connection** menu and select **Connection Setup**.
2. Select **Serial Port**.
3. Select **Com1**.
4. Check the settings and change, if required.

   Go to More Settings to set Xon/Xoff.
5. To close the More Settings window, click **OK**.
6. To close the Connection Setup window, click **OK**.
7. Pull down the **Setup** menu and select **Terminal** (under the **Emulation** tab).

8. Select the **VT100 HP** terminal type.
9. Click **Apply**.

   This option is not highlighted if the terminal type you want is already selected.
10. Click **OK**.

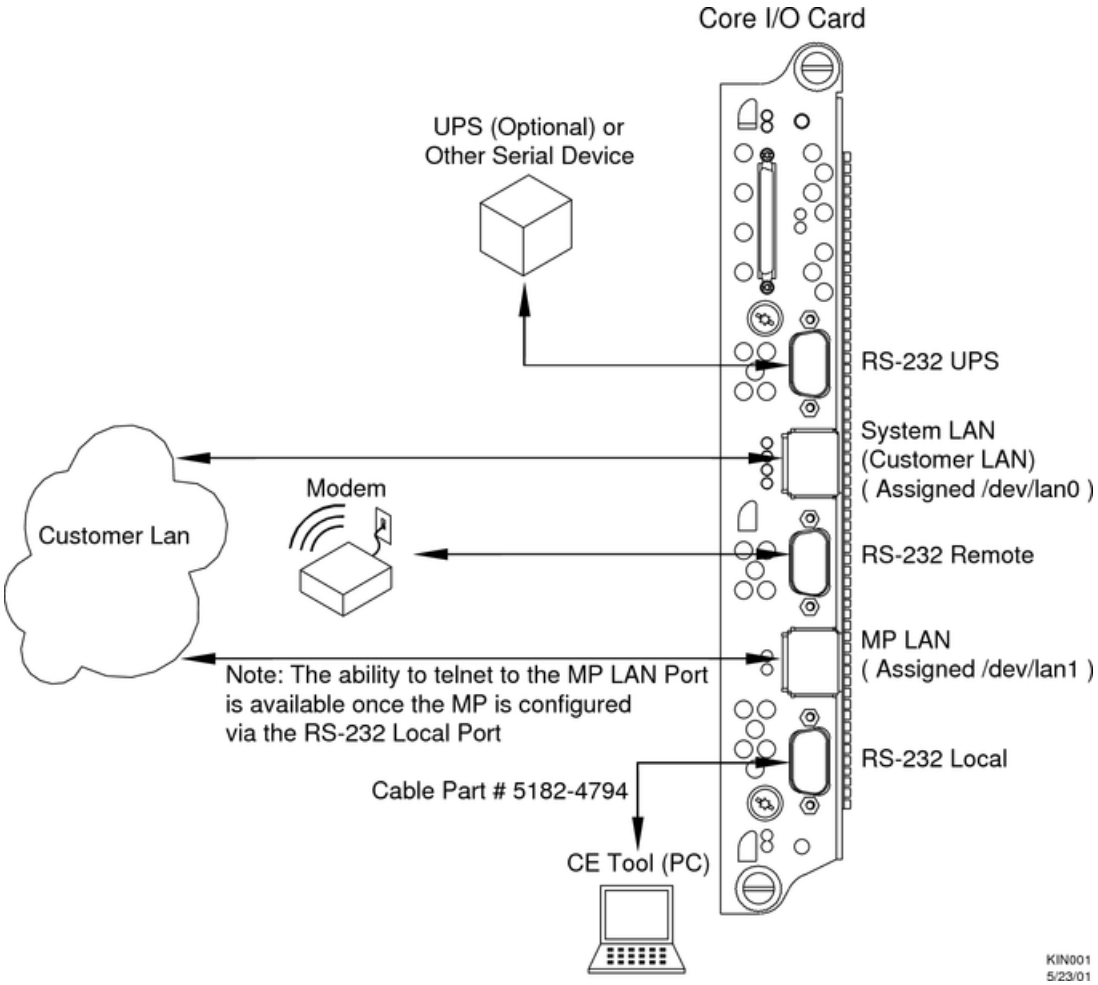
Connecting the CE Tool to the Local RS-232 Port on the MP

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 any partition.

To connect the CE Tool to the local RS-232 port on the MP, follow these steps:

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

Figure 4-9 LAN and RS-232 Connectors on the Core I/O Board



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 enables 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:

1. Verify that the AC voltage at the input source is within specifications for each server cabinet being installed.
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, follow these steps:

1. Apply power to the server cabinet.

   Apply power to any other server cabinets that were shipped to the customer site.

   On the front of the server, a solid green **Standby Power**, and a solid green **MP Present** light will illuminate after about 30 seconds.

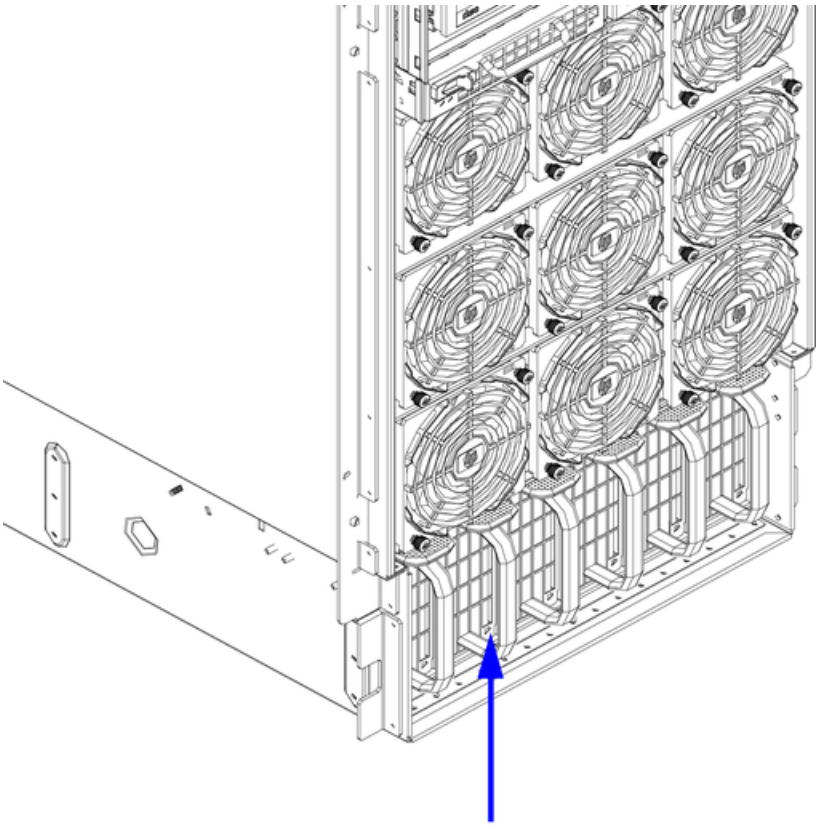
Figure 4-10 Front Panel Display

2. Check the bulk power supply (BPS) LED for each BPS. See Figure 4-11 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. Note the BPS LEDs will be flashing amber.
   - After 30 seconds have elapsed. Note the flashing amber BPS LED for each BPS becomes a flashing green LED.

Figure 4-11 BPS LED Location



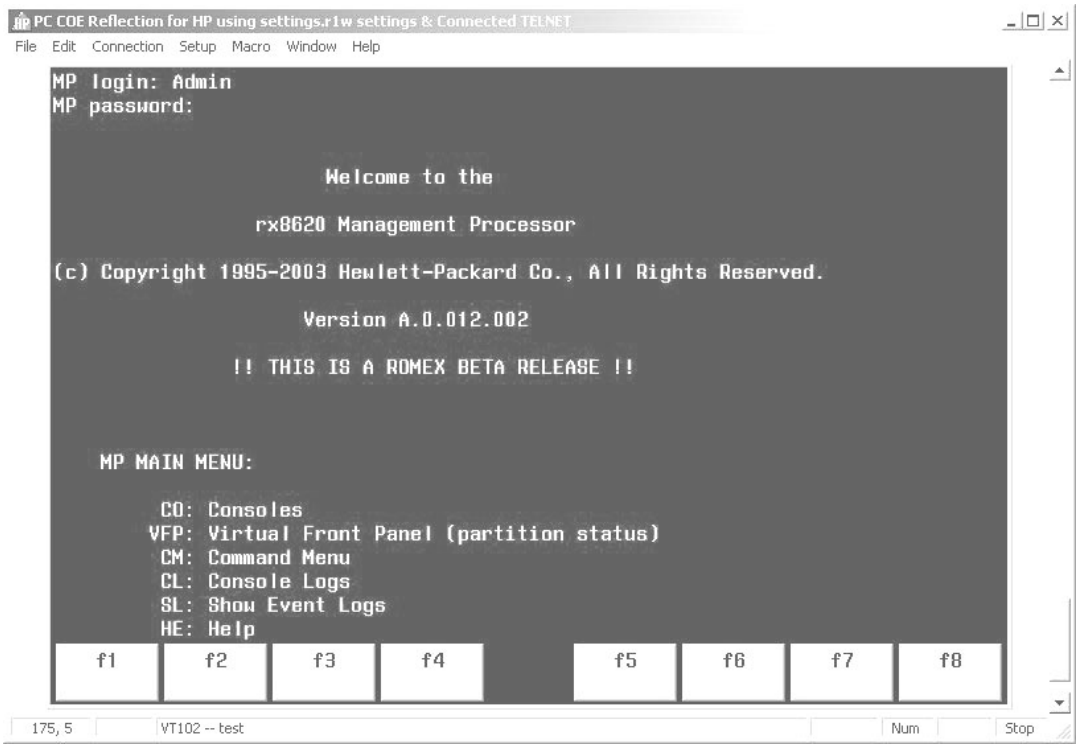
3. Log in to the MP:
   a. Enter **Admin** at the login prompt. (This term is case-sensitive.)

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

   b. Enter **Admin** at the password prompt. (This term is case-sensitive.)

      The MP Main Menu displays:

Figure 4-12 MP Main Menu



Configuring LAN Information for the MP

This section describes how to set and verify the server 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, follow these steps:

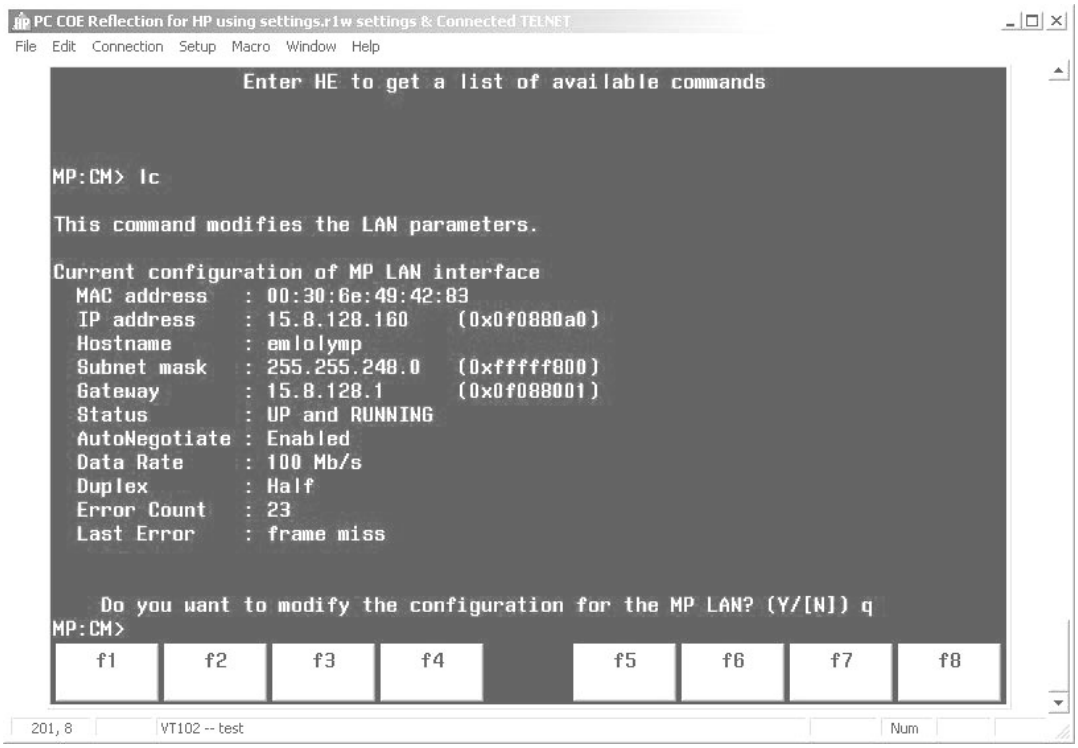
1. At the MP Main Menu prompt (`MP>`), enter **cm**. From the MP Command Menu prompt (`MP:CM>`), enter **lc** (for LAN configuration).

   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, as it may be required for future troubleshooting.

NOTE: If the Command Menu is not shown, enter **q** to return to the MP Main Menu, then enter **cm**.

2. Enter **lc** and press the **Return** key. The following screen displays:

Figure 4-13 The lc Command Screen



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

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])*

4. Enter **y**.
5. Enter the new IP address.

   The customer provides this address for network interface 0.

6. Confirm the new address.
7. Enter the MP Hostname.

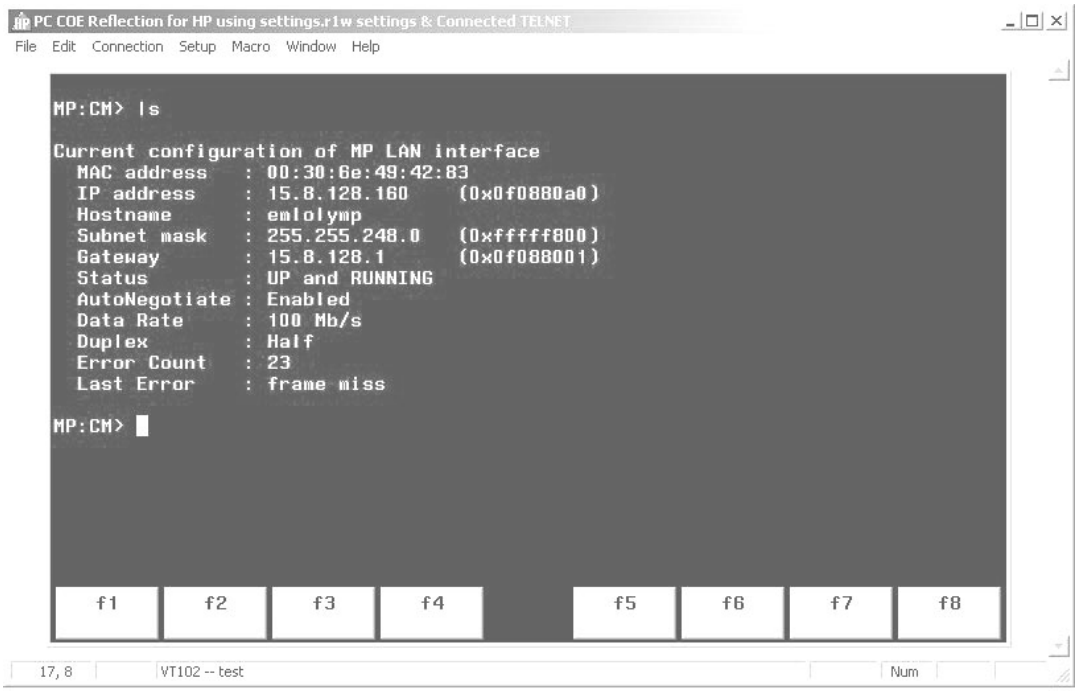
   This is the hostname for the customer LAN. The name can be as many as 64 characters, and include alpha numerics, - (dash), _ (under bar), . (period), or a space. It is recommended that the name be a derivative of the complex name. For example, Acme.com_MP.

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

   This information comes from the customer.

9. When step 7 completes, the server indicates the parameters updated, and returns to the MP Command Menu prompt (`MP:CM>`)
10. To check the LAN parameters and status, enter `ls` at the MP Command Menu prompt (`MP:CM>`).
11. A screen similar to the following displays enabling verification of the settings:

Figure 4-14 The ls Command Screen



12. To return to the MP main menu, enter **ma**.
13. To exit the MP, enter **x** at the MP main menu.

Accessing the Management Processor Using a Web Browser

Web browser access is an embedded feature of the management processor (MP). The web browser enables access to the server through 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, the following information is required:

- IP address for the MP LAN
- Subnet mask
- Gateway address
- Hostname (used when messages are logged or printed)

To configure the LAN port for a web browser, follow these steps:

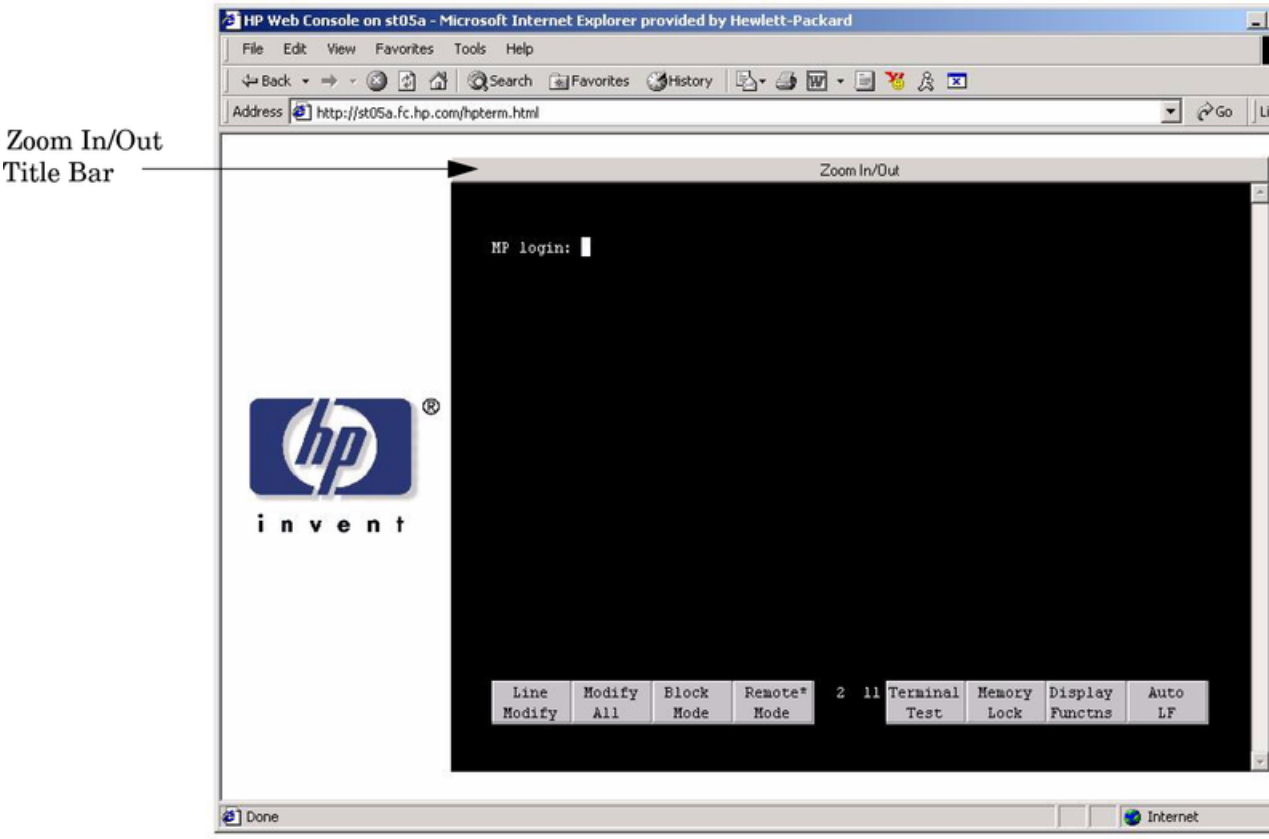
1. Connect to the MP using a serial connection.
2. Configure the MP LAN. See "Configuring LAN Information for the MP".
3. To enter the Command Menu, enter **CM**.
4. To display and set MP remote access, enter **SA** at the `MP:CM>` prompt.

Figure 4-15 Example sa Command

```
MP:CM> sa

This command displays and allows modification of access parameters.

    T - Telnet access           : Enabled.
    M - Modem access            : Enabled.
    W - Web Console             : Enabled (SSL NOT active).
    N - Network Diagnostics     : Disabled.
    I - IPMI Lan access         : Disabled.

    Select access mode to change : w

    The following options are available for Web access:
          1 - Web access disabled
          2 - Web access enabled
          3 - Secure web access enabled
    Select option:
```

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

Figure 4-16 Browser Window



6. To generate a full screen MP window, click anywhere on the Zoom In/Out title bar.
7. Select the emulation type you want to use.
8. Login to the MP when the login window appears.

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

Verifying the Cell Boards

To perform this activity, either connect to the 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 do not boot.

To determine if the MP detects the cell boards, follow these steps:

1. At the MP prompt, enter **cm**.

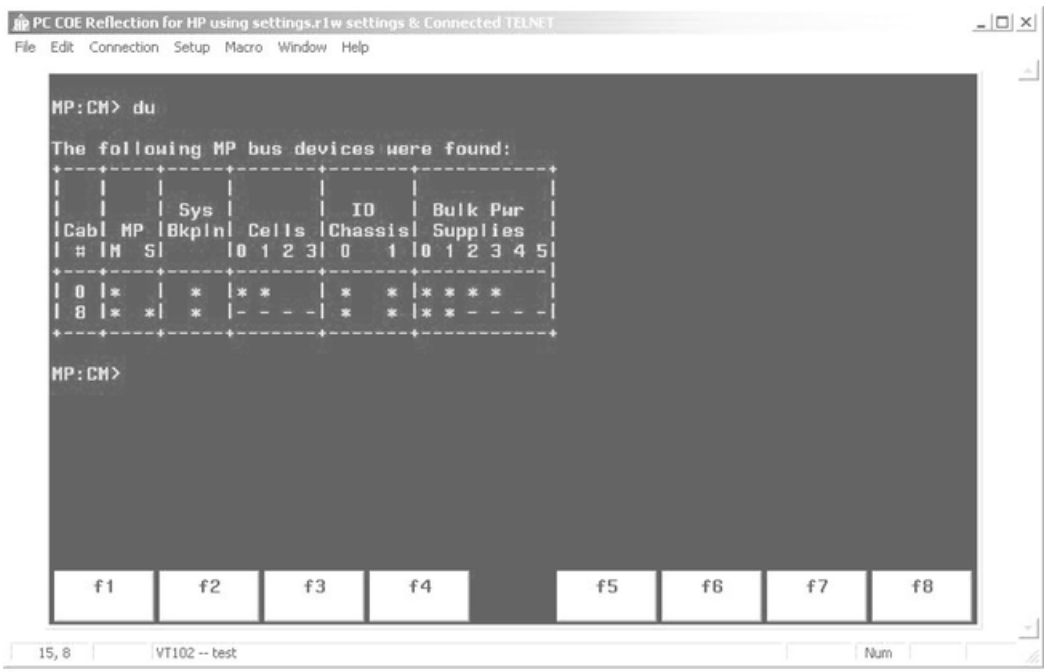
   This displays the Command Menu. Among other things, the Command Menu enables you to view or modify the configuration and look at utilities controlled by the MP.

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

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

   The du command displays the MP Bus topology. A screen similar to the following displays:

   Figure 4-17 The du Command Screen



   There is an asterisk *(*)* in the column marked *MP*.

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 4-17 shows that cells are installed in slots 0 and 1 in cabinet 0. In the server cabinet, there should be cells physically located in slots 0 and 1.

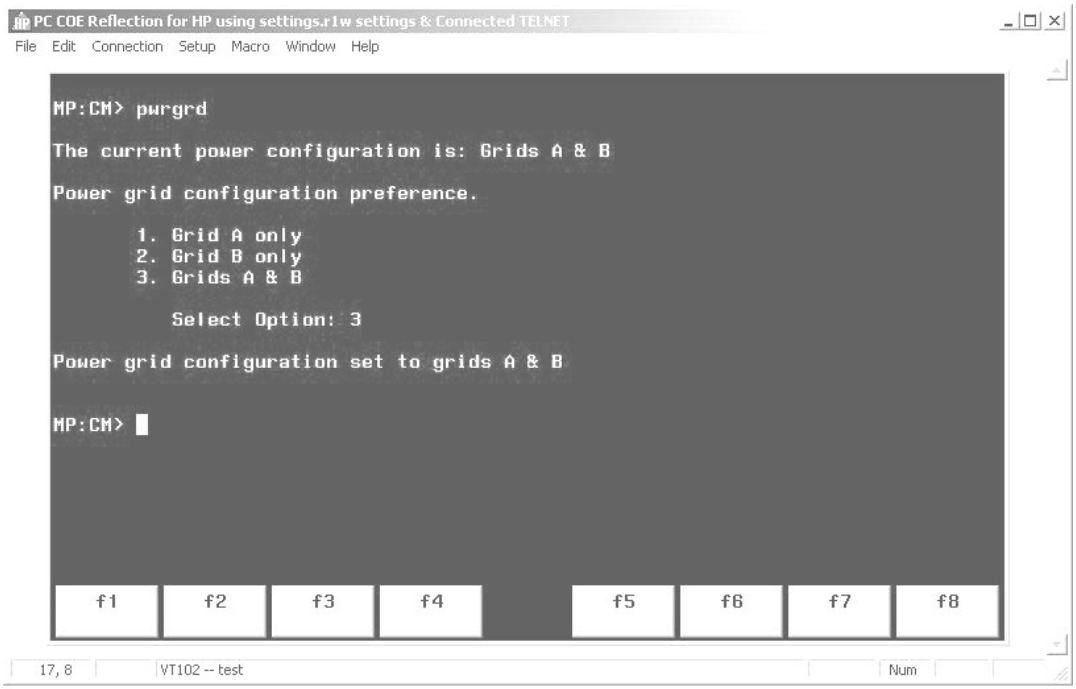
Configuring AC Line Status

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.

Selecting the *Grid A only* option directs the MP utilities to sense locations A0 and A1 for active power. Selecting the *Grid B only* option directs the MP utilities to sense locations B0 and B1 for active power. Selecting the *Grids A & B* option directs the MP utilities to sense active power at locations A0-A1-B0-B1.

1. At the MP prompt, enter **cm**. This displays the command menu and enables viewing and configuring various utilities controlled by the MP.
2. From the command prompt (`MP:CM>`), enter **pwrgrd**. The `pwrgrd` command displays the current power configuration. You can also use this command to change the power grid configuration. A screen similar to the following displays:

Figure 4-18 The pwrgrd Command Screen



3. Verify that the power grid configuration is correct by examining the output from the `pwrgrd` command. The preceding power configuration indicates that both *Grids A & B* have been configured.
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 **Enter**. After you enter the value, the MP responds and indicates the change has taken effect.

Selecting the System Console

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.

1. Determine the console you want to use.

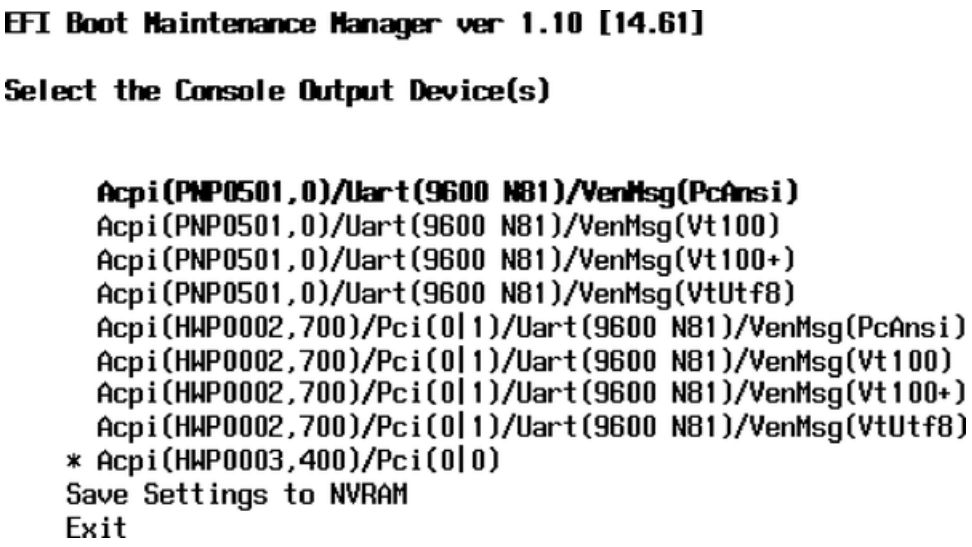
   Depending on your operating system and your hardware you can select one of several possible devices as your system console. The possibilities are:

   - System Serial Port
   - MP Serial Port
   - VGA device

   To determine which console types are supported on your system, see your operating system and hardware documentation.

2. Use the EFI menus and select the appropriate console device (deselect unused devices):
   a. Choose the Boot Option Maintenance menu 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 display for each menu selection. Figure 4-19 shows a typical output of selecting the `Console Output Devices` menu.

Figure 4-19 Console Output Device menu



   d. Choose the correct device for your system and deselect others. For details about choosing the appropriate device, see "Interface Differences Between Itanium-based Systems".
   e. To complete the change, select `Save Settings to NVRAM`, and `Exit`.
   f. You must perform a system reset 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 is a VGA device. If you require a VGA console, choose the device and unmark all others. Figure 4-19 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.

MP Consoles

Any device containing both a Uart and Pci section in its path are MP serial ports. To use the MP as your console device, select the MP serial device entry that matches your console type (PcAnsi, Vt100, Vt100+, VtUtf8) and deselect everything else.

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.

Booting the HP Integrity rx8620 Server

You can power the server on by either pressing the power switch on the front panel, or by using the `PE` command at the MP command menu.

If 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:

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

  To display activity for the complex, follow these steps:

  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.
- A window showing activity for a single partition.

  To display activity for each partition as it powers up:

  1. Open a separate Reflection window and connect to the MP.
  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: More than one window cannot be opened using a serial display device.

To power on the server, follow these steps:

1. If there is a Server Expansion Unit attached to the server, both the server and the SEU power switch needs to be pressed. Alternatively, at the `MP:CM>` prompt, the PE **`X`** command can be used to power on the complex or the PE **`T`** command can be used 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.
2. Once the cell has joined the partition or once boot is blocked (BIB) displays at the virtual front panel (VFP), return to the MP Main Menu by entering **`Ctrl-B`**.
3. To enter console mode, enter **`co`**.
4. Enter the partition number of the partition to boot.
5. Press **Enter**.

Selecting a Boot Partition Using the Management Processor

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.

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

Exiting the MP automatically returns you 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**. Entering **help** lists 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 Instant Ignition was ordered, HP-UX was installed in the factory at the Primary Path address. If HP-UX is at a path other than the Primary Path, follow these steps:

1. To access the Command Menu from the Main Menu, enter **cm**.
2. Select a partition to boot. To boot the selected partition, enter**bo** at the `MP:CM>` prompt.
3. To return to the Main Menu, enter **ma**.
4. From the Main Menu, to go to the Consoles menu, enter **co**. Select the partition number.
5. To go back to the Main Menu, enter **ctrl+b**.
6. Once at the EFI Shell prompt, select the file system to boot. Generally this is “fs0”.

   Shell> **fso:**
7. At the fs0 prompt, enter **HPUX** to boot the HP-UX operating system.

   fso:\> **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 with Instant Capacity On Demand (iCOD)

The Instant Capacity On Demand (iCOD) 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, iCOD systems physically have more CPUs, called iCOD CPUs, than the number of CPUs actually purchased. These iCOD 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 iCOD processor in the system. At any time, any number of iCOD CPUs can be activated. Activating an iCOD CPU automatically and instantaneously transforms the iCOD CPU into an instantly ordered and fulfilled CPU upgrade that requires payment. After the iCOD CPU is activated and paid for, it is no longer an iCOD CPU, but is now an ordered and delivered CPU upgrade for the system.

The most current information on installing, configuring, and troubleshooting iCOD can be found at **http://hp.com**.

NOTE: Ensure that the customer is aware of the iCOD email requirements. For further details, see **http://hp.com**.

Using the Checklist

The following checklist is an installation aid and should be used only after you have installed several systems using the detailed procedures described in the body of this manual. This checklist is a compilation of the tasks described in this manual, and is organized as follows:

PROCEDURES The procedures outlined in this document in order.

IN-PROCESS The portion of the checklist that enables 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**, sub tasks are indented.

Table 4-3 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 SPU 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				

Table 4-3 Factory-Integrated Installation Checklist *(continued)*

PROCEDURE		IN-PROCESS		COMPLETED	
Remove and dispose of packaging material					
Move cabinet(s) and equipment to computer room					
Move cabinets into final position					
	Position cabinets next to each other (approx. 1/2 inch)				
	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). See Appendix B.					
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)					

Table 4-3 Factory-Integrated Installation Checklist *(continued)*

PROCEDURE	IN-PROCESS		COMPLETED	
Perform visual inspection and complete installation				
Set up network services (if required)				
Enable iCOD (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)				

5 Troubleshooting

This chapter contains information about the various status LEDs on the HP Integrity rx8620 server, and other troubleshooting information.

Common Installation Problems

The following sections contain general procedures to help you locate installation problems.

CAUTION: Do not operate the server with the top cover removed for an extended period of time. Overheating can damage chips, boards, and mass storage devices. However, you can safely remove the top cover while the server is running to remove and replace PCI hot-pluggable cards.

Most problems are the result of incorrect system and SCSI subsystem configurations.

To troubleshoot an installation problem, follow these steps:

1. Check all cable and power connections, including those in the rack, and so on.
2. Ensure the server is configured properly.
3. Verify all cables and boards are securely plugged into the appropriate connectors or slots.
4. Remove all extra options, such as disk drives, one at a time, checking its affect on the server.
5. Unplug the power cords, wait 20 seconds, plug the power cords in again, and restart the server.
6. If you suspect a hardware error:
   a. Log users off the LAN and power off the server.
   b. Simplify the server to the minimum configuration.
7. Remove all third-party options, and reinstall each of them one at a time, checking the server after each installation.
8. Boot the server, and if it does not function properly, use the following procedures.

The Server Does Not Power On

To check for power-related problems:

1. Check the LED for each bulk power supply (BPS).

   The LED is located in the lower left-hand corner of the power supply face. Table 5-2 shows the states of the LEDs.

2. Check that the power supply and a minimum of two power cords are plugged into the chassis.

NOTE: Two power cords must be connected to A0 and A1 or B0 and B1.

3. Remove and replace any suspect BPS.

The Server Powers On But Then Shuts Down With a Fault Light

To check for the following problems when the server powers on and then off, follow these steps:

1. Check for fault LEDs and check the MP logs for errors.
2. Check that a conductive item has not been dropped or left inside the server chassis.
3. Check the connections on all boards.
4. Check the cables for bent pins.
5. Check the processors for bent pins if processors were just added and the problem has been isolated to the cell board.
6. Minimize configuration to isolate a potential bad device.

The Server Powers On But Fails Power-On Self Test

To check for the following problems when the server fails power on self test (POST), follow these steps:

1. Check for error messages on the system console.
2. Check for fault LEDs.
3. Check for error messages in the MP logs.

HP Integrity rx8620 Server LED Indicators

The server has LEDs that indicate system health. This section defines those LEDs.

Front Panel LEDs

There are seven LEDs located on the front panel.

Figure 5-1 Front Panel with LED Indicators

Table 5-1 Front Panel LEDs

LED	Driven By	State	Description
Power	GPM[1]	On Green	48 V Good (LED works even if MP is not installed, or installed and is not active)
		Off	48 V Off
Standby Power	GPM	On Green	3.3 V standby good (LED works even if MP is not installed, or installed and is not active)
		Off	3.3 V standby off
MP Present	GPM	On Green	At least one MP is installed and active
		Off	No MPs are installed or at least one is installed but not active
Remote	MP by way of GPM	On Green	Dial-in (remote) console enabled
		Off	Dial-in (remote) console is disabled, or MP not installed, or MP installed and not active
Attention	MP by way of GPM	Flash Yellow	Chassis log alert unread
		Off	No alert, or MP not installed, or MP installed and not active
Run	PDC[2]/MP by way of GPM	On Green	One or more partitions running
		Off	No partition running, or MP not installed, or MP installed and not active
Fault	PDC/MP by way of GPM	Flash Red	One or more partitions have reported a fault
		Off	No partitions running, or MP not installed, or MP installed and not active

1 GPM stands for global power monitor

2 PDC stands for processor dependent code

Bulk Power Supply LEDs

There is a single, three-color LED located on each bulk power supply.

Figure 5-2 BPS LED Location

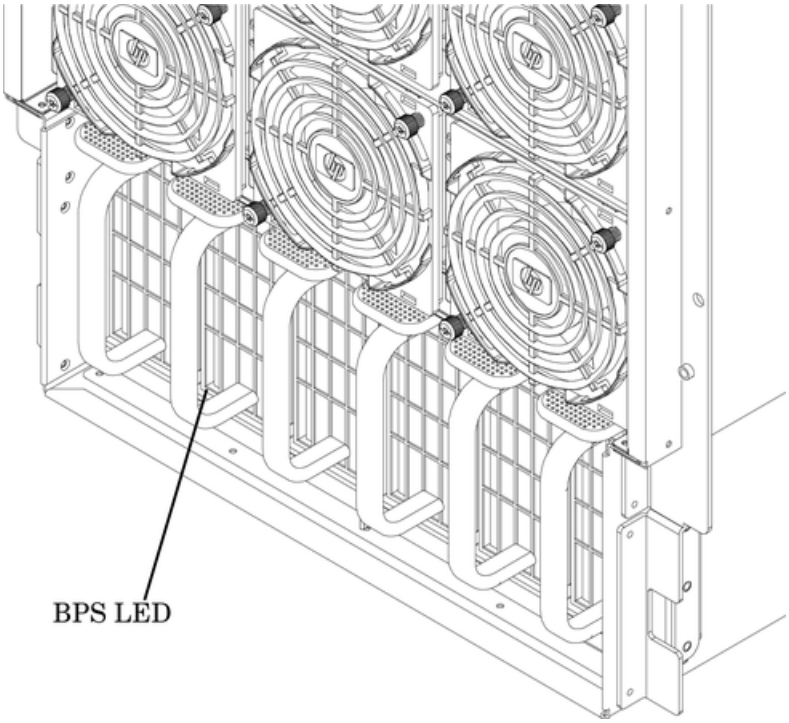


Table 5-2 BPS LEDs

LED Indication	Description
Blink Green	BPS in standby state and no faults or warnings
Green	BPS in run state (48 V output enabled) and no faults or warnings
Blink Yellow	BPS in standby or run state and warnings present but no faults
Yellow	BPS in standby state and recoverable faults present but no non-recoverable faults
Blink Red	BPS state may be unknown, non-recoverable faults present
Red	This LED state is not used
Off	BPS fault or failure, no power cords installed or no power to chassis

PCI Power Supply LEDs

There are three LEDs on the PCI power supply. The green power LED reports overall power status for the PCI power supply. The yellow attention LED is not currently used for status. The multi-colored fault LED reports faults and warnings.

Figure 5-3 PCI Power Supply LED Locations

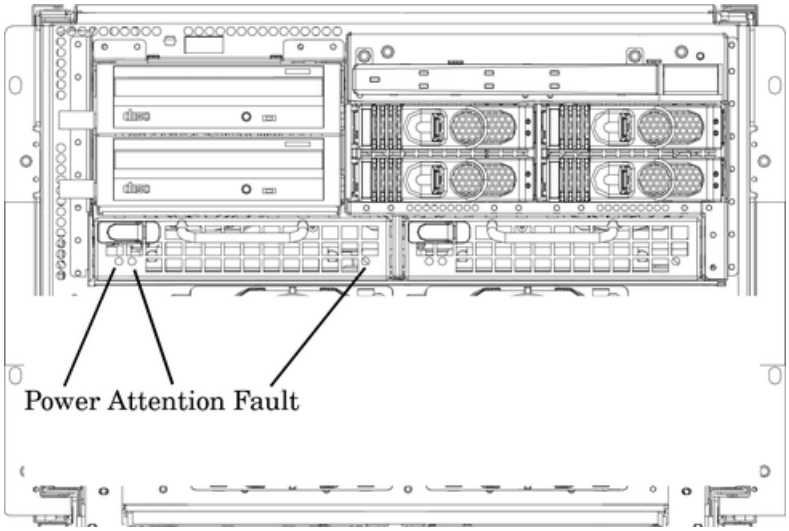


Table 5-3 PCI Power Supply LEDs

LED	Driven By	State	Description
Power	Each supply	On Green	All output voltages generated by the power supply are within limits
		Off	Power to entire system has been removed
Attention	MP through PCI LPM[1]	Yellow	Not currently used for status
Fault	Each supply	Flash Yellow	The temperature within the power supply is above the lower threshold
		On Yellow	The temperature of the power supply is approaching the thermal limit
		Flash Red	Power supply has shut down because of an over temperature condition, a failure to regulate the power within expected limits, or a current-limit condition
		Off	Normal operation

1 LPM stands for local power monitor

System and I/O Fan LEDs

There is a single, three-color LED located on the front OLR fan, the rear OLR fan and the PCI I/O fan.

Figure 5-4 Fan LED Locations

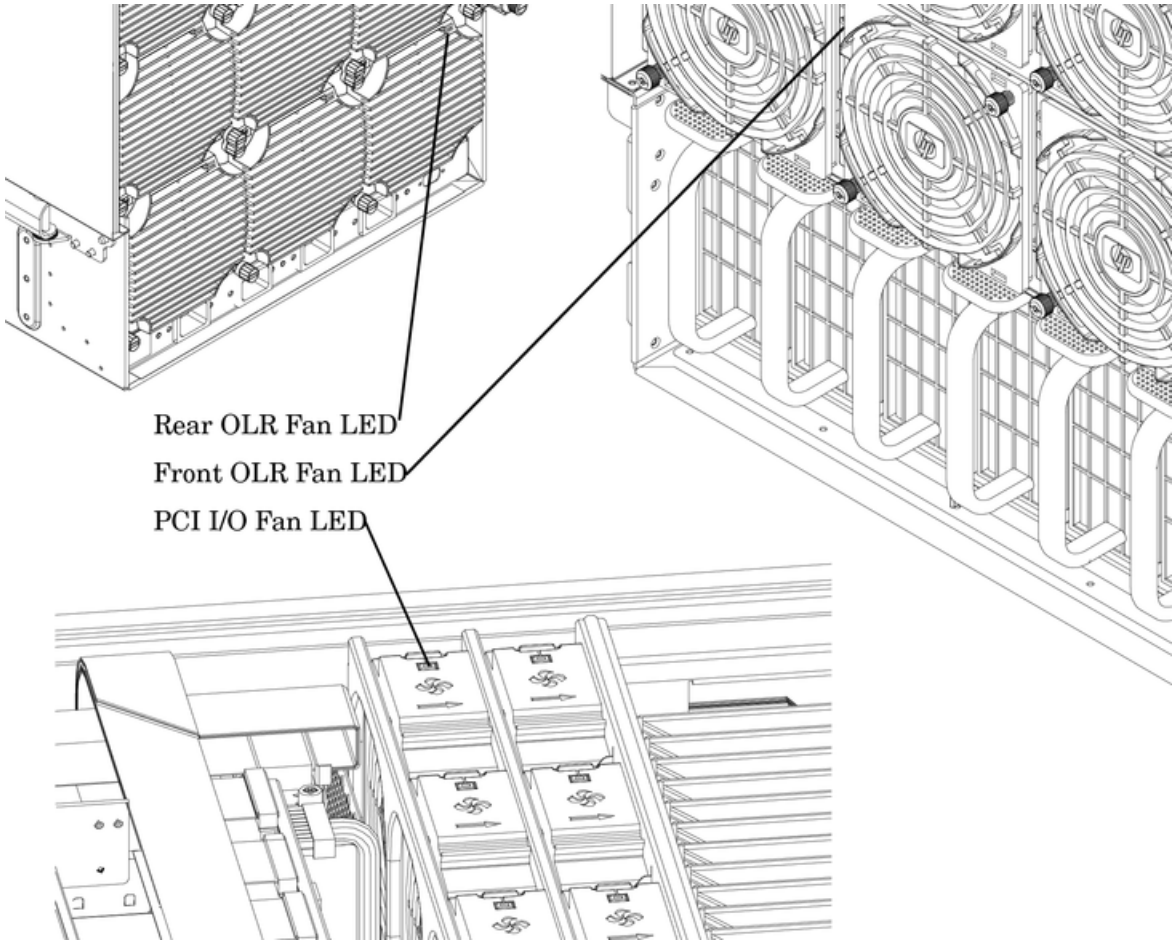


Table 5-4 Front, Rear, and I/O Fan LEDs

LED	Driven By	State	Description
Fan Status	Fan	Solid Green	Normal
		Flash Yellow	Predictive Failure
		Flash Red	Failed
		Off	No Power

OL* LEDs

Cell Board LEDs

There is one green power LED located next to each ejector on the cell board in the server that indicates the power is good. When the LED is illuminated green, power is being supplied to the cell board and it is unsafe to remove the cell board from the server.

There is one yellow attention LED located next to each ejector on the cell board in the server. When the yellow attention LED is flashing, it is safe to remove the cell board from the server.

Figure 5-5 Cell Board LED Locations

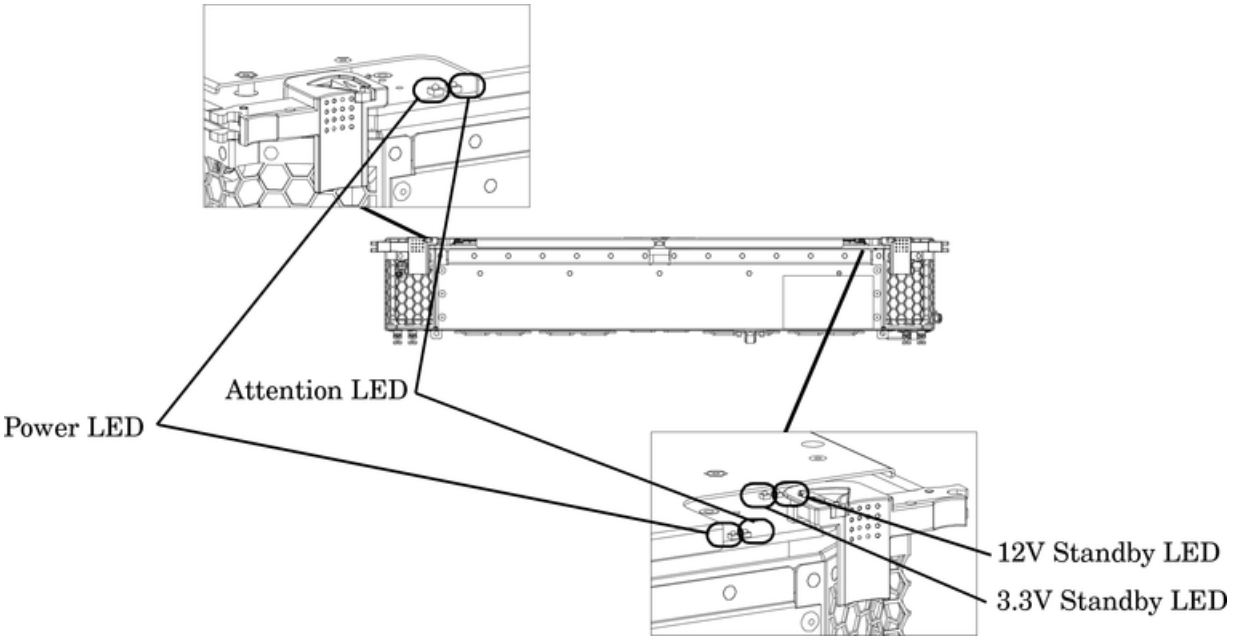


Table 5-5 Cell Board OL* LED Indicators

Location	LED	Driven by	State	Description
On cell board (located in the server cabinet)	Power	Cell LPM	On Green	3.3V Standby and Cell_Power_Good
			Off	3.3V Standby off, or 3.3V Standby on and no Cell_Power_Good
	Attention	MP through GPM	Flash Yellow	Safe to remove the cell board from the system

PCI OL* Card Divider LEDs

The PCI OL* card LEDs are located on each of the 16 PCI slot dividers in the PCI-X card cage assembly area. The green power LED indicates whether power is supplied to the card slot. The yellow attention LED states are defined in Table 5-6 in combination with whether power is being supplied to the card or not.

Figure 5-6 PCI OL* LED Locations

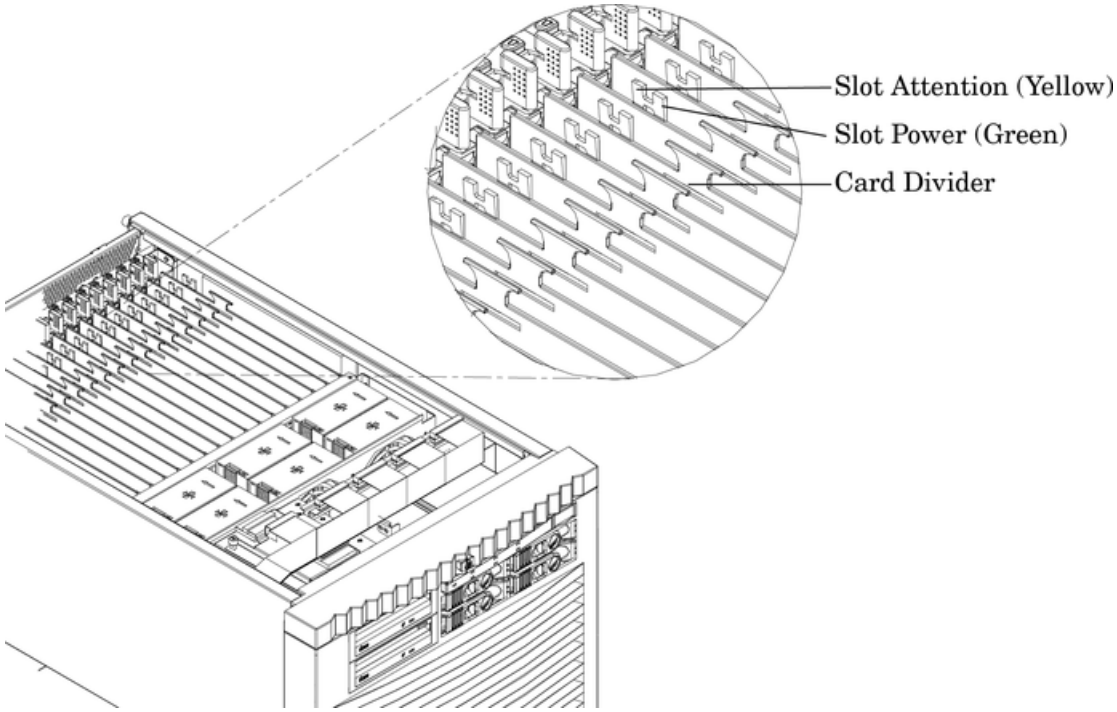


Table 5-6 OL* LED States

State	Power (Green)	Attention (Yellow)
Normal operation, slot power on	On	Off
Slot selected, slot power on	On	Flashing
Slot needs attention, slot power on	On	On
Slot available, slot power off	Off	Off
Ready for OL*, slot power off	Off	Flashing
Fault detected, slot power off	Off	On
Slot powering down or up	Flashing	Off

Core I/O LEDs

The core I/O LEDs in Table 5-7 are located on the bulkhead of the installed core I/O PCA. There is a DIP switch on the core I/O card that is used to select which MP firmware set (indicated by the MP SEL LED) is selected for loading. The DIP switch is only visible when the core I/O card is removed from the system and is located in the center of the PCA.

Figure 5-7 Core I/O Card Bulkhead LEDs

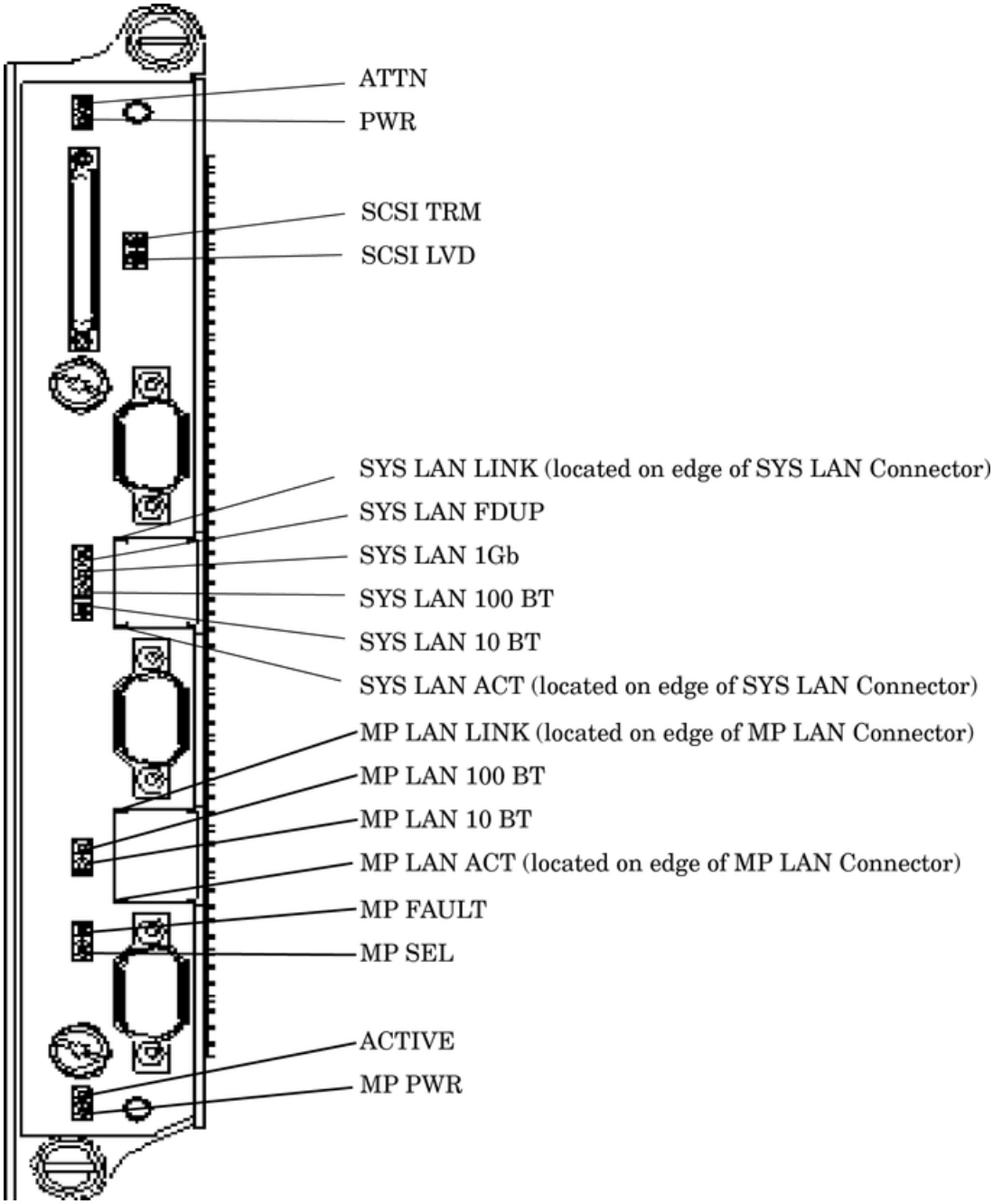


Table 5-7 Core I/O LEDs

LED (as silk-screened on the bulkhead)	Driven by	State	Description
MP PWR	3.3 V standby power rail	On Green	Indicates standby power is on
ACTIVE	MP	On Green	This core I/O is managing the system
MP SEL		On Green	Both switches are in position F1 (silk-screened on the core I/O board) for systems other than the rp8400
		Off	Both switches are in position F0 (silk-screened on the core I/O board) for rp8400 systems

Table 5-7 Core I/O LEDs *(continued)*

LED (as silk-screened on the bulkhead)	Driven by	State	Description
MP FAULT		On Yellow	Core I/O not fully seated or the MP processor is being reset
MP LAN ACT	MP LAN controller	On Green	Indicates MP LAN activity
MP LAN 10 BT	MP firmware controlled	On Green	MP LAN in 10 BT mode
MP LAN 100 BT	MP firmware controlled	On Green	MP LAN in 100 BT mode
MP LAN LINK	MP LAN controller	On Green	MP LAN link is OK
SYS LAN ACT	System LAN controller	On Green	Indicates SYS LAN activity
SYS LAN 10 BT	System LAN controller	On Green	SYS LAN in 10 BT mode
SYS LAN 100 BT	System LAN controller	On Green	SYS LAN in 100 BT mode
SYS LAN 1Gb	System LAN controller	On Green	SYS LAN in 1Gb mode
SYS LAN FDUP	System LAN controller	On Green	SYS LAN full duplex activity
SYS LAN LINK	System LAN controller	On Green	SYS LAN link is ok
SCSI LVD	System SCSI controller	On Green	SCSI LVD mode (on = LVD, off = SE)
SCSI TRM	System SCSI controller	On Green	SCSI termpower is on
PWR	LBA on system backplane	On Green	I/O power on
ATTN	LBA on system backplane	On Yellow	PCI attention

Core I/O Buttons

There are two recessed buttons on the back of the core I/O card, as explained in Table 5-8.

Figure 5-8 Core I/O Button Location

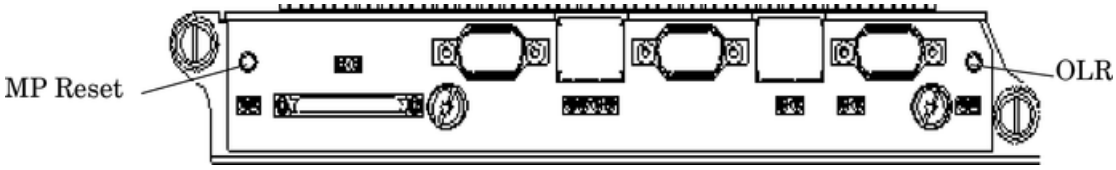


Table 5-8 Core I/O Buttons

Button Identification (as silk-screened on the bulkhead)	Location	Function
MP RESET	To the far left side of the core I/O card	Resets the MP **NOTE:** If the MP RESET button is held for longer than five seconds, it will clear the MP password and reset the LAN, RS-232 (serial port), and modem port parameters to their default values. LAN Default Parameters • IP Address - 192.168.1.1 • Subnet mask - 255.255.255.0 • Default gateway - 192.168.1.1 • Hostname - gsp0 RS-232 (Serial Port) Default Parameters • 9600 baud • 8 bits • No parity Remote/Modem Port Parameters • Disabled
OLR (Symbol next to button is shown below)	To the far right side of the core I/O card	Request OL* for this core I/O slot **NOTE:** The OLR function is not enabled for the core I/O card.

Interlock Switches

There are three interlock switches located in the server. Both side covers and the top cover have an interlock switch located underneath each cover.

Side Covers — If either side cover is removed while the system is powered on, the system fans on the front and rear increase in speed to ensure adequate cooling. An event code is generated to indicate a side cover was removed.

Top Cover — If the top cover is removed while the system power is on, the PCI-X card cage assembly I/O fan speed does not change. An event code is generated to indicate the top cover was removed.

Disk Drive LEDs

There are two tri-color LED on each disk drive.

Figure 5-9 Disk Drive LED Location

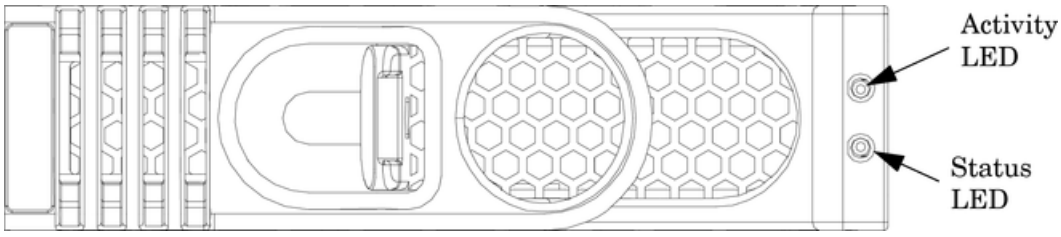


Table 5-9 Disk Drive LEDs

Activity LED	Status LED	Flash Rate	Description
Off	Green	Steady	Normal operation, power applied
Green	Off	Steady	Green stays on during foreground drive self-test
Green	Off	Flutter at rate of activity	I/O Disk activity
Off	Yellow	Flashing at 1Hz or 2 Hz	Predictive failure, needs immediate investigation
Off	Yellow	Flashing at 0.5Hz or 1Hz	Operator inducing manually
Off	Yellow	Steady	Module fault, critical
Off	Off	LEDs off	Unit not powered or installed

Server Management Subsystem Hardware Overview

Server management for the HP Integrity rx8620 server series is provided by an MP on the core I/O board. The server management hardware is powered by standby power that is available whenever the server is plugged into primary AC power. This allows service access even if the DC power to the server is switched off.

TheMP communicates with the server subsystems, sensors, and platform dependent code (PDC) by internal buses. It also communicates with the operating console and session gettys by universal asynchronous receiver-transmitters (UARTs) on the core I/O PCI bus.

Connection to the MP is by way of three I/O paths:

- An RS-232 port for a local terminal
- An RS-232 port for a modem connection
- A 10/100/1000 baseT LAN port (web console)

When the server is configured with one core I/O board, that board must be in slot 0, since the master MP is always the MP on the core I/O board in slot 0.

When the server is configured for two partitions, it must contain two core I/O boards, one for each partition. It also contains two MPs. In this case, the MP in slot 0 is the master MP and provides all of the server management functions. The MP on the core I/O board in slot 1 is a slave MP and redirects the operating system gettys to the master MP over an internal MP-to-MP link. All external connections to the MP must be to the master MP in slot 0. The slave MP ports are disabled.

For high availability (HA), the server powers on and powers off without an MP. Booting HP-UX without an MP depends on the ability of the operating system to boot without a console getty. Thus, in a two-partition system, the partition with a failed MP may not boot, since the MP provides the console getty.

The server configuration may not be changed without the MP.

Resetting the MP through a modem connection may cause `Admin^M` to display on every **enter** keystroke. Attempting a modem reset (MP command `MR`) does not clear this incorrect response. This is not experienced with a telnet connection.

A new Login prompt regains control by following these steps:

1. Enter `Admin` (case sensitive) and press <**enter** >< **ctrl** +**enter**> keys.
2. A new Login prompt is created.
3. To move on to the Password prompt, re-enter `Admin` <**ctrl + enter**>.
4. To reach the Main Menu, enter `Admin` <**ctrl + enter**>.

Afterwards, the `^M` does not return when the **enter** key is pressed. The issue returns if the MP is reset through the modem.

Server Management Overview

Server management consists of four basic functional groups:

- Chassis management
- Chassis logging
- Console and session redirection
- Service access

Chassis Management

Chassis management consists of control and sensing the state of the server subsystems:

- Control and sensing of bulk power
- Control and sensing of DC-to-DC converters
- Control and sensing of fans
- Control of the front panel LEDs
- Sensing temperature
- Sensing of the power switch
- Sensing chassis intrusion
- Reading FRU PROMS

Chassis Logging

Chassis logging consists of maintaining logs of chassis codes:

- Boot codes
- Activity codes
- Error codes

Console and Session Redirection

Console and session redirection enables the console and session terminals to be connected over RS-232, a modem, or a LAN connection (web console).

Service Access

Service access enables access to and control of server state. Service access is secured by a password. Service access functions include:

- Access to chassis logs
- Configuration of partitions
- Control for online addition and replacement
- Access to the virtual front panel
- Transfer of control and reset

Server Management Behavior

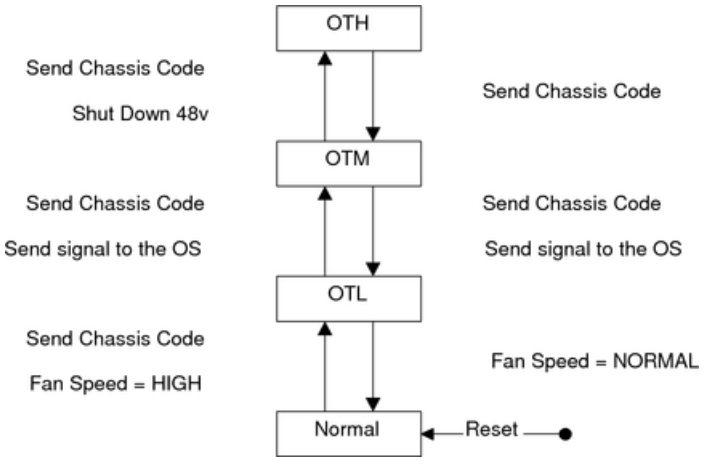
This section describes how the system responds to over-temperature situations, how the firmware controls and monitors fans, and how it controls power to the server.

Thermal Monitoring

The manageability firmware is responsible for monitoring the ambient temperature in the server and taking appropriate action if this temperature becomes too high. To this end, the ambient

temperature of the server is broken into four ranges: normal, overtemp low (OTL), overtemp medium (OTM), and overtemp high (OTH). Figure 5-10 shows the actions taken at each range transition. Actions for increasing temperatures are shown on the left; actions for decreasing temps are shown on the right.

Figure 5-10 Temperature States



On large temperature swings, the server transitions through all states in order. It may go to the following state immediately, but each of the preceding actions occur. If the temperature reaches the highest range, the server is shut down immediately by the manageability firmware.

Fan Control

There are three sets of fans in the system: those on the I/O bay, the front and rear fans that are connected to the main backplane, and those on the cell boards. The front fans are run off of standby power, and will be running any time AC input power is supplied to the server. All of the fans turn on when 48 V power is supplied to the system.

As shown Figure 5-10, the fan behavior is related to the temperature state. The fans are set to high speed when the ambient temperature is anywhere above the normal operating range. The front and rear fans are set to high speed any time a chassis intrusion switch is triggered when removing a side cover.

Altimeter Circuit

The PCI-X backplane contains an altimeter circuit. This circuit is used to adjust the chassis fan speeds for the operating altitude at power on and during MP initialization. The chassis fans consist of the nine front fans, the twelve rear fans, and the six PCI-X I/O assembly fans. If an altimeter failure is detected, the information is logged as an Event ID then propagated to the OS level to be picked up by monitoring diagnostics.

The altimeter circuit is checked at power on by the MP. If an expected value is returned from the altimeter circuit, the altimeter is determined good. The altimeter reading is then set in non-volatile random access memory (NVRAM) on board the core I/O card. If the value is ever lost like for a core I/O replacement, the NVRAM is updated at next boot provided the altimeter is functioning normally. If the altimeter has failed, and the stable storage value has been lost because of a core I/O failure or replacement, the MP adjusts the fan speeds for sea level operation.

NOTE: Fans driven to a high RPM in dense air cannot maintain expected RPM and are considered bad by the MP leading to a “False Fan Failure” condition.

Power Control

If active, the manageability firmware is responsible for monitoring the power switch on the front panel. Setting this switch to the ON position is a signal to the MP to turn on 48 V DC power to the server. The `PE` command can also be used to send this signal. This signal does not always generate a transition to the powered state. The following conditions prevent the manageability firmware from applying 48 V DC power to the server:

- Insufficient number of active bulk power supplies
- Insufficient number of I/O fans
- Insufficient number of main fans
- Ambient temperature is in an OVERTEMP HIGH condition

Unless one of the following conditions occurs, 48 V DC power to the server is maintained:

- A main fan failure causes there to be an insufficient number of main fans.
- A I/O fan failure causes there to be an insufficient number of I/O fans.
- Ambient temperature reaches an OVERTEMP HIGH condition.
- The front panel power switch is turned OFF.
- The `PE` command is issued to the manageability firmware to turn off power to the server cabinet.

Server Management Commands

Table 5-10 lists the server management commands.

Table 5-10 Management Commands

Command	Description
BO	Boot a partition
DF	Display FRU Information of an Entity
MA	Return to Main Menu
MR	Modem reset
PE	Power entities on or off
RE	Reset entity
RR	Reset partition for reconfiguration
RS	Reset a partition
SYSREV	Returns all System Revisions
TC	Send a TOC signal to a partition
TE	Broadcast a message to all users of the MP command handler
WHO	Display list of MP connected users

Table 5-11 lists the server status commands

Table 5-11 Status Commands

Command	Description
CP	Display partition cell assignments

Table 5-11 Status Commands *(continued)*

HE	Display the list of available commands
LS	Display LAN connected console status
MS	Display modem status
PS	Display detailed power and hardware configuration status

Table 5-12 lists the server system and access configuration commands

Table 5-12 System and Access Configuration Commands

Command	Description
CA	Configure Asynchronous and Modem parameters
CC	Initiate a Complex Configuration
CG	Generate ssl key pair and self signed certificate
CP	Display partition cell assignments
DATE	Set the time and date
DC	Reset parameters to default configuration
DE	Display entity status
DI	Disconnect remote or LAN console
DFW	Duplicate firmware
DU	Display devices on bus
FW	Firmware update utility
ID	Change certain stable complex configuration profile fields
IF	Display network interface information
IT	Modify command interface inactivity time-out
LC	Configure LAN connections
LS	Display LAN connected console status
PD	Modify default Partition for this login session
PWRGRD	Allows user to configure the power grid
PARPERM	Enable/Disable interpartition security
RL	Re-key complex profile lock
RU	Reset MP bus device
SA	Display and set MP remote access
SO	Configure security options and access control
XD	MP Diagnostic and reboot

Firmware Updating

The server MP pulls a firmware update from an FTP server over the management LAN. When replacing a cell board in a currently operating system, see “Cell Break-Fix Upgrade and Downgrade Procedure” on page 146.

Instructions

- Log in to the server console through the LAN, local serial, or remote serial locations.
- Enter the **FW** command to start the firmware update.

NOTE: The LAN configuration for the server must be set for the FTP connection to function correctly regardless of whether the console LAN, local serial, or other connection is used to issue the FW command.

FW – Firmware Update

- Access Level: Administrator
- Scope: Complex
- Description: This command prompts you for the location of the firmware software and the FLASH handle (from a list) which represents all upgradeable entities.

DFW – Duplicate Firmware

- Access Level: Administrator
- Scope: Complex
- Description: This command enables field support personnel to copy firmware already installed on the system to an equivalent entity in the same complex.

Figure 5-11 illustrates the output and questions requiring responses. After your reply **Y** to the confirmation request, the firmware update makes the connection to the FTP server at the IP address given using the user and password details supplied. The appropriate files are downloaded and burned into the selected flash memories.

NOTE: The firmware update validates the image to determine that the image name supplied is that of a valid image type before burning the image into the flash memory.

CAUTION: Instructions for updating the firmware are contained in the firmware release notes for each version of firmware. The procedure should be followed exactly for each firmware update otherwise the system could be left in an unbootable state. Figure 5-11 should not be used as an upgrade procedure and is provided only as an example.

Figure 5-11 Firmware Update Command Example

```
MP:CM> fw

    ********************************************************************
    *****                                                          *****
    *****                  Firmware Update Utility                 *****
    *****                                                          *****
    *****        (C) Copyright 2001 Hewlett-Packard Company        *****
    *****                    All Rights Reserved                   *****
    *****                                                          *****
    *****         THIS PROGRAM IS NOT LICENSED TO CUSTOMERS        *****
    *****                                                          *****
    *****  This program is intended for use by trained HP support  *****
    *****  personnel only.  HP shall not be liable for any damages *****
    *****  resulting from unauthorized use of this program.  This  *****
    *****  program is the property of HP.                          *****
    *****                                                          *****
    *****                      Version  4.00                       *****
    *****                                                          *****
    ********************************************************************
                                          Flash        Current
   Number  Cabinet    Name    Partition   Handle   Firmware Version  Comments
   ------ --------- -------- ---------- -------- ------------------ --------
       1         0     MP 0          0        0          5.010       Master
       2         0     MP 1          1        1          5.010       Slave
       3         0   PDHC 0          0      256          3.006          -
       4         0    SFW 0          0      320          0.018          -
       5         0   PDHC 1          1      257          3.006          -
       6         0    SFW 1          1      321          0.018          -
       7         0   PDHC 2         -1      258          3.006          -
       8         0    SFW 2         -1      322          0.018          -
       9         0   PDHC 3         -1      259          3.006          -
      10         0    SFW 3         -1      323          0.018          -

Enter the Entities to be upgraded (Ex: 3,4,10) :2
Enter your user name: anonymous
Enter your user password: ********
Enter the ip address where the firmware can be found: 192.1.1.1
Enter the path where the firmware can be found: /dist/version1
Enter the filename of the firmware image for the MP: mp_A.5.11.0.bin
Are you sure that you want to continue(Y/N): y
```

Possible Error Messages

- Could not ping host
- Could not validate cyclic redundancy check (CRC) of packet
- Could not find firmware update
- Invalid password

Firmware Update Tool for IPF

The OS Initatable Firmware Update Tool for IPF enables the firmware update process to begin and end in the operating system. Minimal interaction from you is required. The tool runs only during installation, after which the system is rebooted.

NOTE: The OS Initiatable Firmware Update Tool for IPF can be used only when system firmware is being upgraded and no other firmware components are to be updated.

In multi-cell systems, the tool updates the firmware for all the cells only in the partition from which the tool is launched. All the other partitions are unaffected and continue to run on the previous version firmware. To update all the partitions, the tool must be run on all the partitions.

NOTE: The use of this tool is restricted to super users.

Installing and Uninstalling on HP_UX

Install

The following must be performed to update the firmware.

Enter the `swinstall` command.

```
# swinstall -x autoreboot=true -s /tmp/FUTests/OSIFU.depot PHSS_28608
```

Figure 5-12 swinstall output

```
=======  08/21/03 20:30:52 PDT  BEGIN swinstall SESSION
         (non-interactive) (jobid=hpdst70-0011)

       * Session started for user "root@hpdst70".

       * Beginning Selection
       * Target connection succeeded for "hpdst70:/".
       * Source:                  /tmp/FUTests/OSUFU.depot
       * Targets:                 hpdst70:/
       * Software selections:
            PHSS_28608.KERN-RUN,r=1.0,a=HP-
UX_B.11.23,v=HP,fr=1.0,fa=HP-UX_B.11.23
       * Selection succeeded.


       * Beginning Analysis and Execution
       * Session selections have been saved in the file
         "/.sw/sessions/swinstall.last".
       * The analysis phase succeeded for "hpdst70:/".
```

Uninstall

The following must be performed to downgrade the firmware.

Enter the `swremove` command.

```
# swremove -x autoreboot=true PHSS_28608
```

Figure 5-13 swremove output

```
=======  10/09/03 05:54:34 PDT  BEGIN swremove SESSION
         (non-interactive) (jobid=hpdst28-0014)

       * Session started for user "root@hpdst28".

       * Beginning Selection
       * Target connection succeeded for "hpdst28:/".
       * Software selections:
            PHSS_28608.KERN-RUN,l=/,r=1.0,a=HP-
UX_B.11.23_64,v=HP,fr=1.0,fa=HP-UX_B.11.23_IA
       * Selection succeeded.


       * Beginning Analysis
       * Session selections have been saved in the file
         "/.sw/sessions/swremove.last".
       * The analysis phase succeeded for "hpdst28:/".
       * Analysis succeeded.


       * Beginning Execution
       * The execution phase succeeded for "hpdst28:/".
       * Execution succeeded.


NOTE:    More information may be found in the agent logfile using the
         command "swjob -a log hpdst28-0014 @ hpdst28:/".

=======  10/09/03 05:54:47 PDT  END swremove SESSION (non-interactive)
         (jobid=hpdst28-0014)
```

Installing on Linux

The firmware update is installed using the `rpm` command.

Enter the `rpm` command.

```
# rpm -i FWPHSS_28608.rpm
```

Figure 5-14 rpm output

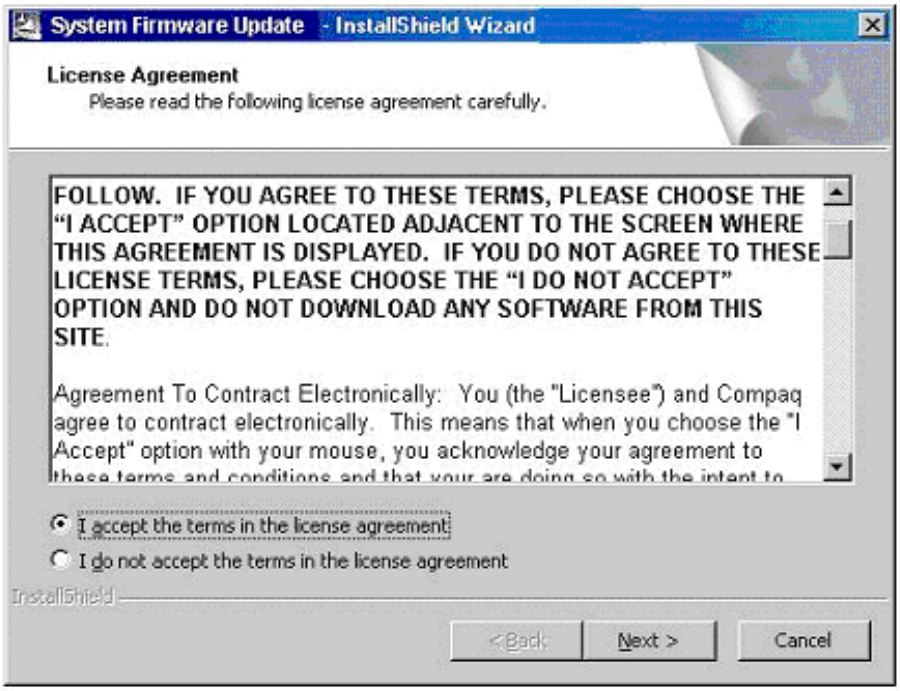
```
Preparing...                ##########################################
[100%]
1:FWUPDATE                  ##########################################
[100%]
```

Installing on Windows

An executable file must be downloaded, then executed in Windows. Upon running the utility, a setup wizard guides you through the installation steps. The following are the various steps of the setup wizard.

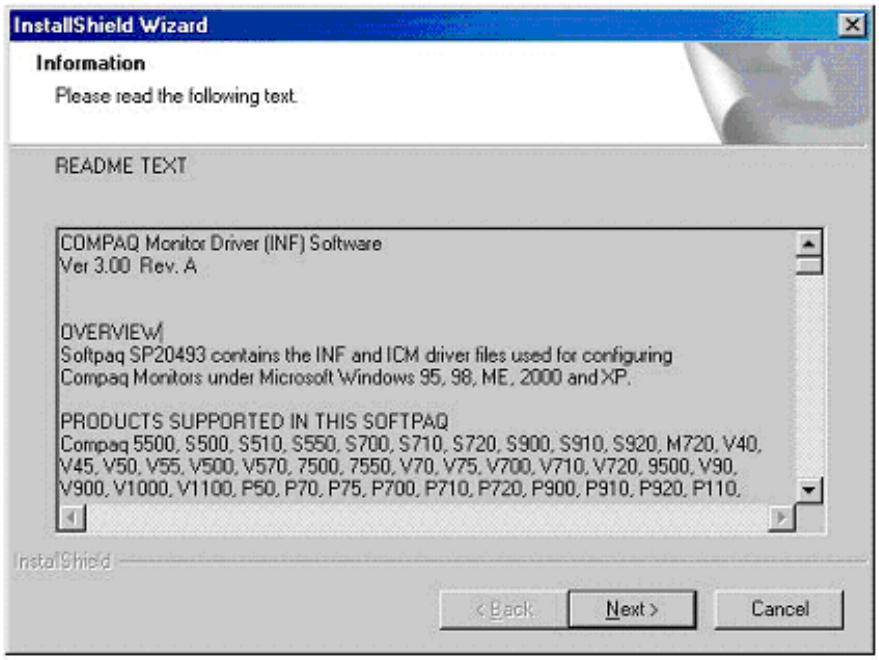
1. Run the executable file.
2. Accept the terms of the agreement and click **Next**.

Figure 5-15 License Agreement



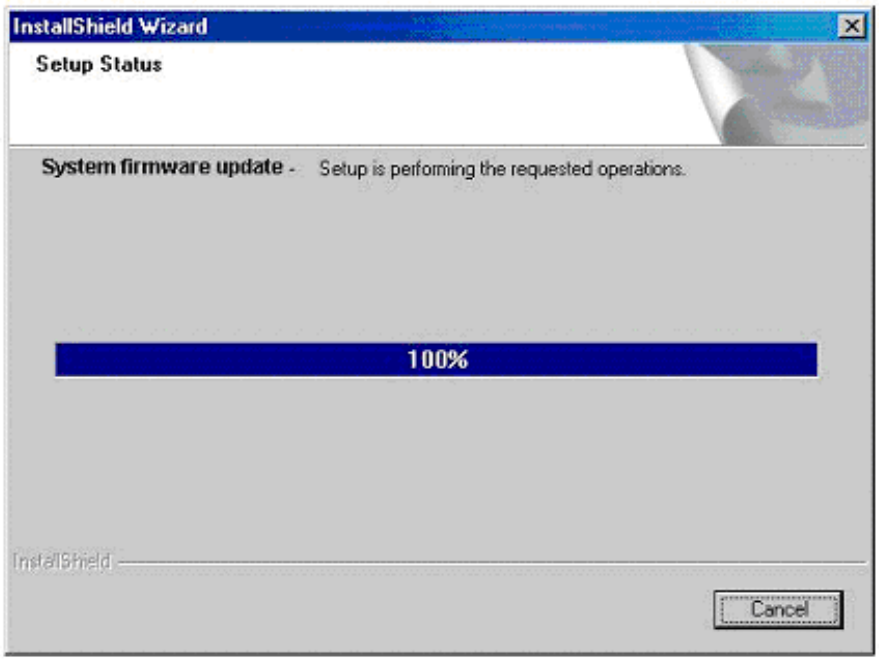
3. Carefully read the readme text and click **Next**.

Figure 5-16 Information Screen



4. The status of the installation displays in the Setup Status screen.

Figure 5-17 Setup Status



PDC Code FRU Reporting

The processor dependent code (PDC) interface defines the locations for the FRUs. These locations are denoted in the following figures to aid in physically locating the FRU when the diagnostics point to a specific FRU that has failed or may be failing in the near future.

Figure 5-18 HP Integrity rx8620 Server Cabinet FRUs (Front View)

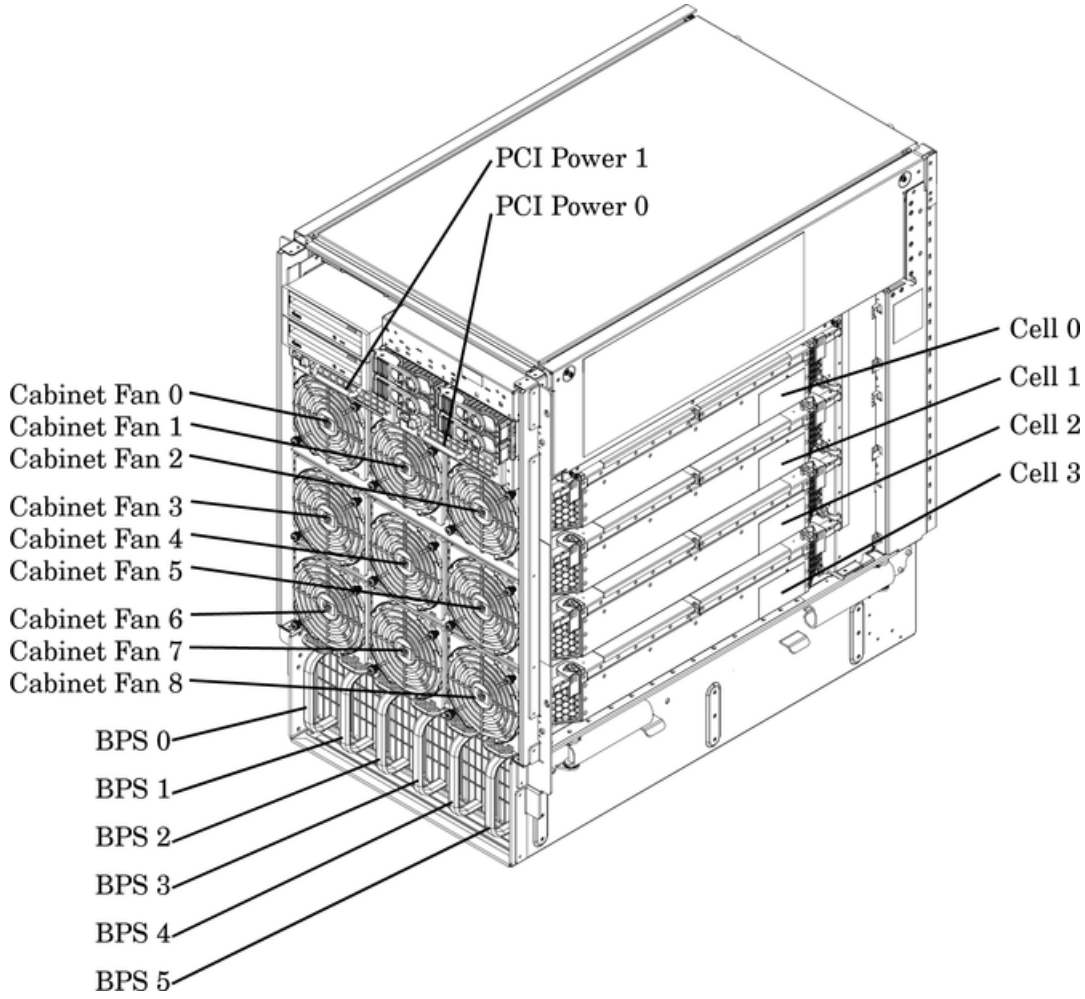
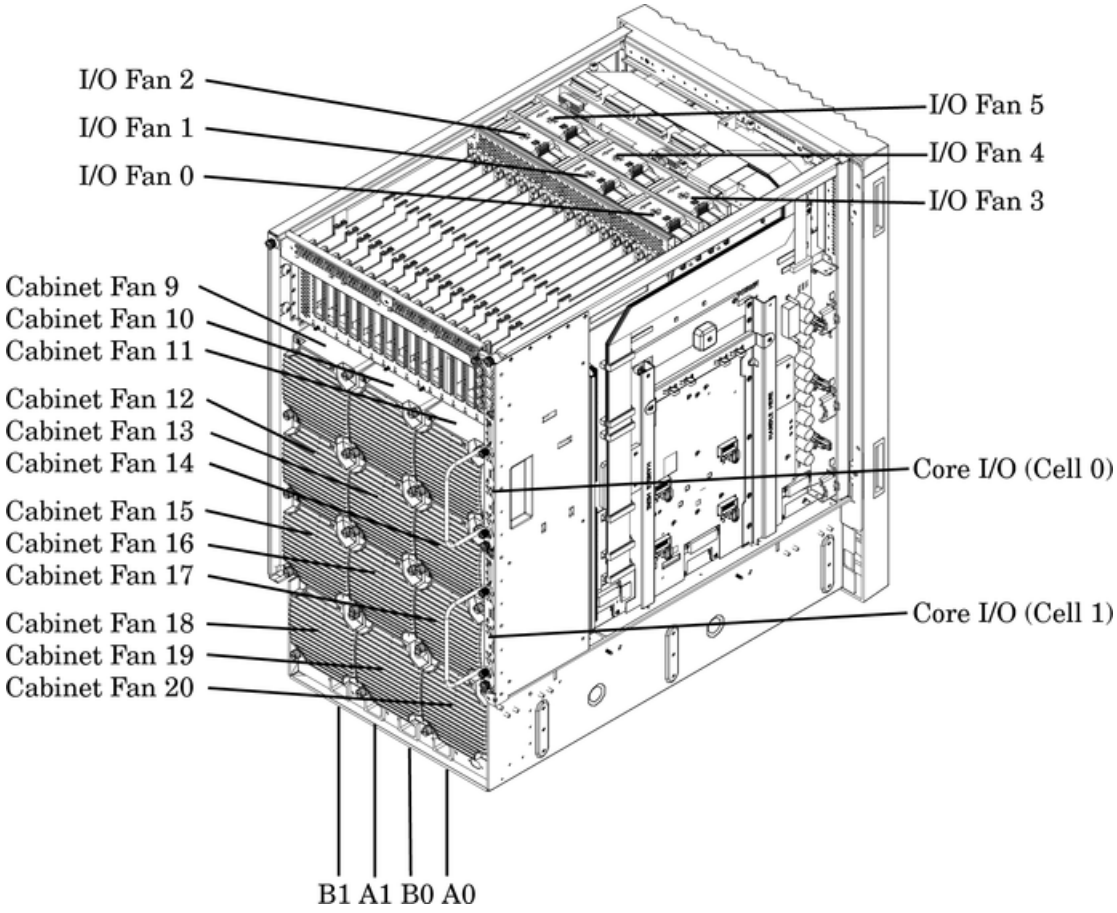


Figure 5-19 HP Integrity rx8620 Server Cabinet FRUs (Rear View)



Verifying Cell Board Insertion

Cell Board Extraction Levers

It is important that both extraction levers on the cell board be in the locked position. Both levers must be locked for the cell board to power on and function properly.

Power to the cell board should only be removed using the `MP:CM> PE` command or by shutting down the partition or server. Therefore, if the levers become unlocked, the partition will not have a chance to logically shut down, and damage could occur to the operating system.

If the cell board is powered on and one lever becomes unlocked, the cell board stays powered on. However, if the cell board is powered off, it does not power on again until both levers are in the locked position.

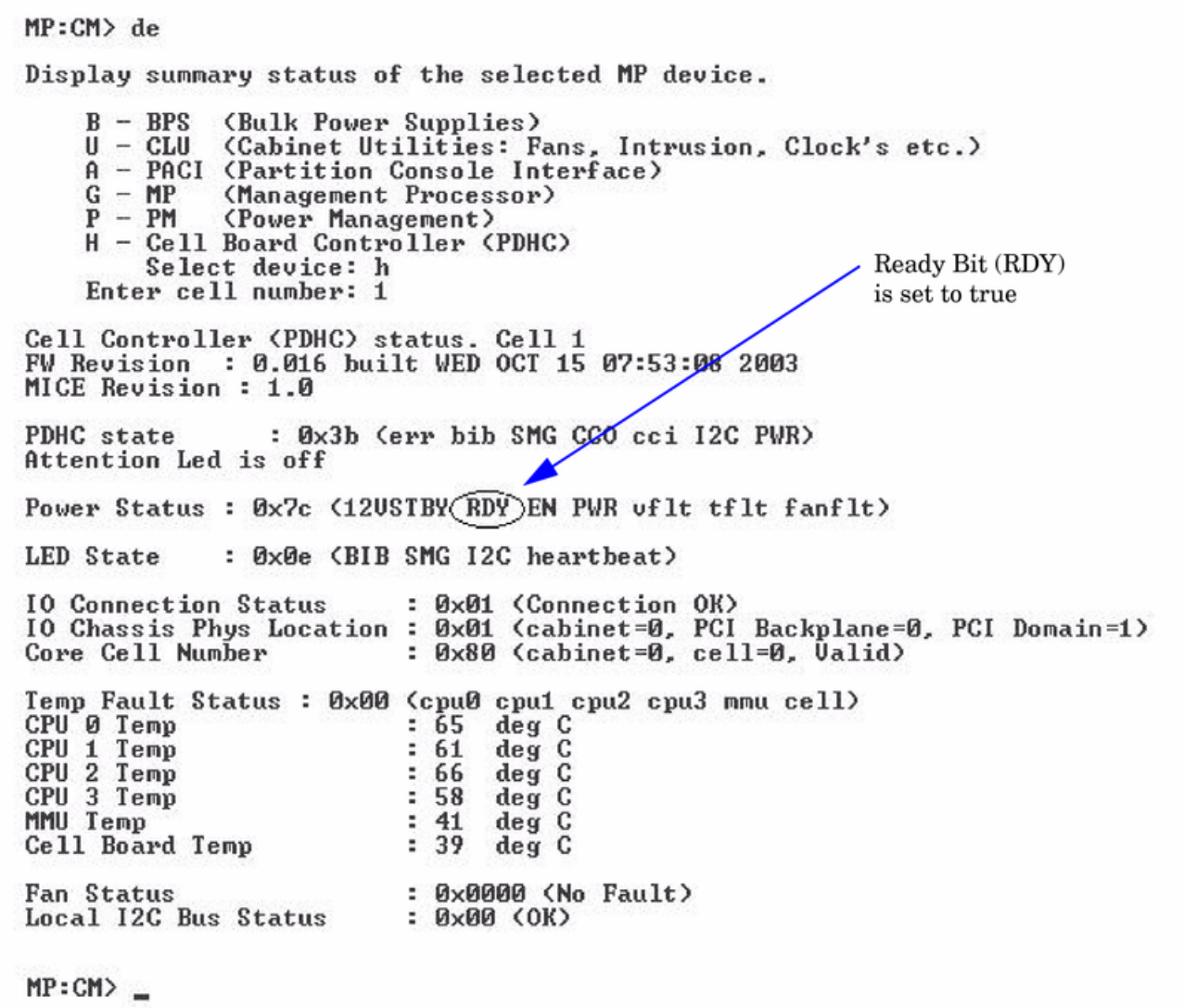
The lever status can be determined by issuing the `MP:CM> DE` command and viewing the power status of the cell board controller (PDHC). The "ready" bit is only true when both levers are locked and all VRMs are installed. This status can be used to determine if both levers are locked and the cell board is properly installed in the chassis. See Figure 5-20 (page 104) for a sample of the output.

If the state is `"RDY"` denoted by capital letters in the computer output then the "ready bit" is true. If the state is "`rdy`" as denoted by lower case letters in the computer output then the "ready bit" is false. For details, see Table 5-13.

Table 5-13 Ready Bit States

Ready Bit State	MP:CM> DE Command Power Status	Meaning
True	"RDY" (denoted by upper case letters)	All cell VRMs are installed and both cell latches are locked.
False	"rdy" (denoted by lower case letters)	One or more VRMs are not installed or failed and/or one or more cell latches are not locked.

Figure 5-20 de Command Output



6 Removal and Replacement

This chapter provides a detailed description of the HP Integrity rx8620 Server field replaceable unit (FRU) replacement procedures.

HP Integrity rx8620 Server Field Replaceable Units (FRUs)

These procedures are intended for use by trained and experienced HP service personnel only.

Hot-Pluggable FRUs

A FRU is defined as hot-pluggable if it can be removed from the chassis while the system remains operational, but requires software intervention before removing the FRU.

The following FRUs are hot-pluggable:

- Removing and Replacing a Disk Drive
- Removing and Replacing a PCI Card

Hot-Swappable FRUs

A FRU is hot-swappable if it can be removed from the chassis while the server remains operational and requires no software intervention before removing the FRU.

The following FRUs are hot-swappable:

- Removing and Replacing the Front Smart Fan Assembly
- Removing and Replacing the Rear Smart Fan Assembly
- Removing and Replacing a PCI Smart Fan Assembly
- Removing and Replacing a Bulk Power Supply (BPS)

Other FRUs

To remove and replace the FRUs that are neither hot-pluggable nor hot-swappable, HP-UX must be shut down in the nPartition where the FRU resides, and power to the FRU must be turned off before removing it. For instructions, see "Powering Off Hardware Components and Powering On the Server" (page 106).

These FRUs include:

- Removing and Replacing a Cell Board
- Removing and Replacing the Core I/O
- Removing and Replacing a Removable Media Drive
- Removing and Replacing DIMMs
- Removing and Replacing the Front Panel Board
- Removing and Replacing the PCI-X Card Cage Assembly
- Removing and Replacing the PCI OLR Assembly
- Removing and Replacing a PCI Power Supply
- Removing and Replacing a System Backplane
- Removing and Replacing a Central Processing Unit

Safety and Environmental Considerations

WARNING! Before proceeding with any installation, maintenance, or service on a system that requires physical contact with electrical or electronic components, be sure that either power is removed or safety precautions are followed to protect against electric shock and equipment damage. Observe all WARNING and CAUTION labels on equipment. All installation and service work must be done by qualified personnel.

Communications Interference

HP system compliance tests are conducted with HP supported peripheral devices and shielded cables, such as those received with the system. The system meets interference requirements of all countries in which it is sold. These requirements provide reasonable protection against interference with radio and television communications.

Installing and using the system in strict accordance with HP instructions minimizes the chances that the system will cause radio or television interference. However, HP does not guarantee that the system will not interfere with radio and television reception.

Take the following precautions:

- Use only shielded cables.
- Install and route the cables per the instructions provided.
- Ensure that all cable connector screws are firmly tightened.
- Use only HP supported peripheral devices.
- Ensure that all panels and cover plates are in place and secure before system operation.

Electrostatic Discharge

CAUTION: Connect to ground with a wrist strap. Connection may be made to any grounded metal assembly in the cabinet. Both you and the electronic devices must be grounded to avoid static discharges that can cause damage.

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

HP systems and peripherals contain assemblies and components that are sensitive to electrostatic discharge (ESD). Carefully observe the precautions and recommended procedures in this manual to prevent component damage from static electricity.

Take the following precautions:

- Prepare an ESD-safe work surface large enough to accommodate the various assemblies handled during the upgrade. Use a grounding mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit (A3024-80004).
- The anti-static bag cannot function as a static dissipating mat. Do not use the anti-static bag for any other purpose than to enclose a product.
- Treat all assemblies, components, and interface connections as static-sensitive.
- When unpacking cards, interfaces, and other accessories that are packaged separately from the system, keep the accessories in the conductive plastic bags until they are ready to be installed.
- Avoid working in carpeted areas, and keep body movement to a minimum while installing accessories.

Powering Off Hardware Components and Powering On the Server

When you remove and replace hardware, you may need to power off hardware components as part of the remove and replace procedure.

This section gives details on how to power off and on hardware components.

Powering Off Hardware Components

To power off individual components or the entire cabinet, follow these steps:

1. Log in to the MP of the server.
2. If the component you will power off is assigned to an nPartition, use the Virtual Front Panel (VFP) to view the current boot state of the nPartition.

   You must shut down HP-UX on the nPartition before you power off any of the hardware assigned to the nPartition. See Appendix E (page 203).

   When you are certain the nPartition is not running HP-UX, you can power off components that belong to the nPartition.

   For details on determining the nPartition boot state and shutting down HP-UX, see Appendix E (page 203).
3. Access the MP Command menu.

   To access the Command menu, enter **CM** from the MP Main menu.
4. To check details about the hardware component you plan to power off, use the MP **PS** command.

   The PS command enables you to check the status of the cabinet, system backplane, MP core I/O, PCI power domains—or bricks—in the I/O card cage, and cells.
5. To power off the hardware component, use the MP Command menu **PE** command.

   Using the PE command, you can power on or off the cabinet (including all cells and I/O in the cabinet), individual cells along with their associated I/O domain, or PCI power domains (bricks).

   Using the Command menu PE command to manage cabinet power is equivalent to using the front panel power switch.
6. If you need to disable *all power* in the entire cabinet, you also must disconnect all power cords to disable all housekeeping power.

IMPORTANT: Because of power redundancy capabilities, it is important that each power cord plug into its proper receptacle. Label all power cords to indicate into which receptacle each cord plugs. Ensure that the cabinet power has been turned off before disconnecting any power cords.

7. Perform the hardware removal and replacement procedure for the powered off component.

Powering On the System

To power on the system after a repair, follow these steps:

1. If needed, reconnect all power cords to the appropriate receptacles and power on the system.
2. To power on the hardware component that was powered off and replaced, use the MP Command menu PE command.
3. To verify that power is enabled to the newly replaced part, use the PS command. For example: Enter **C** from within the PS command to select cell.

   To power on the entire cabinet if power is absent from the part, enter the **PE** command and select **T**.

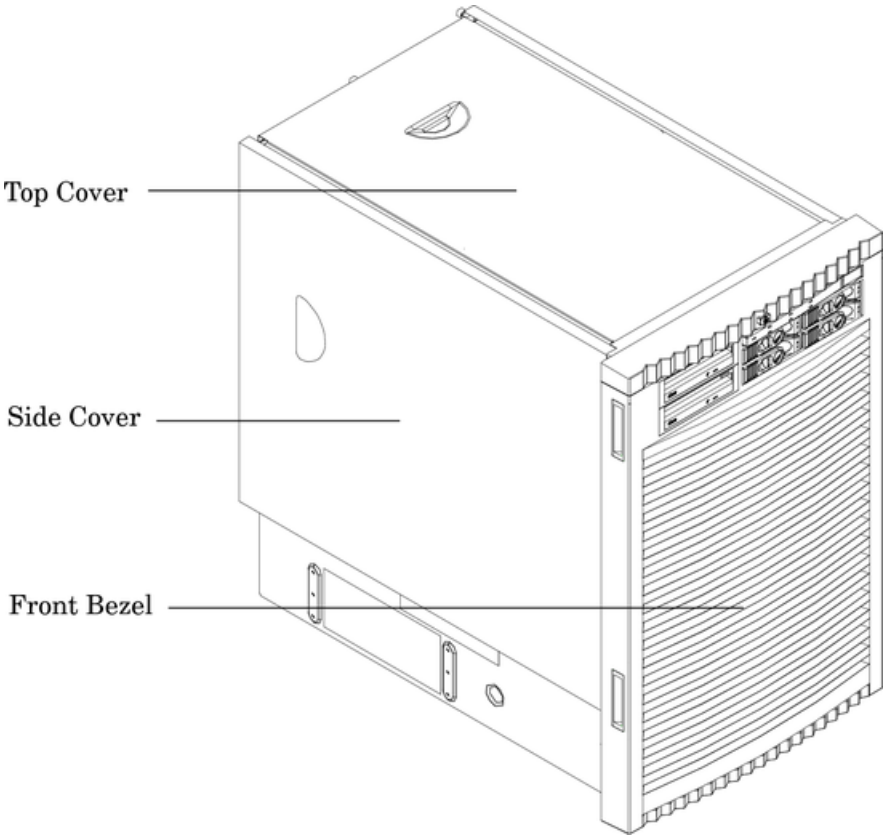
NOTE: You may need to allow time for some components to complete power on self test (POST) before a complete status is available.

4. Reboot each nPartition. See Appendix E (page 203).
5. Verify system functionality by using the Online Diagnostic Support Tools Manager (STM) exerciser.

Removing and Replacing Covers

It is necessary to remove one or more of the covers to access many of the FRUs within the server chassis.

Figure 6-1 Cover Locations

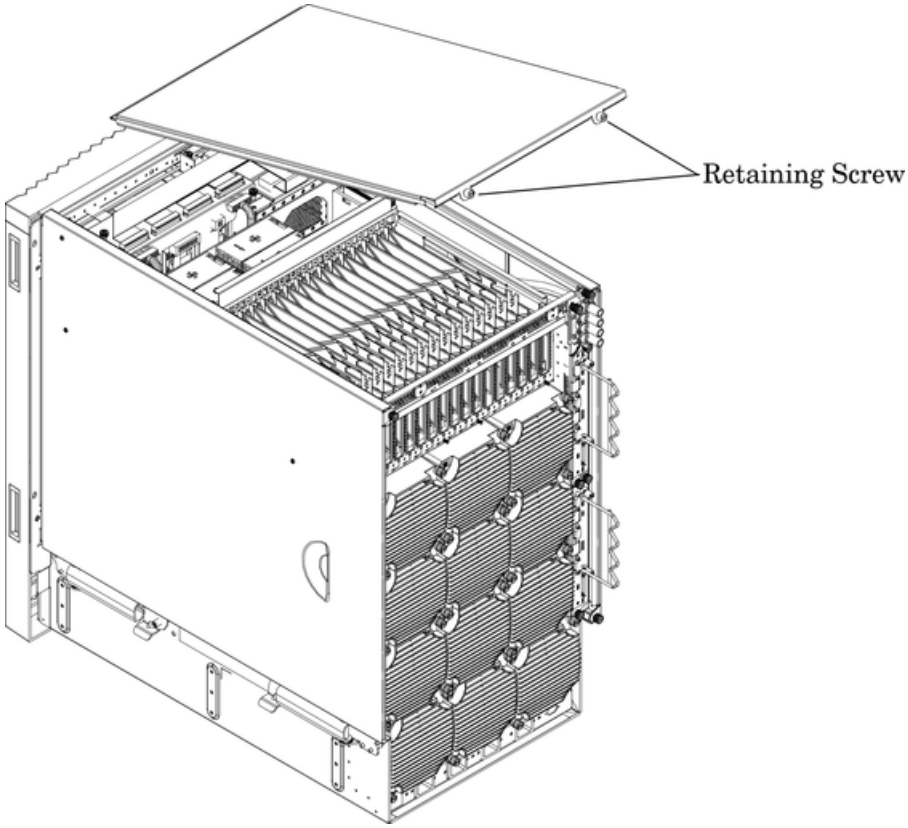


Removing the Top Cover

To remove the top cover, follow these steps:

1. Connect to ground with a wrist strap. see "Electrostatic Discharge " (page 106).
2. Loosen the blue retaining screws securing the cover to the chassis.
3. Slide the cover toward the rear of the chassis.
4. Lift the cover up and away from the chassis.
5. Place the cover in a safe location.

Figure 6-2 Top Cover Removed



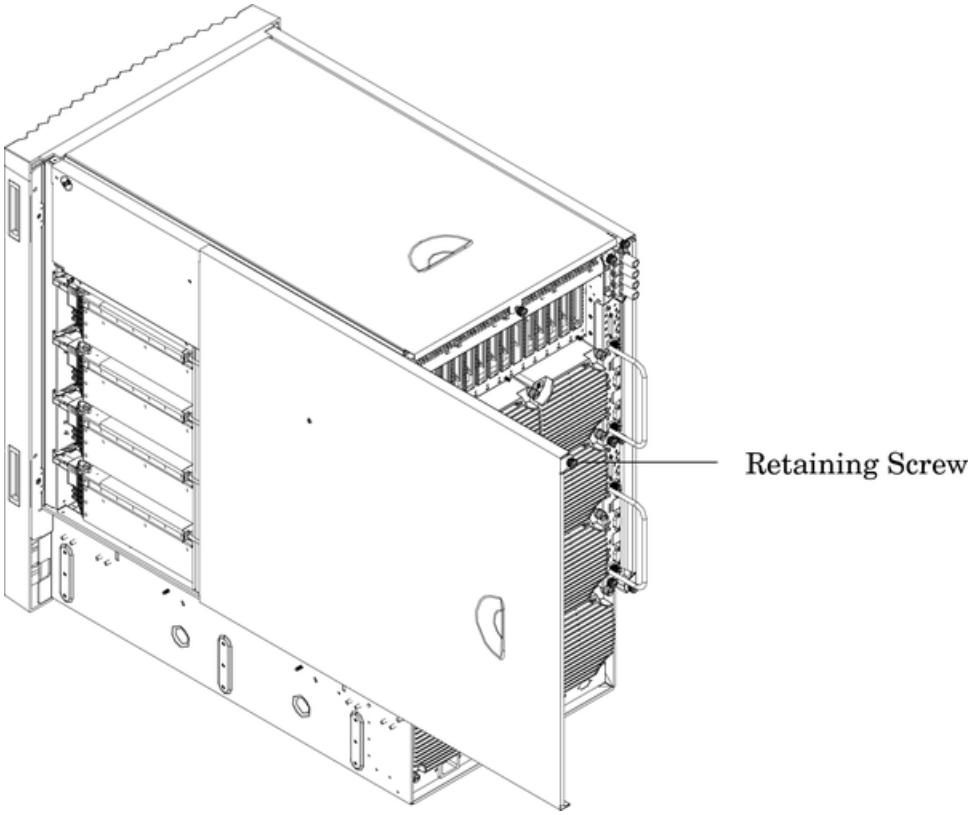
Replacing the Top Cover

To replace the top cover, follow these steps:

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

Removing the Side Cover

Figure 6-3 Side Cover Removal Detail



To remove the side cover, follow these steps:

1. Connect to ground with a wrist strap.See “Electrostatic Discharge ” (page 106).
2. Loosen the blue retaining screw securing the cover to the chassis. See Figure 6-3.
3. Slide the cover from the chassis toward the rear of the system.
4. Place the cover in a safe location.

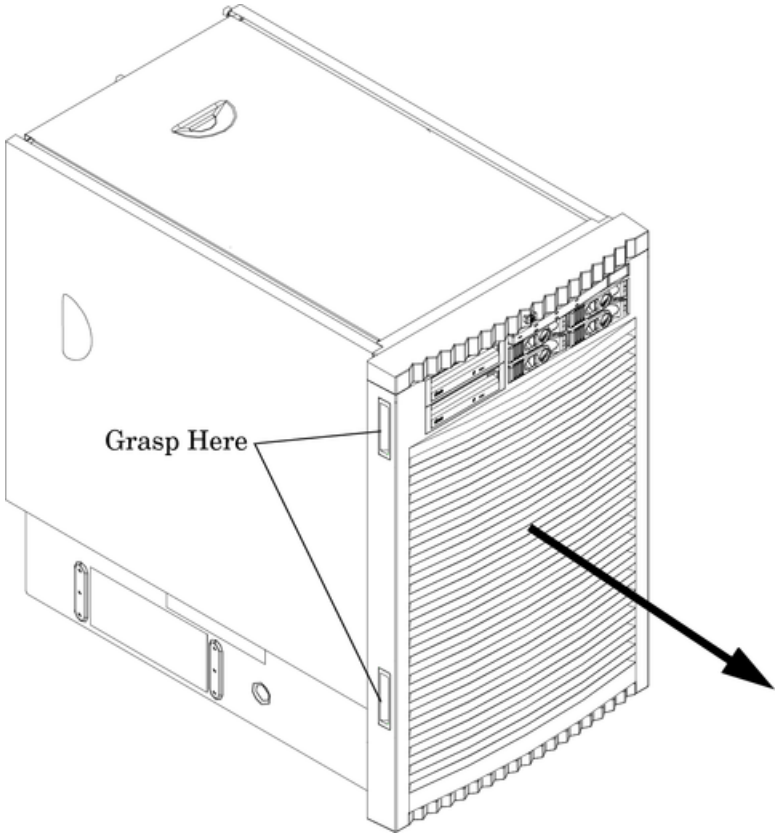
Replacing the Side Cover

To replace the side cover, follow these steps:

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

Removing the Front Bezel

Figure 6-4 HP Integrity rx8620 Server Bezel Removal and Replacement



To remove the front bezel, follow these steps:

- From the front of the server, grasp both sides of the bezel and pull firmly toward you. The catches release and the bezel pulls free.

Replacing the Front Bezel

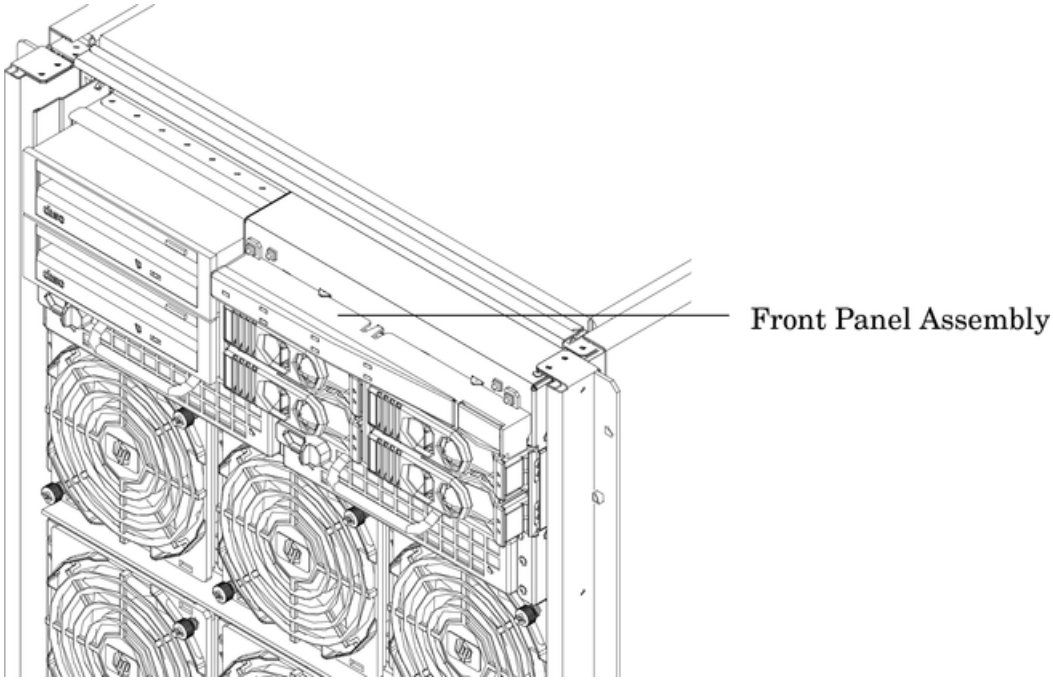
To replace the front bezel, follow these steps:

1. If the bezel is being replaced, visually inspect the replacement part for the proper part number.
2. From the front of the server, grasp both sides of the bezel and push toward the server. The catches secure the bezel to the chassis.

Removing and Replacing the Front Panel Board

The front panel board is located in the front of the chassis. The system power must be turned off to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

Figure 6-5 Front Panel Assembly Location

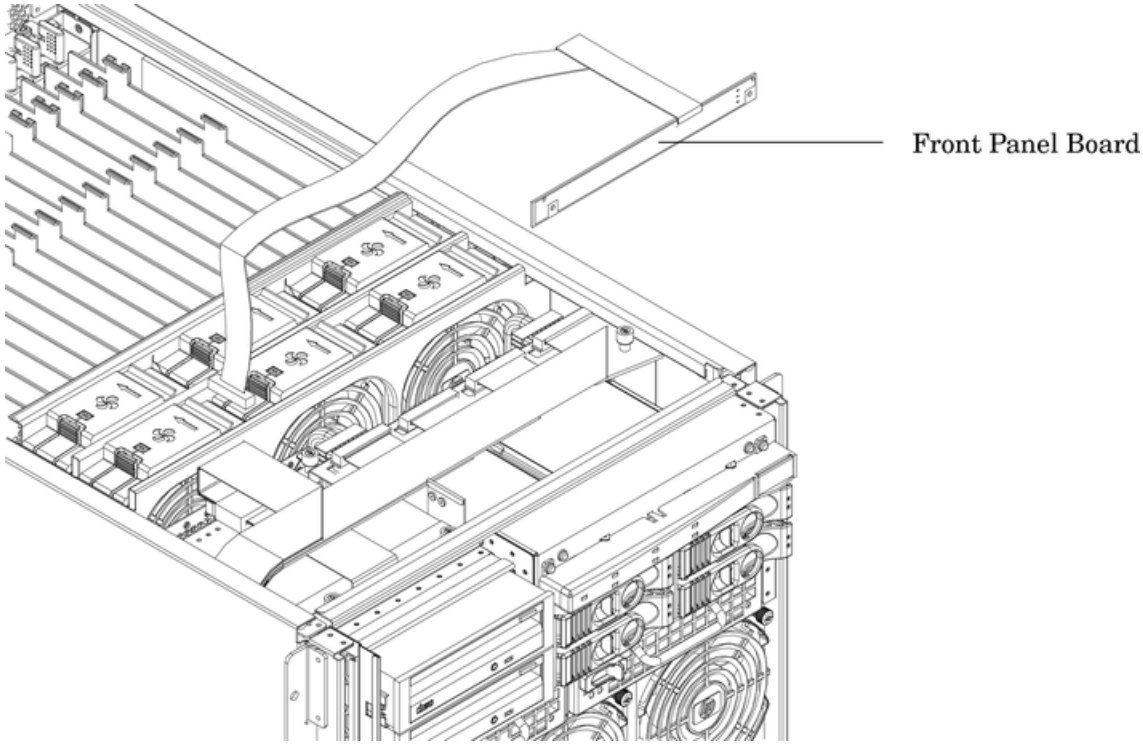


Removing the Front Panel Board

To remove the front panel board, follow these steps:

1. Power off the system.
2. Remove the front bezel.
3. Remove the top cover.
4. Remove the left side cover.
5. Remove and retain the two screws securing the front panel bezel to the front panel. Depress the front bezel center tab and slide away from chassis toward the rear of the system.
6. Remove and retain the three screws securing the front panel board. Remove the board by sliding it out the rear of the front panel assembly.
7. Make note of the cable routing and disconnect the cable assembly from the system board.

Figure 6-6 Front Panel Board Detail

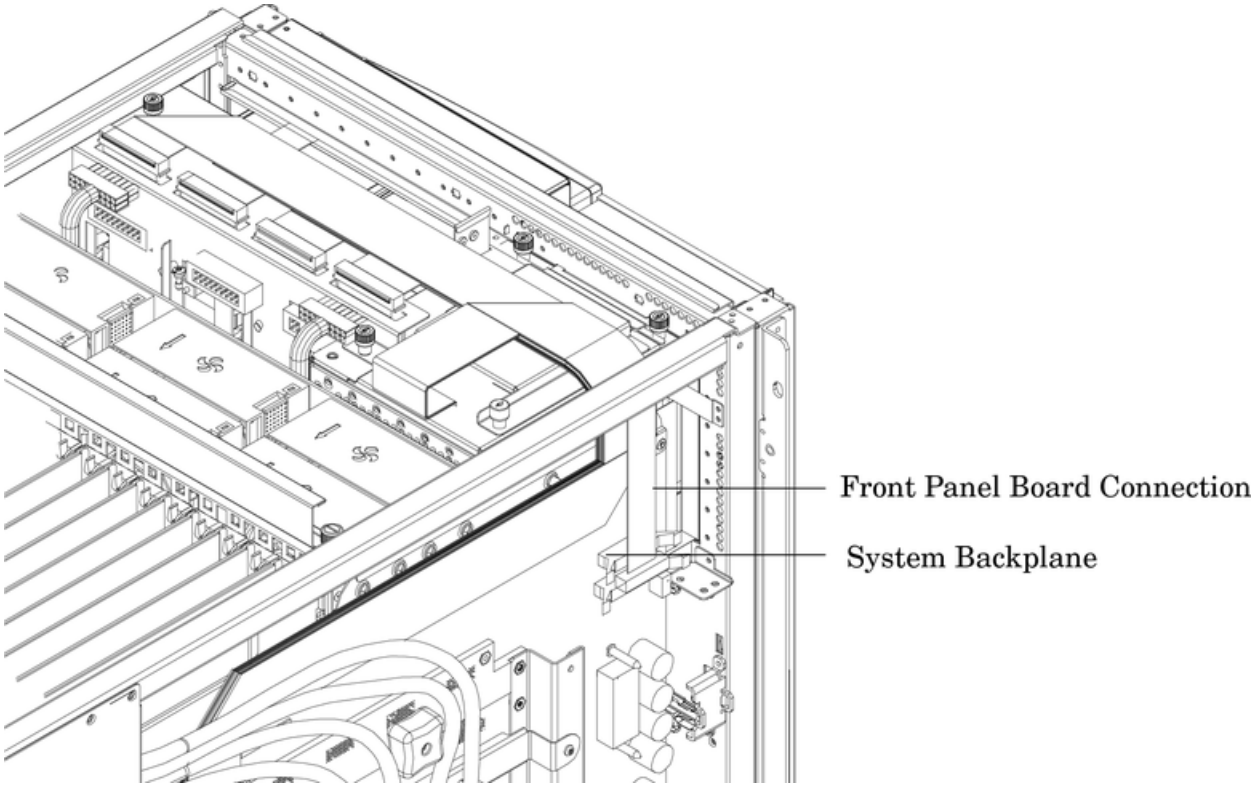


Replacing the Front Panel Board

To replace the front panel board, follow these steps:

1. Position the front panel board within the front panel assembly. Ensure the standoffs on the board are aligned with the screw holes in the front panel assembly.
2. Secure the board to the assembly with the three screws (inner two top screws and one bottom screw) retained during removal.
3. Route the cable in the same manner as it was removed and connect the cable to the system backplane.
4. Reinstall the front panel bezel. Use care when aligning light pipes and then screw back into place.
5. Replace top cover.
6. Replace the left side cover.
7. Replace the front bezel.
8. Power on the system.

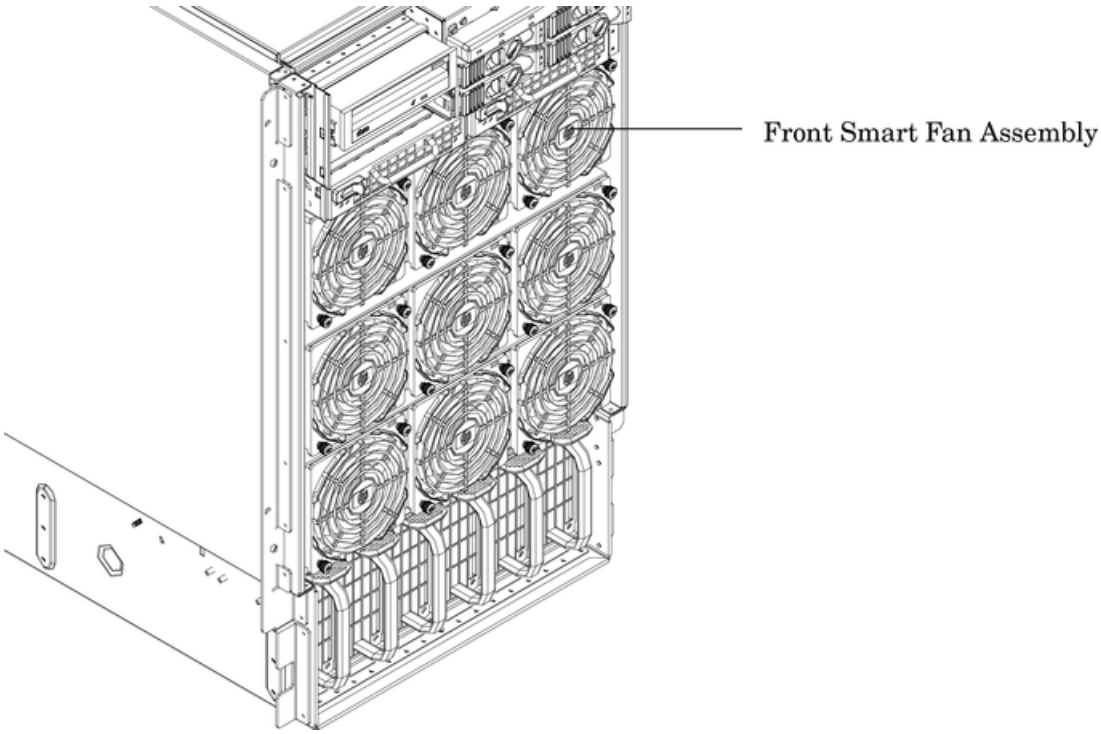
Figure 6-7 Front Panel Board Cable Location on Backplane



Removing and Replacing the Front Smart Fan Assembly

The front smart fan assembly is located in the front of the chassis. The fan assembly is a hot-swappable component.

Figure 6-8 Front Smart Fan Assembly Location



Preliminary Procedures

These procedures must be completed before removing the front smart fan assembly.

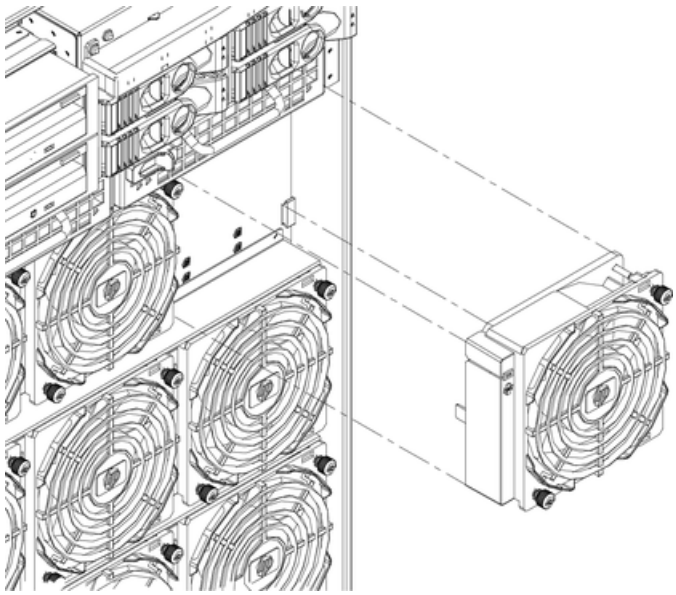
1. Identify the failed fan assembly. Table 6-1 defines the fan LED states.
2. Remove the front bezel.

Table 6-1 Smart Fan Assembly LED definitions

LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than 12 seconds.
Flash Yellow	Fan is not keeping up with speed/sync pulse for greater than 12 seconds.
Red	Fan failed or stalled, has run slow, or fast for greater than 12 seconds.
Off	Fan is not present, or no power is applied to fan, or the fan has failed.

Removing the Front Smart Fan Assembly

Figure 6-9 Front Fan Removal



To remove the front smart fan assembly, follow these steps:

1. Loosen the two thumb screws securing the fan to the chassis.
2. Slide the fan from the chassis.

Replacing the Front Smart Fan Assembly

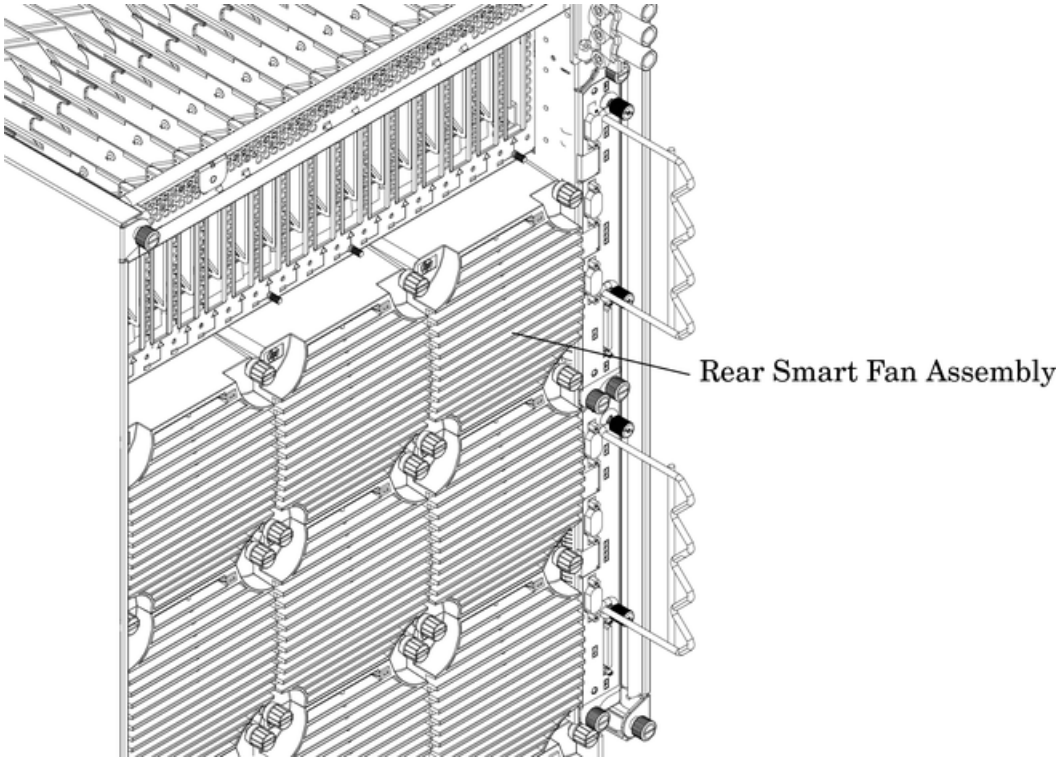
To replace the front smart fan assembly, follow these steps:

1. Position the fan assembly in the chassis.
2. Tighten the two thumb screws to secure the fan to the chassis.
3. Check the fan status LED. It should be GREEN. Refer to Table 6-1 for LED definitions.

Removing and Replacing the Rear Smart Fan Assembly

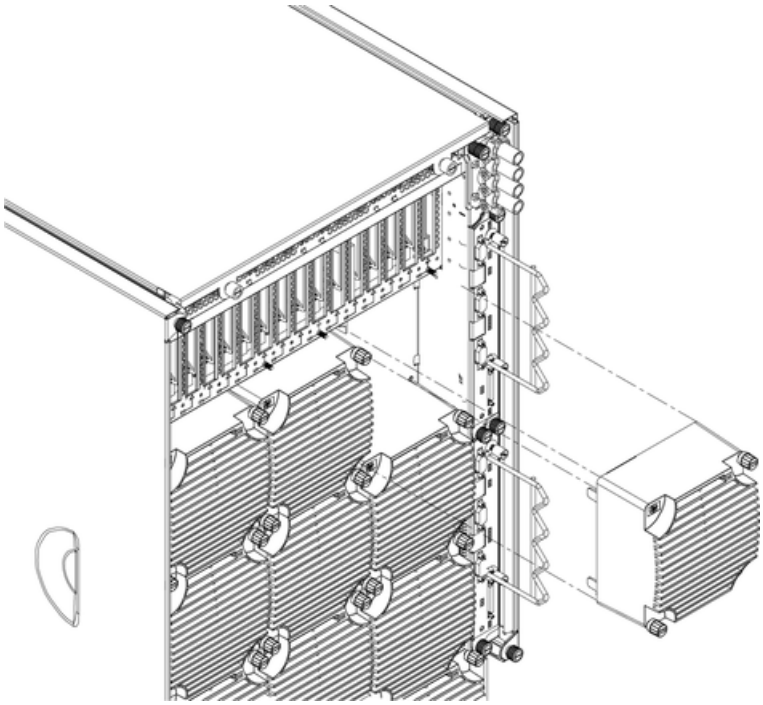
The rear smart fan assembly is located in the rear of the chassis. The fan assembly is a hot-swappable component.

Figure 6-10 Rear Smart Fan Assembly Location



Removing the Rear Smart Fan Assembly

Figure 6-11 Rear Fan Detail



To remove the rear smart fan assembly, follow these steps:

1. Identify the failed fan assembly. Table 6-2 defines the fan LED states.

Table 6-2 Smart Fan Assembly LED Indications

LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than 12 seconds.
Flash Yellow	Fan is not keeping up with speed/sync pulse for greater than 12 seconds.
Red	Fan failed or stalled, has run slow, or fast for greater than 12 seconds.
Off	Fan is not present, or no power is applied to fan, or the fan has failed.

2. Loosen the two thumb screws securing the fan to the chassis.
3. Slide the fan from the chassis.

Replacing the Rear Smart Fan Assembly

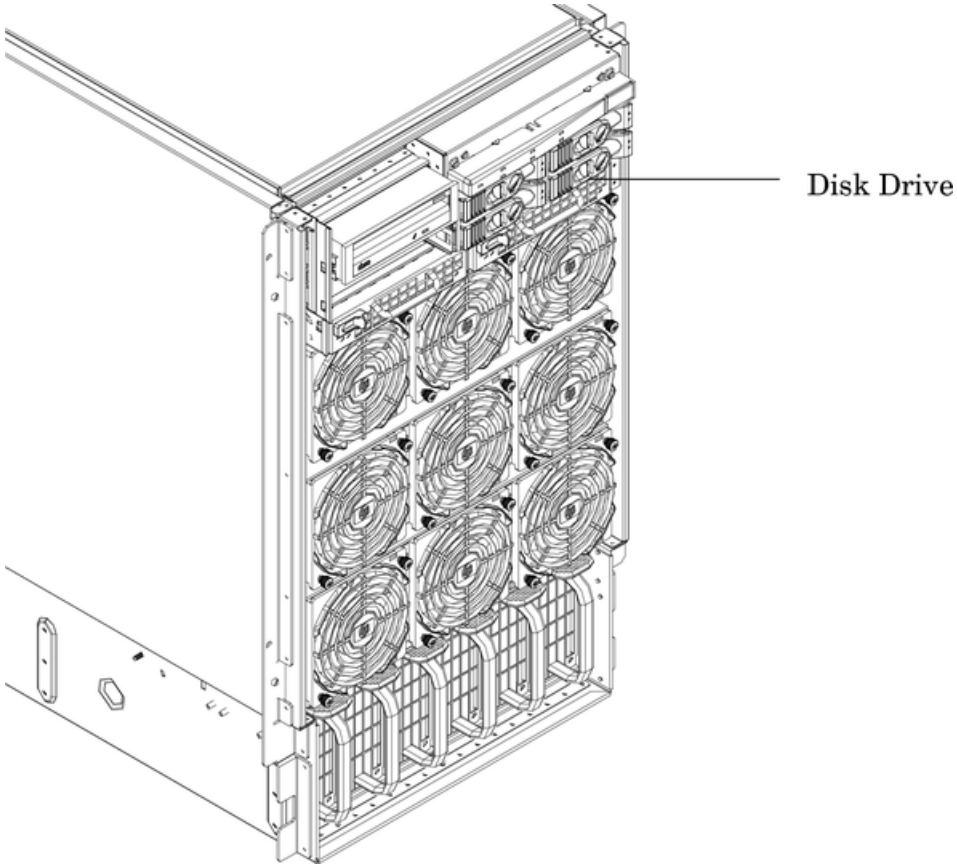
To replace the rear smart fan assembly, follow these steps:

1. Position the fan assembly in the chassis.
2. Slide the fan into the connector.
3. Tighten the two thumb screws to secure the fan to the chassis.
4. The LED should be GREEN. For a listing of LED definitions, see Table 6-2 (page 117).

Removing and Replacing a Disk Drive

The disk drive is located in the front of the chassis. Internal disk drives are hot-plug components.

Figure 6-12 Disk Drive Location

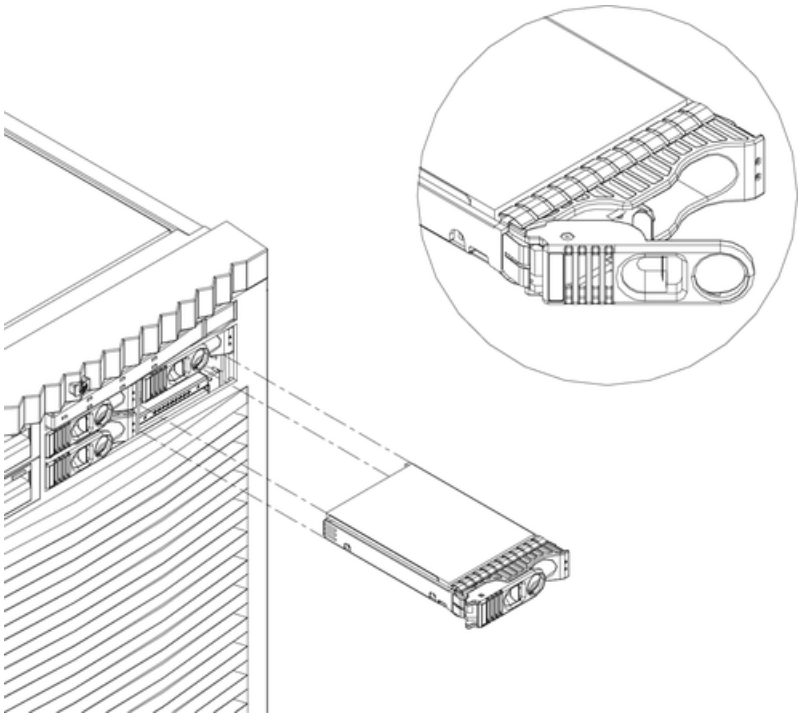


Removing the Disk Drive

To remove a disk drive, follow these steps:

1. Disengage the front locking latch on the disk drive by pushing the release tab to the right and the latch lever to the left.
2. Pull forward on the front locking latch and carefully slide the disk drive from the chassis.

Figure 6-13 Disk Drive Detail



Replacing the Disk Drive

To replace a disk drive, follow these steps:

1. Sometimes `diskinfo` and `ioscan` display cached data. Running `diskinfo` on the device without a disk installed clears the cached data. Enter the following commands.

   For the `diskinfo` command, the 'x' s are replaced with actual values.

   ```
   #diskinfo -v /dev/rdsk/cxtxdx
   #ioscan -f
   ```

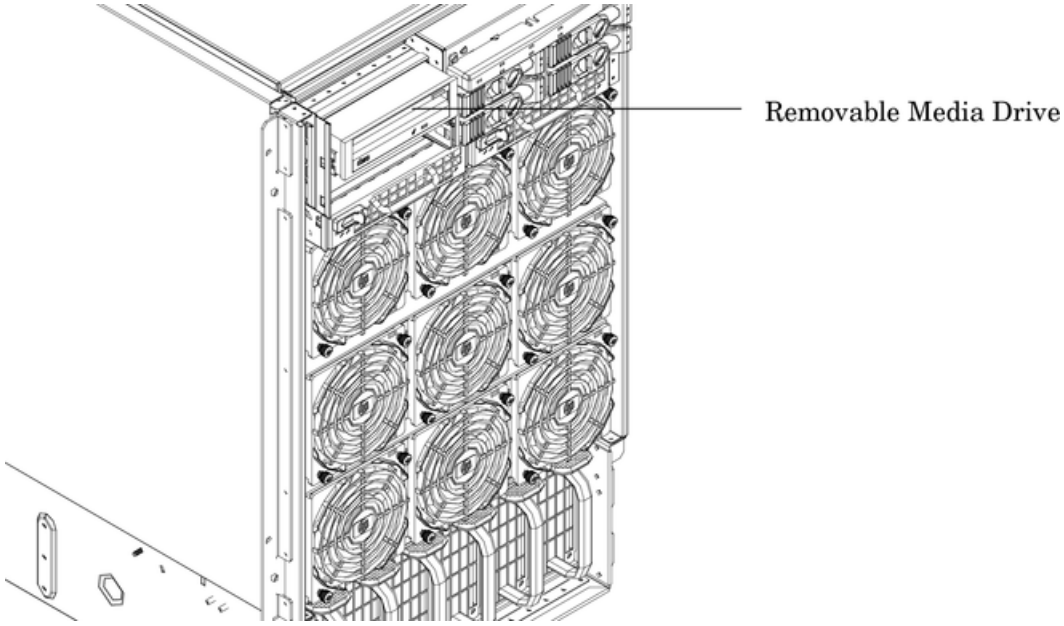
2. Be sure the front locking latch is open, then carefully position the disk drive in the chassis.
3. Slide the disk drive into the chassis; a slow, firm pressure is needed to properly seat the connection.
4. Depress the front locking latch to secure the disk drive in the chassis.
5. Spin up the disk by entering one of the following commands:

   ```
   #diskinfo -v /dev/rdsk/cxtxdx
   #ioscan -f
   ```

Removing and Replacing a Removable Media Drive

A removable media drive may either be a DVD drive or DDS-4 tape drive located in the front of the chassis. The system power must be shut down before attempting to remove or replace this FRU. For more information, see "Powering Off Hardware Components and Powering On the Server" (page 106) and Appendix E (page 203).

Figure 6-14 Removable Media Drive Location

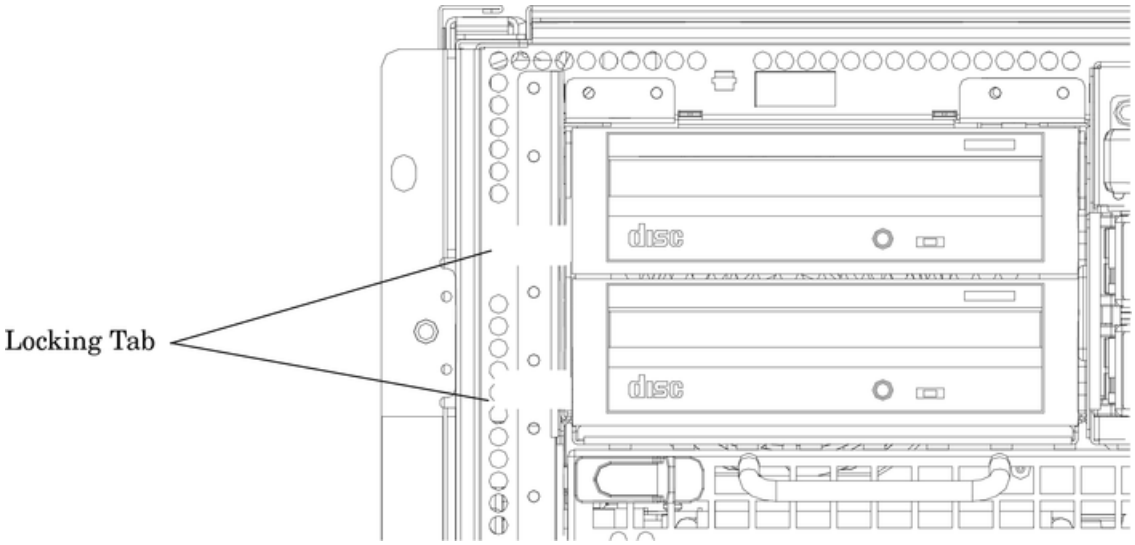


Removing the Removable Media Drive

To remove the media drive, follow these steps:

1. Turn off the power to the server.
2. Identify the failed removable media drive.
3. Connect to ground with a wrist strap. For more information, see "Electrostatic Discharge " (page 106).
4. Press the front locking tab to detach the drive from the chassis.
5. Pull the drive out of the chassis.
6. Unhook the cables from the rear of the drive. When removing the bottom drive, remove the top drive first.
7. Slide the drive from the chassis.
8. Remove the rails and clips from the drive.

Figure 6-15 Removable Media Drive Detail



Replacing the Removable Media Drive

To replcae the media drive, follow these steps:

1. Attach the rails and clips to the drive.
2. Connect the cables to the rear of the drive.
3. Position the drive in the chassis. If applicable, install the bottom drive before installing the top drive.
4. Turn the power on to the server.
5. To ensure that the system recognizes the drive, verify operation of the drive. Perform a `SEArch` or `INFO` at the EFI shell.

Removing and Replacing a Cell Board

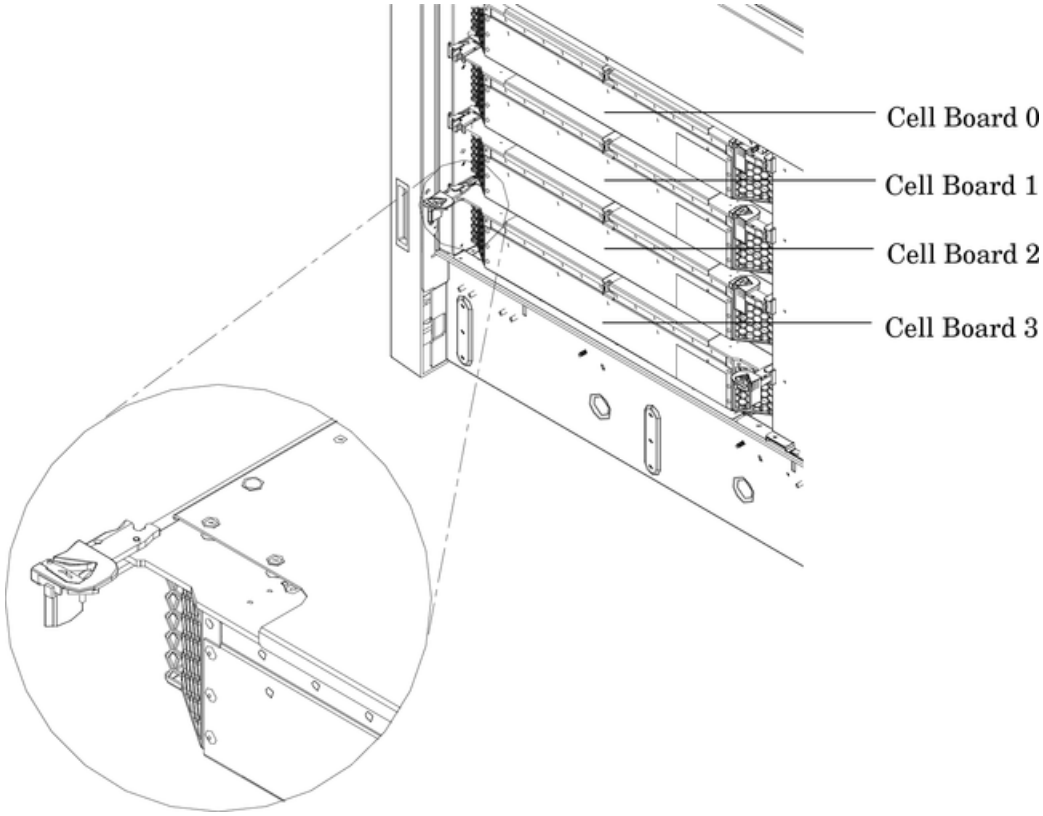
The cell boards are located in the right side of the chassis. The cell power must be turned off to replace this FRU. Refer to "Powering Off Hardware Components and Powering On the Server" (page 106) and Appendix E (page 203).

Cell boards are shipped with all four processors installed. Should the old cell board to be replaced have fewer processors than the new cell board, you must remove the processors from the new cell board to match what the customer has installed on the old cell board. The DIMMs from the old cell board must be transferred to the new cell board.

To remove and replace a cell board, follow these steps:

1. Prepare an ESD safe work surface large enough to accommodate two cell boards. Use a grounded mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit.
2. Place the new cell board on the work surface.
3. Remove the cell board from the server and place it on the work surface. See "Removing the Cell Board" (page 121).
4. Transfer the DIMMs from the old cell board to the new cell board.
5. Remove any additional processors from the new cell board and return the processors with the old cell board. See "Removing and Replacing a Central Processing Unit" (page 141).
6. Install the new cell board in the server. See "Replacing a Cell Board" (page 123).

Figure 6-16 Cell Board Extraction Lever



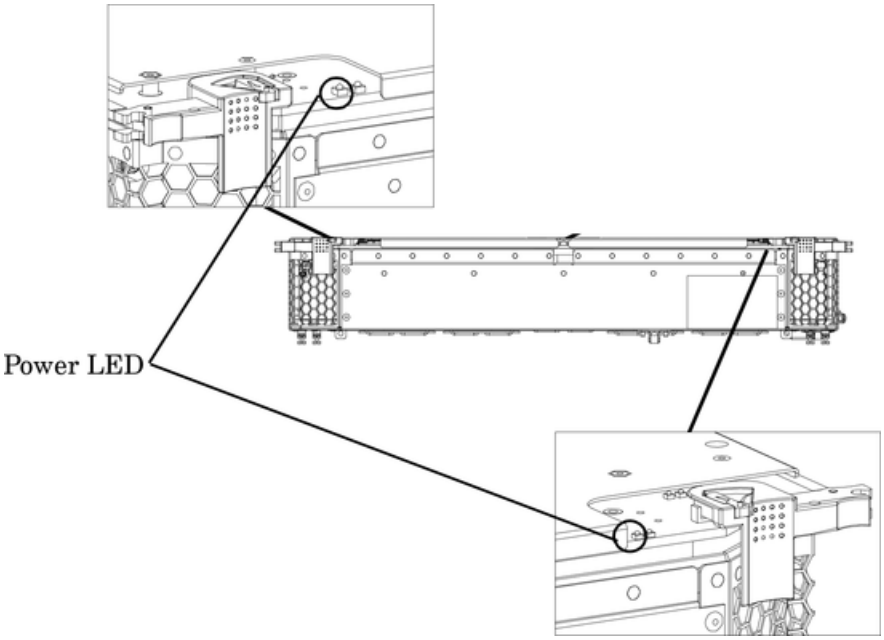
Removing the Cell Board

NOTE: The cell board weighs 27.8 lb. Support both side edges while removing the cell board from the chassis.

To remove the cell board, follow these steps:

1. Remove the right side cover. See "Removing and Replacing Covers" (page 108).
2. Power off the cell board using the MP command menu `PE` command.
3. Verify that the green power LED located on either the left-hand side or right-hand side of the cell board is off before removing the cell board. See Figure 6-17.

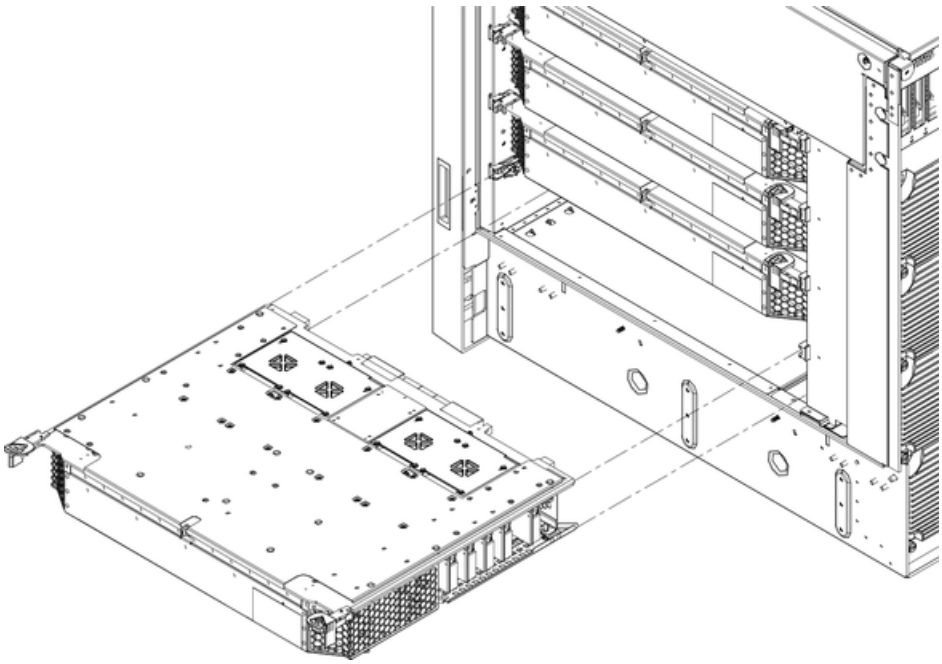
Figure 6-17 Cell Board Power LED



4. Press each extraction lever to release the cell board then pull the extraction levers outwards. See Figure 6-16.
5. Slide the cell board from the chassis. See Figure 6-18.
6. Follow proper procedures to remove and replace all FRU's on the cell board.

NOTE: For the procedures, see "Removing and Replacing a Central Processing Unit" (page 141) and "Removing and Replacing DIMMs" (page 139).

Figure 6-18 Cell Board Removal and Replacement



Replacing a Cell Board

NOTE: The cell board weighs 27.8 lb. Support both side edges while replacing the cell board into the chassis.

To replace the cell board, follow these steps:

1. Position the cell board on the cell board guide rails.
2. The cell board easily slides into the chassis. To properly seat the cell board, use a slow, firm pressure.
3. Using equal pressure, simultaneously depress both extraction levers to secure the cell board in the chassis.

   Ensure that both levers are in the locked position. If both levers are not locked, the cell board does not power up.
4. To verify that the extraction levers are locked and the cell board is in the proper operational status, enter **`de`** from the Command Menu.
5. To select the `Cell Board Controller (PDHC)` enter **`h`** and enter the cell number.

NOTE: The `PDHC state` should read `Attention LED is off`, and the `Power Status` should read `RDY`. If the `Power Status` reads `rdy`, then one or both of the extraction levers are not properly locked. Ensure both cell board extraction levers are locked. Figure 6-19 shows a sample of the output.

Figure 6-19 de Command Output

```
MP:CM> de

Display summary status of the selected MP device.

    B - BPS  (Bulk Power Supplies)
    U - CLU  (Cabinet Utilities: Fans, Intrusion, Clock's etc.)
    A - PACI (Partition Console Interface)
    G - MP   (Management Processor)
    P - PM   (Power Management)
    H - Cell Board Controller (PDHC)
        Select device: h
    Enter cell number: 1

Cell Controller (PDHC) status. Cell 1
FW Revision  : 0.016 built WED OCT 15 07:53:08 2003
MICE Revision : 1.0

PDHC state       : 0x3b (err bib SMG CCO oci I2C PWR)
Attention Led is off

Power Status : 0x7c (12VSTBY RDY EN PWR vflt tflt fanflt)

LED State    : 0x0e (BIB SMG I2C heartbeat)

IO Connection Status      : 0x01 (Connection OK)
IO Chassis Phys Location  : 0x01 (cabinet=0, PCI Backplane=0, PCI Domain=1)
Core Cell Number          : 0x80 (cabinet=0, cell=0, Valid)

Temp Fault Status : 0x00 (cpu0 cpu1 cpu2 cpu3 mmu cell)
CPU 0 Temp                : 65  deg C
CPU 1 Temp                : 61  deg C
CPU 2 Temp                : 66  deg C
CPU 3 Temp                : 58  deg C
MMU Temp                  : 41  deg C
Cell Board Temp           : 39  deg C

Fan Status                : 0x0000 (No Fault)
Local I2C Bus Status      : 0x00 (OK)

MP:CM> _
```

Ready Bit (RDY) is set to true

6. Replace the right side cover. See "Replacing the Side Cover" (page 110).

Cell Break-Fix Upgrade and Downgrade Procedure

This release notice provides information, upgrade and downgrade instructions for the rp7420, rp8420, rx7620 and an rx8620 system products. These instructions pertain to a break fix scenario where a replacement cell is added to a currently operating system.

Upgrading Using the FW Command

To upgrade using the FW command, follow these steps:

1. Execute the Onboard Scan Programming Utility to upgrade / downgrade the new Cell FPGA to match the version on the other cells.

   ```
   MP:CM> osp
   ```

   Enter the following information when prompted:

   ```
   Enter the Entities to be upgraded (Ex: 2,4,7):
   (1)Enter your user name:
   (2)Enter your user password:
   (3)Enter the ip address where the FPGA image file can be found:
   (4)Enter the path where the file(s) can be found:
   (5)Enter PDHC FPGA image filename:
   (6)Are you sure that you want to continue (Y/N): y
   ```

   (1) Select the appropriate entity corresponding to the replacement cell to be upgraded / downgraded by entering the number from the first column of the OSP table.

   (2) Enter your user name.

   (3) Enter account password.

   (4) Enter the ip address of the anonymous FTP server where the firmware images reside.

   (5) Enter the directory path. For example: `/dist/version3_0` (or some other location). Do not list the actual firmware image filename.

   (6) Enter the filename. For example: `pdhc_1.7.0.osp`

   Example (rp8420 with SEU)

```
MP:CM> osp
    ***********************************************************************
    *****                                                             *****
    *****            Onboard Scan Programming Utility                 *****
    *****                                                             *****
    *****       (C) Copyright 2001 Hewlett-Packard Company            *****
    *****                   All Rights Reserved                       *****
    *****                                                             *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS            *****
    *****                                                             *****
    *****  This program is intended for use by trained HP support     *****
    *****  personnel only.  HP shall not be liable for any damages    *****
    *****  resulting from unauthorized use of this program.  This     *****
    *****  program is the property of HP.                             *****
    *****                                                             *****
    *****                     Version  1.03                           *****
    *****                                                             *****
    ***********************************************************************
                                                 Flash    Current
    Number  Cabinet       Name  Partition   Handle   FPGA Version
    ------ ---------  -------- ---------- -------- --------------
       1         0     CIO 0         0     2048      2.008
       2         0     CIO 1         1     2049      2.008
       3         0       GPM         0     2184      1.002
       4         0        FM         0     2192      1.002
       5         0       OSP         0     2232      1.002
       6         0    Pci HS         0     2328      1.000
       7         0   PciXLPM         0     2352      2.000
 (2)   8    (1)  8     CIO 0         0    34816      2.008
 (2)   9    (1)  8     CIO 1         1    34817      2.008
 (2)  10    (1)  8       GPM         0    34952      1.002
 (2)  11    (1)  8        FM         0    34960      1.002
 (2)  12    (1)  8       OSP         0    35000      1.002
 (2)  13    (1)  8    Pci HS         0    35096      1.000
 (2)  14    (1)  8   PciXLPM         0    35120      2.000
      15         0    PDHC 0         0     2472      1.007
      16         0   CLPM  0         0     2480      1.002
      17         0    PDHC 1         1     2473      1.007
      18         0   CLPM  1         1     2481      1.002
 (2)  19         0    PDHC 2         0     2474      1.007
 (2)  20         0   CLPM  2         0     2482      1.002
 (2)  21         0    PDHC 3         1     2475      1.007
 (2)  22         0   CLPM  3         1     2483      1.002
```

```
Enter the Entities to be upgraded (Ex: 2,4,7) : 15
Enter your user name: anonymous
Enter your user password: ********
Enter the ip address where the FPGA image file can be found: 192.1.1.1
Enter the path where the file(s) can be found: /dist/versionX_X
Enter PDHC FPGA image filename: pdhc_X.X.X.osp (Refer to Note (3) in this step)
Are you sure that you want to continue(Y/N): y

**** Updating PDHC FPGA ****
```

Firmware updating progress will be reported

NOTE: (1): When a SEU is connected to an rp8420 system, the cabinet id `8` is assigned to the SEU.

(2): These entities are only seen on the rp8420.

(3): `X.X.X` is the version number corresponding to the version of the FPGA on the other cells.

CAUTION: *DO NOT RESET* the cell or server unless you have received confirmation that the FPGAs were updated successfully. Repeat the firmware update procedure immediately for all entities failing to update successfully.

2. Verify that you have received confirmation that the FPGA was updated successfully. If any entity failed to update properly, do not continue until the entity has successfully updated. A successful update returns the following message:

   ```
   OSP has completed successfully for all selected FPGAs.
   ```

NOTE: FPGAs updated in step 4 do not show the updated version when running the `sysrev` command until after the next AC cycle of the cell. Once ALL firmware images have been updated, you are instructed to AC cycle the cell later in this procedure.

3. **Do not reset** the cell until step 4 has completed.
4. Execute the Firmware Update Utility to update Cell PDHC version (s) to `A.X.X.X` (see Note (1) in this step) using the `fw` command:

   ```
   MP:CM> fw
   ```

   Enter the following information when prompted:

   ```
   Enter the Entities to be upgraded (Ex: 3,4,10): (1)
   Enter your user name: (2)
   Enter your user password: (3)
   Enter the ip address where the firmware can be found: (4)
   Enter the path where the firmware can be found: (5)
   Enter the filename of the firmware image for the PDHC: (6)
   Enter the filename of the System Firmware image: (7)
   Enter the filename of the firmware image for the MP: (8)
   Are you sure that you want to continue (Y/N): y
   ```

   (1) Select the appropriate entity corresponding to the replacement cell to be upgraded / downgraded by entering the number from the first column of the FW table.

   (2) Enter your user name.

   (3) Enter account password.

   (4) Enter the ip address of the anonymous FTP server where the firmware images reside.

   (5) Enter the directory path. For example: `/dist/versionX_X` (or some other location). Do not list the actual firmware image filename.

   (6) Enter the PDHC filename: `pdhc_A.X.X.X.bin`

(see Note (1) in this step).

NOTE (1): X.X.X is the version number corresponding to the version of the PDHC firmware on the other cells.

Example (rp8420 with SEU):

```
MP:CM> fw
    ************************************************************************
    *****                                                                *****
    *****                  Firmware Update Utility                       *****
    *****                                                                *****
    *****       (C) Copyright 2001 Hewlett-Packard Company               *****
    *****                    All Rights Reserved                         *****
    *****                                                                *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS               *****
    *****                                                                *****
    *****  This program is intended for use by trained HP support        *****
    *****  personnel only.  HP shall not be liable for any damages       *****
    *****  resulting from unauthorized use of this program.  This        *****
    *****  program is the property of HP.                                *****
    *****                                                                *****
    *****                       Version  4.00                            *****
    *****                                                                *****
    ************************************************************************
                                       Flash        Current
Number  Cabinet    Name   Partition   Handle   Firmware Version  Comments
------ --------- -------- ---------- -------- ----------------- --------
(1)  1        0     MP 0          0        0          5.022      Master
(1)  2        0     MP 1          1        1          5.022      Slave
(3)  3   (2)  8     MP 0          0    32768          5.022      Master
(3)  4   (2)  8     MP 1          1    32769          5.022      Slave
     5        0   PDHC 0          0      256          3.012         -
     6        0    SFW 0          0      320         21.003         -
     7        0   PDHC 1          1      257          3.014         -
     8        0    SFW 1          1      321         21.003         -
(3)  9        0   PDHC 2          0      258          3.014         -
(3) 10        0    SFW 2          0      322         21.003         -
(3) 11        0   PDHC 3          1      259          3.014         -
(3) 12        0    SFW 3          1      323         21.003         -

Enter the Entities to be upgraded (Ex: 3,4,10): 5
Enter your user name: anonymous
Enter your user password: ********
Enter the ip address where the firmware can be found: 192.1.1.1
Enter the path where the firmware can be found: /dist/versionX_X
Enter the filename of the firmware image for the PDHC: pdhc_A.X.X.X.bin
Are you sure that you want to continue(Y/N): y

**** Firmware Updating PDHC ****
```

Firmware updating progress will be reported

NOTE: 1. When a SEU is connected to an rp8420 system, the cabinet id 8 is assigned to the SEU.

2. These entities will only be seen on the rp8420.

3. X.X.X is the version number corresponding to the version of the PDHC Firmware on the other cells.

---

5. Ensure the entity selected was updated successfully. A successful update returns the following message:

```
Firmware Update has completed successfully for all entities.

MP:CM>
```

An unsuccessful update results in an error message. If the FTP connection was successful, but the update failed, a warning is noted for the entity being updated. For example:

```
Firmware Update failed for entity SFW 0.
DO NOT REBOOT SFW 0 until it has been successfully updated!!!
Firmware Update completed with errors.
```

CAUTION: Repeat the firmware update procedure immediately for all entities failing to update successfully. *DO NOT RESET* or *AC POWER CYCLE* until you get a message indicating that all updates have completed successfully.

6. Activate the new firmware for all updated components by cycling power to the cell, following these specific steps:
   a. Eject the cell.
   b. Reinsert the cell.
7. Following the Cell AC power cycle, verify the updated firmware revisions by using the `sysrev` command.

   Example (rp8420 with SEU):

```
MP:CM> sysrev
                    Cabinet firmware revision report

                PROGRAMMABLE HARDWARE :
                System Backplane :   GPM          FM         OSP
                                   -------     -------    -------
                                    1.002       1.002      1.002

                PCI-X Backplane  :   LPM          HS
                                   -------     -------
                                     2.000       1.000

                Core IO          :  Master       Slave
                                   --------    -------
                                     2.009       2.009

                                     LPM         PDHC
                                   -------     -------
                 Cell 0 :            1.002       1.007
                 Cell 1 :            1.002       1.007
                 Cell 2 :            1.002       1.007
                 Cell 3 :            1.002       1.007

                 FIRMWARE:

                 Core IO
                   Master         :  A.006.012
                   Event Dict.    :          0.009
                   Slave          :  A.006.012
                   Event Dict.    :          0.009

                 Cell 0
                   PDHC           :  A.003.023
                   Pri SFW        :     21.003 (PA)
                   Sec SFW        :     21.003 (PA)

                 Cell 1
                   PDHC           :  A.003.023
                   Pri SFW        :     21.003 (PA)
                   Sec SFW        :     22.002 (PA)

                 Cell 2
                   PDHC           :  A.003.023
                   Pri SFW        :     21.003 (PA)
                   Sec SFW        :     22.002 (PA)
```

```
 Cell 3
   PDHC          :  A.003.023
   Pri SFW       :     21.003 (PA)
   Sec SFW       :     22.002 (PA)

      IO Cabinet FPGA and Firmware revision report

System Backplane :      GPM          FM         OSP
                        -------     -------    -------
                          1.002       1.002      1.002

PCI-X Backplane  :      LPM          HS
                       -------     -------
                        2.000       1.000

                        FPGA         MP
                       -------     -------
  IOX Master Core IO  :   2.009    A.006.012
  Event Dict.                         0.009
  IOX Slave  Core IO  :   2.009    A.006.012
  Event Dict.                         0.009
```

NOTE: System Firmware does not display the correct revision until it has been updated separately in step 8.

8. Having verified that all other firmware components have been updated successfully, execute the Firmware Update Utility to update Cell System Firmware version(s) to `A.X.X.X` (see Note (1) in this step) using the `fw` command:

   ```
   MP:CM> fw
   ```

   Enter the following information when prompted:

   ```
   Enter the Entities to be upgraded (Ex: 3,4,10): (1)
   Enter your user name: (2)
   Enter your user password: (3)
   Enter the ip address where the firmware can be found: (4)
   Enter the path where the firmware can be found: (5)
   Enter the filename of the firmware image for the PDHC: (6)(a or b)
   Enter the filename of the System Firmware image: (7)
   Enter the filename of the firmware image for the MP: (8)
   Are you sure that you want to continue (Y/N): y
   ```

   (1) Select the appropriate entity corresponding to the replacement cell to be upgraded / downgraded by entering the number from the first column of the FW table

   (2) Enter your user name.

   (3) Enter account password.

   (4) Enter the ip address of the anonymous FTP server where the firmware images reside.

   (5) Enter the directory path. For example: `/dist/versionX_X` (or some other location). Do not list the actual firmware image filename.

   (6a) **For the rp8420 and rp7420**: Enter the System Firmware filename: `pinn.bin.X.X.fh` (see Note (1) in this step).

   (6b) **For the rx8620 and rx7620**: Enter the System Firmware filename: `sfw.X.X.X.fh` (see Note (1) in this step).

   NOTE (1): `X.X.X` is the version number corresponding to the version of the system firmware on the other cells. Example (rp8420 with SEU):

   ```
   MP:CM> fw
       ********************************************************************
       *****                                                          *****
       *****                 Firmware Update Utility                  *****
       *****                                                          *****
   ```

```
*****       (C) Copyright 2001 Hewlett-Packard Company          *****
*****                   All Rights Reserved                     *****
*****                                                           *****
*****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS          *****
*****                                                           *****
*****  This program is intended for use by trained HP support   *****
*****  personnel only.  HP shall not be liable for any damages  *****
*****  resulting from unauthorized use of this program.  This   *****
*****  program is the property of HP.                           *****
*****                                                           *****
*****                      Version  4.00                        *****
*****                                                           *****
*****************************************************************
                                        Flash        Current
Number  Cabinet    Name    Partition   Handle   Firmware Version  Comments
------ --------- -------- ---------- -------- ------------------ --------
(1)  1        0     MP 0          0        0          5.022      Master
(1)  2        0     MP 1          1        1          5.022      Slave
(3)  3   (2)  8     MP 0          0    32768          5.022      Master
(3)  4   (2)  8     MP 1          1    32769          5.022      Slave
     5        0   PDHC 0          0      256          3.014         -
     6        0    SFW 0          0      320         21.001         -
     7        0   PDHC 1          1      257          3.014         -
     8        0    SFW 1          1      321         22.002         -
(3)  9        0   PDHC 2          0      258          3.014         -
(3) 10        0    SFW 2          0      322         22.002         -
(3) 11        0   PDHC 3          1      259          3.014         -
(3) 12        0    SFW 3          1      323         22.002         -

Enter the Entities to be upgraded (Ex: 3,4,10): 6
Enter your user name: anonymous
Enter your user password: ********
Enter the ip address where the firmware can be found: 192.1.1.1
Enter the path where the firmware can be found: /dist/versionX_X
Enter the filename of the System Firmware image: pin.bin.X.X.fh
Are you sure that you want to continue(Y/N): y

**** Firmware Updating System Firmware ****
```

Firmware updating progress will be reported

NOTE: 1. When a SEU is connected to an rp8420 system, the cabinet id `8` is assigned to the SEU.

2. These entities are only seen on the rp8420.

3. `X.X.X` is the version number corresponding to the version of the system firmware on the other cells.

---

9. Ensure the entity selected was updated successfully. A successful update returns the following message:

   ```
   Firmware Update has completed successfully for all entities.

   MP:CM>
   ```

   An unsuccessful update results in an error message. If the FTP connection was successful, but the update failed, a warning will be noted for the entity being updated. For example:

   ```
   Firmware Update failed for entity SFW 0.
   DO NOT REBOOT SFW 0 until it has been successfully updated!!!
   Firmware Update completed with errors.
   ```

CAUTION: Repeat the firmware update procedure immediately for all entities failing to update successfully. *DO NOT RESET* or *AC POWER CYCLE* until you get a message indicating that all updates have completed successfully.

---

10. Verify the updated firmware revisions using the `sysrev` command. Example (rp8420 with SEU):

```
MP:CM> sysrev
                    Cabinet firmware revision report
                        PROGRAMMABLE HARDWARE :
                        System Backplane :   GPM          FM        OSP
                                           -------     -------    -------
                                             1.002       1.002      1.002

                        PCI-X Backplane  :   LPM          HS
                                           -------     -------
                                             2.000       1.000

                        Core IO          :  Master       Slave
                                           --------    -------
                                             2.009       2.009

                                             LPM        PDHC
                                             -------    -------
                        Cell 0 :             1.002      1.007
                        Cell 1 :             1.002      1.007
                        Cell 2 :             1.002      1.007
                        Cell 3 :             1.002      1.007

                                    FIRMWARE:
                        Core IO
                          Master         :  A.006.012
                          Event Dict.    :          0.009
                          Slave          :  A.006.012
                          Event Dict.    :          0.009

                        Cell 0
                          PDHC           :  A.003.023
                          Pri SFW        :     21.003 (PA)
                          Sec SFW        :     22.002 (PA)

                        Cell 1
                          PDHC           :  A.003.023
                          Pri SFW        :     21.003 (PA)
                          Sec SFW        :     22.002 (PA)

                        Cell 2
                          PDHC           :  A.003.023
                          Pri SFW        :     21.003 (PA)
                          Sec SFW        :     22.002 (PA)

                        Cell 3
                          PDHC           :  A.003.023
                          Pri SFW        :     21.003 (PA)
                          Sec SFW        :     22.002 (PA)

                    IO Cabinet FPGA and Firmware revision report
                       System Backplane :      GPM          FM        OSP
                                           -------     -------    -------
                                             1.002       1.002      1.002

                       PCI-X Backplane  :      LPM          HS
                                           -------     -------
                                             2.000       1.000

                                             FPGA         MP
                                            -------     -------
                    IOX Master Core IO  :      2.009    A.006.012
                    Event Dict.                                  0.009
                    IOX Slave  Core IO  :      2.009    A.006.012
                    Event Dict.                                  0.009
```

11. After resetting the firmware, verify the firmware and programmable hardware revisions again using the `sysrev` command. If all versions are now correct, continue to step 12. If not correct, run `dfw`, `fw` or `osp` again to copy or download the correct firmware.

12. Reset the partition using the `rs` command:

```
MP:CM> rs

This command resets the selected partition.
WARNING: Execution of this command irrecoverably halts all system processing
and I/O activity and restarts the selected partition.

Part#  Name
-----  ----
   0)  Partition 0
   1)  Partition 1
    Select a partition number: 0 (or 1)
```

Upgrading Using the DFW Command

1. If problems are encountered during the firmware update procedure, it may be necessary to use the MP `dfw` command. The `dfw` command can be used to copy a PDHC or a System firmware image from one cell to another. The steps for upgrading using the `dfw` command are the same as listed in "Upgrading Using the FW Command" (page 124):
   a. OSP the PDHC FPGA image to the new cell.
   b. Use DFW to copy the PDHC image to the new cell.
   c. AC power cycle the Cell
   d. Use DFW to copy the System Firmware image to the new cell.
2. Perform step 1 and step 2 from "Upgrading Using the FW Command" (page 124) Step 2.

   Do not reset the cell until step 3 completes.
3. Example (to upgrade the PDHC firmware):

```
MP:CM> dfw
    ************************************************************************
    *****                                                              *****
    *****               Duplicate Firmware Utility                     *****
    *****                                                              *****
    *****       (C) Copyright 2001 Hewlett-Packard Company             *****
    *****                   All Rights Reserved                        *****
    *****                                                              *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS             *****
    *****                                                              *****
    *****  This program is intended for use by trained HP support      *****
    *****  personnel only.  HP shall not be liable for any damages     *****
    *****  resulting from unauthorized use of this program.  This      *****
    *****  program is the property of HP.                              *****
    *****                                                              *****
    *****                      Version  1.04                           *****
    *****                                                              *****
    ************************************************************************

                                        Flash        Current
Number  Cabinet    Name   Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ------------------ --------
     1         0   PDHC 0A         0      256      A.003.023      Current
     2         0   PDHC 0B         0      264      A.003.023      Old
     3         0    SFW 0A         0      320         21.003      Pri PA
     4         0    SFW 0B         0      328         21.003      Sec PA
     5         0   PDHC 1A         0      257      A.003.034      Current
     6         0   PDHC 1B         0      265      A.003.034      Old
     7         0    SFW 1A         0      321         22.002      Pri PA
     8         0    SFW 1B         0      329         22.002      Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 1
Enter the source entity for the PDHC firmware image: 5
Are you sure that you want to continue(Y/N): y

**** Updating device PDHC 0A ****
```

```
Erasing Flash(es). This may take several minutes.
DFW has completed successfully for all entities
```

Once DFW has completed, verify the following message is returned:

```
DFW has completed successfully for all entities
```

CAUTION: *DO NOT RESET* or *AC POWER CYCLE* the server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

NOTE (1): After a `dfw` copy of a Cell PDHC firmware image is captured, the version displayed by the `sysrev` command is not correct until the cell PDHC is reset using the `ru` command, or AC power is cycled.

4. Perform steps 6 and 7 from "Upgrading Using the FW Command" (page 124).
5. Example (to upgrade the system firmware):

```
MP:CM> dfw
    ************************************************************************
    *****                                                                *****
    *****               Duplicate Firmware Utility                       *****
    *****                                                                *****
    *****       (C) Copyright 2001 Hewlett-Packard Company               *****
    *****                   All Rights Reserved                          *****
    *****                                                                *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS               *****
    *****                                                                *****
    *****  This program is intended for use by trained HP support        *****
    *****  personnel only.  HP shall not be liable for any damages       *****
    *****  resulting from unauthorized use of this program.  This        *****
    *****  program is the property of HP.                                *****
    *****                                                                *****
    *****                      Version  1.04                             *****
    *****                                                                *****
    ************************************************************************
                                        Flash        Current
Number  Cabinet    Name    Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ------------------ --------
     1         0   PDHC 0A         0      256      A.003.034      Current
     2         0   PDHC 0B         0      264      A.003.034      Old
     3         0    SFW 0A         0      320         21.001      Pri PA
     4         0    SFW 0B         0      328         21.001      Sec PA
     5         0   PDHC 1A         0      257      A.003.034      Current
     6         0   PDHC 1B         0      265      A.003.034      Old
     7         0    SFW 1A         0      321         22.002      Pri PA
     8         0    SFW 1B         0      329         22.002      Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 3
Enter the source entity for the System firmware image: 7
Are you sure that you want to continue(Y/N): y

**** Updating device SFW 0A ****

Erasing Flash(es). This may take several minutes.
DFW has completed successfully for all entities
```

Once DFW has completed, verify the following message is returned:

```
DFW has completed successfully for all entities
```

CAUTION: *DO NOT RESET* or *AC POWER CYCLE* the cell or server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

6. Perform steps 11 and 12 from "Upgrading Using the FW Command" (page 124).

Downgrading Using the DFW Command

1. If problems are encountered during the firmware update procedure, it may be necessary to use the MP `dfw` command. The `dfw` command can be used to copy a PDHC or a System firmware image from one cell to another. The steps for upgrading using the `dfw` command are the same as listed in "Upgrading Using the DFW Command" (page 132) with two additional steps:
   a. OSP the PDHC FPGA image to the new cell.
   b. Use DFW to copy the PDHC image to the new cell image A.
   c. Use DFW to copy the PDHC image to the new cell image B.
   d. AC power cycle the Cell.
   e. Use DFW to copy the System Firmware image to the new cell image A.
   f. Use DFW to copy the System Firmware image to the new cell image B.
2. Perform step 1 and step 2 from "Upgrading Using the FW Command" (page 124).

   Do not reset the cell until step 4 completes.
3. Example (to downgrade the PDHC image A firmware):

```
MP:CM> dfw
    ************************************************************************
    *****                                                                *****
    *****               Duplicate Firmware Utility                       *****
    *****                                                                *****
    *****       (C) Copyright 2001 Hewlett-Packard Company               *****
    *****                   All Rights Reserved                          *****
    *****                                                                *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS               *****
    *****                                                                *****
    *****  This program is intended for use by trained HP support        *****
    *****  personnel only.  HP shall not be liable for any damages       *****
    *****  resulting from unauthorized use of this program.  This        *****
    *****  program is the property of HP.                                *****
    *****                                                                *****
    *****                      Version  1.04                             *****
    *****                                                                *****
    ************************************************************************

                                        Flash        Current
Number  Cabinet    Name   Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ------------------ --------
    1         0   PDHC 0A         0      256      A.003.034      Current
    2         0   PDHC 0B         0      264      A.003.034      Old
    3         0    SFW 0A         0      320         22.002      Pri PA
    4         0    SFW 0B         0      328         22.002      Sec PA
    5         0   PDHC 1A         0      257      A.003.023      Current
    6         0   PDHC 1B         0      265      A.003.023      Old
    7         0    SFW 1A         0      321         21.001      Pri PA
    8         0    SFW 1B         0      329         21.001      Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 1
Enter the source entity for the PDHC firmware image: 5
Are you sure that you want to continue(Y/N): y

**** Updating device PDHC 0A ****
Erasing Flash(es). This may take several minutes.

DFW has completed successfully for all entities
```

   Once DFW has completed, verify the following message is returned:

   `DFW has completed successfully for all entities`

CAUTION: *DO NOT RESET* or *AC POWER CYCLE* the server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

NOTE (1): After a `dfw` copy of a cell PDHC firmware image is captured, the version displayed by the `sysrev` command is not correct until the cell PDHC is reset using the `ru` command, or AC power is cycled.

4. Example (to downgrade the PDHC image B firmware):

```
MP:CM> dfw
    ********************************************************************
    *****                                                          *****
    *****               Duplicate Firmware Utility                 *****
    *****                                                          *****
    *****       (C) Copyright 2001 Hewlett-Packard Company         *****
    *****                   All Rights Reserved                    *****
    *****                                                          *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS         *****
    *****                                                          *****
    *****  This program is intended for use by trained HP support  *****
    *****  personnel only.  HP shall not be liable for any damages *****
    *****  resulting from unauthorized use of this program.  This  *****
    *****  program is the property of HP.                          *****
    *****                                                          *****
    *****                     Version  1.04                        *****
    *****                                                          *****
    ********************************************************************

                                        Flash        Current
Number  Cabinet    Name   Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ------------------ --------
    1         0   PDHC 0A         0      256      A.003.034      Current
    2         0   PDHC 0B         0      264      A.003.034      Old
    3         0    SFW 0A         0      320         22.002      Pri PA
    4         0    SFW 0B         0      328         22.002      Sec PA
    5         0   PDHC 1A         0      257      A.003.023      Current
    6         0   PDHC 1B         0      265      A.003.023      Old
    7         0    SFW 1A         0      321         21.001      Pri PA
    8         0    SFW 1B         0      329         21.001      Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 2
Enter the source entity for the PDHC firmware image: 5
Are you sure that you want to continue(Y/N): y

**** Updating device PDHC 0B ****

Erasing Flash(es). This may take several minutes.
DFW has completed successfully for all entities
```

Once DFW has completed, verify the following message is returned:

`DFW has completed successfully for all entities`

CAUTION: *DO NOT RESET* or *AC POWER CYCLE* the server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

NOTE (1): After a `dfw` copy of a Cell PDHC firmware image is captured, the version displayed by the `sysrev` command will not be correct until the cell PDHC is reset using the `ru` command or AC power is cycled.

5. Perform steps 6 and 7 from Step 6.
6. Example (to downgrade the system firmware image A firmware):

```
MP:CM> dfw
    ************************************************************************
    *****                                                                *****
    *****               Duplicate Firmware Utility                       *****
    *****                                                                *****
    *****       (C) Copyright 2001 Hewlett-Packard Company               *****
    *****                   All Rights Reserved                          *****
    *****                                                                *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS               *****
    *****                                                                *****
    *****  This program is intended for use by trained HP support        *****
    *****  personnel only.  HP shall not be liable for any damages       *****
    *****  resulting from unauthorized use of this program.  This        *****
    *****  program is the property of HP.                                *****
    *****                                                                *****
    *****                      Version  1.04                             *****
    *****                                                                *****
    ************************************************************************

                                        Flash        Current
Number  Cabinet    Name   Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ------------------ --------
    1         0   PDHC 0A         0      256      A.003.023      Current
    2         0   PDHC 0B         0      264      A.003.023      Old
    3         0    SFW 0A         0      320         22.002      Pri PA
    4         0    SFW 0B         0      328         22.002      Sec PA
    5         0   PDHC 1A         0      257      A.003.034      Current
    6         0   PDHC 1B         0      265      A.003.034      Old
    7         0    SFW 1A         0      321         21.001      Pri PA
    8         0    SFW 1B         0      329         21.001      Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 3
Enter the source entity for the System firmware image: 7
Are you sure that you want to continue(Y/N): y

**** Updating device SFW 0A ****

Erasing Flash(es). This may take several minutes.
DFW has completed successfully for all entities
```

Once DFW has completed, verify the following message is returned:

```
DFW has completed successfully for all entities
```

△ **CAUTION:** *DO NOT RESET* or *AC POWER CYCLE* the cell or server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

---

7. Example (to downgrade the system firmware image B firmware):

```
MP:CM> dfw
    ************************************************************************
    *****                                                                *****
    *****               Duplicate Firmware Utility                       *****
    *****                                                                *****
    *****       (C) Copyright 2001 Hewlett-Packard Company               *****
    *****                   All Rights Reserved                          *****
    *****                                                                *****
    *****        THIS PROGRAM IS NOT LICENSED TO CUSTOMERS               *****
    *****                                                                *****
    *****  This program is intended for use by trained HP support        *****
    *****  personnel only.  HP shall not be liable for any damages       *****
    *****  resulting from unauthorized use of this program.  This        *****
    *****  program is the property of HP.                                *****
    *****                                                                *****
    *****                      Version  1.04                             *****
    *****                                                                *****
    ************************************************************************
```

```
                                                Flash        Current
Number  Cabinet    Name    Partition  Handle   Firmware Version  Comments
------ --------- -------- --------- -------- ----------------- --------
    1         0   PDHC 0A         0      256      A.003.034      Current
    2         0   PDHC 0B         0      264      A.003.034      Old
    3         0    SFW 0A         0      320         21.001      Pri PA
    4         0    SFW 0B         0      328         22.002      Sec PA
    5         0   PDHC 1A         0      257      A.003.034      Current
    6         0   PDHC 1B         0      265      A.003.034      Old
    7         0    SFW 1A         0      321         21.001      Pri PA
    8         0    SFW 1B         0      329         21.001     Sec PA

Note: You can only duplicate one firmware type at a time.

Enter the Entities to be updated (EX: 7,8) : 4
Enter the source entity for the System firmware image: 7
Are you sure that you want to continue(Y/N): y

**** Updating device SFW 0B ****

Erasing Flash(es). This may take several minutes.
DFW has completed successfully for all entities
```

Once DFW has completed, verify the following message is returned:

```
DFW has completed successfully for all entities
```

CAUTION: *DO NOT RESET* or *AC POWER CYCLE* the cell or server unless you have received confirmation that DFW has completed successfully. Repeat the `dfw` command immediately if the firmware failed to complete successfully.

8. Perform steps 11 and 12 from Step 11.

Installing the VRM Cover (AB388-00002) and Door Opener (AB388-00003)

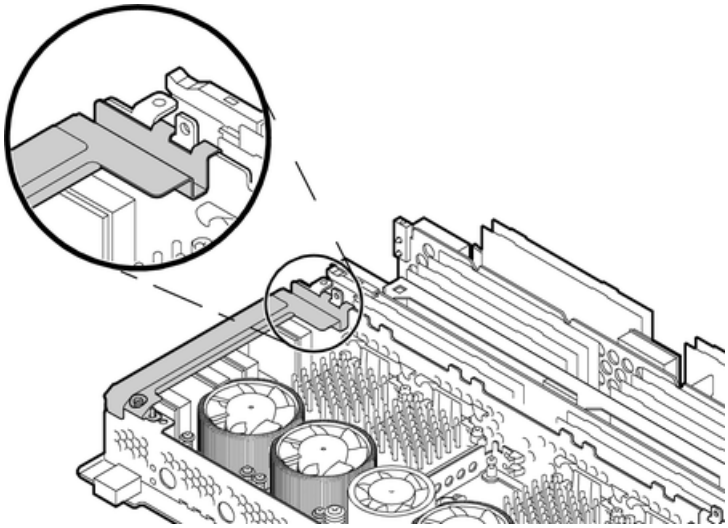
These two assemblies replace the single CPU cover when installing PA8800 and Dual-Core IPF processors. The assemblies are included in upgrade kits and will not be available to order individually. The following is a list of processors that require the new air baffles.

- Intel ® Itanium® 2 CPUs (AB548A and AB439A)
- PA8800 CPUs (AB536A and AB537A)

To install new air baffles, follow these steps:

1. Remove the old CPU cover.
2. Install the VRM Cover (AB388-00002), onto the left side of the cell board. Tighten the screw. See Figure 6-20.

Figure 6-20 VRM Cover Installed



3. Install the Door Opener (AB388-00003), onto the right side of the cell board. Tighten the screw. See Figure 6-21.

Figure 6-21 Door Opener Installed

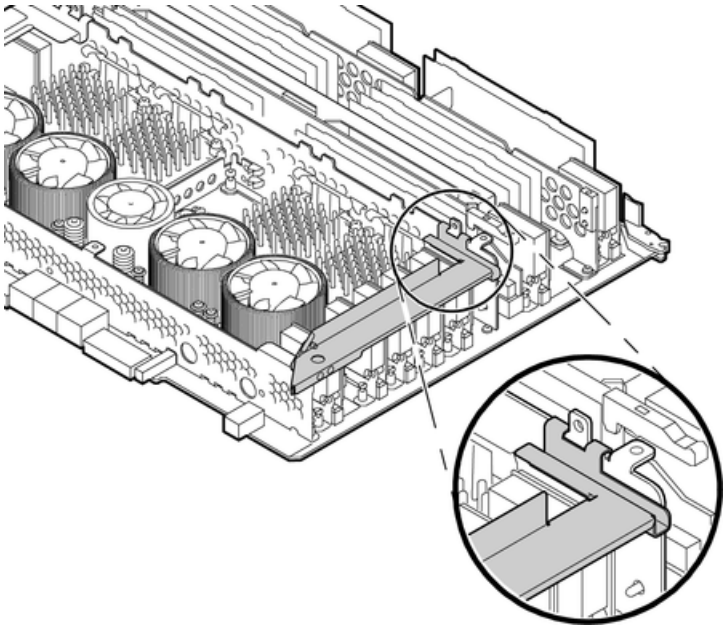
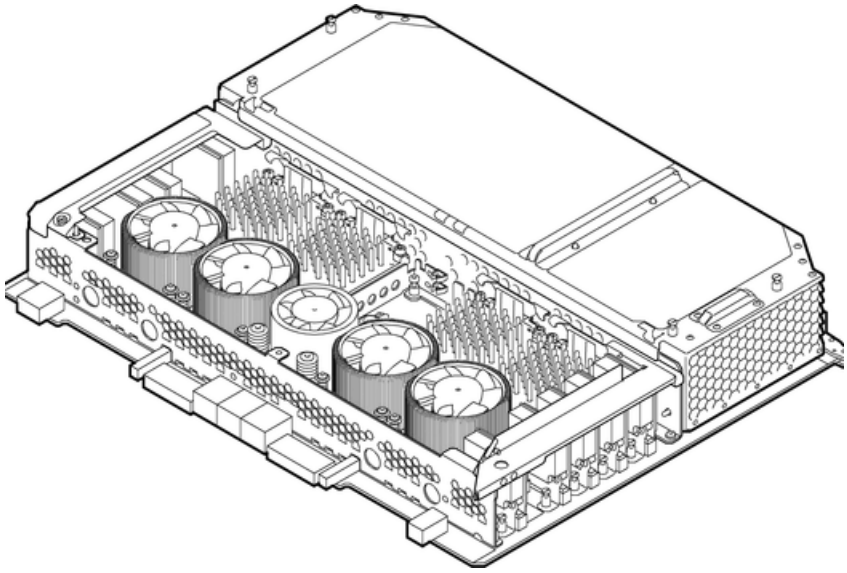


Figure 6-22 VRM Cover, Door Opener and DIMM Cover Installed

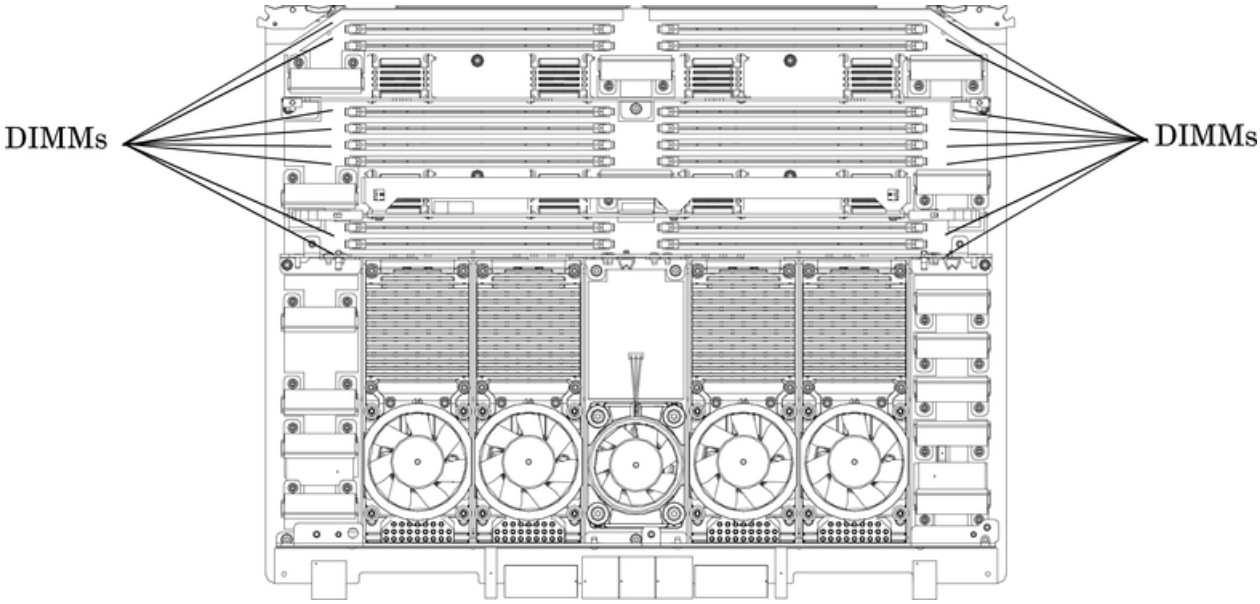


4. Install the cell board into the server.
5. Replace the right side cover.
6. Power on the server. See "Powering Off Hardware Components and Powering On the Server" (page 106).
7. Power up the nPartition. See Appendix E (page 203).
8. To verify proper operation of the cell board, use the `info cpu` command from the EFI Shell.

Removing and Replacing DIMMs

The dual in-line memory modules (DIMMs) reside on the cell board. You must turn off he cell power to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106) and Appendix E (page 203).

Figure 6-23 Cell Board with DIMM Location

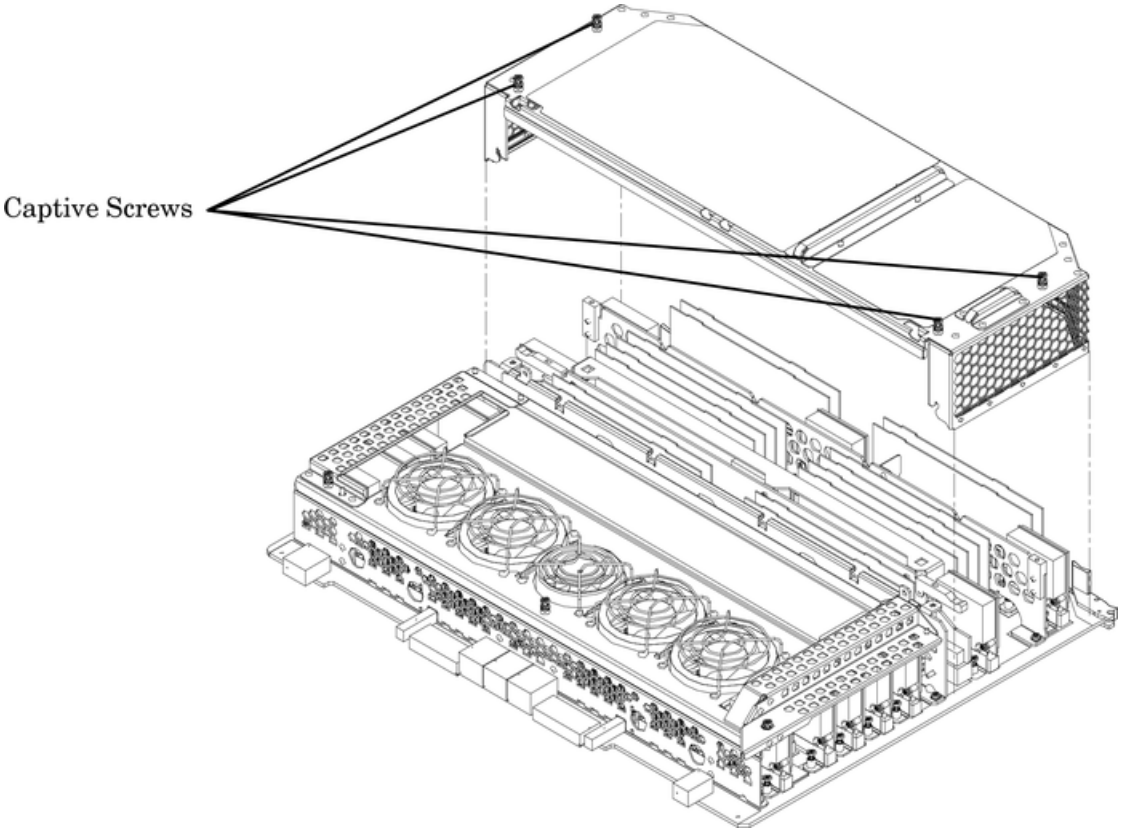


Preliminary Procedures

These procedures must be completed before removing the DIMM assembly.

1. Remove the right side cover. See “Removing and Replacing Covers” (page 108).
2. Remove the cell board. See “Removing the Cell Board” (page 121).
3. Place the cell board on the ESD safe work surface.
4. Loosen the four captive thumb screws securing the removable DIMM cover. See Figure 6-24.

Figure 6-24 DIMM Cover Assembly



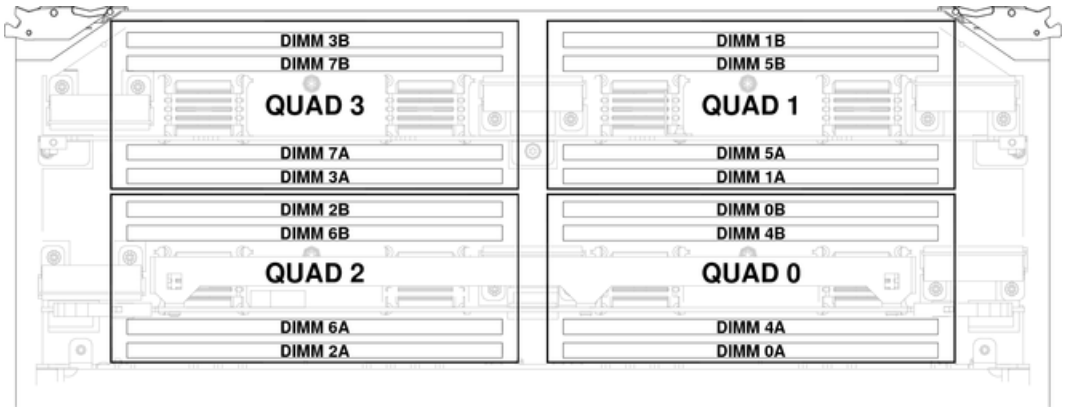
5. Lift the cover to gain access to the DIMMs.

Removing a DIMM

To remove a DIMM, follow these steps:

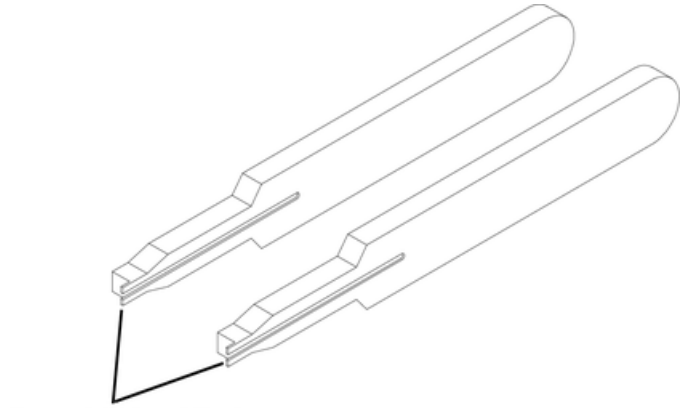
1. Identify the defective DIMMs using Figure 6-25 to aid with DIMM location on cell board.

Figure 6-25 DIMM Detail with Locations



2. Using both DIMM removal tools, place the grooved side of each tool on each side of the target DIMM. See Figure 6-26.

Figure 6-26 DIMM Removal Tools



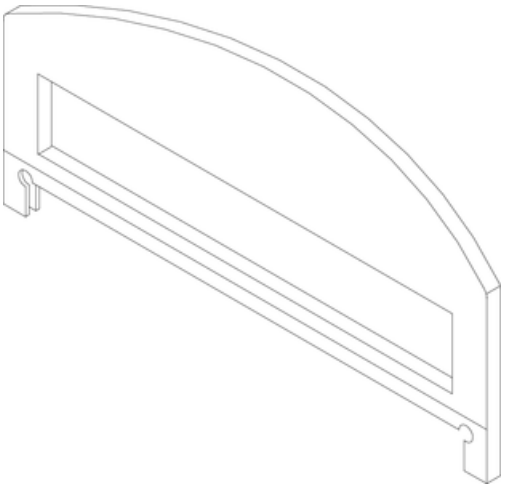
3. Seat the tool tips down to limit, then leverage connector latches outward to unseat the DIMM from the memory slot.

Replacing a DIMM

To replace a DIMM, follow these steps:

1. Orient the replacement DIMM connector key over the memory slot.
2. Using the DIMM installer tool shown in Figure 6-27, press downward evenly to seat the DIMM into the memory slot.

Figure 6-27 DIMM Installation Tool



3. Position the cover over the cell board and gently press the corners to snap the cover in place.
4. Tighten the four captive screws to secure the cover to the cell board.
5. Replace the cell board into the chassis. See "Replacing a Cell Board" (page 123).
6. Replace the side cover. See "Removing and Replacing Covers" (page 108).
7. Verify proper operation by using the MP Command menu `PS` command to display cell and DIMM status for the cell.

Removing and Replacing a Central Processing Unit

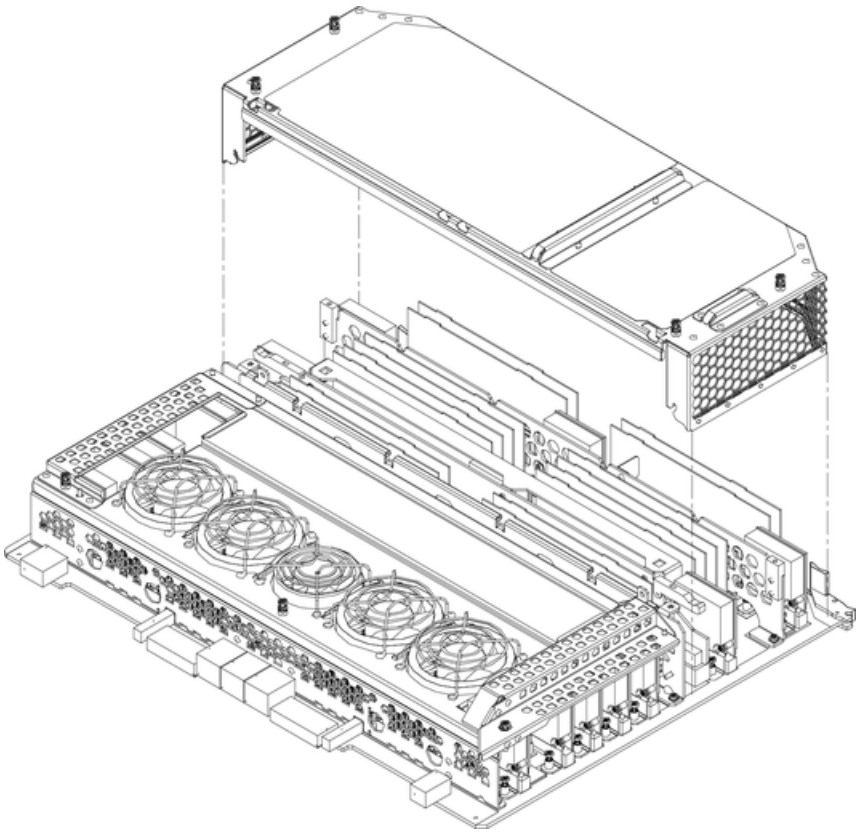
The CPUs are located on the cell boards.

Removing the Processor

To remove a processor, follow these steps:

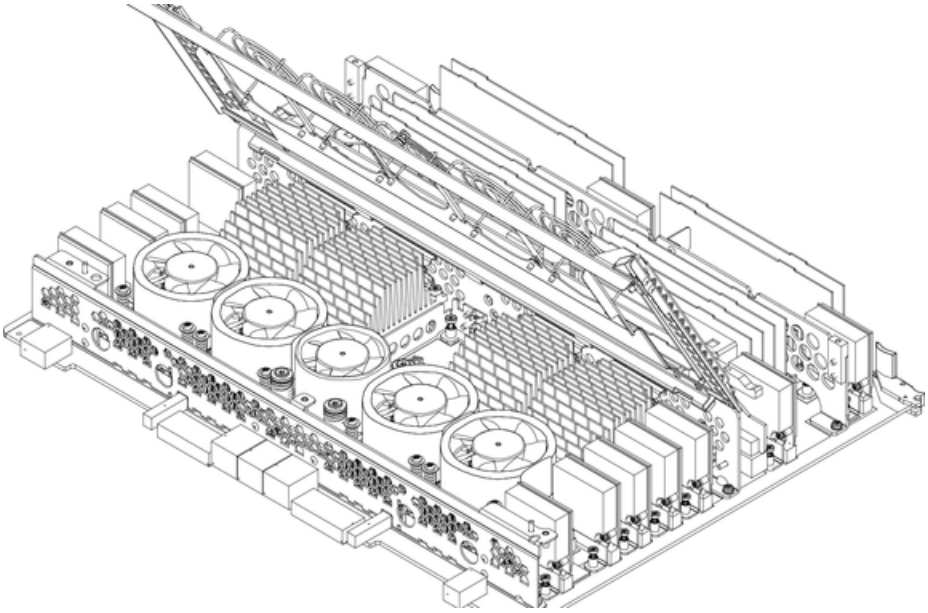
1. Prepare an ESD safe work surface large enough to accommodate the cell board. Use a grounded mat and an anti-static wrist strap, such as those included in the ESD Field Service Kit (HP P/N/ A3024-80004).
2. Identify the partition, cell board and processors that are to be removed.
3. Power off the server. See "Powering Off Hardware Components and Powering On the Server" (page 106), and Appendix E (page 203).
4. Remove the right side cover.
5. Remove the cell board.
6. Position the cell board on the ESD-safe work surface with the backplane connectors facing toward you.
7. Loosen the four captive screws that secure the DIMM cover.
8. Lift the DIMM cover away from the cell board.

Figure 6-28 DIMM Cover Removed



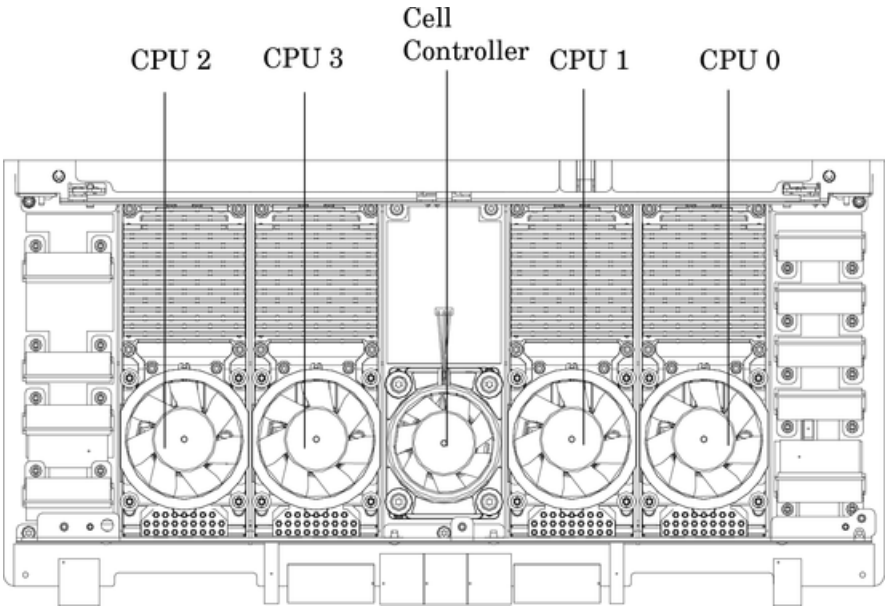
9. Loosen the captive screws on the CPU cover, lift the cover, and set aside.

Figure 6-29 CPU Cover Raised



10. Identify the CPUs to be removed.
11. Disconnect the CPU power pod cable connector from its connector on the cell board.
12. Disconnect the Turbocooler fan cable from the cell board.

Figure 6-30 CPUs with Turbocooler Fans



13. Loosen the four T15 heat-sink screws and the four turbocooler load screws. Loosen these screws in an X pattern, rotating each screw two to three turns until all screws are loose from the cell board.
14. Push the load screw sequencer toward the fan.

15. Locate the peep hole on the left side of the CPU Turbocooler by slightly rotating the fan blades.

WARNING! When unlocking the ZIF socket, do not exceed the one half turn counter-clockwise. Damage to the socket will occur, requiring replacement of the cell board.

16. Insert the 2.5 mm hex driver between the fan blades, through the peep hole, and turn the ZIF socket lock screw one half turn counter-clockwise to unlock the CPU from the socket.
17. Lift the CPU/Turbocooler/Power Pod assembly straight up and off the cell board.

NOTE: If the socket will not be populated with a replacement processor module, place the ZIF socket pin cover over the ZIF socket and tighten the captive screws in an X pattern.

Replacing the Processor

NOTE: CPU load order must be maintained when adding CPUs to the cell board. Always load CPU socket 0 first.

To replace a processor, follow these steps:

1. If the CPU 0 ZIF socket is not exposed, remove the ZIF socket pin cover from the cell board.
2. Ensure that the cell board ZIF socket is in the unlocked position.
3. Remove the CPU module from the packaging.
4. Remove the CPU module pin cover and inspect the pins for any damage.

NOTE: Carefully remove the pin cover to avoid any damage to the pins.

5. Slide the load screw sequencer toward the turbocooler to expose the ZIF socket peep hole through the turbocooler.
6. Lower the CPU module onto the ZIF socket making sure it is held level to the board until the pins engage the ZIF socket.
7. Using a 2.5 mm hex driver through the peep hole, turn the ZIF socket lock/unlock screw one half turn to lock the CPU into place.

CAUTION: Do not exceed one half turn clockwise when locking the CPU into the ZIF socket. Damage to the ZIF socket will occur, requiring the cell board to be replaced.

NOTE: Ensure that the ZIF socket is fully locked. Use a 2.5mm hex wrench to lock the ZIF socket. Check that the CPU module housing is level and shifts slightly right when locking the ZIF socket.

8. Slide the load screw sequencer away from the turbocooler.
9. Tighten the four CPU module screws on the sequencer in an X pattern, turning each screw 2-3 turns until all screws are secure.

CAUTION: Do not overtighten the screws. The cell board can be damaged.

NOTE: The processor screws do not need to be torqued. The processor will be properly secured when the screws reach the bottom on the socket frame.

10. Tighten the four captive screws on the power pod in an X pattern until secured.
11. Connect the Turbocooler fan cable to the the cell board connector.
12. Reconnect the CPU power cable to the cell board connector.

13. Replace the processor cover and tighten the captive screws.

NOTE: New cell boards housing the new IPF processors require new air baffles. See "Installing the VRM Cover (AB388-00002) and Door Opener (AB388-00003)" (page 137).

14. Position the DIMM cover in place.
15. Tighten the four captive screws to secure the DIMM cover.
16. Install the cell board in the server.
17. Replace covers.
18. Power on the server.
19. Power up the nPartition. See Appendix E "Operating System Boot and Shutdown" for details.

Installing Dual-Core CPUs (A9767A)

There are three additional components required when replacing a CPU with a dual-core CPU. If only one CPU module is installed on the cell board, a terminator must be installed in CPU socket 2.

- Dual-core CPU (A9767-04012)
- Sequencer fan assembly (A9767-04007)
- CPU cover

All CPU sockets must be empty before proceeding.

NOTE: CPU load order must be maintained when adding CPUs to the cell board. Always load CPU socket 0 first.

To install dual-core processors, follow these steps:

1. Remove the dual-core CPU from its packaging.
2. Route the red and black cables into the groove in the back of the CPU module toward the appropriate power connector on the cell board.
3. Lower the CPU module onto the socket making sure it is held level to the board.
4. Align the locating pins on the underside of the module into the guide holes on the cell board socket rails.

Figure 6-31 Locating Pins on CPU Module

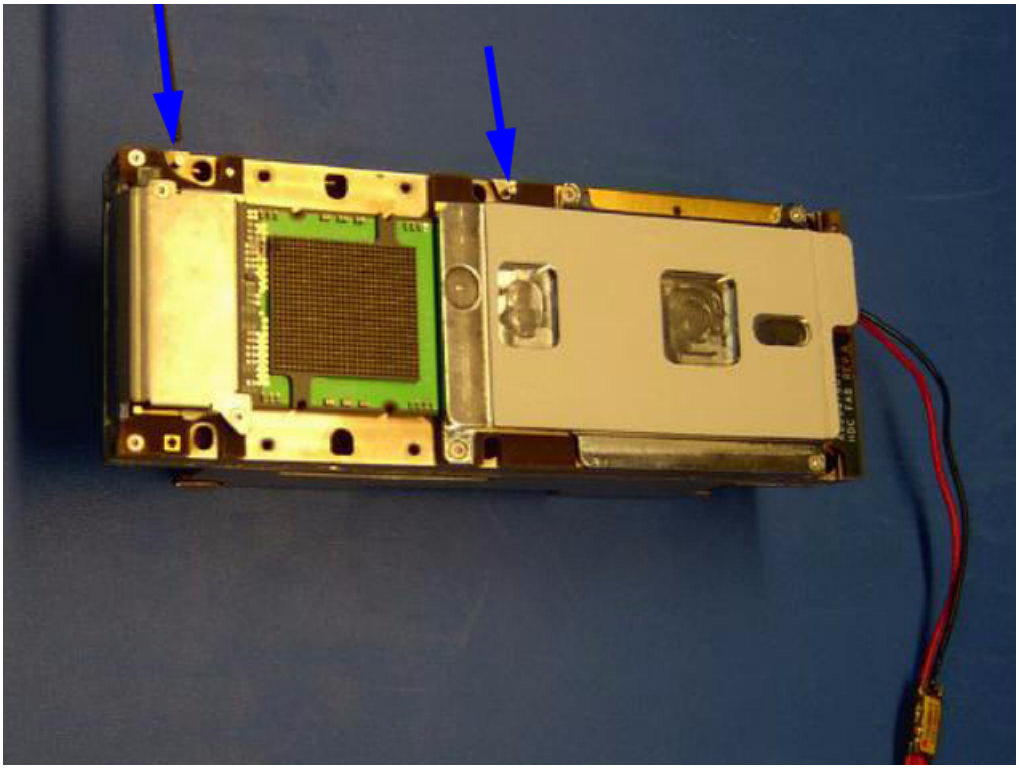
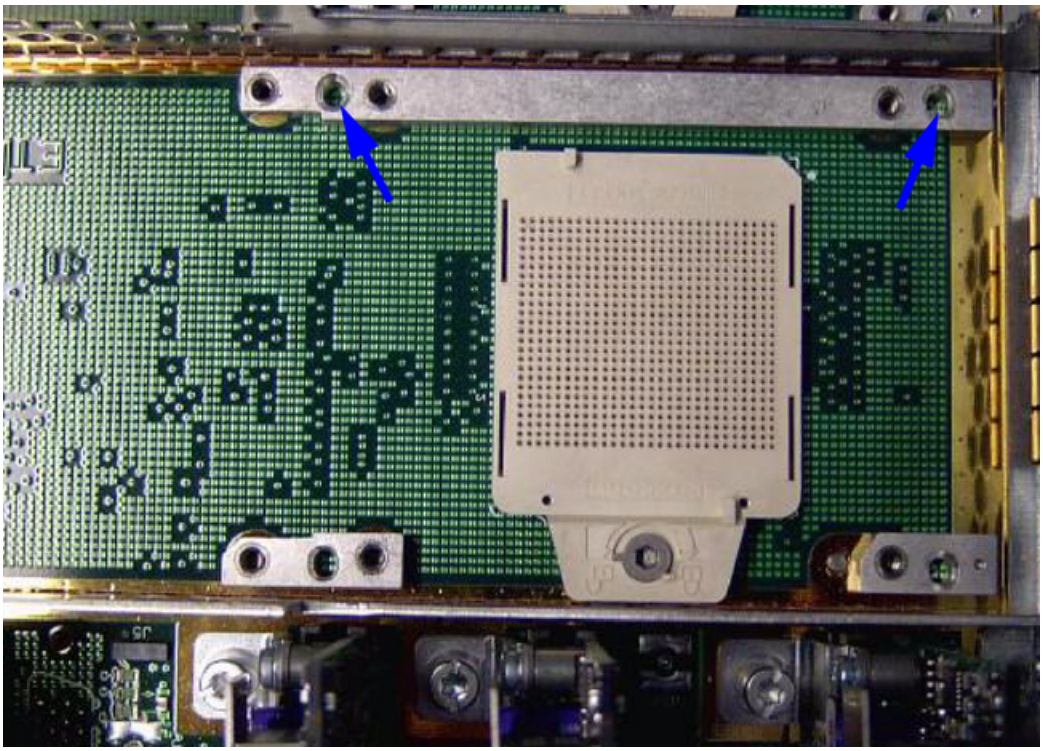
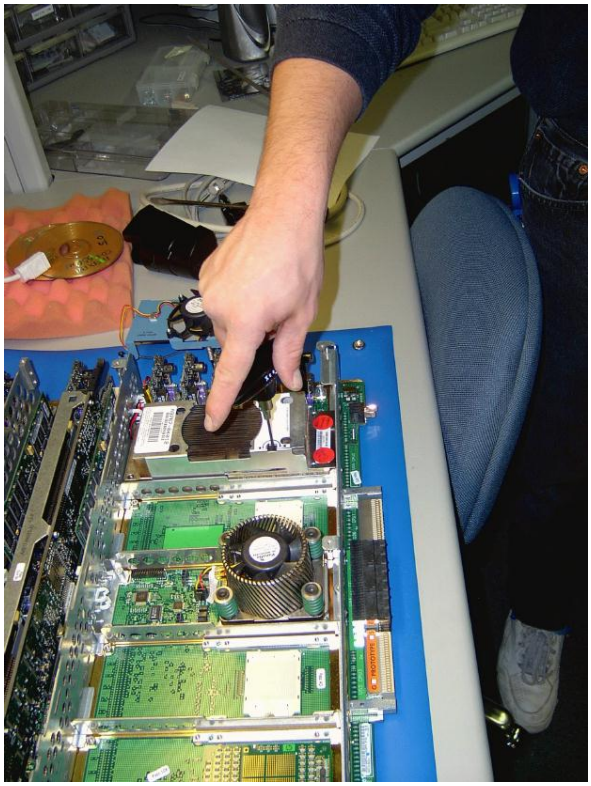


Figure 6-32 Guide Holes on Cell Board



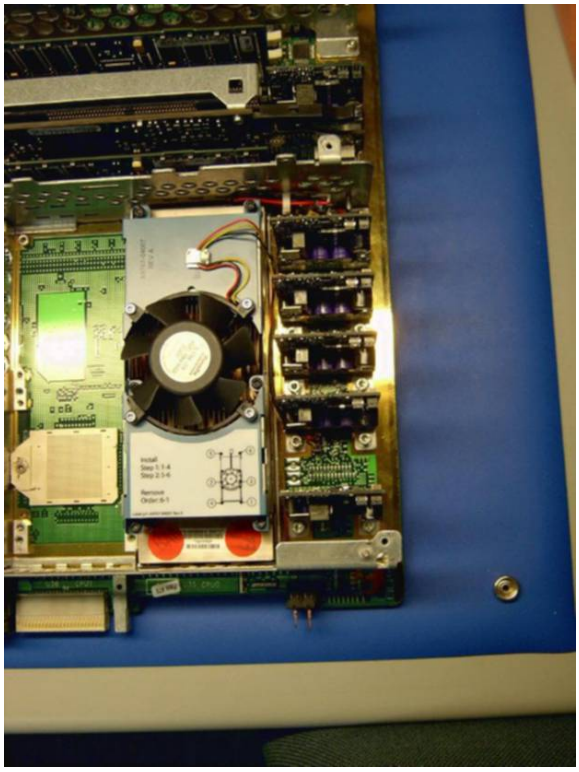
5. Using a 2.5 mm hex driver, turn the ZIF socket screw one half turn clockwise to lock the CPU into place.

Figure 6-33 Locking CPU Into the Cell Board ZIF Socket



6. Place the sequencer fan assembly over the CPU module.
7. Tighten the T15 screws on the sequencer in an X pattern turning each screw 2–3 turns until all screws are secure.

Figure 6-34 Sequencer Fan Assembly Installed



8. Alternately tighten the power module screws until secure.

9. Connect the sequencer fan cable to the connector on the cell board.
10. Connect the CPU power cables to the CPU power connector.
11. Ensure all cables are properly routed, secured and connected.
12. Repeat steps 1 through 10 for all remaining CPU modules.
13. Reinstall any VRMs that were removed.
14. Install the new processor cover and secure all screws.
15. Position the DIMM cover in place and tighten all captive screws.
16. Install the cell board in the server.
17. Repeat steps 1 through 15 for all remaining cell boards to be upgraded.
18. Replace covers.
19. Power on the server.
20. To update firmware to the latest revision, use the Firmware Update Utility (FW) from the MP Command Menu.
21. Upgrade the operating system if required.

22. **NOTE:** Firmware must be updated to support the new dual-core processors. Below is an example of the minimum firmware version.

PROGRAMMABLE HARDWARE	
System Backplane GPM	1.002
System Backplane FM	1.002
System Backplane OSP	1.002
PCI-X Backplane LPM	2.000
PCI-X Backplane HS	1.000
Core IO Master	2.008
Core IO Slave	2.008
Cell LPM	1.002
Cell PDHC	1.006
FIRMWARE:	
Core IO Master	A.005.021
Core IO Slave	A.005.021
Cell PDHC	A.003.014
Cell SFW	1.015

23. Power on the nPartition.
24. Use the `info cpu` command from the EFI Shell to verify proper operation of the cell board.

Installing Intel Itanium 2 CPUs (AB548A and AB439A)

There are additional components required when replacing a CPU with an Intel Itanium 2 CPU.

- Intel Itanium 2 CPUs (AB548A and AB439A)
- VRM Cover (AB388-00002)
- Door Opener (AB388-00003)
- Review IMPORTANT information regarding A1 vs. A2 stepping processors prior to installation.

AB439A and AB548A Processor Stepping Information

IMPORTANT: Intel is planning an updated A2 stepping of the Itanium 2 AB439A and AB548A processors. Intel will no longer be providing A1 stepping processors. HP and its customers will have to gradually transition to A2 stepping processors.

For approximately two years (June 2005 — June 2007), A1 stepping processors were replaced with A1 stepping processors and A2 stepping processors were replaced with A2 stepping processors. Once A1 processor exchange parts are no longer available, the parts will be replaced with A2 processors and the system firmware updated if necessary.

How to Identify A1 Stepping processor from an A2 Stepping processor

Table 6-3 Processor Stepping Comparisons

FRU Exchange P/N	Description	Stepping Number	FRU-ID P/N
A6913-69009	1.5GHz 4MB	A1	AB439-04001
A6913-69011	1.6GHz 6MB	A1	AB548-04001
A6913-69014	1.5GHz 4MB	A2	AB439-04004
A6913-69015	1.6GHz 6MB	A2	AB548-04004

Mixing A1 and A2 Stepping Processors

A1 and A2 processors can be mixed on the same cell board with A2 compatible firmware. Cell boards with A1 processors can be mixed with cell boards with A2 processors within the same partition.

CAUTION: Minimum Firmware Version must be 3.3 with A2 processor cell board(s) or the system does not boot. If the logical firmware download order is not followed, unpredictable results may also occur.

Search for More Information

- There is a WTEC CPU Hardware webpage titled *Intel Madison9M "A1" vs. "A2" Stepping* at this URL: http://wtec.cup.hp.com/~cpuhw/IA64/Mad-A1vsA2/A1-A2.htm that has additional technical details and information.
- On the WTEC server, there is also a WTEC newsletter of Current Issues titled *Communications Relative to the Intel Itanium 2 Madison 9M Processor and Upcoming Firmware* (#319): http://15.13.122.166/list_issues.php.
- Service Notes for the firmware releases with A2 Stepping processor support: http://snserver.mayfield.hp.com/ServiceNotes/Snwebsite/default.asp. Firmware Release notes are summarized in the service note for the HP Integrity rx8620.
- *ReadMe* flyers are included with the Add-On A2 processor parts and GSO replacement parts indicating the minimum level of firmware required.

CPU Installation Procedures

All CPU sockets must be empty before proceeding. Use the following procedure to install new CPUs.

CAUTION: Avoid removing any VRMs to connect the CPU power pod and Turbocooler cables into the cell board connectors.

NOTE: CPU load order must be maintained when adding CPUs to the cell board. Always load CPU socket 0 first.

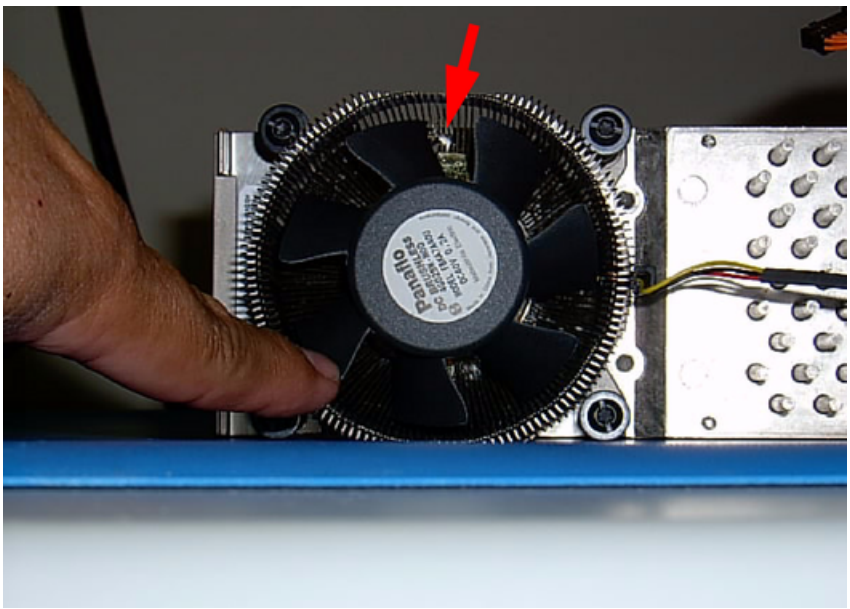
To install new processors, follow these steps:

1. If the CPU 0 ZIF socket is not exposed, remove the ZIF socket pin cover from the cell board.
2. Ensure that the cell board ZIF socket is in the “unlocked” position.
3. Remove the CPU module from its packaging.
4. Remove the CPU module pin cover and inspect the pins for any damage.

NOTE: Carefully remove the pin cover to avoid any damage to the pins.

5. Slide the load screw sequencer toward the turbocooler to expose the ZIF socket peep hole through the turbocooler.
6. Rotate the fan to expose the ZIF socket peep hole location. See Figure 6-35.

Figure 6-35 ZIF Socket Lock/Unlock Peep Hole Location



7. Lower the CPU module into the ZIF socket making sure it is held level to the board, until the pins on the CPU engage with the ZIF socket.

NOTE: The new CPU power pod is slightly hinged. Ensure that the CPU assembly is level prior to lowering it onto the cell board.

8. Using a 2.5 mm hex driver through the peep hole, turn the ZIF socket lock/unlock screw one half turn to lock the CPU into place.

CAUTION: Do not exceed one half turn clockwise when locking the CPU into the ZIF socket. Damage to the ZIF socket will occur, requiring the cell board to be replaced.

NOTE: Ensure that the ZIF socket is fully locked. Use a 2.5mm hex wrench to lock the ZIF socket. Check that the CPU module housing is level and shifts slightly right when locking the ZIF socket.

9. Push the load sequencer away from the fan.
10. Tighten the four CPU module screws in an X pattern, turning each screw two to three turns, until all screws are secure.

NOTE: The processor screws do not need to be torqued. The processor will be properly secured when the screws reach the bottom on the socket frame.

11. Tighten the two power pod screws, turning each two to three turns until secured. Ensure that the entire CPU module is seated level in the cell board.

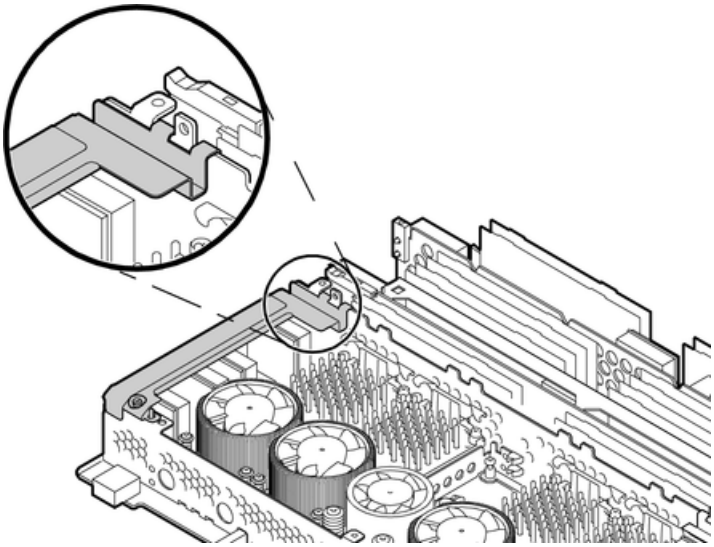
NOTE: Do not overtighten the screws. Damage can occur to the cell board.

12. Connect the Turbocooler fan cable to the connector on the cell board.
13. Route the power cable, left or right, to the cell board connector.
14. Reconnect the CPU power pod cable to the cell board connector.

NOTE: Due to space constraints, it may be necessary to use a tool to assist with inserting CPU 0 and CPU2 power pod and Turbocooler cables into the cell board connectors.

15. Install remaining CPUs, keeping load order in mind.
16. Install the VRM Cover (AB388-00002), onto the left side of the cell board. Tighten the screw. See Figure 6-36.

Figure 6-36 VRM Cover Installed



17. Install the Door Opener (AB388-00003), onto the right side of the cell board. Tighten the screw. See Figure 6-37.

Figure 6-37 Door Opener Installed

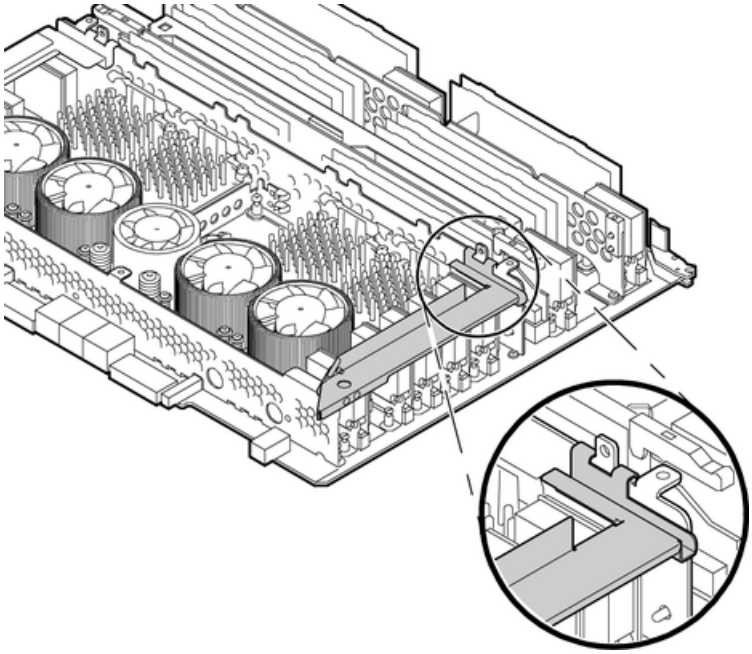
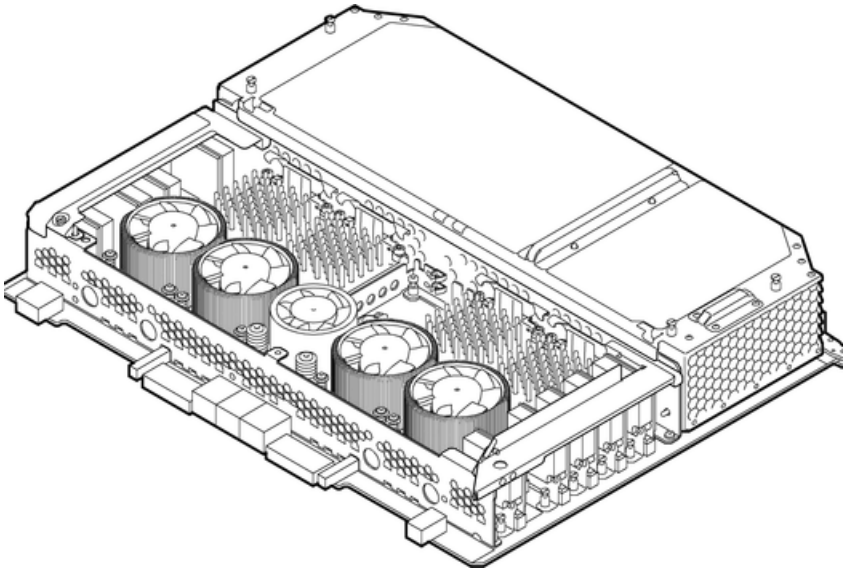


Figure 6-38 VRM Cover and Door Opener Installed



18. Position the DIMM cover in place.
19. To secure the DIMM cover, tighten the four captive screws.
20. Install the cell board in the server.
21. Replace the right side cover.
22. Power on the server. See "Powering Off Hardware Components and Powering On the Server" (page 106).
23. Verify the firmware and hardware programmable hardware revisions are in standby power mode by using the `MP:CM>`**`SYSREV`** command. Below is an example of the minimum firmware version.

NOTE: Firmware must be updated to support the new processors. Below is an example of minimum Firmware Version 4.0.

PROGRAMMABLE HARDWARE	
System Backplane GPM	1.002
System Backplane FM	1.002
System Backplane OSP	1.002
PCI-X Backplane LPM	2.000
PCI-X Backplane HS	1.000
Core IO	2.008
Cell LPM	1.002
Cell PDHC	1.009
FIRMWARE:	
Core IO MP	A.007.002
Event Dictionary	1.012
Cell PDHC	A.003.024
Cell SFW	3.066

NOTE: If the firmware or programmable hardware versions are not at or above the minimum versions, go to the following website to obtain the latest Firmware Release Notice and firmware patches.

External web site :

http://itrc.hp.com

The Firmware Update Release notice is included in the download bundle and includes the upgrade instructions.

24. Power up the nPartition. See Appendix E (page 203).
25. To verify proper operation of the cell board, use the `info cpu` command from the EFI Shell.

Removing and Replacing a Processor Turbo-Cooler Fan

The processor turbo-cooler fans are located on the cell boards.

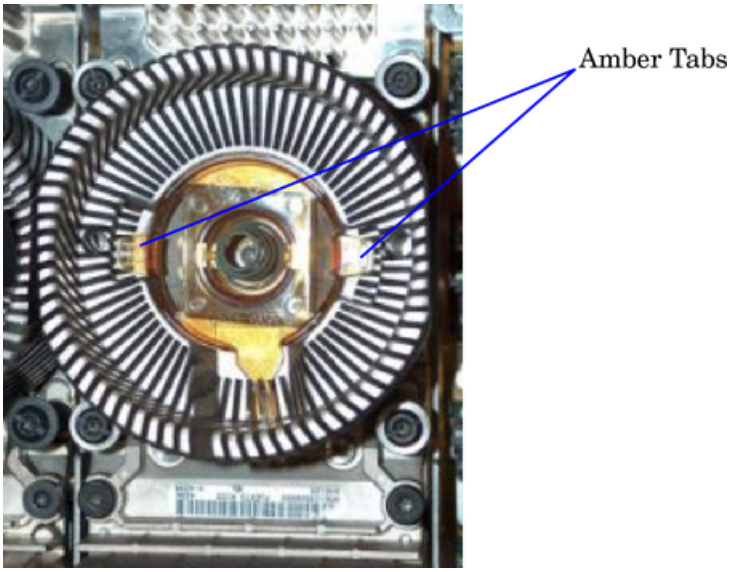
Removing a Turbo-Cooler Fan

To remove a turbo-cooler fan, follow these steps:

1. Prepare an ESD safe work surface large enough to accommodate the cell board.
2. Identify the partition and cell to be removed.
3. Power off the nPartition and remove the cell with the fan to be replaced by following the instructions in "Removing and Replacing a Cell Board" (page 120).
4. Place the cell board on the ESD safe work surface.
5. If necessary, loosen the four captive screws that secure the DIMM cover, remove the cover and set it aside.
6. If so equipped, loosen the captive screws on the CPU cover, remove the cover and set it aside.
7. Identify the CPU turbo-cooler fan to be removed and unplug the fan power cord from the cell board.

8. By inserting a screwdriver or pen between the fan blades, gently press the two amber tabs underneath. Once the two tabs are pressed, the fan pops up. See Figure 6-39.

Figure 6-39 Heatsink with Turbo-Cooler Fan Removed



NOTE: There are two different heatsinks used in the turbo-cooler fan assemblies. The removal and replacement procedure is essentially the same between the two. The machined heatsink has thicker fins, and is one piece. The other heatsink has fins that are thinner and soldered to a base piece. The machined heatsink has a clip holding the power cable in place that cannot be removed. The soldered heatsink has a clip that must be removed in order to correctly route the cable. See Figure 6-40 and Figure 6-41.

Figure 6-40 Soldered Heatsink and Clip

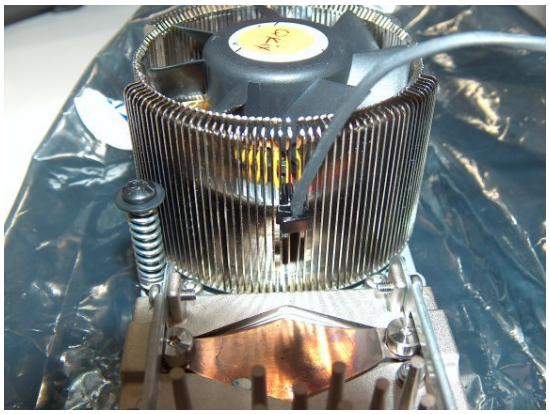
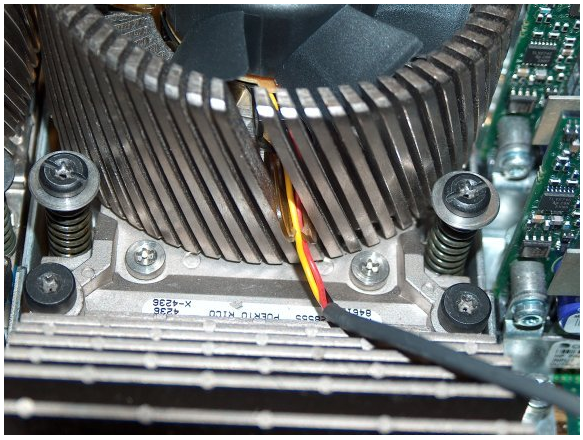


Figure 6-41 Machined Heatsink and Clip



9. On the machined heatsink: note the fan power cable routing and unhook the fan power cable from the clip on the heatsink fin. Care should be used not to break the clip.

   On the soldered heatsink: note the power cable routing and remove the clip by sliding it up and off the heatsink fin. Remove the power cable from the clip and set the clip aside.

Replacing a Turbo-Cooler Fan

To replace a turbo-cooler fan, follow these steps:

1. Position the new fan with the power cable routed toward the clip.
2. Seat the replacement fan in the turbo-cooler by pressing down on the center of the fan. You should hear a snap when each of the two tabs engage.
3. Route the cable carefully through the fins of the heatsink without leaving excess slack inside which could impede the fan.

   On the soldered heatsink: after routing the cable, slide the clip onto the fin immediately next to where you routed the cable.
4. Secure the power cable in the clip. The fan spins freely when seated properly with the fan power cable secured in the clip.
5. Plug the fan power cable into the cell board.
6. If so equipped, replace the CPU cover and tighten all the captive screws.
7. If removed, replace the DIMM cover and tighten all the captive screws.
8. Replace the cell board in the cabinet.
9. To return 48V power to the cell board, use the MP:CM> `PE` option **`c`**.
10. To boot the partition, use the MP:CM> `bo` option.

Removing and Replacing a Voltage Regulator Module

There are a total of 15 voltage regulator modules (VRMs) located on the cell board. Both low voltage VRMs and high voltage VRMs reside on the cell board.

Physical Identification for a VRM

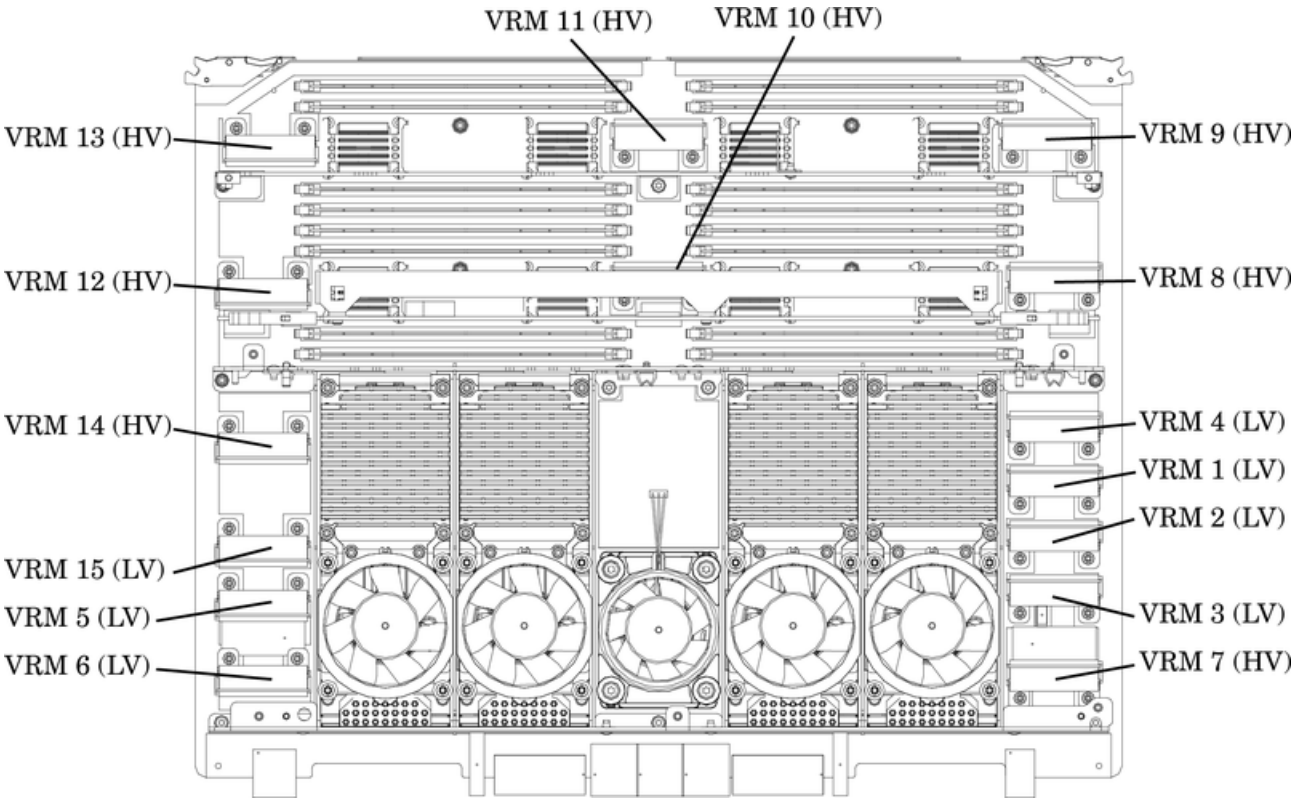
There are three methods to visually determine if a VRM is a low or high voltage VRM:

Markings	Low voltage VRMs are marked “0.88–1.9V” while high voltage VRMs are marked “1.75–3.3V”.
Key Pin	Low voltage VRMs have the key pin located near the center of the connector while high voltage VRMs have the key pin near the edge of the connector.
Heatsink	Low voltage VRMs have a smaller heatsink while high voltage VRMs have a larger heatsink.

Firmware Identification for a VRM

System firmware reports which VRM has failed. To locate the failed VRM, use Figure 6-42. 'LV' refers to low voltage , and 'HV' refers to high voltage.

Figure 6-42 VRM Locations on Cell Board

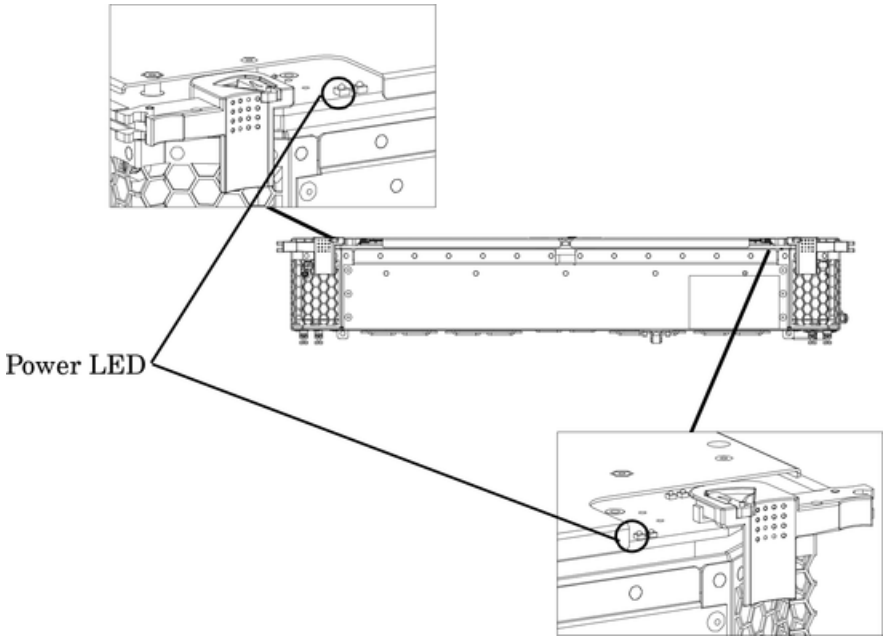


Removing a VRM

To remove a VRM, follow these steps:

1. Remove the right side cover. See "Removing and Replacing Covers" (page 108).
2. Power off the cell board using the MP command menu `PE` command.
3. Verify that the green power LED located on either the left-hand side or right-hand side of the cell board is off before removing the cell board. For the power LED locations, see Figure 6-43.

Figure 6-43 Cell Board Power LED



4. Press each extraction lever to release the cell board then pull the extraction levers outwards. See Figure 6-16 (page 121).
5. Slide the cell board from the chassis. See Figure 6-18 (page 122).
6. Remove the memory and CPU covers.
7. Locate the VRM to be replaced.
8. Loosen the VRM retaining screws.
9. Pull the VRM off the cell board.

Replacing a VRM

To replace a VRM, follow these steps:

1. Insert the new VRM into the socket.

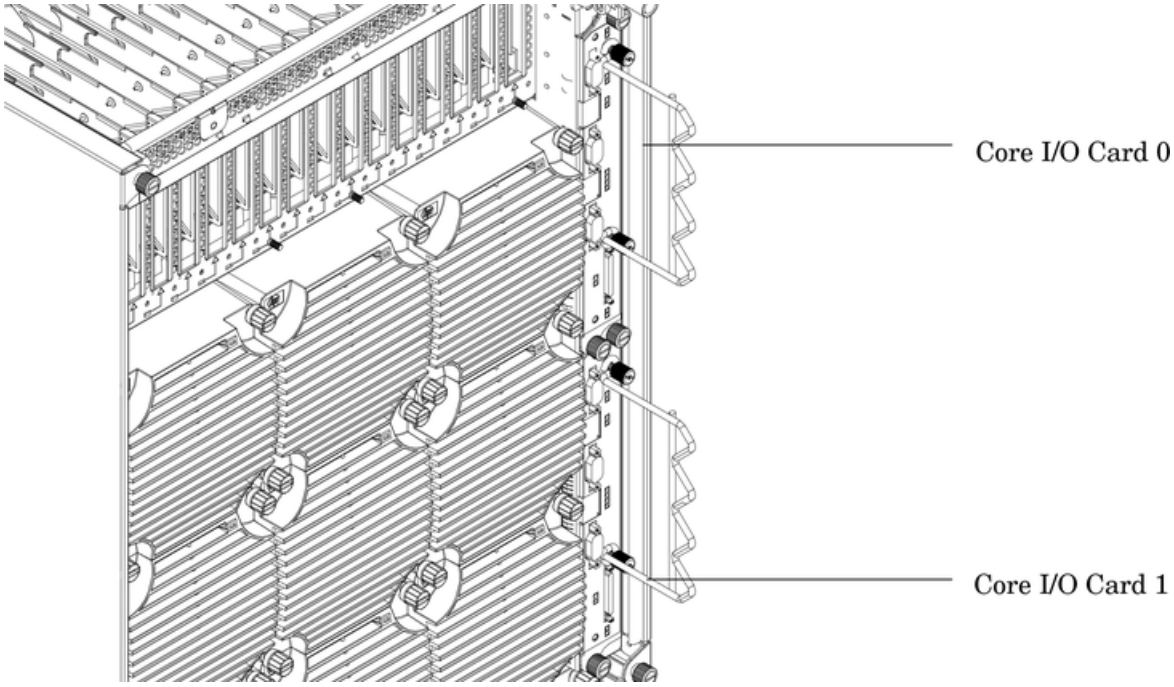
CAUTION: Check for proper pin orientation before inserting VRM.

2. Tighten the screws until snug but do not over tighten.
3. Replace cell board memory and CPU covers.
4. Insert the cell board into the chassis.
5. Restore power to the cell board and test.
6. Install the right side cover. See "Replacing the Side Cover" (page 110).

Removing and Replacing the Core I/O

The core I/O is located in the rear of the chassis. There can be two core I/O boards installed in the server, core I/O 0 and core I/O 1. The core I/O can be replaced while standby power is applied. However, the operating system on the nPartition must be shut down to replace the FRU.

Figure 6-44 Core I/O Location



The core I/O card has a DIP switch positioned at the location shown in Figure 6-45 that must be set prior to operation of the server.

NOTE: The Server Expansion Unit (SEU) uses the same core I/O card with DIP switch as the host server. The DIP switch on the core I/O cards installed in the SEU must be set to the same position as the host server.

Figure 6-45 Core I/O Card Bottom with DIP Switch Location Shown

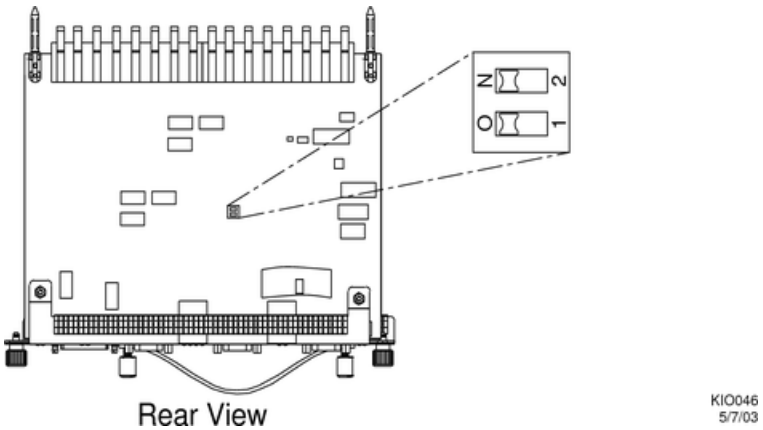


Table 6-4 lists the correct switch settings.

Table 6-4 Dip Switch Settings

System	Dip Switch 1	Dip Switch 2
HP 9000 rp8400 server	On	On
All other servers	Off	Off

IMPORTANT: If the `igelan` and `c8xx` drivers are not already in the kernel, they must be added before installing the A7109A core I/O cards in the server. The HWE bundle required to enable the card is HWE 0603.

Removing the Core I/O Assembly

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

1. Save all MP networking details, including: the IP address, hostname, subnet mask, gateway, and other information.
2. To display the current MP customer LAN interface status enter the **`LS`** command from the MP Command menu.
3. To determine the core I/O board status, use the MP:CM> `PS`, or the MP:CM> `DE` commands, with option G. See Figure 6-46 and Figure 6-47.

Figure 6-46 PS Command

```
MP:CM> ps

Display detailed status of the selected MP bus device.


The following MP bus devices were found:
+---+----+-----+-------+-------+-----------+
|   |    |     |       |       |           |
|   |    | Sys |       |  IO   | Bulk Pwr  |
|Cab| MP |Bkpln| Cells |Chassis| Supplies  |
| # |M  S|     |0 1 2 3| 0   1 |0 1 2 3 4 5|
+---+----+-----+-------+-------+-----------+
| 0 |*  *|  *  |* * * *| *   * |* * * * * *|
+---+----+-----+-------+-------+-----------+

You may display detailed power and hardware status for the following items:

    T - Cabinet
    S - System Backplane
    G - MP (Core I/O)
    P - IO Chassis
    C - Cell
        Select Device: g

HW status for MP : No Fault Detected

Complex model string: 9000/800/rx8620

 1P is failed over

Attention LED is ON
Remote LED is on

Battery state is good

Last MP software reset occurred WED MAR 31 21:01:35 2004

MP firmware rev 5.018, built on Jan 23 2004 10:11:10


MP:CM>
```

Figure 6-47 DE Command

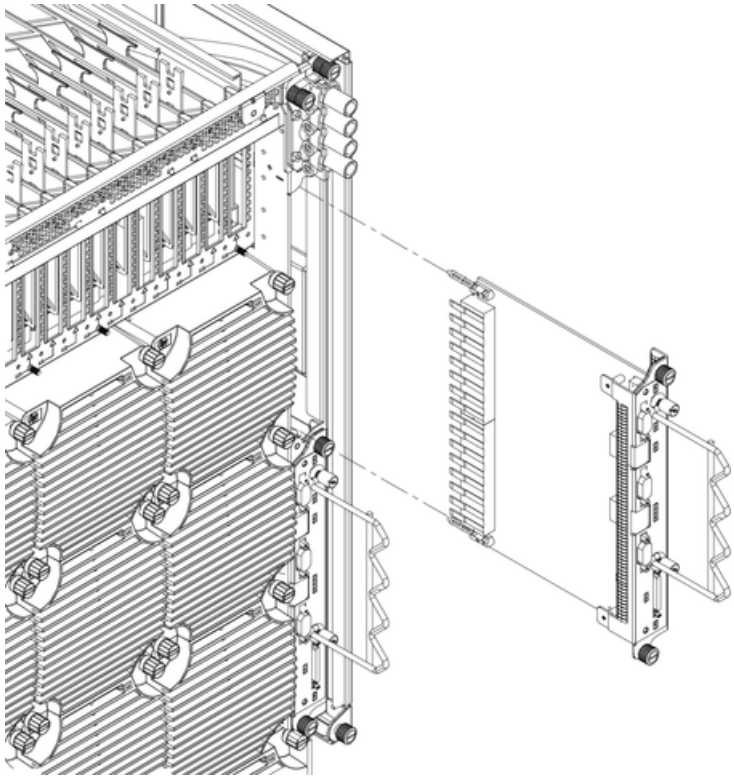
```
MP:CM> de

Display summary status of the selected MP device.

    B - BPS  (Bulk Power Supplies)
    U - CLU  (Cabinet Utilities: Fans, Intrusion, Clock's etc.)
    A - PACI (Partition Console Interface)
    G - MP   (Management Processor)
    P - PM   (Power Management)
    H - Cell Board Controller (PDHC)
        Select device: g

Cabinet 0 MP status
FW revision    :   5.018 built on Jan 23 2004 at 10:11:10
MP failed over : TRUE
Battery state  : good
Attention LED  : on
Remote LED     : on
Cabinet type   : rx8620

MP Reset Registry
Timestamp     :  WED MAR 31 21:01:35 2004
Task name     :  tRpcServer
Function name :  rpcSubResetSelf
Line number   :  257
Module errno  :  0
VxWorks errno :  0x3d0002
Error level   :  Crash
Parameter1    :  0xffffffff
Parameter2    :  0xffffffff

 MP:CM>
```

4. Label and remove all cables connected to the core I/O to be removed.
5. Loosen the two retaining screws securing the assembly to the chassis.
6. Securely grasp the cable strain relief on the core I/O assembly.
7. Slide the core I/O from the chassis.

   The core I/O can be gently rocked up and down as it is pulled out of the server to help loosen the core I/O from the server backplane.

8. Remove the cable strain relief from the core I/O assembly and transfer it to the new core I/O assembly.

Figure 6-48 Core I/O Detail



Replacing the Core I/O Assembly

To replace the core I/O assembly, follow these steps:

1. Locate the battery on the new MP. Remove the insulating mylar strip. If there is no mylar strip, momentarily break the battery connection to clear any previously stored data that could conflict with your current configuration.
2. Slide the core I/O into the chassis while rocking it gently up and down to mate the two connectors.
3. Tighten the two retaining screws securing the assembly to the chassis.
4. Connect the cables that were labeled and detached during removal of the core I/O.
5. Reset the nPartition with the MP `RR` command. This command stops the boot process at BIB and enables you to check the firmware revision of the new MP. Update or backdate as needed. Configure the network settings as outlined in the following section.

Configuring Management Processor Network Settings

After removing and replacing the core I/O in the server, configure the customer LAN network settings, using the settings from the original (replaced) core I/O.

To *configure* management processor network settings, use the MP Command menu `LC` command. To list the current MP network configuration, use the `LS` command.

Default Management Processor Network Settings Table 6-5 lists the default customer LAN network settings for the server.

Table 6-5 Default Configuration for MP Customer LAN

Customer LAN IP Address	192.168.1.1
Customer LAN Host Name	gsp0
Customer LAN Subnet Mask	255.255.255.0
Customer LAN Gateway	192.168.1.1

This procedure (Command menu, `LC` command) configures the MP customer LAN network settings from the MP Command menu.

1. Connect to the server complex MP and enter **`CM`** to access the Command menu.

   Use `telnet` to connect to the MP, if possible.

   If an MP is at its default configuration (including default network settings), connect to it using either of these methods:

   - Establish a direct serial cable connection through the MP local RS-232 port.
   - Access a PC or workstation on the same subnet as the MP, modify its network routing tables to include the default customer LAN IP address, and telnet to the MP. The procedure to modify networking and connect is as follows:

   a. Access a PC or workstation on the MP subnet.

   b. Modify the network routing tables for the PC or workstation by using the

      `route add 192.168.1.1` *ClientName*

      command, where

      ClientName Is the network name of the PC or workstation.

      From a PC command prompt:

      `route add 192.168.1.1` *ClientName*

      On an HP-UX workstation log in as `root` and use this command:

      `/usr/sbin/route add 192.168.1.1` ***ClientName***

      After reconfiguring the MP networking, remove these network routing table changes with the `route delete` command.

   c. Enter this command to confirm the new network connection to the MP:

      `ping 198.168.1.1 -n 2`

   d. Use the

      `telnet 192.168.1.1`

      command from the PC or workstation to connect to the MP.

2. From the MP Command menu, enter `LS` to *list* the current network settings, and, if needed, use the `LC` command to *reconfigure* the network settings for the MP.

   The `LC` command enables modifications to the customer LAN and/or the private LAN configuration.

   Cancel all changes to the MP LAN configuration at any time by replying **`Q`** to any of the `LC` command prompts.

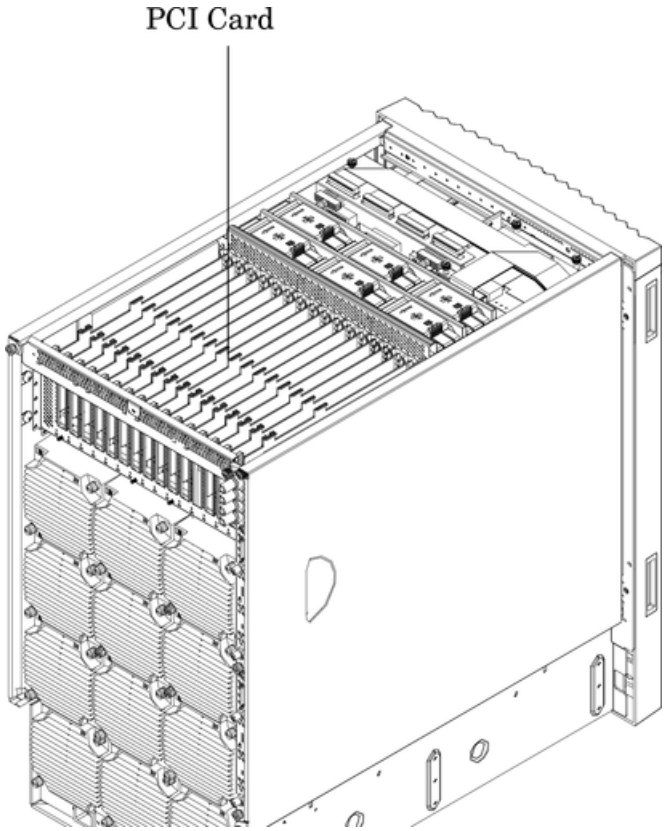
3. Ensure that the MP networking configuration is correct.

Removing and Replacing a PCI Card

The PCI cards are located in the rear of the chassis in the PCI card cage. PCI cards are hot-pluggable components.

IMPORTANT: Complete information regarding OL* for I/O cards is on the HP website at http://hp.com. For details, see the *Interface Card OL* Support Guide*. HP recommends that you obtain a copy of this guide and refer to it before beginning the removal and replacement of PCI cards.

Figure 6-49 PCI Card Location



Removing the PCI Card

PCI I/O OL* Card Methods

There are three methods for performing OL* operations on PCI I/O cards.

`pdweb`	The Peripheral Device Tool (pdweb) web-based method of performing OL*.
`olrad`	The command line method of performing OL*.
Attention Button	The hardware system slot based method of performing OL*.

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

Prerequisites for this procedure are as follows:

- The card to be replaced uses the same drivers and is of the same type as the card being replaced.
- The green power LED is steady ON.
- The yellow attention LED if steady OFF or is blinking if a user has requested the slot location.
- Run the `olrad -q` command to determine the status of all the PCI I/O slots.

To remove the PCI card, follow these steps:

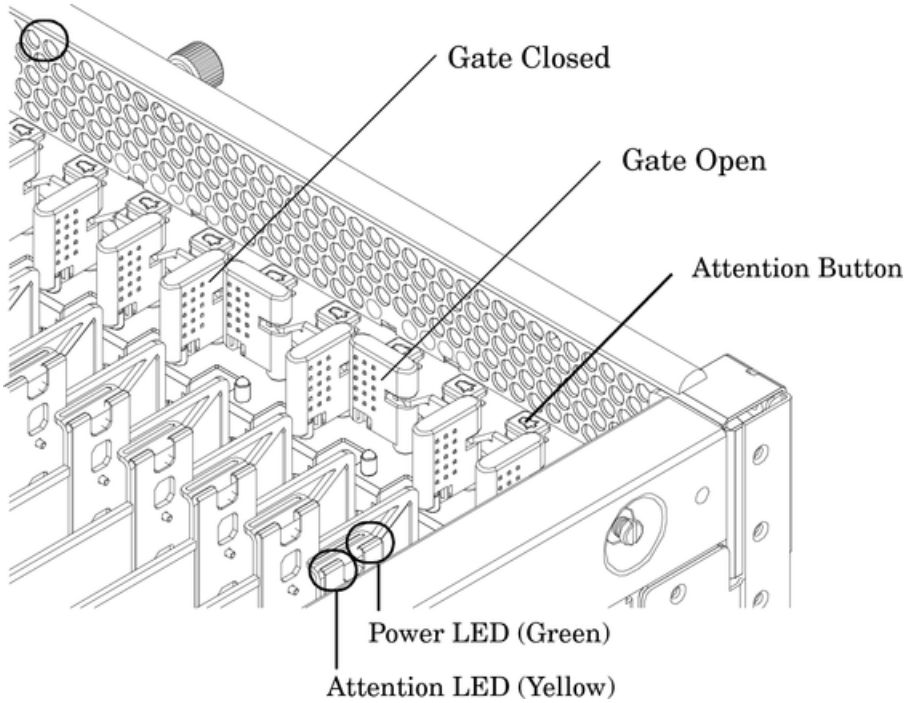
1. Remove the top cover. See "Removing and Replacing Covers" (page 108).

2. Press the Attention Button. See Figure 6-50.

   The green power LED starts to blink and then turn steady OFF. If the green power LED does not go OFF, check the `hotplugd` daemon log file (default: `/var/adm/hotplugd.log`) for errors and do not proceed further.

NOTE: If the attention button is pressed a second time during the first five seconds while the green LED is blinking, the operation is cancelled and the power to the slot remains on.

Figure 6-50 PCI I/O Slot Details



3. Label and remove the cables connected to the PCI card to be removed.
4. Flip the PCI gate for the card slot to the open position.
5. Firmly pull up on the tabs on the PCI card separator.
6. Remove the card from the PCI slot.

Replacing the PCI Card

To replace the PCI card, follow these steps:

1. Install the new replacement PCI card in the slot.

NOTE: Online addition using the attention button does not perform the pre-add sequence of `olrad` which uses the `olrad -a` command.

2. Flip the PCI gate for the card slot to the closed position.
3. Press the attention button.

   The green power LED starts to blink.

4. Wait for the green power LED to stop blinking and turn solid green.
5. Check for errors in the `hotplugd` daemon log file (default: `/var/adm/hotplugd.log`).
6. Connect all cables to the replacement PCI card.

7. Replace the top cover. See "Replacing the Top Cover" (page 109).

   The critical resource analysis (CRA) performed while doing an attention button initiated replace action is very restrictive and the action will not complete–it will fail–to protect critical resources from being impacted. For finer control over CRA actions use `pdweb` or the `olrad` command. See the *Interface Card OL* Support Guide* located on the HP website at **`http://hp.com`**.

Option ROM

To enable faster booting, system firmware does not auto-scan PCI devices with an Option ROM. In order to boot from a PCI-connected device with an Option ROM, you must add IT to the table of boot devices as follows:

To add an Option ROM, follow these steps:

1. Install the I/O card into the chassis.
2. Boot the server to the EFI shell.
3. Execute the EFI `search` command.

   To add a single card:

   search <cell> <pci_slot #>

   To add all cards:

   `search all`
4. Execute the following EFI command:

   `map -r`
5. Enter the Boot Manager by executing the following command:

   `exit`
6. From the EFI Boot Manager Menu, select "Boot Option Maintenance Menu" and then from the Main Menu, select "Add a Boot Option". Now add the device as a new boot device.

Updating Option ROMs

The Option ROM on a PCI I/O card can be "flashed" or updated. To flash an I/O card, follow these steps:

1. Install the I/O card into the chassis.
2. Boot the server to the EFI shell.
3. Execute the EFI search command.

   To add a single card:

   search <cell> <pci_slot #>

   To add all cards:

   `search all`
4. Execute the following EFI command:

   `map -r`

NOTE: Each I/O card type and firmware image update may require a different flash utility and procedure. Follow the instructions in the `.txt` file included with the latest HP IPF Offline Diagnostic & Utilities CDROM.

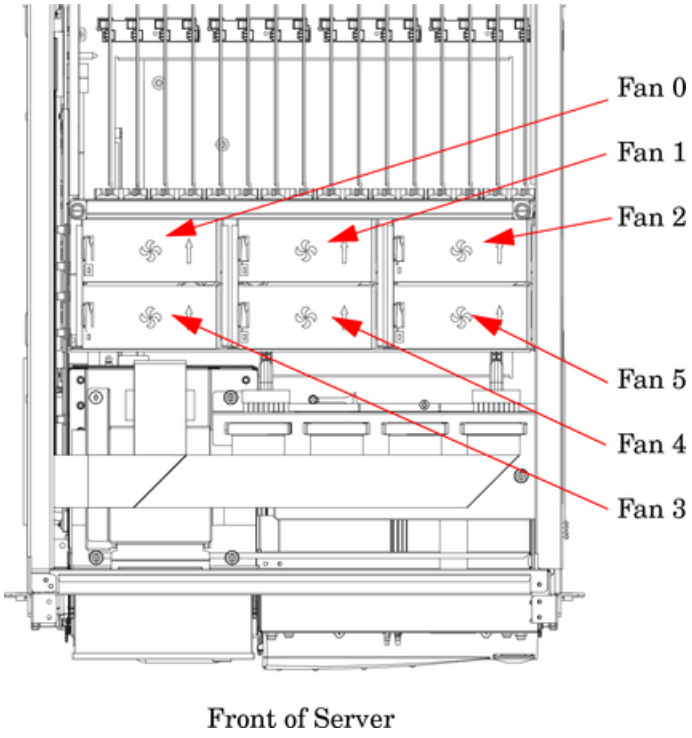
5. Load the HP IPF Offline Diagnostic & Utilities CDROM.

   The CDROM contains the flash utility for IO each card type, firmware images, and a `.txt` file that includes instructions and information about updating the firmware images.

Removing and Replacing a PCI Smart Fan Assembly

The PCI smart fan assembly is located in front of the PCI card cage. The fan assembly is a hot-swappable component.

Figure 6-51 PCI Smart Fan Assembly Location



Preliminary Procedures

These procedures must be completed before removing the PCI smart fan assembly.

1. Identify the failed fan assembly. Table 6-6 defines the fan LED states.
2. Connect to ground with a wrist strap. For more information, see "Electrostatic Discharge " (page 106).
3. Remove the top cover. See "Removing and Replacing Covers" (page 108).

Table 6-6 Smart Fan Assembly LED Indications

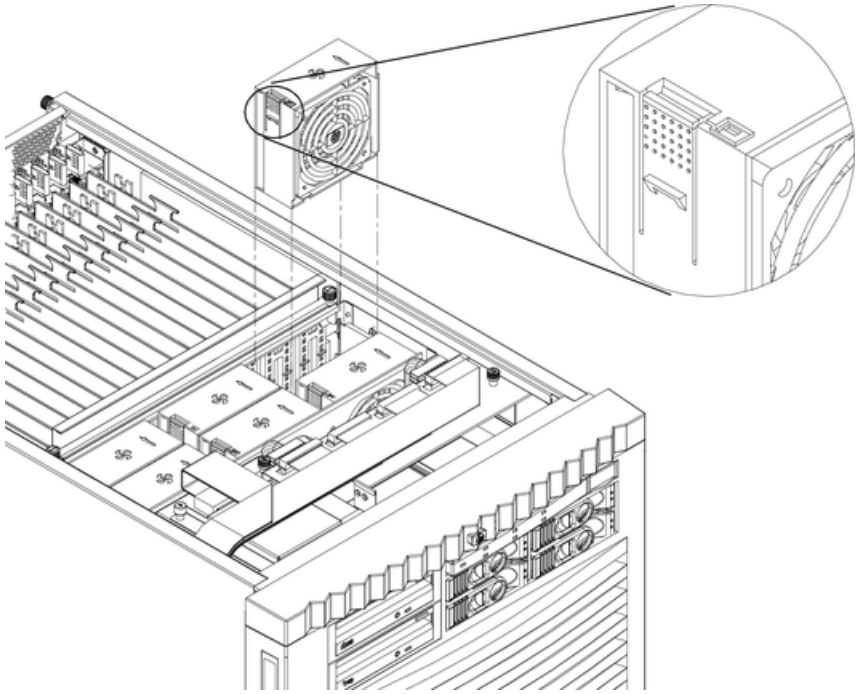
LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than 12 seconds.
Flash Yellow	Fan is not keeping up with speed/sync pulse for greater than 12 seconds.
Red	Fan failed/stalled, has run slow, or fast for greater than 12 seconds.
Off	Fan is not present, or no power is applied to fan, or the fan has failed.

Removing the PCI Smart Fan Assembly

To remove the PCI smart fan assembly, follow these steps:

1. Securely grasp the two thumb holds on the fan assembly.
2. Slide the fan upward from the chassis.

Figure 6-52 PCI Smart Fan Assembly Detail



Replacing the PCI Smart Fan Assembly

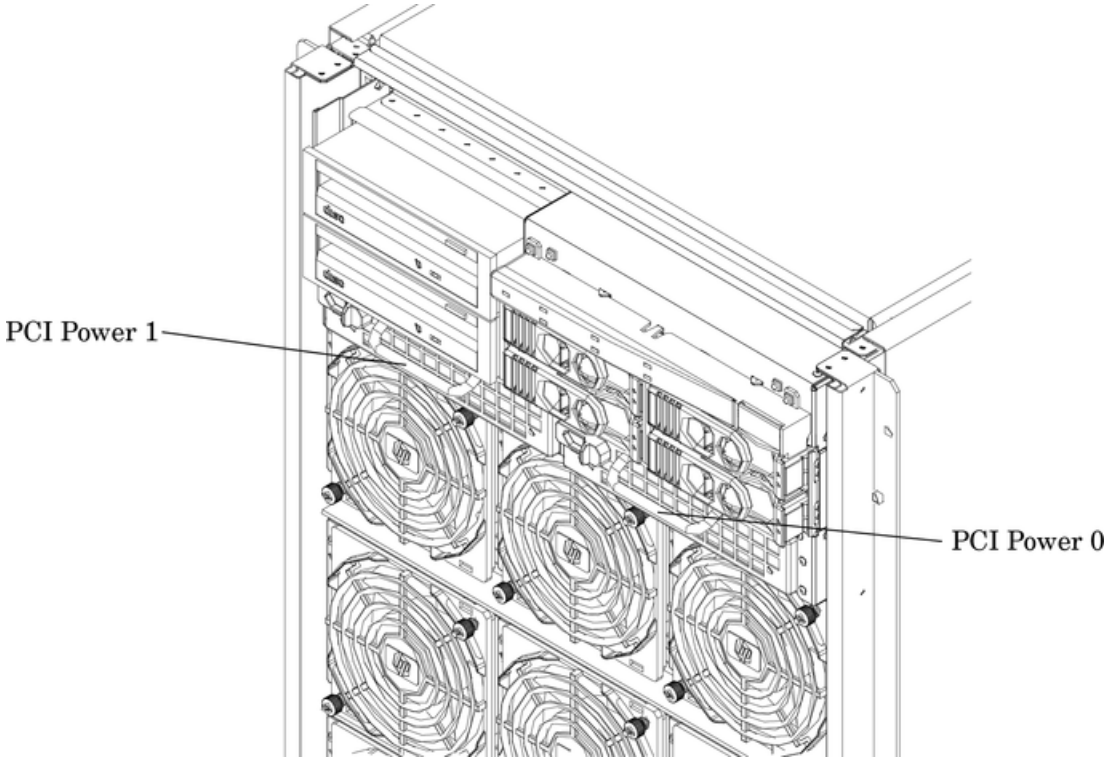
To replace the PCI smart fan assembly, follow these steps:

1. Position the fan assembly in the chassis.
2. The fan easily slides into the chassis; however, a slow, firm pressure is needed to properly seat the connection.
3. Fan status LED should be GREEN.
4. Replace the top cover. See "Removing and Replacing Covers" (page 108).

Removing and Replacing a PCI Power Supply

The PCI power supply is located in the front of the chassis. You must turn off the PCI domain power to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

Figure 6-53 PCI Power Supply Location



Preliminary Procedures

These procedures must be completed before removing the PCI power supply.

1. Identify the failed power supply. Table 6-7 identifies the meaning of the PCI power supply LED state.

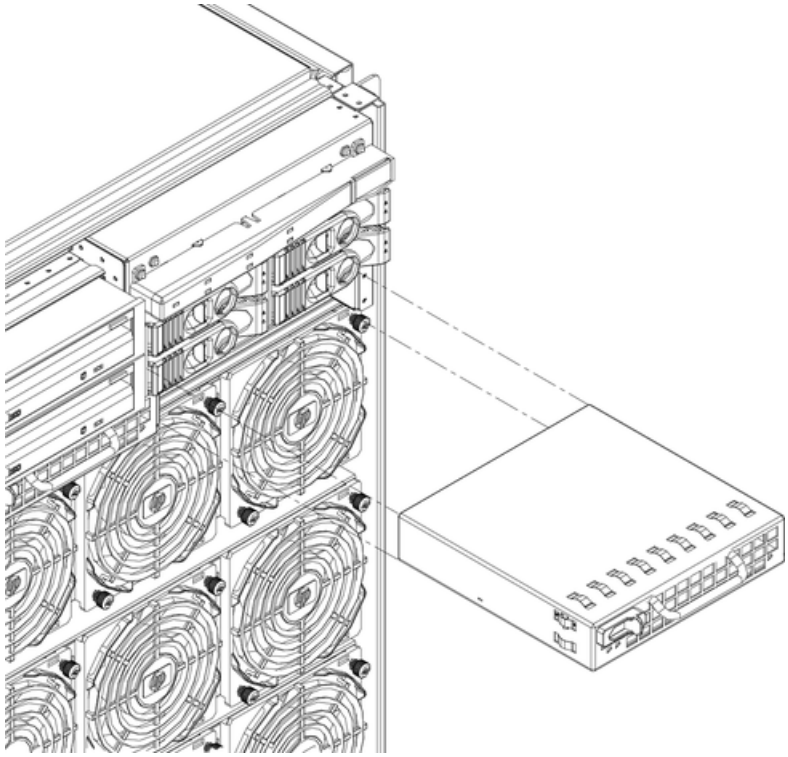
Table 6-7 PCI Power Supply LED Indications

LED	LED State	Meaning
Power LED (Green)		
	Off	Power supply failure or the power to the respective I/O chassis is OFF.
	On	Normal operation
Fault LED (Multi-color)	Off	Normal operation
	Blink amber	Over temperature condition internal to supply
	Amber	Imminent failure detected
	Blink red	Module internal failure

2. Connect to ground with a wrist strap. For more information, see "Electrostatic Discharge " (page 106).
3. Visually inspect the replacement part for proper part number and revision.
4. Shut down the partition and power off the PCI domain.
5. Remove the front bezel. See "Removing the Front Bezel" (page 111).

Removing the PCI Power Supply

Figure 6-54 PCI Power Supply Detail



To remove the PCI power supply, follow these steps:

1. Securely grasp the handle on the front of the power supply.
2. Firmly depress the securing thumb latch.
3. Slide the module from the chassis.

Replacing the PCI Power Supply

To replace the PCI power supply, follow these steps:

1. Slide the power supply in the chassis until the thumb latch clicks into the locked position.
2. The module easily slides into the chassis; however, a slow, firm pressure is needed to properly seat the connection.
3. Release the thumb latch.
4. Power on the system. To confirm the server is powered on, use the `PE` and `PS` commands.
5. Note status of the power supply LEDs. Green LED should be ON and the fault LED should be OFF.

Removing and Replacing the PCI-X Card Cage Assembly

The PCI-X assembly comes with the PCI-X backplane and a card cage assembly mounted to the backplane and is located in the rear of the server. The system power must be turned off to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

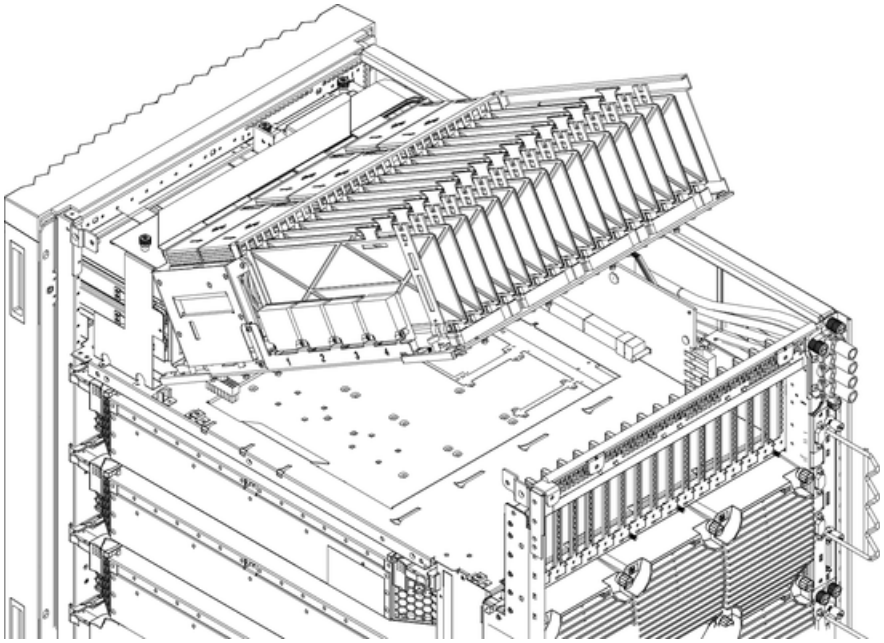
Preliminary Procedures

These procedures must be completed before removing the PCI-X card cage assembly.

1. Shut down and power off the system. See "Powering Off Hardware Components and Powering On the Server" (page 106).
2. Disconnect all power cords from the server.

3. Remove the front bezel, top and right side covers. Refer to "Removing and Replacing Covers" (page 108).

Figure 6-55 PCI-X Card Cage Assembly Location

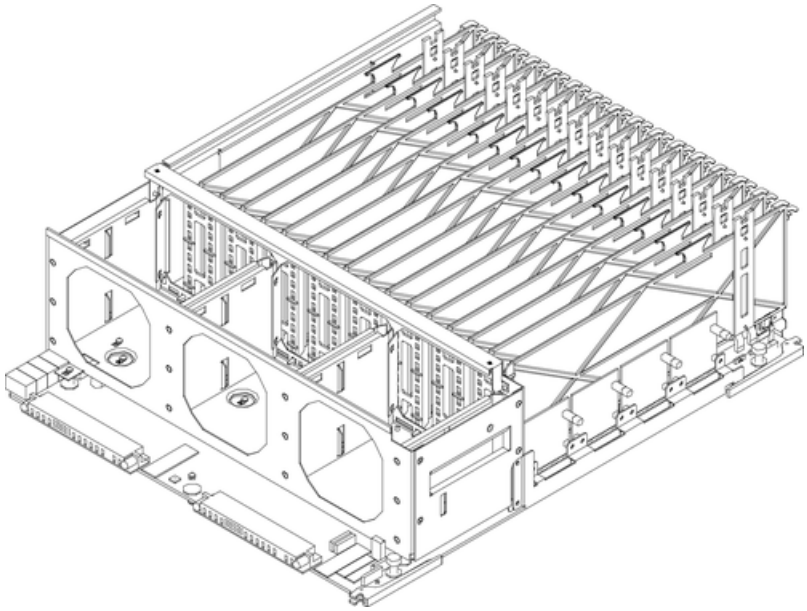


Removing the PCI-X Card Cage Assembly

To remove the PCI-X card cage assembly, follow these steps:

1. Confirm the target chassis identity by checking cabinet and chassis labels.
2. Unplug all I/O cables from PCI cards and remove the cards.
3. Remove PCI fans.
4. Remove PCI panel.
5. Unseat the PCI power supplies (bricks) and pull them 1.5 inches out of the chassis.
6. Unplug the two mass storage power cables and the OLR cable.
7. Loosen the two thumbscrews.
8. Using board extractors, unseat the PCI-X backplane.
9. Using handles, tilt and lift the backplane out of chassis.

Figure 6-56 PCI-X Card Cage Assembly Detail



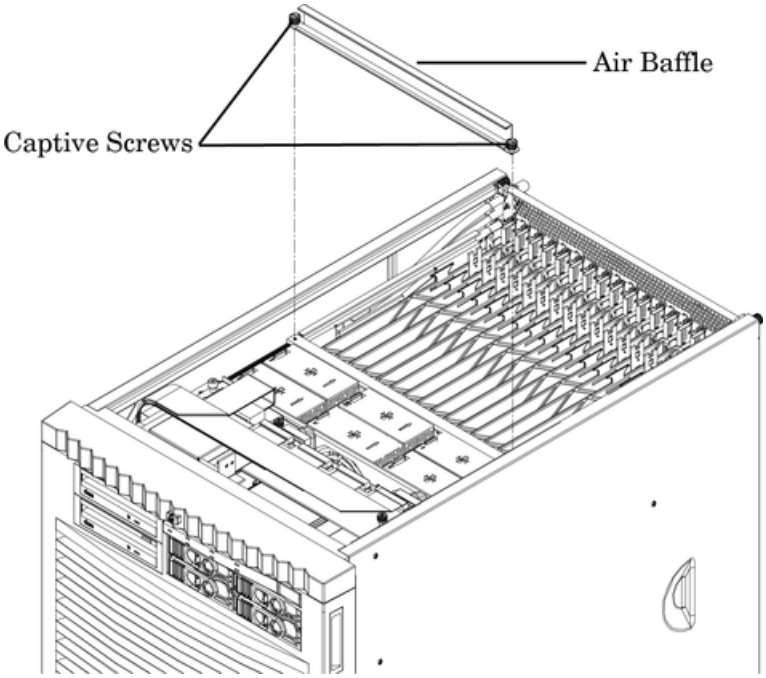
Replacing the PCI-X Card Cage Assembly

To replace the PCI-X card cage assembly, follow these steps:

1. Tilt the assembly toward the chassis. Position the assembly at an angle so that the retaining standoff pins engage.
2. Using extractors, slide the board toward the system backplane until fully seated.
3. Reconnect the two cable bundles at the rear of the mass storage board and tighten the two captive screws onboard the backplane near the extractor levers.
4. Replace all PCI cards into their proper slots.
5. Reconnect all PCI card cables.
6. Reconnect the PCI OLR ribbon cable to the PCI backplane.
7. Re-engage the PCI power supplies.
8. Remove the air baffle from the old PCI-X card cage assembly and install on the new PCI-X assembly. For the location of the air baffle, see Figure 6-57.

   The air baffle attaches to the PCI-X assembly by two captive thumbscrews. One thumbscrew is located on each end of the air baffle.

Figure 6-57 PCI-X Card Assembly Air Baffle

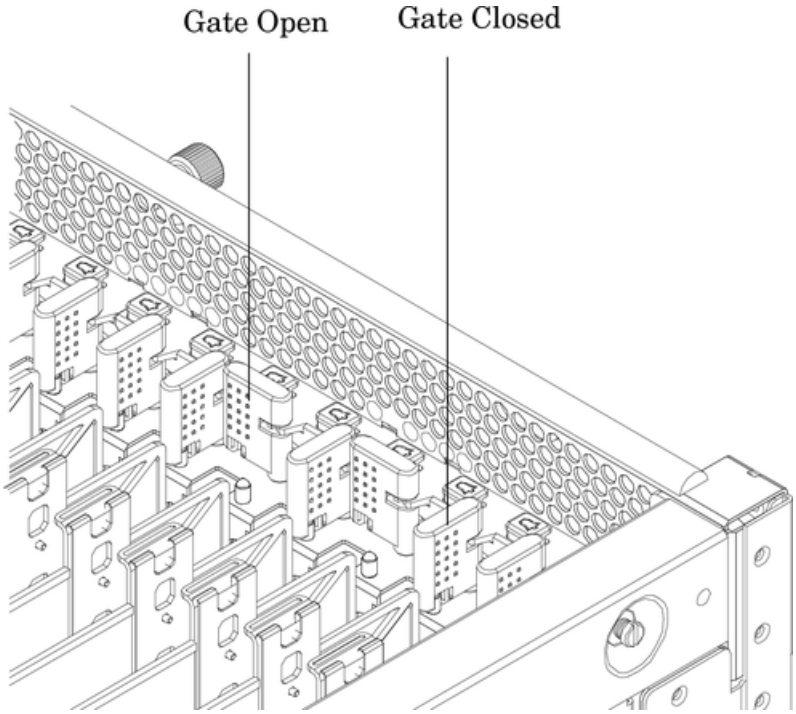


9. Install PCI fans, PCI panel, top and side covers, and front bezel.
10. Replace the top and right side covers.
11. Replace the front bezel.
12. Power on the system.
13. Using the **PS** command, the domains are referred to as chassis 0 (zero) and 1.

Removing and Replacing the PCI OLR Assembly

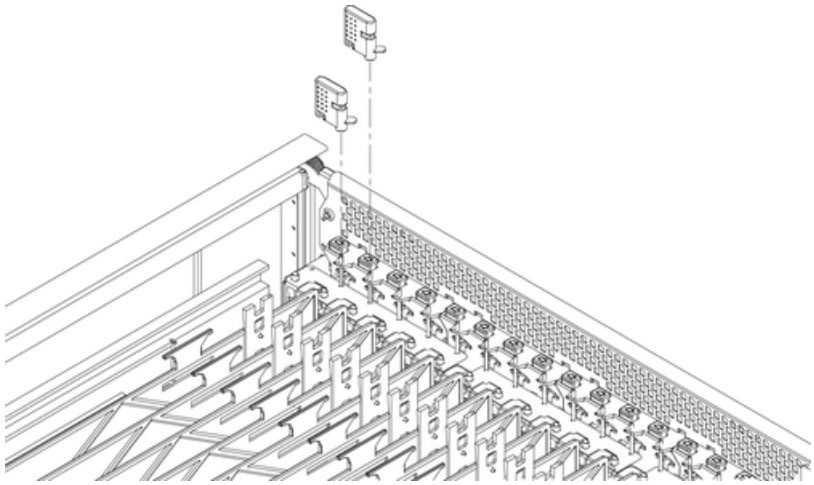
The PCI OLR assembly is located in the rear of the chassis. You must turn off system power to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

Figure 6-58 PCI OLR Assembly Location (Rear of Server with Top Cover Removed)



Removing the PCI OLR Assembly

Figure 6-59 PCI Gate Detail



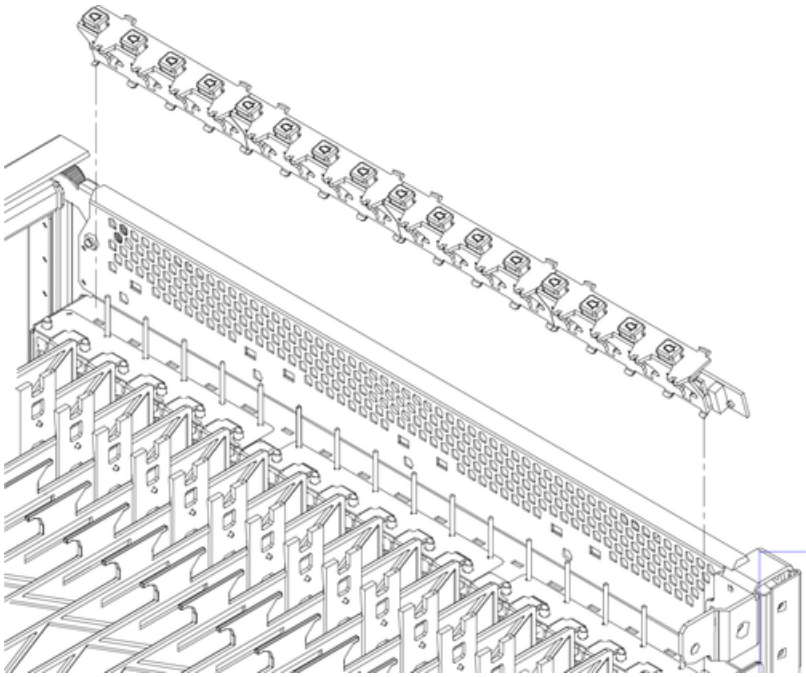
NOTE: It is highly recommended that extra PCI gates are available as these may be easily broken when removing or replacing the gates.

To remove the PCI OLR assembly, follow these steps:

1. Shut down and power off the server.
2. Remove the top and right side covers. See "Removing and Replacing Covers" (page 108).
3. Loosen the captive screws and remove the PCI access panel.
4. Disconnect the PCI OLR cable from the PCI backplane. The connector is located on the cell board side of the system.
5. Flip all 16 of the PCI gates to the OPEN position.
6. Carefully remove all 16 of the PCI gates, beginning on the OLR cable side of the system (left side when viewed from the rear of the system).

7. Push out on top of the PCI gate to unclip the PCI gate axle from the retaining slot carefully, so as not to break off the optic sensor tab.
8. With the tab clear of obstruction, lift the gate up and out.
9. Remove the PCI OLR assembly by pushing in on the eight plastic tabs that secure the assembly to the chassis.
10. Tilt the assembly away from the attach points. Disengage the bottom holding tabs from the chassis.
11. Lift the assembly up and out.
12. Remove the PCI OLR cable from the PCI OLR assembly.

Figure 6-60 PCI OLR Assembly Removed



Replacing the PCI OLR Assembly

To replace the PCI OLR assembly, follow these steps:

1. Position the assembly at an angle so that the bottom holding tabs engage into the bottom holes of the chassis.
2. Tilt the assembly toward the chassis, bringing it upright, and engage the 8 plastic tabs so that the assembly is firmly and evenly attached to the chassis.
3. Replace all the PCI gates one at a time, beginning at the right-most clip position. Before inserting the bottom pivot pin into the hole in the chassis, make sure the PCI gate is open.
4. Press the PCI gate axle into the retaining clip.
5. Close all the PCI gates.
6. Reconnect the PCI OLR cable.
7. Replace the PCI access panel.
8. Replace the top and side covers. See "Removing and Replacing Covers" (page 108).

Removing and Replacing the PCI-X Voltage Regulator Modules

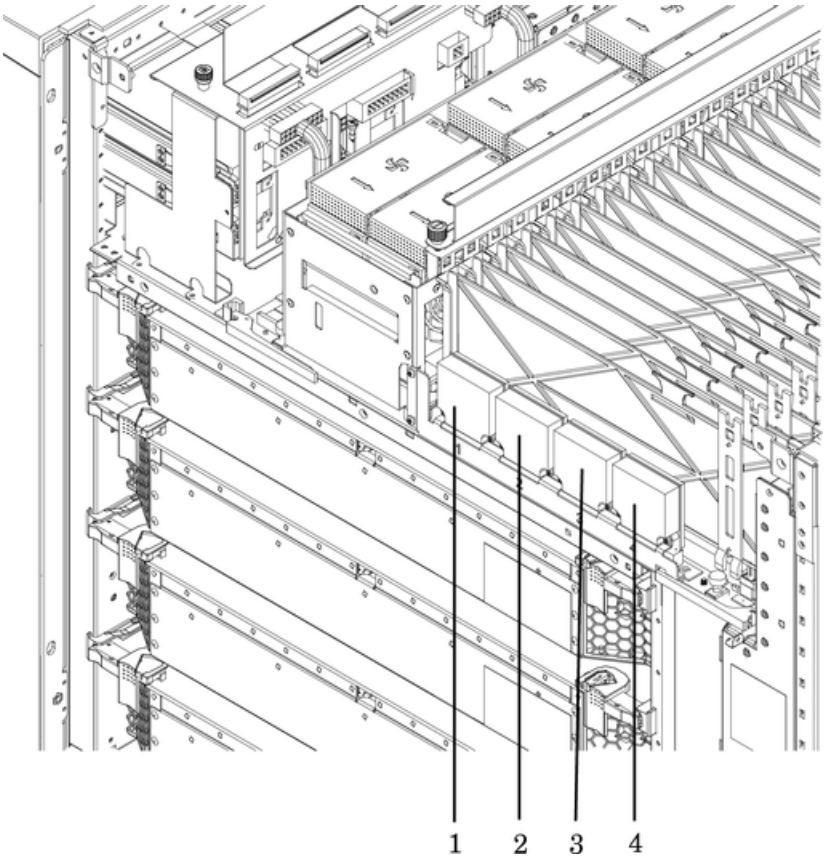
The PCI-X voltage regulator modules (VRMs) are located on the PCI-X backplane. You must turn off system power to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

Removing the PCI-X VRM

To remove the PCI-X VRM, follow these steps:

1. Use the `PS:P` command from the Command Menu to identify the failed VRM needing replacement. They are labeled 1 through 4 in Figure 6-61.

Figure 6-61 VRM Identification



2. Power off the server and remove all the power cords.

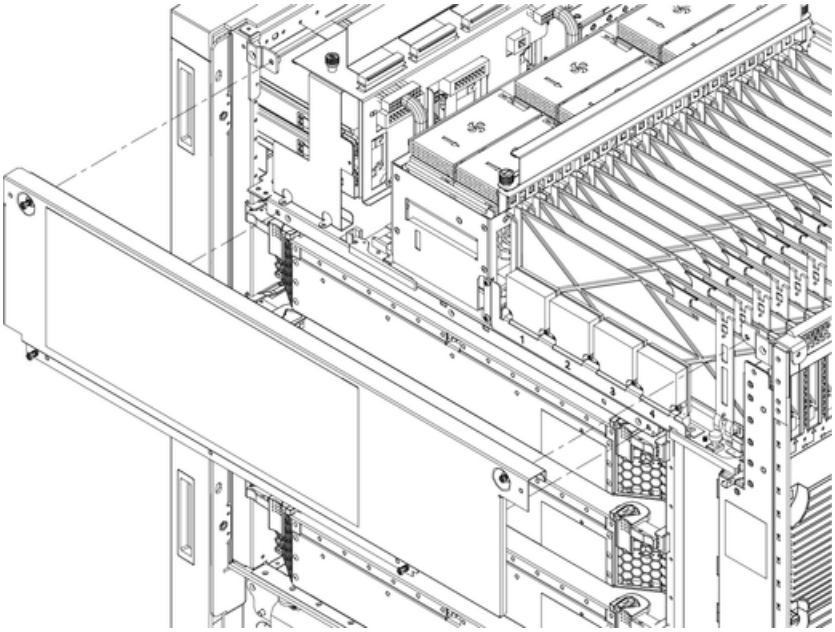
IMPORTANT: The standby/housekeeping power needs to be off for this operation and removing the power cords must be done to accomplish this.

3. Remove the right side cover.

NOTE: The top cover can also be removed for ease of removal of the VRMs.

4. Remove PCI side panel. See Figure 6-62.

Figure 6-62 PCI Side Panel



5. Unscrew the two screws to remove the VRM from bracket.
6. Lift up and gently pull the VRM from the socket.

Replacing the PCI-X VRM

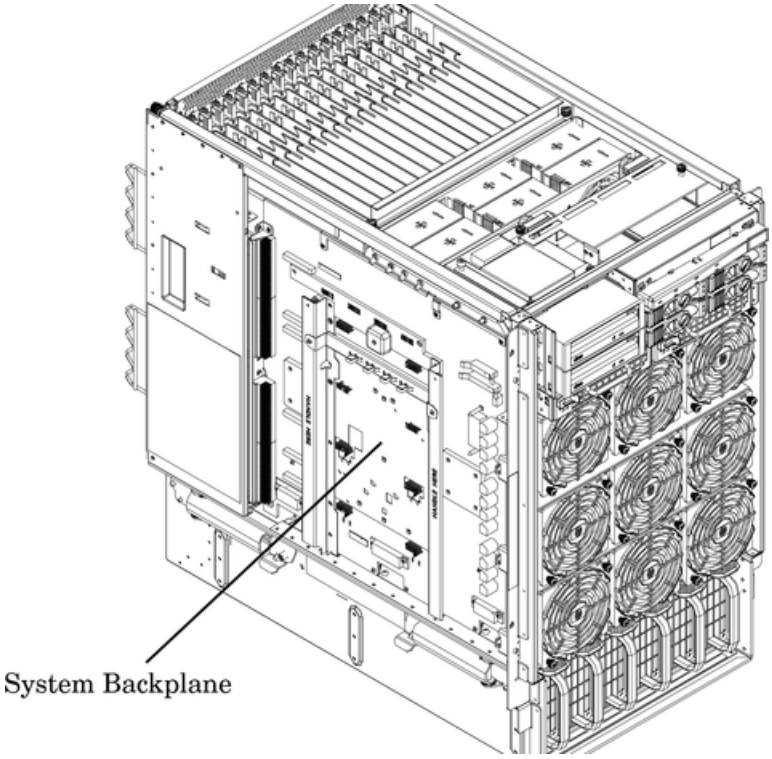
To replace the PCI-X VRM, follow these steps:

1. Verify the replacement VRM is a low-voltage VRM (P/N 0950-4122).
2. Firmly seat the VRM into the socket. Be careful not to bend the pins.
3. Attach the bracket to the VRM using the two screws removed earlier.
4. Put the PCI side panel back on the chassis.
5. Put the right side cover back on the chassis.
6. Replace the top cover if it was removed.
7. Connect the power cords.
8. Apply power to the server.
9. To verify that the VRM power is good, use the `PS:P` command from the Command Menu.

Removing and Replacing a System Backplane

The system backplane is located in the left side of the chassis. You must turn off system power to replace this FRU. See "Powering Off Hardware Components and Powering On the Server" (page 106).

Figure 6-63 System Backplane Location



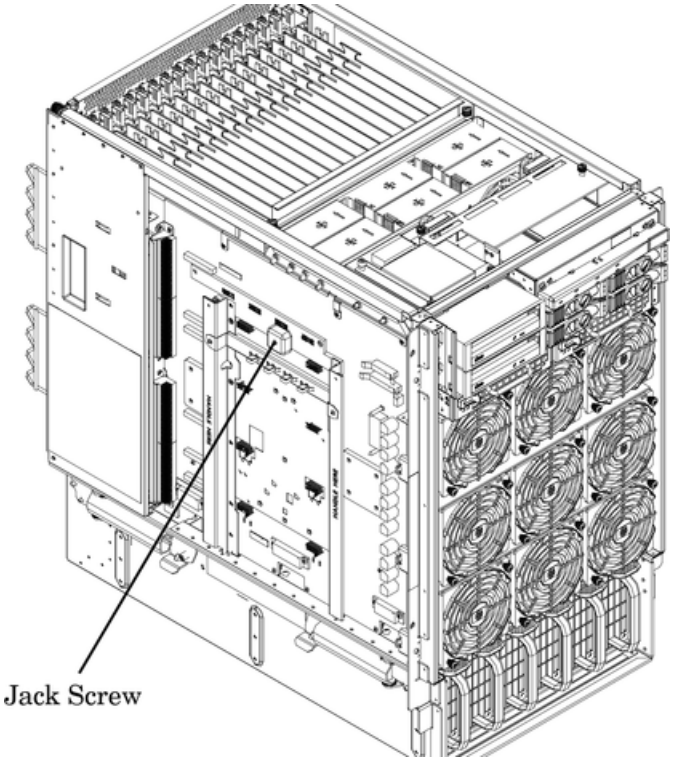
Removing the System Backplane

Before removing the system backplane, confirm the target chassis identity by checking cabinet and chassis labels.

To remove the system backplane, follow these steps:

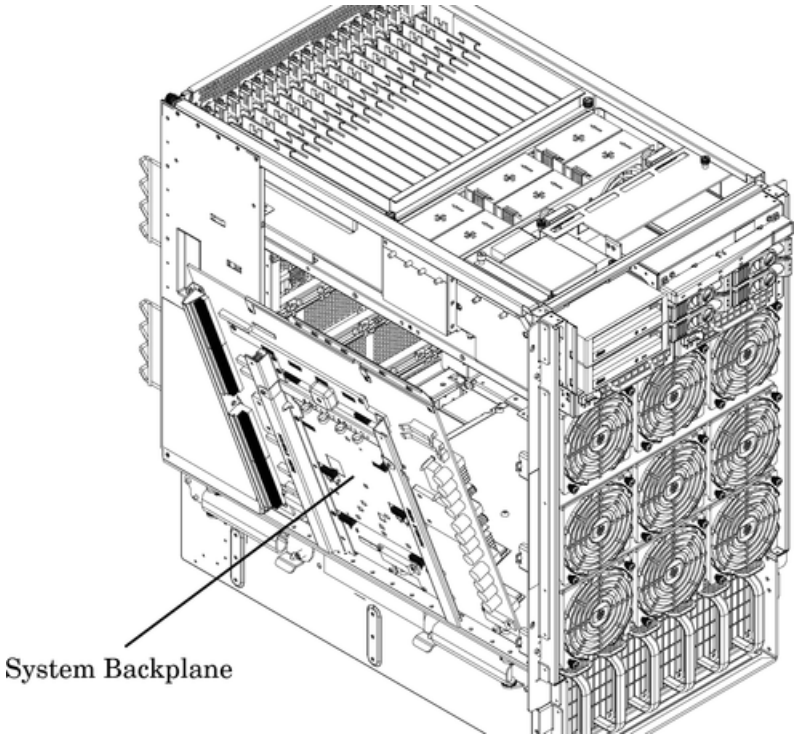
1. Shut down and power off the system.
2. Unplug all AC power cords.
3. Remove the side covers. See "Removing and Replacing Covers" (page 108).
4. Unseat cell boards about five inches.
5. Unseat core I/O cards about one inch.
6. Disconnect all cables from system backplane—15 cables and all SBA I/O cables if an SEU is attached to the server.
7. Unscrew the blue jack screw until it spins freely.

Figure 6-64 Jack Screw



8. Rotate the backplane out, using handles to lift the board from hinges and out of the chassis.

Figure 6-65 System Backplane Detail



Replacing the System Backplane

To install the system backplane, follow these steps:

1. Position the system backplane in the chassis at a 45-degree angle.
2. Align tabs at the bottom of the backplane with the slots on the bottom of the chassis.

3. Tilt the backplane forward until it is resting against the chassis. Ensure all cables are correctly routed to the outer side of the backplane to avoid damage to the cables. Tighten the jack screw (eight to nine turns to tighten).

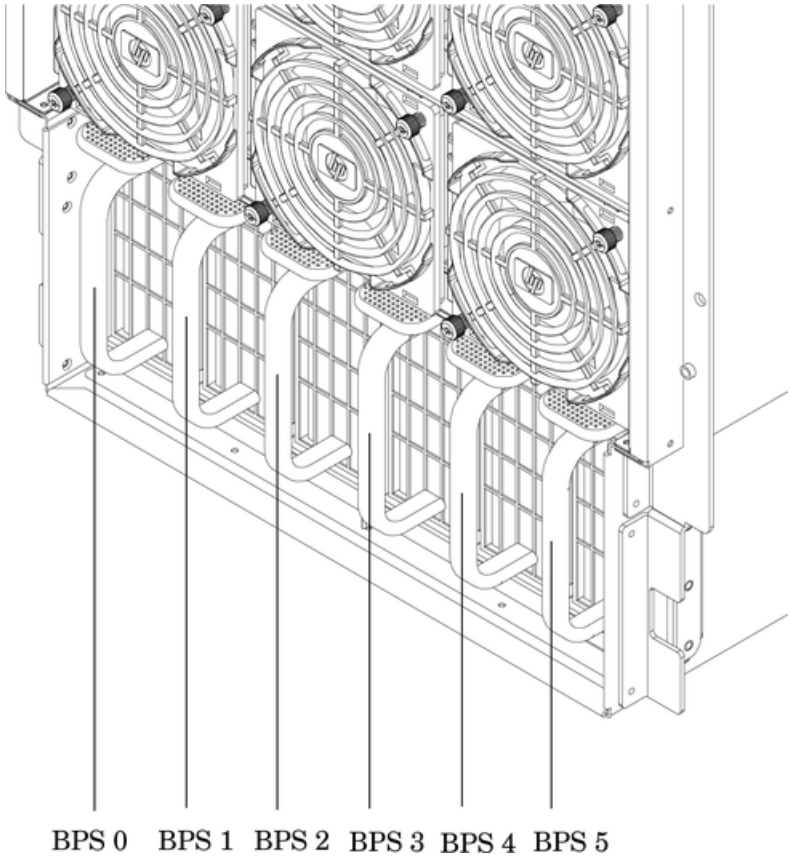
CAUTION: Watch for system board flex when tightening the jack screw. Over-compression will destroy the backplane.

4. Reconnect all cables.
5. Reconnect core I/O cards.
6. Reconnect all cell boards.
7. Replace all covers. See "Removing and Replacing Covers" (page 108).
8. Plug in the power cords and power on the system.
9. Check status with the `PS` command by selecting **`S`** for the system backplane.

Removing and Replacing a Bulk Power Supply (BPS)

The bulk power supply (BPS) is located in the front of the chassis. The BPS is a hot-swap component.

Figure 6-66 BPS Location (Front Bezel Removed)



Removing the BPS

To remove the BPS, follow these steps:

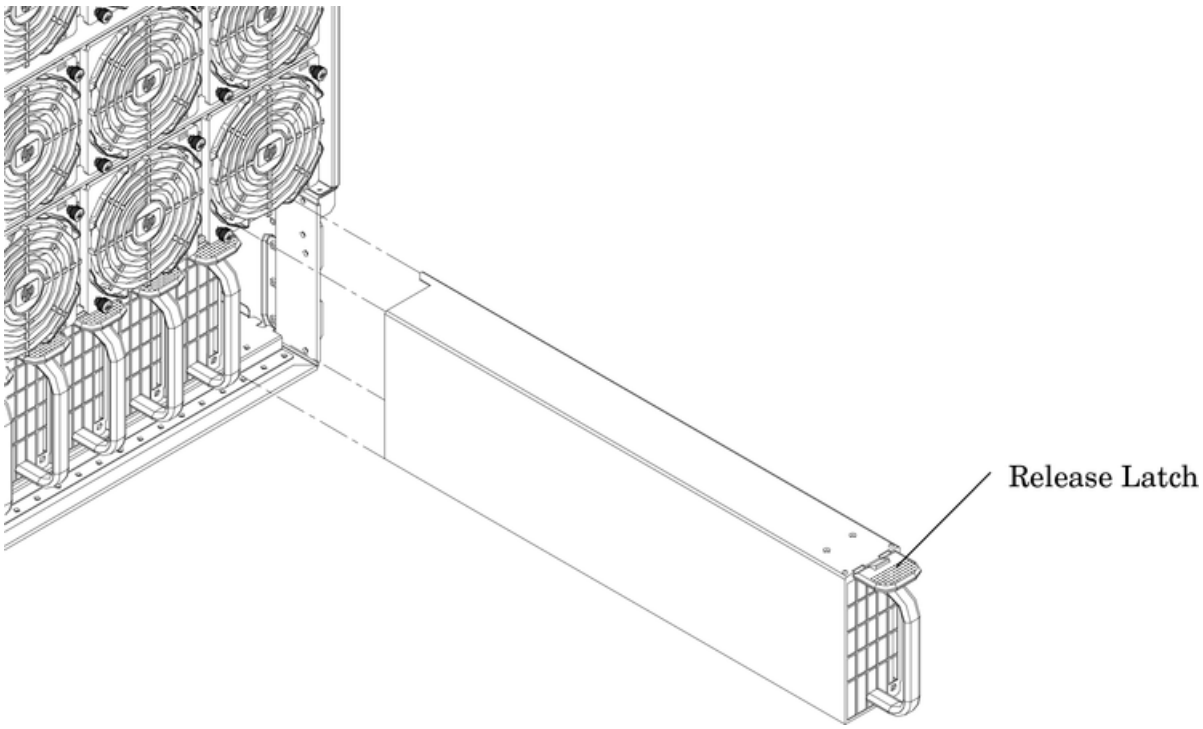
1. Isolate the failing BPS. Table 6-8 defines the states of the single multicolored LED on the BPS.

Table 6-8 BPS LED definitions

LED State	Description
Blink Green	BPS in standby state and no faults or warnings
Green	BPS in run state (48 volt output enabled) and no faults or warnings
Blink Yellow	BPS in standby or run state and warnings present but no faults
Yellow	BPS in standby state and recoverable faults present but no non-recoverable faults
Blink RED	BPS state may be unknown, non-recoverable faults present
Red	This LED state is not used
Off	BPS fault or failure (unless AC power is not connected to server)

2. Remove the front bezel.
3. Depress the release latch on the upper front center portion of the BPS.
4. Slide the BPS forward using the handle to remove it from the chassis.

Figure 6-67 BPS Detail



Replacing the BPS

To replace the BPS, follow these steps:

1. Grip the handle with one hand while supporting the rear of BPS in the other hand.

NOTE: The BPS easily slides into the chassis; however, a slow, firm pressure is needed to properly seat the connection.

2. Slide the power supply into the slot until fully seated.

   When seated, the release latch clicks and locks into place.

3. Note status of the BPS LED. The LED should be green.

NOTE: When a BPS fails and is replaced online, the `PS` command sometimes displays the cached status data of the BPS. To verify the actual state of the BPS, use the `CM> DE` command.

A Replaceable Parts

This appendix contains the HP Integrity rx8620 Server FRU list.

Table A-1 HP Integrity rx8620 Server FRU List

FRU Description	Replace Part Number	Exchange Part Number
PCA BOARDS		
System Backplane	A6093-67001	A6093-69301
Cell Board with 1.1 GHz CPU	A6913-67008	A6913-69008
Cell Board with 1.5 GHz CPU (A1)	A6913-67009	A6913-69009
Cell Board with 1.6 GHz CPU (A1)	A6913-67011	A6913-69011
Cell Board with 1.5 GHz CPU (A2)	A6913-67009	A6913-69014
Cell Board with 1.6 GHz CPU (A2)	A6913-67011	A6913-69015
Mass Storage Backplane	A6093-67003	A6093-69003
Front Panel Board	A6093-67005	N/A
PCI OLR Board	A6093-60006	A6093-69006
AC Distribution PCA	A6093-67007	A6093-69007
DC Distribution PCA	A6093-67008	A6093-69008
Core I/O	A7109-67001	A7109-69001
512 MB DIMM (single)	A6097AX	A6097-69001
1 GB DIMM (single)	A6098AX	A6098-69001
2 GB DIMM (single)	A6100AX	A6100-69001
256 MB DIMM (single)	A6802AX	A6802-69001
CABLES		
Fan Assembly Front Cable (power and sense)	A6093-63000	N/A
Fan Assembly Rear Cable (power and sense)	A6093-63001	N/A
SBA Cable	A6093-63005	N/A
Mass Storage Power Cable	A6093-63008	N/A
Interface Cable (to internal I/O)	A6093-63012	N/A
DC Distribution Signal Cable	A6093-63014	N/A
Intrusion Switch Cable	A6093-67025	N/A
PCI OLR Switch Cable	A6093-63027	N/A
Mass Storage Ribbon Cable	A6093-63028	N/A
Power Cord, C19/unterminated International-Europe	8120-6895	N/A
Power Cord, C19/IEC-309 4.5m	8120-6897	N/A
Power Cord, C19/L6-20 4.5m	8120-6903	N/A
Power Cord, C19/GB 1002 4.5m	8121-0070	N/A
240V N. America UPS 4.5m C19/L6-30P	8120-8494	N/A

Table A-1 HP Integrity rx8620 Server FRU List *(continued)*

FRU Description	Replace Part Number	Exchange Part Number
C19/C20 4.5m - Jumper	8121-0806	N/A
C19/C20 2.5m - Jumper	8121-0802	N/A
RS-485 Interface Cable (external cable)	A6434-63003	N/A
DISKs and REMOVABLE MEDIA		
Removable DVD Device	A9879-67001	N/A
36 GB 15K RPM SCSI Disk (A9880A)	A9896-64001	A9896-69001
72 GB 15K RPM SCSI Disk (A9881A)	A9897-64001	A9897-69001
146 GB 10K RPM Disk (A9882A)	A9898-64001	A9898-69001
Removable DAT 40i (DDS4)	C5686-67204	C5686-67204
FANS		
Front Smart Fan Assembly	A6093-67017	N/A
Rear Smart Fan Assembly	A6093-67018	N/A
Turbo-Cooler Fan (Madison/Mako)	A6436-67001	N/A
PCI Smart Fan Assembly	A6752-04010	N/A
ASSEMBLIES		
PCI-X Assembly	A6093-67013	A6093-69013
PCI OLR Assembly	A6093-67014	N/A
Front Panel Plastic Assembly	A6912-04010	N/A
Cell/Processor Assembly (1.3GHz-IPF)	A6913-67004	A6913-69004
Cell/Processor Assembly (1.5GHz-IPF)	A6913-67003	A6913-69003
KITS		
Cable Management Towel Rack Kit	A6093-04046	N/A
Removable Media Rail Kit	A6752-67011	N/A
Cell Board Air Baffle Kit	N/A	A6093-69016
AC Cable Strain Relief Kit	N/A	A6093-67029
POWER SUPPLIES		
rp8400 Power Supply (Exchange)	0950-3794	A6093-69021
rp8400 Power Supply (Exchange) Artesyn	0950-3794	A6093-69028
PCI Power Module	0950-3819	A6093-69123
DC to DC Converter, Low Voltage VRM	0950-4122	N/A
DC to DC Converter, High Voltage VRM	0950-4123	N/A
MISCELLANEOUS		
PCI Filler Plate	5001-6892	N/A
Intrusion Switch	5040-6317	N/A
PCI Separator Assembly (with light pipe)	5065-0246	N/A
Power Supply EMI Filler Assembly	A6093-00089	N/A

Table A-1 HP Integrity rx8620 Server FRU List *(continued)*

FRU Description	Replace Part Number	Exchange Part Number
SBA Cable Shroud	A6093-00188	N/A
Top Cover Assembly	A6093-04120	N/A
Right Side Cover Assembly	A6093-04121	N/A
Left Side Cover Assembly	A6093-04122	N/A
Front Card Guide (includes two)	A6093-40014	N/A
Rear Card Guide (includes two)	A6093-40015	N/A
PCI OLR Paddle Assembly	A6093-40041	N/A
Internal Disk Filler	A6198-60003	N/A
DVD Filler Box	A6912-00014	N/A
Bezel (graphite color)	A6912-04009	N/A
rx8620 Nameplate	A7026-40001	N/A
Snap Bezel Attach	C2786-40002	N/A
PCI OLR Button	A6093-40009	N/A
Chassis Assembly	A6912-04012	N/A
TOOLS		
DIMM Remover Tool	A5201-68005	N/A
DIMM Installer Tool	A5201-68003	N/A
24" x 36" Static Mat (with ground strap)	A5201-68004	N/A

B System Specifications

This chapter describes the basic system configuration and its physical specifications and requirements.

Dimensions and Weights

This section provides dimensions and weights of the server and server components.

Table B-1 HP Integrity rx8620 Server Dimensions and Weights

	Stand-alone	Packaged
Height - Inches (centimeters)	29.55 (75.00)	86.50 (219.70)
Width - Inches (centimeters)	17.50 (44.50)	40.00 (101.60)
Depth - Inches (centimeters)	30.00 (76.20)	48.00 (122.00)
Weight - Pounds (kilograms)	368.00[1] (166.92)	813.00[2] (368.77)

1 This weight represents a fully configured server before it is installed in a rack.

2 The packaged weight represents a server installed in a 2-m rack. The packaged weight includes a fully configured server in a 2-m rack with a rear door, rail slide kit, line cord anchor kit, interlock assembly, cable management arm, 120 lb. ballast kit, and a 60A PDU. The shipping box, pallet, and container, not included in the packaged weight in Table B-1, adds approximately 150.0 lb. to the total system weight when shipped. The size and number of miscellaneous pallets is determined by the equipment ordered by the customer.

Table B-2 provides component weights for calculating the weight of a server not fully configured. Table B-6 (page 192) provides an example of how to calculate the weight. Table B-7 (page 192) is a blank worksheet for calculating the weight of the server.

Table B-2 HP Integrity rx8620 Server Component Weights

Quantity	Description	Weight (lb./kg.)
1	Chassis	131.00 (59.42)
1	System backplane	20.0 (9.07)
1	PCI-X card cage assembly	20.40 (9.25)
2	PCI-X power supply	5.00 (2.27) each
6	Bulk power supply	12.00 (5.44) each
1	Mass storage backplane	1.00 (0.45)
1 - 4	Cell board	27.80 (12.61) each
1 - 4	Hard disk drive	1.60 (0.73) each
1 - 2	Removable media disk drive	2.20 (1.00) each

Electrical Specifications

This section provides electrical specifications for the HP Integrity rx8620 server.

Grounding

The site building shall provide a safety ground and protective earth for each AC service entrance to all cabinets.

Install a protective earthing (PE) conductor that is identical in size, insulation material, and thickness to the branch-circuit supply conductors. The PE conductor must be green with yellow stripes. The earthing conductor described is to be connected from the unit to the building

installation earth or if supplied by a separately derived system, at the supply transformer or motor-generator set grounding point.

Circuit Breaker

The Marked Electrical for the HP Integrity rx8620 server is 15 amps per line cord. The recommended circuit breaker size is 20 amps for North America. For countries outside North America, consult your local electrical authority having jurisdiction for the recommended circuit breaker size.

The HP Integrity rx8620 server contains four C20 power receptacles located at the bottom rear bulkhead. A minimum of two power cords must be used to maintain normal operation of the server. A second set of two cords can be added to improve system availability by protecting, for example, against power source failures or accidentally tripped circuit breakers. The server can receive AC input from two different AC power sources.

System AC Power Specifications

Power Cords

Table B-3 lists the various power cables available for use with the server. Each power cord is 15 feet (4.5-m) in length with a IEC 60320-1 C19 female connector attached to one end.

Table B-3 Power Cords

Part Number	Description	Where Used
8120-6895	Stripped end, 240 volt	International - Other
8120-6897	Male IEC309, 240 volt	International
8121-0070	Male GB-1002, 240 volt	China
8120-6903	Male NEMA L6-20, 240 volt	North America/Japan

System Power Specifications

Table B-4 and Table B-5 list the AC power requirements for the server. These tables provide information to help determine the amount of AC power needed for your computer room.

Table B-4 Power Requirements

Requirements	Value	Comments
Nominal input voltage	200–240 VAC	
Minimum operating voltage	180 VAC	
Maximum operating voltage	269 VAC	
Frequency range (minimum - maximum)	50/60 Hz	
Number of phases	1	
Rated line current	15 A	Per line cord
Maximum inrush current	54 A peak for 20 ms	Per line cord
Dropout carry-through time at minimum line voltage	20 ms	
Circuit breaker rating	20A	Per line cord
Power factor correction	>0.98 >0.95	At all loads of 50%–100% of supply rating At all loads 0f 25%–50% of supply rating
Ground leakage current (mA)	<3.0 (ma)	Per line cord

Power Required (50 - 60 Hz)	Watts	VA	Comments
Maximum Theoretical Power	5292	5400	See #1 below
Marked Electrical Power	---	5400	30A @ 180 VAC, see note #2
Typical Maximum Power	3724	3800	See note #3

- "Maximum theoretical power" is used to describe input power at the AC input. It is expressed in Watts and Volt-Amps to take into account power factor correction. The calculated sum is the maximum worst case power consumption for every subsystem in the server. This number will not be exceeded by a properly functioning server for any combination of hardware and software.
- "Marked electrical power" is the input power measured at the ac input expressed in Volt-Amps. The marked electrical power is the rating given on the chassis label and represents the input power required for facility AC power planning and wiring requirements. This number represents the expected maximum power consumption for the server based on the power rating of the bulk power supplies. This number can safely be used to size ac circuits and breakers for the system.
- "Typical maximum power" is the input power measured at the AC input expressed in Watts and Volt-Amps, and the measured maximum worst case power consumption. This number represents the largest power consumption for the server under laboratory conditions, using aggressive software applications designed specifically to work the system at maximum loads and power consumption.

Environmental Specifications

This section provides the environmental, power dissipation, noise emission, and air flow specifications for the server.

Temperature and Humidity

The cabinet is actively cooled using forced convection in a Class C1-modified environment. The recommended humidity level for Class C1 is 40 to 55% relative humidity (RH).

Operating Environment

The system is designed to run continuously and meet reliability goals in an ambient temperature of 5° C–35° C at sea level. The maximum allowable temperature is derated 1° C per 1,000 feet of elevation above 5,000 feet above sea level up to 30° C at 10,000 feet. For optimum reliability and performance, the recommended operating range is 20° C to 25° C. This meets or exceeds the requirements for Class 2 in the corporate and ASHRAE standard. See Table C-4 on page 210.

Environmental Temperature Sensor

To ensure that the system is operating within the published limits, the ambient operating temperature is measured using a sensor placed on the server backplane. Data from the sensor is used to control the fan speed and also to initiate system overtemp shutdown.

Non-Operating Environment

The system is designed to withstand ambient temperatures between -40° C to 70° C under non-operating conditions.

Cooling

Internal Chassis Cooling

The cabinet incorporates front-to-back airflow across the system backplane. Nine 120-mm fans mounted externally on the front chassis wall behind the cosmetic front bezel push air into the

unit. Twelve 120-mm fans housed in cosmetic plastic fan carriers and mounted externally to the rear chassis wall pull air through the unit.

Each fan is controlled by a smart fan control board embedded in the fan module plastic housing. The smart fan control board receives fan control input from the system fan controller on the system backplane and returns fan status information to the system fan controller. The smart fan control board also controls the power and the pulse width modulated control signal to the fan and monitors the speed indicator back from the fan. The fan status LED is driven by the smart fan control board.

Bulk Power Supply Cooling

Cooling for the bulk power supplies (BPS) is provided by two 60-mm fans contained within each BPS. Air flows into the front of the BPS and is exhausted out of the top of the power supply though upward facing vents near the rear of the supply. The air is then ducted out of the rear of the chassis.

PCI/Mass Storage Section Cooling

Six 92-mm fans located between the mass storage devices and the PCI card cage provide airflow through these devices. The PCI fans are powered off of housekeeping power and run at full speed at all times. The air is pulled through the mass storage devices and pushed through the PCI card cage. Separation is provided between the PCI bulkheads to allow adequate exhaust ventilation and to help reduce the localized airflow dead spots that typically occur at the faceplate tail of each PCI card.

Standby Cooling

Several components within the chassis consume significant amounts of power while the system is in standby mode. The system fans will run at a portion of full speed during standby to remove the resulting heat from the cabinet. The fans within the power supply will operate at full speed during standby.

Typical Power Dissipation and Cooling

Table B-5 provides calculations for the configurations.

Table B-5 Typical HP Integrity rx8620 Server Configurations

Cell Board	Memory per Cell Board	PCI Cards (assumes 10W each)	DVDs	Hard Disk Drives	Core I/O	Bulk Power Supplies	Typical Power	Typical Cooling
Qty	GBytes	Qty	Qty	Qty	Qty	Qty	Watts	BTU/hour
4	16	16	2	4	2	6	3800	12973
4	8	16	2	4	2	6	3395	11591
4	4	8	0	2	2	6	3177	10846
2	16	16	2	4	2	4	2241	7651
2	8	8	0	2	2	4	1936	6610
2	4	8	0	2	2	4	1880	6418
1	4	8	0	1	1	3	1228	4192

The air-conditioning data in Table B-5 is derived using the following equations.

- Watts x (0.860) = kcal/hour
- Watts x (3.414) = Btu/hour
- BTU/hour divided by 12,000 = tons of refrigeration required

NOTE: When determining power requirements, you must consider any peripheral equipment to be installed during initial installation, or as a later update. To determine the power and air-conditioning that is required, see the applicable documentation for such devices.

Acoustic Noise Specification

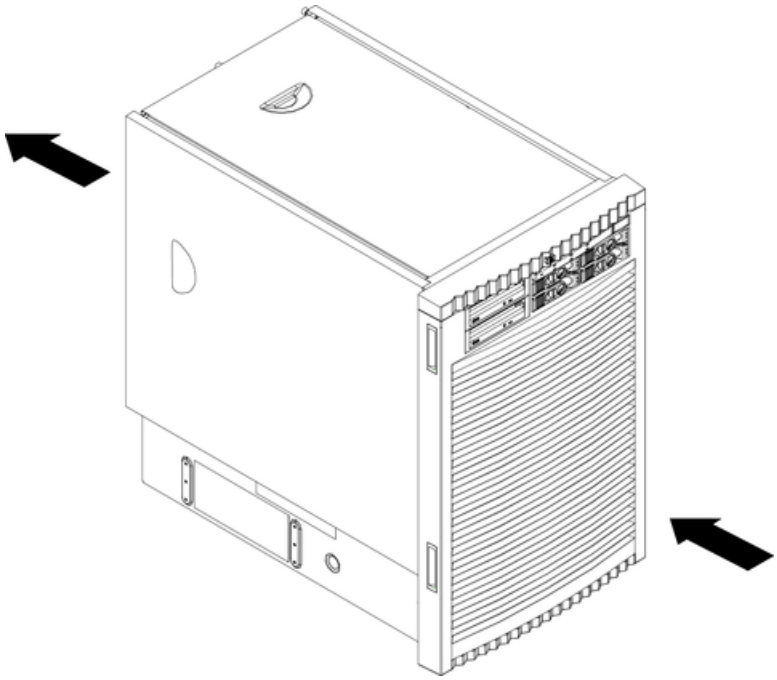
The acoustic noise specification for the HP Integrity rx8620 Server is 55.6 db (sound pressure level at bystander position). It is appropriate for dedicated computer room environments, not office environments. The LwA is 7.4 Bels. Care should be taken to understand the acoustic noise specifications relative to operator positions within the computer room or when adding servers to computer rooms with existing noise sources.

Air Flow

The recommended server cabinet air intake temperature is between 68° F and 77° F (20° C and 25° C) at 960 CFM.

Figure B-1 illustrates the location of the inlet and outlet airducts on a single cabinet. Air is drawn into the front of the server and forced out the rear.

Figure B-1 Airflow Diagram



Power Distribution Unit

The server may ship with a power distribution unit (PDU). There are two 60A PDUs available for the server. Each PDU is mounted horizontally between the rear columns of the server cabinet. The 60A PDUs are delivered with an International Electrotechnical Commission (IEC)-309 60A plug.

The 60A National Electrical Manufacturers Association (NEMA) PDU has four 20A circuit breakers and is constructed for North American use. Each of the four circuit breakers has two IEC-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 accompanies the PDU.

NOTE: 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

Weight

To determine overall weight, follow the example in Table B-6, then complete the entries in Table B-7.

Table B-6 Example Weight Summary

Component	Quantity	Multiply By	Weight (kg)
Cell Board	4	27.8 lb. (12.16)	107.20 lb. (48.64)
PCI Card (varies - used sample value)	4	0.34 lb. (0.153)	1.36 lb. (0.61)
Power Supply (BPS)	6	12 lb. (5.44)	72 lb. (32.66)
DVD Drive	2	2.2 lb. (1.0)	4.4 lb. (2.0)
Hard Disk Drive	4	1.6 lb. (0.73)	6.40 lb. (2.90)
Chassis with skins and front bezel cover	1	131 lb. (59.42)	131 lb. (59.42)
		Total weight	322.36 lb. (146.22)

Table B-7 Weight Summary

Component	Quantity	Multiply By	Weight (kg)
Cell Board		27.8 lb. (12.16)	lb. ( )
PCI Card		varies lb. (varies)	lb. ( )
Power Supply (BPS)		12 lb. (5.44)	lb. ( )
DVD Drive		2.2 lb. (1.0)	lb. ( )
Hard Disk Drive		1.6 lb. (0.73)	lb. ( )
Chassis with skins and front bezel cover		131 lb. (59.42)	lb. ( )
		Total weight	lb. ( )

C MP Commands

This appendix contains a list of the Server Management Commands.

Server Management Commands

Table C-1 lists the server m anagement commands.

Table C-1 Service Commands

Command	Description
BO	Boot a partition
DATE	Set the time and date
DF	Display FRU Information of an entity
MA	Return to Main Menu
PE	Power entities on or off
PWRGRD	Allows user to configure the power grid
RE	Reset entity
RR	Reset partition for reconfiguration
RS	Reset a partition
SYSREV	Returns all system revisions
TC	Send a TOC signal to a partition
TE	Broadcast a message to all users of the MP command handler
WHO	Display list of MP connected users
LOC	Display and Set Locator LED status

Table C-2 lists the server status commands

Table C-2 Status Commands

Command	Description
CP	Display partition cell assignments
DE	Display entity status
DU	Display devices on bus
HE	Display the list of available commands
LS	Display LAN connected console status
PS	Display detailed power and hardware configuration status

Table C-3 lists the server system and access config commands

Table C-3 System and Access Config Commands

Command	Description
CA	Only displays local rs232 parameters
CC	Initiate a Complex Configuration
UPS	Set parameters for ups monitoring via SNMP

Table C-3 System and Access Config Commands *(continued)*

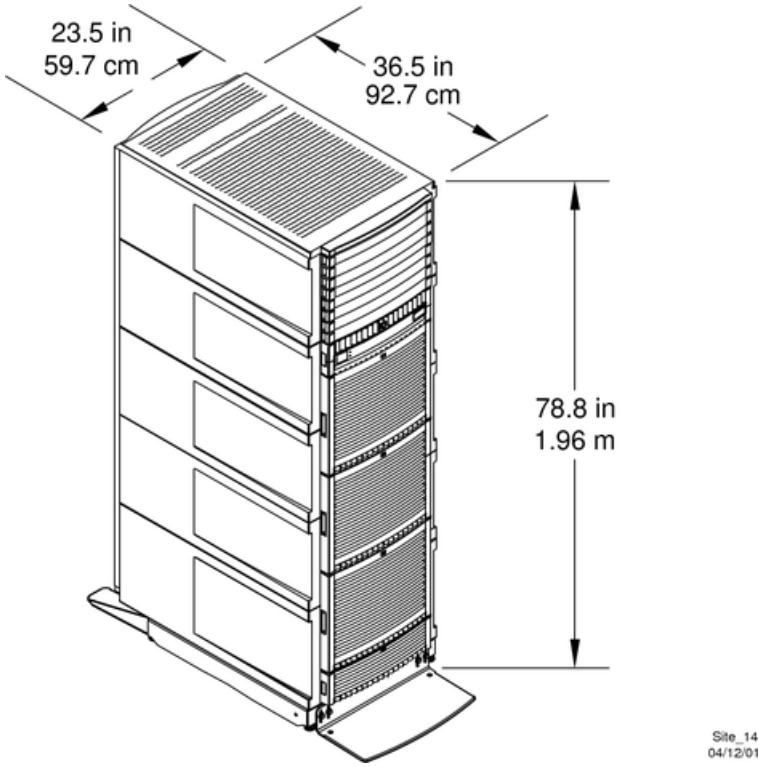
SNMP	Set SNMP daemon parameters
CP	Display partition cell assignments
DC	Reset parameters to default configuration
DI	Disconnect Remote or LAN console
ID	Change certain stable complex configuration profile fields
IF	Display network interface information
IT	Modify command interface inactivity time-out
LC	Configure LAN connections
LS	Display LAN connected console status
PARPERM	Enable/Disable Interpartition Security
PD	Modify default Partition for this login session
RL	Re-key complex profile lock
RU	Reset MP bus device
SA	Display and set MP remote access
SO	Configure security options and access control
XD	MP Diagnostic and reboot

D Templates

This appendix contains blank floor plan grids and equipment templates. Combine the necessary number of floor plan grid sheets to create a scaled version of the computer room floor plan.

Figure D-1 illustrates the overall dimensions required for the HP Integrity rx8620 server.

Figure D-1 HP Integrity rx8620 Server Space Requirements



Equipment Footprint Templates

Equipment footprint templates are drawn to the same scale as the floor plan grid (1/4 inch = 1 foot). These templates show basic equipment dimensions and space requirements for servicing.

The service areas shown on the template drawings are lightly shaded.

The equipment templates should be used with the floor plan grid to define the location of the equipment that will be installed in your computer room.

NOTE: Photocopying typically changes the scale of drawings copied. If any templates are copied, then all templates and floor plan grids must also be copied.

Computer Room Layout Plan

To create a computer room layout plan, follow these steps:

1. Remove several copies of the floor plan grid.
2. Cut and join them together (as necessary) to create a scale model floor plan of your computer room.
3. Remove a copy of each applicable equipment footprint template.
4. Cut out each template selected in step 3; then place it on the floor plan grid created in step 2.
5. Position pieces until the desired layout is obtained; then fasten the pieces to the grid. Mark locations of computer room doors, air-conditioning floor vents, utility outlets, and so on.

NOTE: Attach a reduced copy of the completed floor plan to the site survey. HP installation specialists use this floor plan during equipment installation.

Figure D-2 HP Integrity rx8620 Server Cabinet Template

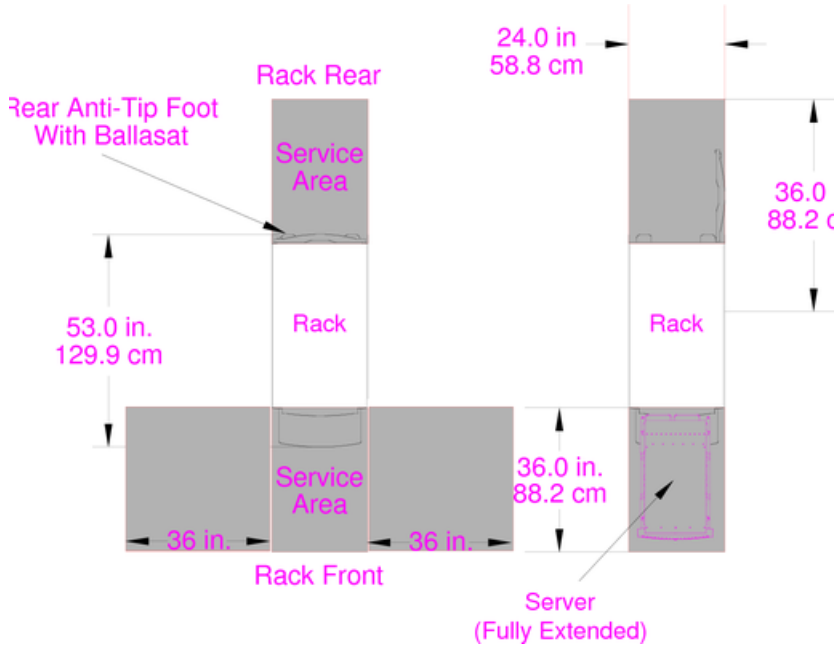


Figure D-3 Planning Grid

Scale: 1/4 inch = 1 foot

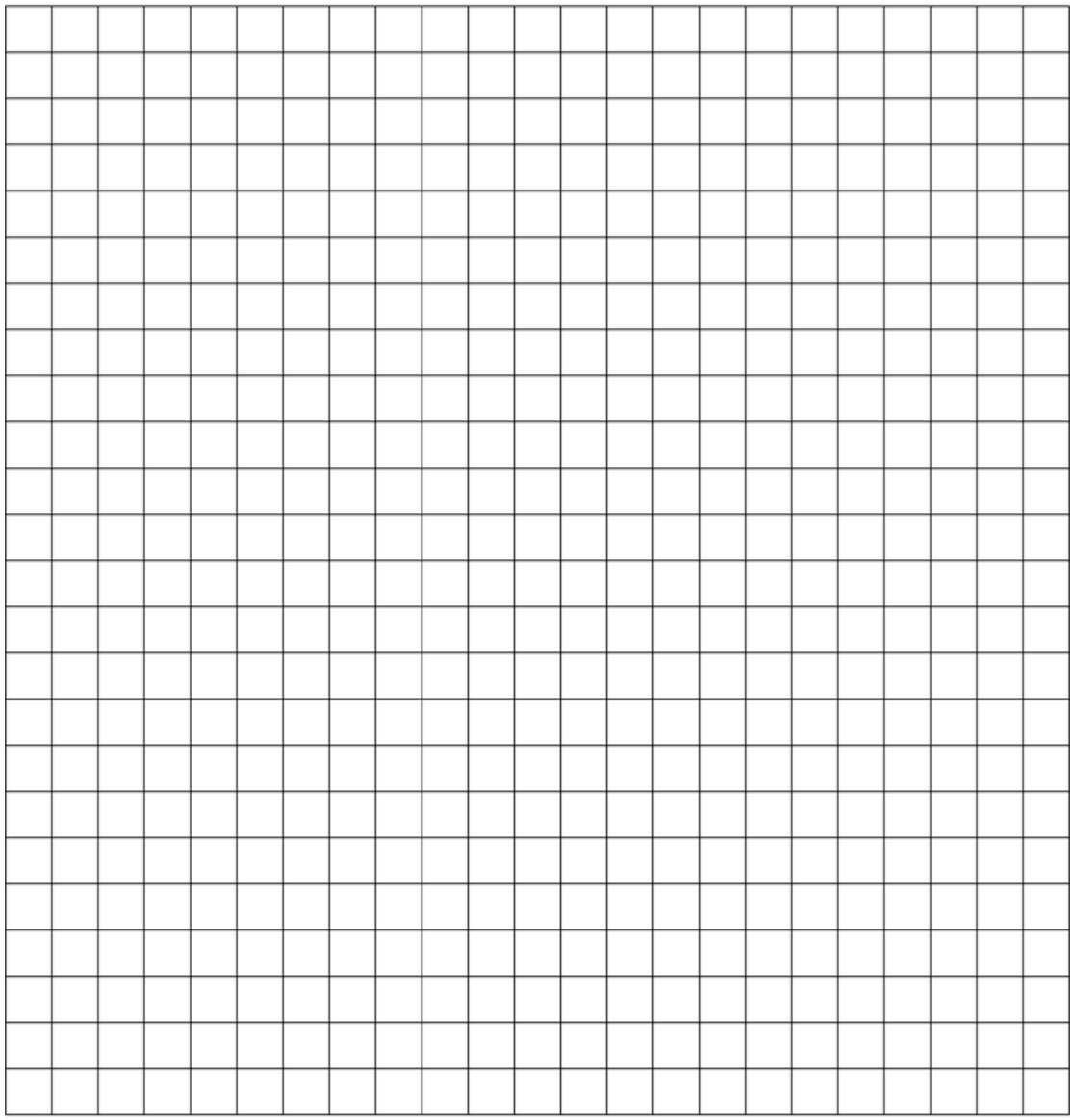


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Figure D-4 Planning Grid

Scale: 1/4 inch = 1 foot

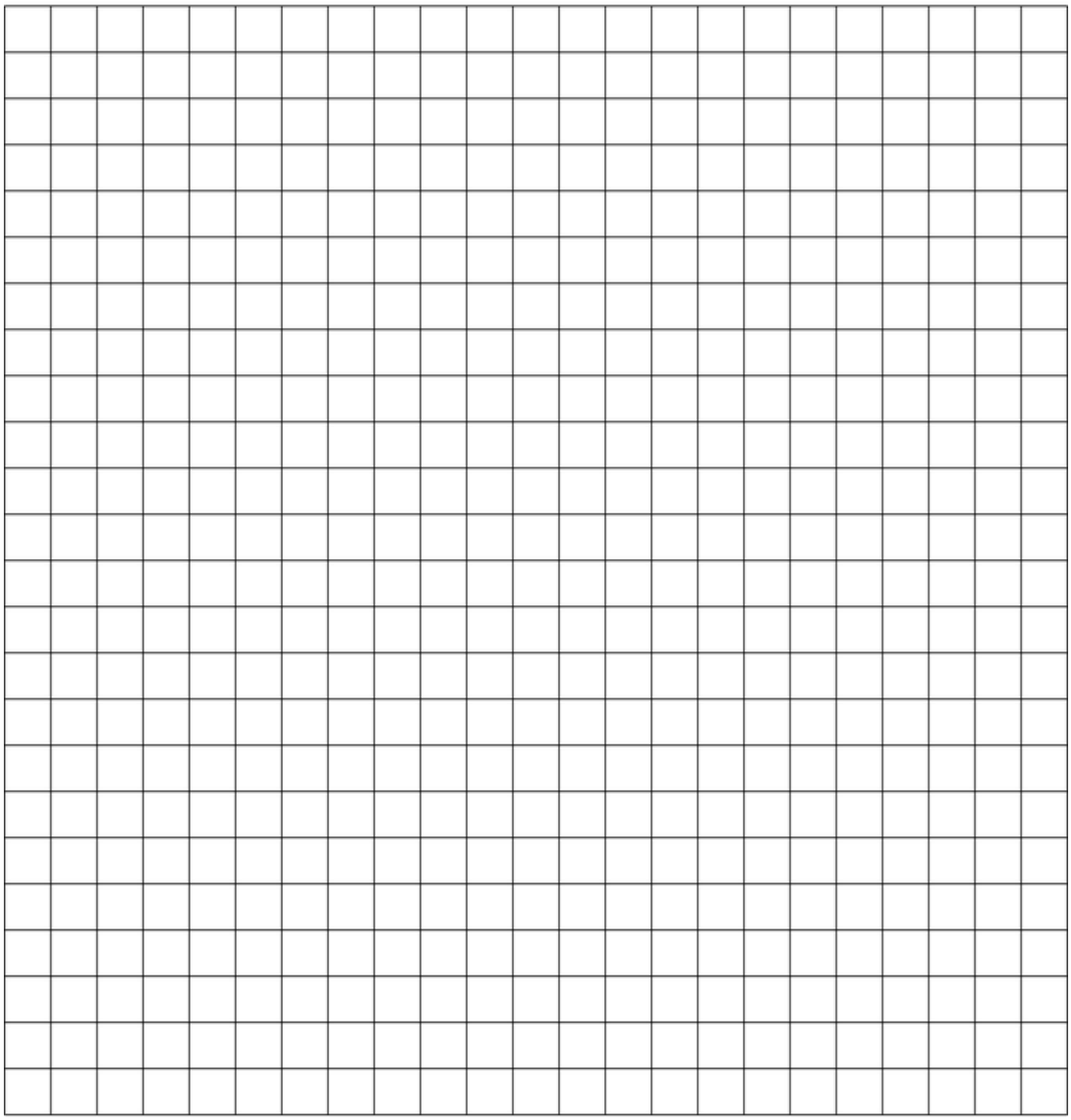

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Figure D-5 Planning Grid

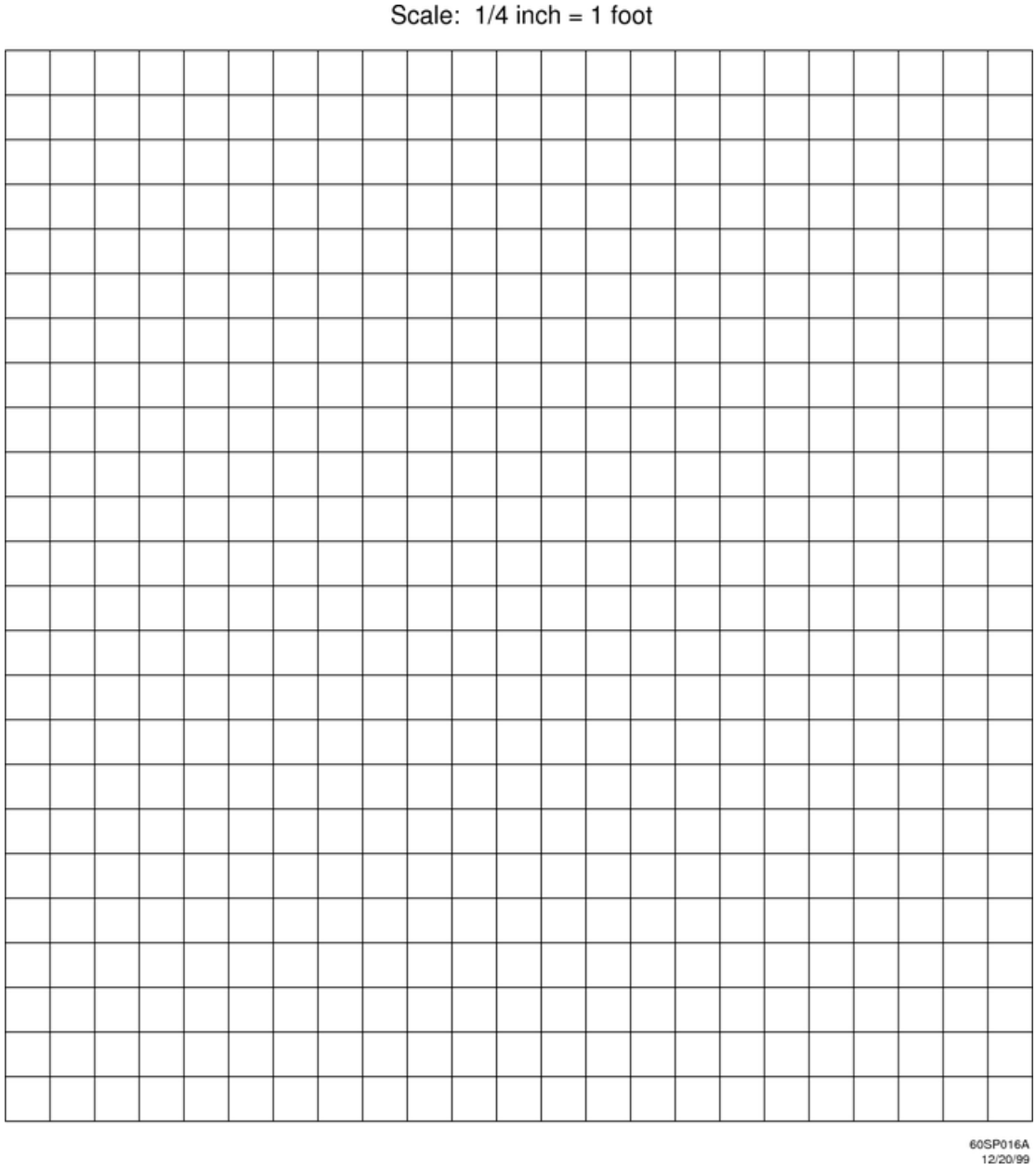

Figure D-6 Planning Grid

Scale: 1/4 inch = 1 foot

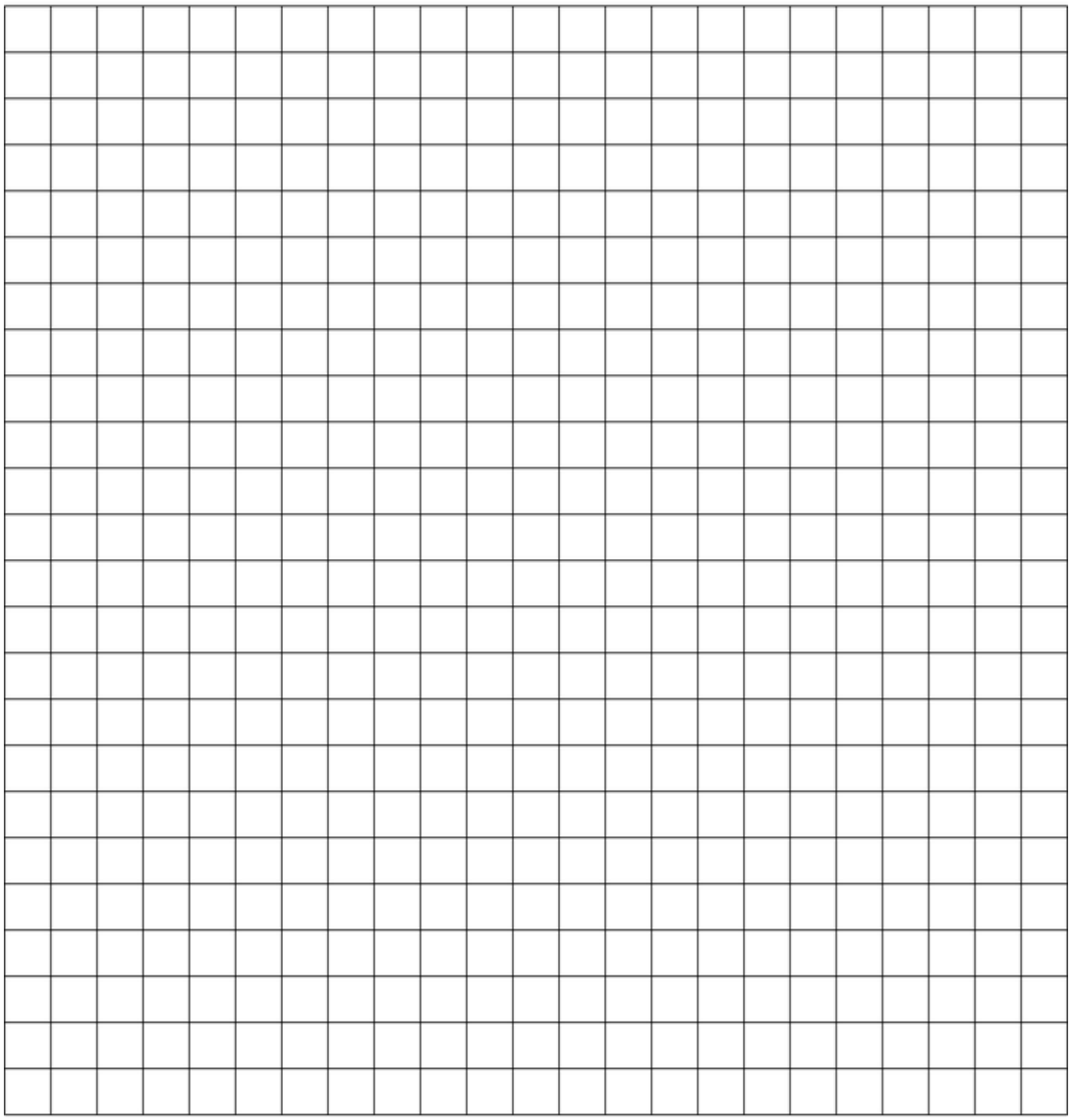

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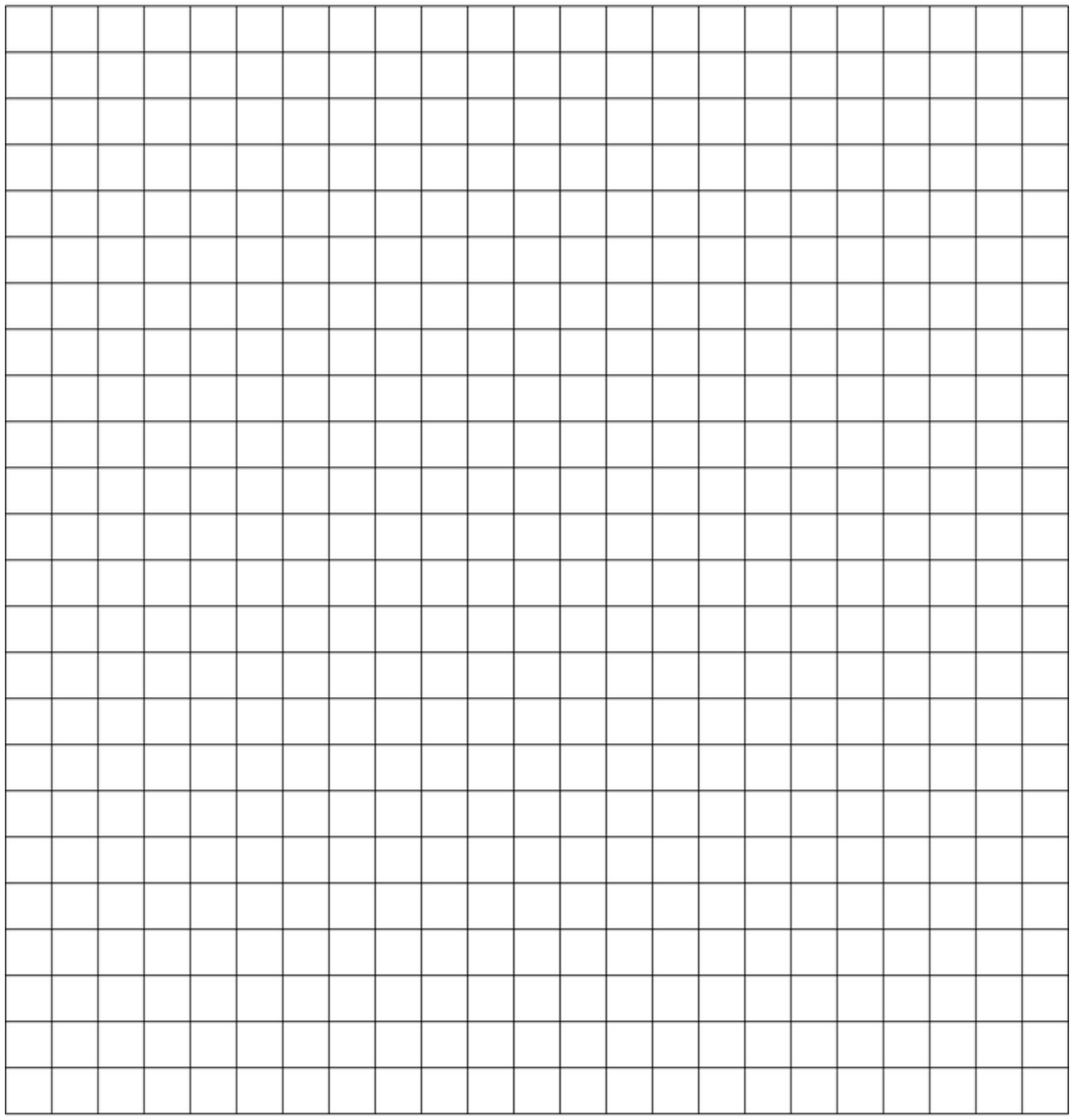
Figure D-7 Planning Grid

Scale: 1/4 inch = 1 foot



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E Operating System Boot and Shutdown

This appendix covers procedures for booting an operating system (OS) on an nPartition (hardware partition) and procedures for shutting down the OS.

Operating Systems Supported on HP nPartition-capable Servers

HP supports nPartitions on HP 9000 servers and HP Integrity servers. The following list describes the operating systems supported on the different nPartition-capable models.

- HP Integrity servers have Intel Itanium 2 processors and include the following nPartition-capable models:
  - HP Integrity Superdome (SD16A, SD32A, and SD64A models)
  - HP rx8620
  - HP rx7620

  These HP Integrity servers run the following OSes:
  - HP-UX 11i Version 2 (B.11.23) — See "Booting HP-UX" (page 205) for details.
  - Microsoft® Windows® Server 2003 — See "Booting the Microsoft Windows Operating System" (page 208) for details.
  - Red Hat Enterprise Linux 3 Update 2 and Red Hat Enterprise Linux 3 Update 3 — See "Booting the Red Hat Linux Operating System" (page 210) for details.
  - SuSE Linux Enterprise Server 9 — See "Booting the SuSE Linux Enterprise Server Operating System" (page 211)for details.

System Boot Configuration Options

This section briefly discusses the system boot options you can configure on nPartition-capable servers. You can configure boot options that are specific to each nPartition in the server complex.

HP Integrity Boot Configuration Options

On nPartition-capable HP Integrity servers you must properly specify the ACPI configuration value, which affects the OS startup process and on some servers can affect the shutdown behavior. You also can configure boot device paths and the autoboot setting for the nPartition. Details are given in the following list.

- **Boot Options List—HP Integrity Server Boot Device Paths** You can manage the boot options list for each nPartition either by using the `bcfg` command at the EFI Shell, or by using the `Add a Boot Option`, `Delete Boot Option(s)`, and `Change Boot Order` menu items at the EFI `Boot Option Maintenance menu`.

  To set boot options from HP-UX use the `setboot` command.

- **Autoboot Setting** You can configure the autoboot setting for each nPartition either by using the `autoboot` command at the EFI Shell, or by using the `Set Auto Boot TimeOut` menu item at the EFI `Boot Option Maintenance menu`.

  To set autoboot from HP-UX, use the `setboot` command.

- **ACPI Configuration Value—HP Integrity Server OS Boot** On nPartition-capable HP Integrity servers you must set the proper ACPI configuration for the OS that will be booted on the nPartition.

  To check the ACPI configuration value, issue the `acpiconfig` command with no arguments at the EFI Shell.

  To set the ACPI configuration value, issue the `acpiconfig` *value* command at the EFI Shell, where *value* is either `default`, `windows`, or `single-pci-domain`. Then reset the nPartition by issuing the `reset` EFI Shell command for the setting to take effect.

The ACPI configuration settings for the supported operating systems are in the following list.

— **HP-UX ACPI Configuration: default** On nPartition-capable HP Integrity servers, to boot or install the HP-UX operating system an nPartition must have its ACPI configuration value set to `default`.

For details see "ACPI Configuration for HP-UX Must Be "default"" (page 205).

— **Windows ACPI Configuration: windows** On nPartition-capable HP Integrity servers, to boot or install the Windows operating system an nPartition must have its ACPI configuration value set to `windows`.

For details see "ACPI Configuration for Windows Must Be "windows"" (page 209).

— **Red Hat Linux 3 ACPI Configuration: single-pci-domain** On nPartition-capable HP Integrity servers, to boot or install the Red Hat Linux 3 operating system an nPartition must have its ACPI configuration value set to `single-pci-domain`.

For details see "ACPI Configuration for Red Hat Linux 3 Must Be "single-pci-domain"" (page 210).

— **SuSE Linux Enterprise Server ACPI Configuration: default** On nPartition-capable HP Integrity servers, to boot or install the SuSE Linux Enterprise Server operating system an nPartition must have its ACPI configuration value set to `default`.

For details see "ACPI Configuration for SuSE Linux Enterprise Server Must Be "default"" (page 211).

- **ACPI "Softpowerdown" Configuration OS Shutdown Behavior** You can configure the nPartition behavior when an OS is shutdown and halted. The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state). The normal OS shutdown behavior depends on the ACPI configuration for the nPartition.

  You can run the `acpiconfig` command with no arguments to check the current ACPI configuration setting; however, softpowerdown information is displayed only when different from normal behavior.

  To change the nPartition behavior when an OS is shutdown and halted use either the `acpiconfig enable softpowerdown` EFI Shell command or the `acpiconfig disable softpowerdown` command and then reset the nPartition to make the ACPI configuration change take effect.

  — **acpiconfig enable softpowerdown** When set, `acpiconfig enable softpowerdown` causes nPartition hardware to be powered off when the operating system issues a shutdown for reconfig command (for example, `shutdown -h` or `shutdown /s`).

  This is the normal behavior on with a `windows` ACPI configuration setting.

  When softpowerdown is enabled, if one nPartition is defined in the server then halting the operating system powers off the server cabinet (including all cells and I/O chassis). On a server with multiple nPartitions, halting the operating system from an nPartition with `softpowerdown` enabled causes only the resources on the local nPartition to be powered off.

  To power on hardware that has been powered off, use the `PE` command at the MP command menu.

  — **acpiconfig disable softpowerdown** When set, `acpiconfig disable softpowerdown` causes nPartition cells to remain at a boot-is-blocked state when the operating system issues a shutdown for reconfig command (for example, `shutdown -h` or `shutdown /s`). In this case an OS shutdown for reconfig makes the nPartition inactive.

  This is the normal behavior with an ACPI configuration setting of `default` or `single-pci-domain`.

  To make an inactive nPartition active, use the MP `BO` command to boot the nPartition past the boot-is-blocked state.

Booting HP-UX

This section covers the following methods of booting HP-UX:

- HP-UX Booting — The standard ways to boot HP-UX. Typically this results in booting HP-UX in multi-user mode.
- Single-User Mode HP-UX Booting — How to boot HP-UX in single-user mode.
- LVM-Maintenance Mode HP-UX Booting — How to boot HP-UX in LVM-maintenance mode.

For details on shutting down the HP-UX operating system, see "Shutting Down HP-UX" (page 212).

CAUTION:

ACPI Configuration for HP-UX Must Be "default" On nPartition-capable HP Integrity servers, to boot the HP-UX operating system an nPartition must have its ACPI configuration value set to `default`.

At the EFI Shell interface, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `default`, then HP-UX cannot boot; in this situation you must reconfigure `acpiconfig` or else booting will be interrupted with a panic when launching the HP-UX kernel.

To set the ACPI configuration for HP-UX: at the EFI Shell interface enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (`default`) configuration for HP-UX.

HP-UX Booting

You can boot HP-UX by using any one of the following procedures:

- "HP-UX Booting [EFI Boot Manager]" (page 205)

  The EFI system boot environment is provided on HP Integrity servers.
- "HP-UX Booting [EFI Shell]" (page 206)

  The EFI system boot environment is provided on HP Integrity servers.

Procedure E-1 HP-UX Booting [EFI Boot Manager]

From the EFI Boot Manager menu, select an item from the boot options list to boot HP-UX using the selected boot option.

For required configuration details, see "ACPI Configuration for HP-UX Must Be "default"" (page 205).

1. Access the EFI Boot Manager menu for the nPartition on which you want to boot HP-UX.
   a. Login to the MP and enter `CO` to access the Console list.
   b. Select the nPartition console.

      When accessing the console, confirm that you are at the EFI Boot Manager menu (the main EFI menu). If you are at another EFI menu, select **Exit** from the sub-menus until you return to the screen with the `EFI Boot Manager` heading.
2. At the EFI Boot Manager menu, select an item from the boot options list.

   Each item in the boot options list references a specific boot device and provides a specific set of boot options or arguments to be used when booting the device.
3. To initiate booting using the selected boot option, press **Return** or **Enter**.
4. Exit the console and MP interfaces if finished using them.

   To exit the EFI environment enter **^B** (**Control-B**); this exits the nPartition console and returns you to the MP Main Menu. To exit the service processor, enter `X` at the Main Menu.

Procedure E-2 HP-UX Booting [EFI Shell]

From the EFI Shell environment, to boot HP-UX on a device first access the EFI System Partition (for example `fs0:`) for the root device and then enter **`HPUX`** to invoke the loader. The EFI Shell is available only on HP Integrity servers.

See "ACPI Configuration for HP-UX Must Be "default"" (page 205) for required configuration details.

1. Access the EFI Shell environment for the nPartition on which you want to boot HP-UX.
   a. Log in to the MP and enter `CO` to access the Console list.
   b. Select the nPartition console.

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

   c. From the EFI Boot Manager menu, select **EFI Shell** to access the EFI Shell environment.
2. At the EFI Shell environment, issue the `acpiconfig` command to list the current ACPI configuration for the local nPartition.

   On nPartition-capable HP Integrity servers, to boot the HP-UX operating system an nPartition must have its ACPI configuration value set to `default`. If the `acpiconfig` value is not set to `default`, HP-UX cannot boot. In this situation, you must reconfigure `acpiconfig` or else booting will be interrupted with a panic when launching the HP-UX kernel.

   To set the ACPI configuration for HP-UX: at the EFI Shell interface enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (`default`) configuration for HP-UX.
3. At the EFI Shell environment, issue the `map` command to list all currently mapped bootable devices.

   The bootable filesystems of interest typically are listed as `fs0:`, `fs1:`, and so on.
4. Access the EFI System Partition (`fs`*X*`:` where *X* is the filesystem number) for the device from which you want to boot HP-UX.

   For example, enter **`fs2:`** to access the EFI System Partition for the bootable filesystem number `2`. Note that the EFI Shell prompt changes to reflect the filesystem currently accessed.

   Also note that the filesystem number may change each time it is mapped (for example, when the nPartition boots, or when the `map -r` command is issued).
5. When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to invoke the `HPUX.EFI` loader on the selected devive.

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

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

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

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

Shell> fs0:

fs0:\> hpux
```

```
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HP-UX Boot Loader for IA64  Revision 1.723

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

6. Exit the console and MP interfaces if finished using them.

   To exit the EFI environment enter **^B** (**Control-B**); this exits the nPartition console and returns you to the MP Main Menu. To exit the MP, enter `X` at the Main Menu.

Single-User Mode HP-UX Booting

You can boot HP-UX in single-user mode by using the following procedure:

Procedure E-3 Single-User Mode HP-UX Booting [EFI Shell]

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

For required configuration details, see "ACPI Configuration for HP-UX Must Be "default"" (page 205).

1. Access the EFI Shell environment for the nPartition on which you want to boot HP-UX in single-user mode.
   a. Log in to the MP and enter `CO` to access the Console list.
   b. Select the nPartition console.

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

   c. From the EFI Boot Manager menu, select **EFI Shell** to access the EFI Shell environment.
2. Access the EFI System Partition (`fs`*X*`:` where *X* is the filesystem number) for the device from which you want to boot HP-UX.
3. When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to invoke the `\EFI\HPUX\HPUX.EFI` loader on the selected devive.
4. Boot to the HP-UX Boot Loader prompt (`HPUX>`) by pressing any key within the ten seconds given for interrupting the HP-UX boot process. Use the `HPUX.EFI` loader to boot HP-UX in single-user mode in the next step.

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

```
fs0:\> hpux

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All rights reserved

HP-UX Boot Loader for IA64  Revision 1.723

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

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

```
   Type 'help' for help

HPUX>
```

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

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

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

6. Exit the console and MP interfaces if finished using them.

   To exit the EFI environment enter **^B** (**Control-B**); this exits the nPartition console and returns you to the MP Main Menu. To exit the MP, enter `X` at the Main Menu.

LVM-Maintenance Mode HP-UX Booting

You can boot HP-UX in LVM-maintenance mode by using the following procedure:

Procedure E-4 LVM-Maintenance Mode HP-UX Booting [EFI Shell]

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

For required configuration details, see "ACPI Configuration for HP-UX Must Be "default"" (page 205).

1. Access the EFI Shell environment for the nPartition on which you want to boot HP-UX in LVM-maintenance mode.
   a. Log in to the MP and enter `CO` to access the Console list.
   b. Select the nPartition console.

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

   c. From the EFI Boot Manager menu, select **EFI Shell** to access the EFI Shell environment.
2. Access the EFI System Partition (`fs`*X*`:` where *X* is the filesystem number) for the device from which you want to boot HP-UX.
3. When accessing the EFI System Partition for the desired boot device, issue the `HPUX` command to invoke the `\EFI\HPUX\HPUX.EFI` loader on the selected device.
4. Press any key within the ten seconds given for interrupting the HP-UX boot process. This stops the boot process at the `HPUX.EFI` interface (the HP-UX Boot Loader prompt, `HPUX>`).
5. At the `HPUX.EFI` interface, enter the **`boot -lm vmunix`** command to boot HP-UX (the `/stand/vmunix` kernel) in LVM-maintenance (`-lm`) mode.
6. Exit the console and MP interfaces if finished using them.

   To exit the EFI environment enter **^B** (**Control-B**); this exits the nPartition console and returns you to the MP Main Menu. To exit the MP, enter `X` at the Main Menu.

Booting the Microsoft Windows Operating System

You can boot the Windows Server 2003 operating system on an HP Integrity server by using the EFI Boot Manager to select the appropriate Windows item from the boot options list.

For details on shutting down the Windows operating system, see "Shutting Down Microsoft Windows" (page 214).

CAUTION:

ACPI Configuration for Windows Must Be "windows" On nPartition-capable HP Integrity servers, to boot the Windows operating system an nPartition must have its ACPI configuration value set to `windows`.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `windows`, Windows cannot boot. In this situation, you must reconfigure `acpiconfig` or booting is interrupted with a panic when launching Windows.

To set the ACPI configuration for Windows: at the EFI Shell enter the `acpiconfig windows` command, and then enter the `reset` command for the nPartition to reboot with the proper (`windows`) configuration for Windows.

NOTE:

Microsoft Windows Booting on HP Integrity Servers The recommended method for booting Windows is to use the EFI Boot Manager menu to select a Windows entry from the boot options list. Using the `ia64ldr.efi` Windows loader from the EFI Shell is not recommended.

Procedure E-5 Windows Booting

From the EFI Boot Manager menu, select an item from the boot options list to boot Windows using the selected boot option. The EFI Boot Manager is available only on HP Integrity servers.

See "ACPI Configuration for Windows Must Be "windows"" (page 209) for required configuration details.

1. Access the EFI Boot Manager menu for the system on which you want to boot Windows.

   To access the Console list, log in to the MP and enter `CO`. Select the nPartition console.

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

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

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

3. To initiate booting using the selected boot option, press **Return** or **Enter**.
4. Once Windows begins loading, wait for the Special Administration Console (SAC) to become available.

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

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



                                Starting Windows...
********************************************************************************

Computer is booting, SAC started and initialized.

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

SAC>
```

5. Exit the console and MP interfaces if finished using them.

   To exit the console environment enter **^B** (**Control-B**); this exits the console and returns to the MP Main menu. To exit the MP, enter **x** at the Main menu.

Booting the Red Hat Linux Operating System

You can boot the Red Hat Linux operating system on HP Integrity servers using either of the methods described in this section.

For details on shutting down the Red Hat Linux operating system, see "Shutting Down Linux" (page 215).

CAUTION:

ACPI Configuration for Red Hat Linux 3 Must Be "single-pci-domain" On nPartition-capable HP Integrity servers, to boot the Red Hat Linux 3 operating system, an nPartition must have its ACPI configuration value set to `single-pci-domain`.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `single-pci-domain`, Red Hat Linux could panic. In this situation you must reconfigure `acpiconfig` to eliminate any bus address conflicts and ensure all I/O slots have unique addresses.

To set the ACPI configuration for Red Hat Linux 3: at the EFI Shell enter the `acpiconfig single-pci-domain` command, and then enter the `reset` command for the nPartition to reboot with the proper (`single-pci-domain`) configuration for Red Hat Linux 3.

Use either of these methods to boot Red Hat Linux:

- Select a Red Hat Linux entry from the EFI Boot Manager menu.

  To load the Red Hat Linux operating system at the EFI Boot Manager menu, select its entry from the list of boot options.

  Selecting a Linux entry from the boot options list boots the operating system using `ELILO.EFI` loader and the `elilo.conf` file.

- Invoke the `ELILO.EFI` Linux loader from the EFI Shell.

  See the procedure "Red Hat Linux Operating System Booting from the EFI Shell" (page 210) for details.

  On a Red Hat Linux boot device EFI System Partition, the full paths to the loader and configuration files are:

  `\EFI\redhat\elilo.efi`

  `\EFI\redhat\elilo.conf`

  After selecting the filesystem for the boot device (for example, `fs0:`) you can invoke the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO boot` prompt. To exit the `ELILO.EFI` loader use the `exit` command.

Procedure E-6 Red Hat Linux Operating System Booting from the EFI Shell

Use this procedure to boot Red Hat Linux from the EFI Shell.

For required configuration details, see "ACPI Configuration for Red Hat Linux 3 Must Be "single-pci-domain"" (page 210).

1. Access the EFI Shell.

   From the system console, select **EFI Shell** from the EFI Boot Manager menu to access the shell.

2. Access the EFI System Partition for the Red Hat Linux boot device.

   To list the filesystems (`fs0`, `fs1`, and so on) that are known and have been mapped, use the `map` EFI Shell command.

   To select a filesystem to use, enter its mapped name followed by a colon (`:`). For example, to operate with the boot device that is mapped as `fs3`, enter **`fs3:`** at the EFI Shell prompt.

3. To launch the `ELILO.EFI` loader, enter **`ELILO`** at the EFI Shell command prompt.

   If needed, you can specify the loader's full path by entering **`\EFI\redhat\elilo`** at the EFI Shell command prompt.

4. Allow the `ELILO.EFI` loader to proceed with booting the Red Hat Linux kernel.

   By default, the `ELILO.EFI` loader boots the kernel image and options specified by the default item in the `elilo.conf` file.

   To interact with the `ELILO.EFI` loader, interrupt the boot process (for example, enter a space) at the `ELILO boot` prompt.

5. To exit the loader use the `exit` command.

Booting the SuSE Linux Enterprise Server Operating System

You can boot the SuSE Linux Enterprise Server 9 operating system on HP Integrity servers using either of the methods described in this section.

See "Shutting Down Linux" (page 215) for details on shutting down the SuSE Linux Enterprise Server operating system.

CAUTION:

ACPI Configuration for SuSE Linux Enterprise Server Must Be "default" On nPartition-capable HP Integrity servers, to boot the SuSE Linux Enterprise Server operating system an nPartition must have its ACPI configuration value set to `default`.

At the EFI Shell, enter the `acpiconfig` command with no arguments to list the current ACPI configuration. If the `acpiconfig` value is not set to `default`, SuSE Linux Enterprise Server could panic.

To set the ACPI configuration for SuSE Linux Enterprise Server: at the EFI Shell enter the `acpiconfig default` command, and then enter the `reset` command for the nPartition to reboot with the proper (`default`) configuration for SuSE Linux Enterprise Server.

To boot SuSE Linux Enterprise Server, use either of these methods:

- Select a SuSE Linux Enterprise Server entry from the EFI Boot Manager menu.

  To load the SuSE Linux Enterprise Server operating system at the EFI Boot Manager menu, select its entry from the list of boot options.

  Selecting a Linux entry from the boot options list boots the operating system using `ELILO.EFI` loader and the `elilo.conf` file.

- Invoke the `ELILO.EFI` Linux loader from the EFI Shell.

  For details, see "SuSE Linux Enterprise Server Operating System Booting from the EFI Shell" (page 212).

  On a SuSE Linux Enterprise Server boot device EFI System Partition, the full paths to the loader and configuration files are:

  ```
  \efi\SuSE\elilo.efi
  \efi\SuSE\elilo.conf
  ```

  After selecting the filesystem for the boot device (for example, `fs0:`) you can invoke the Linux loader from the EFI Shell prompt by entering the full path for the `ELILO.EFI` loader.

By default the `ELILO.EFI` loader boots Linux using the kernel image and parameters specified by the default entry in the `elilo.conf` file on the EFI System Partition for the boot device.

To interact with the ELILO.EFI loader, interrupt the boot process (for example, enter a space) at the ELILO boot prompt. To exit the ELILO.EFI loader use the exit command.

Procedure E-7 SuSE Linux Enterprise Server Operating System Booting from the EFI Shell

To boot SuSE Linux Enterprise Server 9 from the EFI Shell, follow these steps:

For required configuration details, see "ACPI Configuration for SuSE Linux Enterprise Server Must Be "default"" (page 211).

1. Access the EFI Shell.

   To access the shell, select **EFI Shell** from the EFI Boot Manager menu from the system console.

2. Access the EFI System Partition for the SuSE Linux Enterprise Server boot device.

   Use the map EFI Shell command to list the filesystems (fs0, fs1, and so on) that are known and have been mapped.

   To select a filesystem to use, enter its mapped name followed by a colon (:). For example, to operate with the boot device that is mapped as fs3, enter **fs3:** at the EFI Shell prompt.

3. To launch the ELILO.EFI loader, enter **ELILO** at the EFI Shell command prompt.

   If needed, you can specify the loader's full path by entering **\efi\SuSE\elilo** at the EFI Shell command prompt.

4. Allow the ELILO.EFI loader to proceed with booting the Red Hat Linux kernel.

   By default, the ELILO.EFI loader boots the kernel image and options specified by the default item in the elilo.conf file.

   To interact with the ELILO.EFI loader, interrupt the boot process (for example, enter a space) at the ELILO boot prompt. To exit the loader use the exit command.

Shutting Down HP-UX

When HP-UX is running on an nPartition, you can shut down HP-UX using the shutdown command.

On nPartitions you have the following options when shutting down HP-UX:

- To shut down HP-UX and reboot an nPartition: **shutdown -r**

  On nPartition-capable HP Integrity servers, the shutdown -r command is equivalent to the shutdown -R command.

- To shut down HP-UX and halt an nPartition: **shutdown -h**

  On nPartition-capable HP Integrity servers, the shutdown -h command is equivalent to the shutdown -R -H command.

- To perform a reboot for reconfig of an nPartition: **shutdown -R**
- To hold an nPartition at a shutdown for reconfig state: **shutdown -R -H**

For details, see the *shutdown*(1M) manpage.

NOTE: You can configure the nPartition behavior when an OS is shutdown and halted (shutdown -h or shutdown -R -H). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for HP-UX shutdown and halt is for the nPartition be made inactive.

For details, see ACPI "Softpowerdown" Configuration OS Shutdown Behavior (page 204).

Procedure E-8 Shutting Down HP-UX [/sbin/shutdown command]

To shut down the HP-UX operating system, issue the shutdown command from the HP-UX command line.

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

   You can log in to HP-UX on the nPartition either by directly connecting (with the `telnet` or `rlogin` commands) or by logging in to the service processor (GSP or MP) for the complex where it resides and using the Console menu to access the nPartition console.

   Accessing the console through the service processor enables you to maintain console access to the nPartition after HP-UX has shut down.

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

   The command-line options you specify dictate the way in which HP-UX is shut down, whether the nPartition is rebooted, and whether any nPartition configuration changes (adding or removing cells) take place.

   To choose an HP-UX shut down option for your nPartition, use the following list.

   - Shut down HP-UX and halt the nPartition.

     On nPartition-capable HP Integrity servers, the `shutdown -h` command puts an nPartition into the shutdown for reconfig state; for details see the discussion of `shutdown -R -H` in this list.

   - Shut down HP-UX and reboot the nPartition.

     Issue the `shutdown -r` command to shut down and reboot the nPartition.

     On nPartition-capable HP Integrity servers, the `shutdown -r` command is equivalent to the `shutdown -R` command.

   - Perform a reboot for reconfig of the nPartition.

     Issue the HP-UX `shutdown -R` command to perform a reboot for reconfig.

     This shuts down HP-UX, reconfigures the nPartition if needed, and reboots the nPartition.

   - Reboot the nPartition and put it in to the shutdown for reconfig state.

     Use the HP-UX `shutdown -R -H` command to hold the nPartition in the shutdown for reconfig state.

     This leaves the nPartition and all its cells in an inactive state (the nPartition can be reconfigured remotely), unless the normal behavior has been modified. For details on changing OS halt behavior, see "ACPI "Softpowerdown" Configuration OS Shutdown Behavior" (page 204).

     To reboot the nPartition, you must do so manually by using the `BO` command at the service processor Command menu.

   If HP-UX is halted on the nPartition, thus not allowing you to use the `shutdown` command, you can reboot or reset the nPartition by issuing commands from the service processor Command menu.

Shutting Down Microsoft Windows

You can shut down the Windows operating system on HP Integrity servers using the `Start` menu or the `shutdown` command.

CAUTION: Do not shut down Windows using Special Administration Console (SAC) `restart` or `shutdown` commands under normal circumstances.

Issuing `restart` or `shutdown` at the `SAC>` prompt causes the system to restart or shutdown immediately and can result in the loss of data.

Instead use the Windows **Start** menu or the `shutdown` command to shut down gracefully.

To shut down Windows use either of the following methods.

- Select `Shut Down` from the `Start` menu and choose either `Restart` or `Shut down` from the pull-down menu.

  The `Restart` menu item shuts down and restart the system. The **Shut down** menu item shuts down the system.

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

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

  For details, see "Windows Shutdown from the Command Line" (page 214).

  You can issue this command from a command prompt through the Special Administration Console (SAC) or from any other command line.

  The Windows `shutdown` command includes the following options:

  `/s` Shut down the system. This is the equivalent of **Start—>Shut Down, Shut down**.

  `/r` Shut down and restart the system. This is the equivalent of **Start—>Shut Down, Restart**.

  `/a` Abort a system shutdown.

  `/t xxx` Set the timeout period before shutdown to *xxx* seconds. The timeout period can be 0–600, with a default of 30.

  For details, see the `help shutdown` Windows command.

NOTE: Performing a shutdown using `shutdown /s` (or the equivalent **Start—>Shut Down, Shut down**) powers off the server cabinet or powers off the cells and I/O chassis assigned to the nPartition. This behavior can be customized. For details, see "ACPI "Softpowerdown" Configuration OS Shutdown Behavior" (page 204).

Procedure E-9 Windows Shutdown from the Command Line

From the Windows command line, issue the `shutdown` command to shut down the operating system.

1. Login to Windows running on the system that you want to shut down.

   For example, access the system console and use the Windows SAC interface to start a command prompt, from which you can issue Windows commands to shut down the system.

2. Check to see whether any users are logged in.

   Use the `query user` or `query session` command.

3. Issue the `shutdown` command and the appropriate options to shut down the Windows Server 2003 on the system.

   You have the following options when shutting down Windows:

   - To shut down Windows and reboot: **`shutdown /r`** or select the **Start —> Shut Down** action and choose **Restart** from the pull-down menu.
   - To shut down Windows and not reboot (either power down server hardware or put an nPartition into a shutdown for reconfig state): **`shutdown /s`** or select the **Start —> Shut Down** action and choose **Shut down** from the pull-down menu.
   - To abort a shutdown (stop a shutdown that has been initiated): **`shutdown /a`**

   For example:

   ```
   shutdown /r /t 60 /c "Shut down in one minute."
   ```

   This command initiates a Windows system shutdown-and-reboot after a timeout period of 60 seconds. The `/c` option specifies a message that is broadcast to any other users of the system.

Shutting Down Linux

To shut down the Red Hat Linux or the SuSE Linux Enterprise Server operating system, use the `shutdown` command.

The Red Hat Linux and SuSE Linux Enterprise Server `shutdown` command includes the following options:

`-h` Halt after shutdown.

On nPartition-capable HP Integrity servers, this powers down server hardware, or puts the nPartition into a `shutdown for reconfig` state.

To manually power on or power off server hardware, use the `PE` command at the MP Command menu.

`-r` Reboot after shutdown.

`-c` Cancel an already running shutdown.

time When to shut down. (Required.) *time* can be specified in any of the following ways:

- Absolute time in the format *hh*:*mm*, in which *hh* is the hour (one or two digits) and *mm* is the minute of the hour (two digits).
- Number of minutes to wait in the format +*m*, in which *m* is the number of minutes.
- `now` to immediately shut down; this is equivalent to using `+0` to wait zero minutes.

For details, see the *shutdown*(8) Linux manpage. Also refer to the Linux mapage for the `poweroff` command.

NOTE: You can configure the nPartition behavior when an OS is shutdown and halted (`shutdown -h` or `poweroff`). The two options are to have hardware power off when the OS is halted, or to have the nPartition be made inactive (all cells are in a boot-is-blocked state).

The normal behavior for Red Hat Linux or SuSE Linux Enterprise Server shutdown and halt is for the nPartition to be made inactive.

For details see "ACPI "Softpowerdown" Configuration OS Shutdown Behavior" (page 204).

Procedure E-10 Linux Shutdown

To shut down the operating system, issue the `shutdown` command from the command line for Red Hat Linux or SuSE Linux Enterprise Server.

1. Log in to Linux running on the system you want to shut down.
2. Issue the `shutdown` command with the desired command-line options, and include the required *time* argument to specify when the operating shutdown is to occur.

   For example, `shutdown -r +20` will shutdown and reboot the system starting in twenty minutes.

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