

User Service Guide

HP Integrity rx7620 Server

Fifth Edition



Manufacturing Part Number : A7027-96036
May 2007

Printed in the U.S.A.

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Revision History

First Edition Initial release. September 2003.

Second Edition Edits to the removal and replacement chapter, November 2003.

Third Edition Minor edits. May 2004.

Fourth Edition Consolidated the documentation for the rx7620-16 and the rx7620-DC into the rx7620.
Updated system power requirements information in Appendix B. October 2006.

Fifth Edition Minor edits. Added warranty information. May 2007.



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1 Introduction

The HP Integrity rx7620 Server is a member of HP's business-critical computing platform family: a mid-range, mid-volume server, positioned as an upgrade to the HP 9000 rp7410 product in the IA-64 product line. The HP Integrity rx7620 Server shares the same hardware as the HP 9000 rp7410 with changes to the cell board, CPU modules, core I/O and the PCI-X backplane. The HP Integrity rx7620 Server provides increased performance over its predecessor.

Overview

The HP Integrity rx7620 Server is a 10U, 8-socket Symmetric Multi-Processing, rack-mount server that accommodates up to 64 GB of memory, PCI-X I/O, and internal peripherals, including disks and DVD/tape. Its high availability features include N+1 hot-pluggable fans and power, redundant power cords, and hot-pluggable PCI-X cards and internal disks. It currently accommodates up to 8 IA64 processor modules with a maximum of four processor modules per cell board and a maximum of two cell boards.

Figure 1-1 HP Integrity rx7620 Server (left-front view)

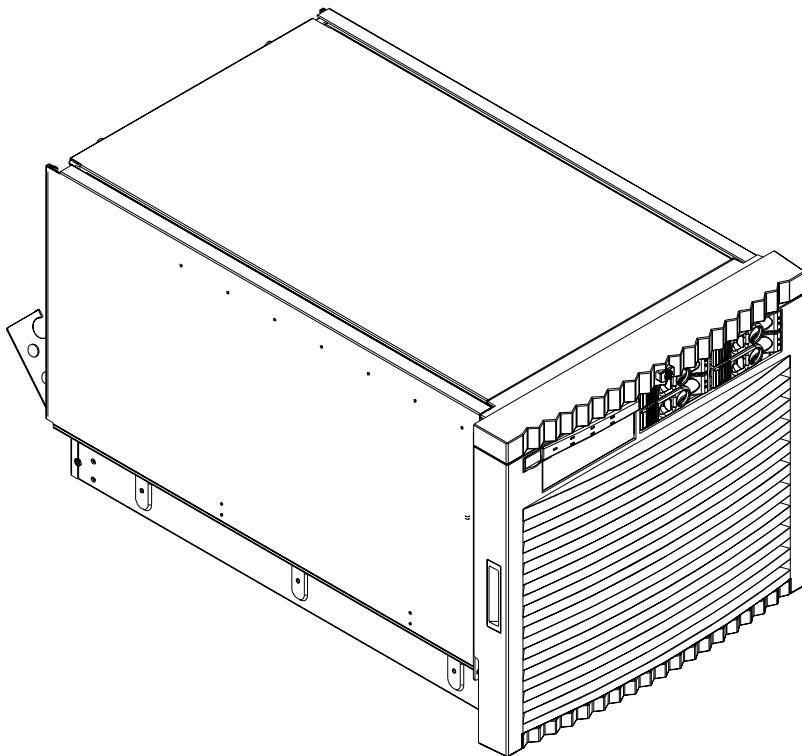
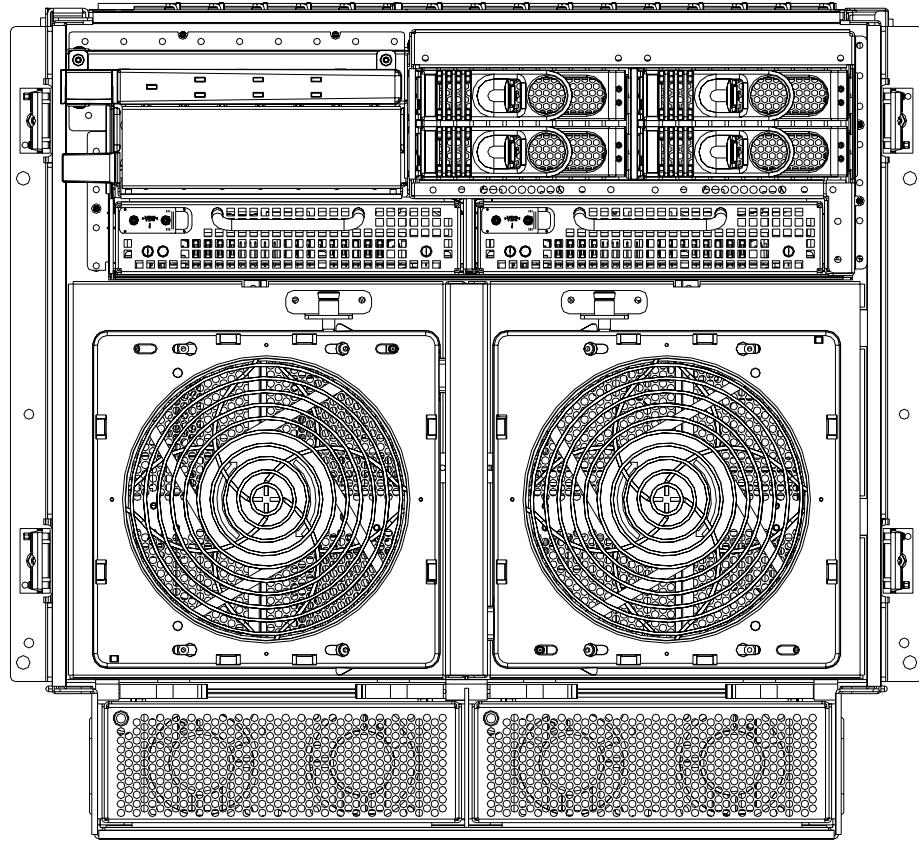


Figure 1-2 HP Integrity rx7620 Server (without front bezel)

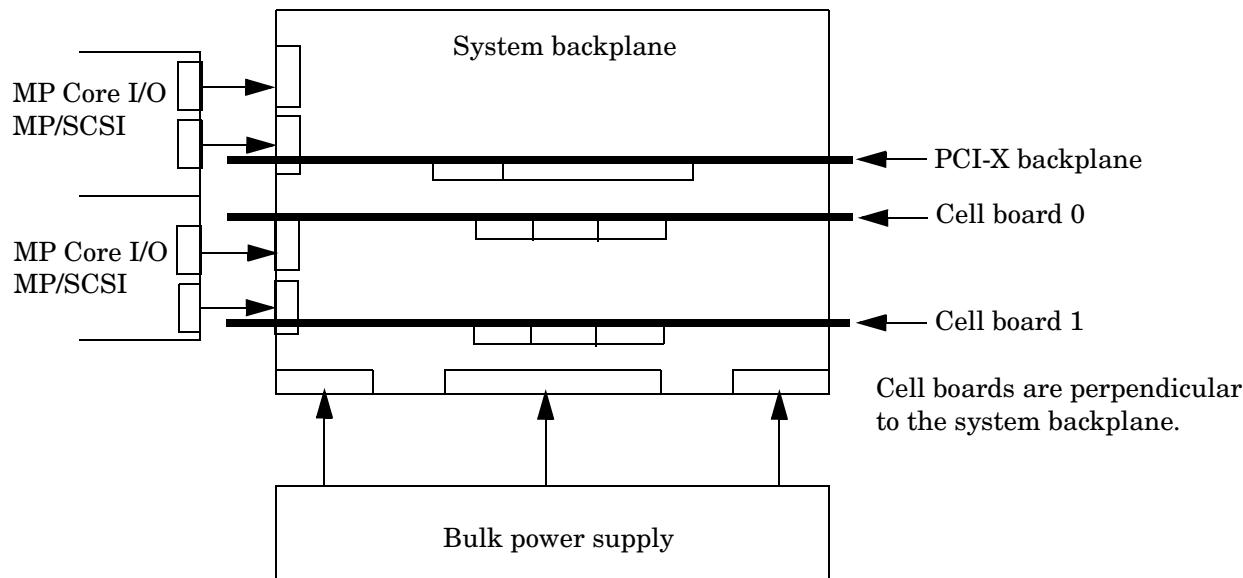


System Backplane

The system backplane comprises the system clock generation logic, the system reset generation logic, DC-to-DC converters, power monitor logic, and two Local Bus Adapter (LBA) link-to-PCI converter ASICs. It also includes connectors for attaching the cell boards, the PCI-X backplane, MP/SCSI Core I/O boards, SCSI cables, bulk power, chassis fans, the front panel display, intrusion switches, and the system scan card. Unlike Superdome or the rp8400, there are no Crossbar Chips (XBC) on the system backplane. The “crossbar-less” back-to-back CC connection increases performance and reduces costs.

Only half of the MP/SCSI Core I/O board set connects to the system backplane. The MP/SCSI boards plug into the backplane, while the LAN/SCSI boards plug into the PCI-X backplane.

Figure 1-3 System Backplane Block Diagram



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

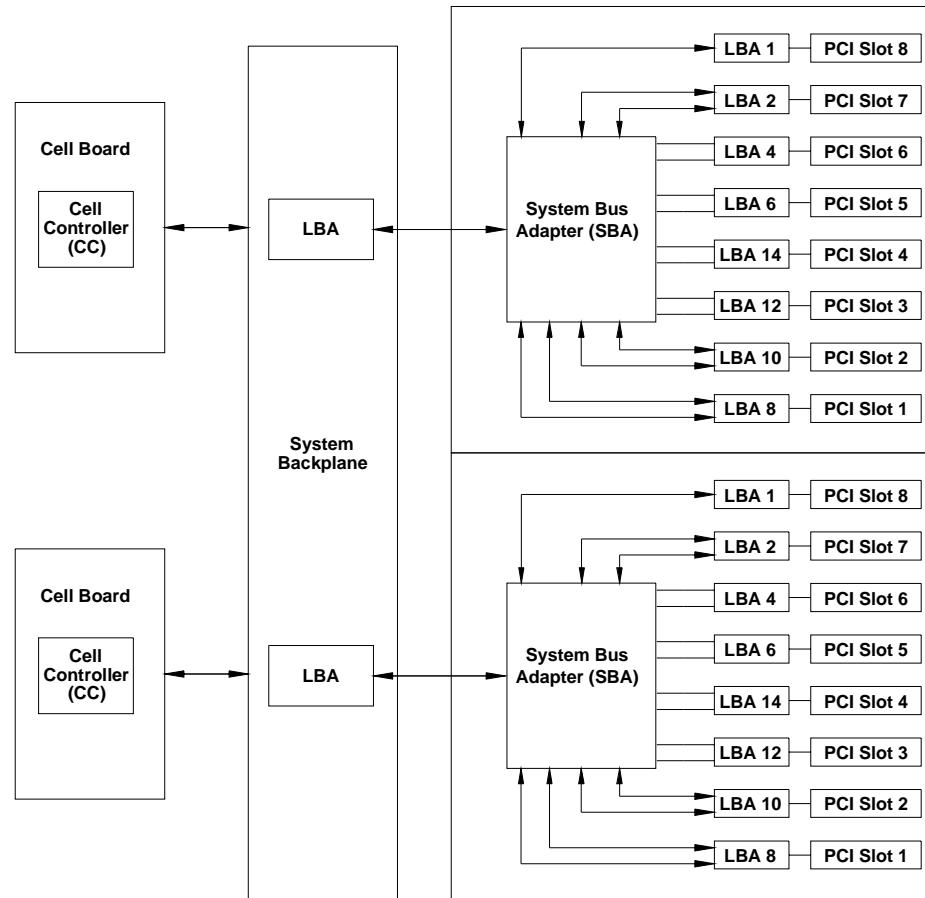
The system backplane contains reset and clock circuitry that propagates through the whole system. The central clocks drive all major chip set clocks. Therefore, these circuits represent a system wide single point of failure.

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 1-4. The CC on cell board 0 and cell board 1 communicates with one each 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/sec. 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/sec. 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.

Figure 1-4 PCI-X Board to Cell Board Block Diagram



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 HP Integrity rx7620 Server systems. It provides sixteen 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 sixteen slots are capable of 66MHz/33MHz PCI or 133MHz/66MHz PCI-X. All sixteen PCI slots are keyed for 3.3 volt connectors (accepting both Universal and 3.3 V cards). The PCI-X backplane does not provide any 5 volt slots for the I/O cards. See Table 1-1 for more details.

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 separately from the other I/O partition.

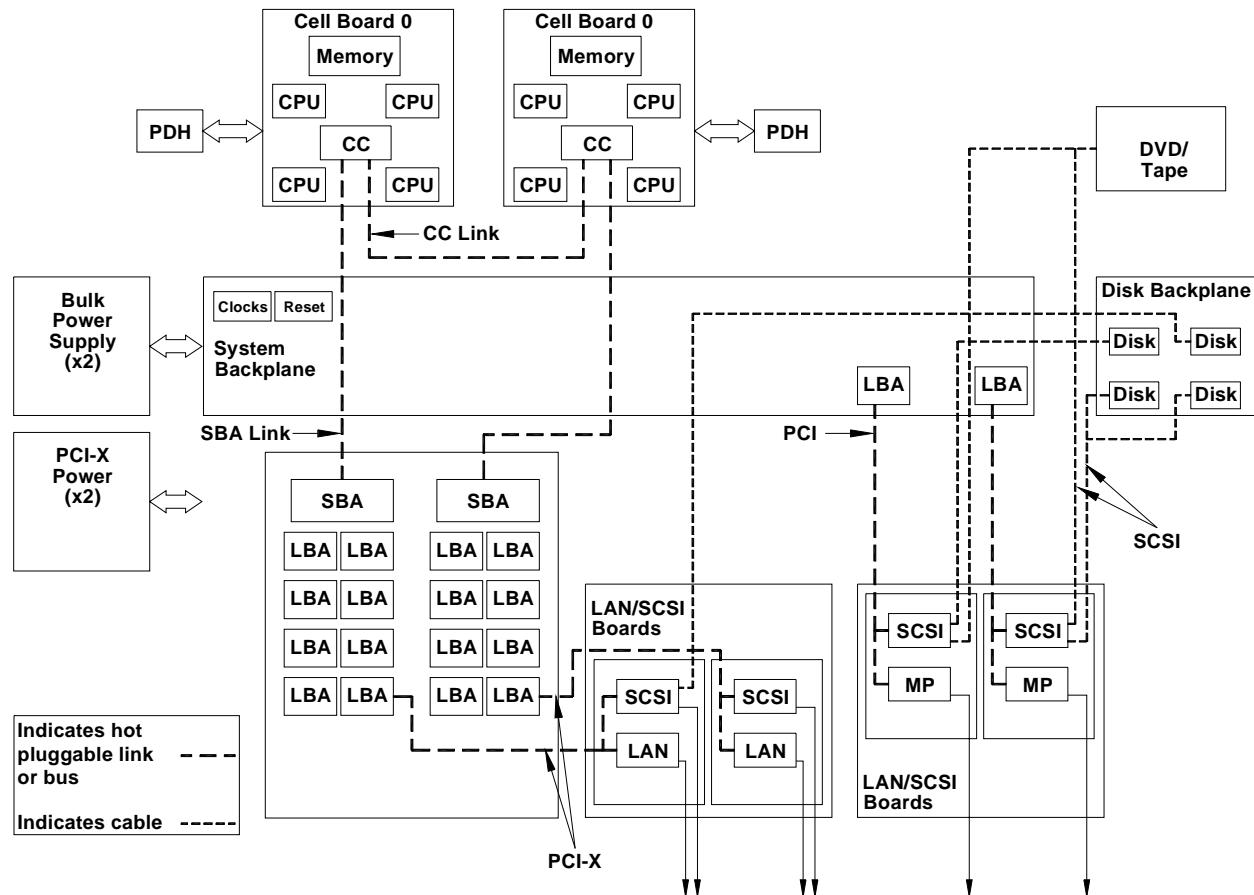
Table 1-1 PCI-X Slot Types

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

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

Detailed HP Integrity rx7620 Server Description

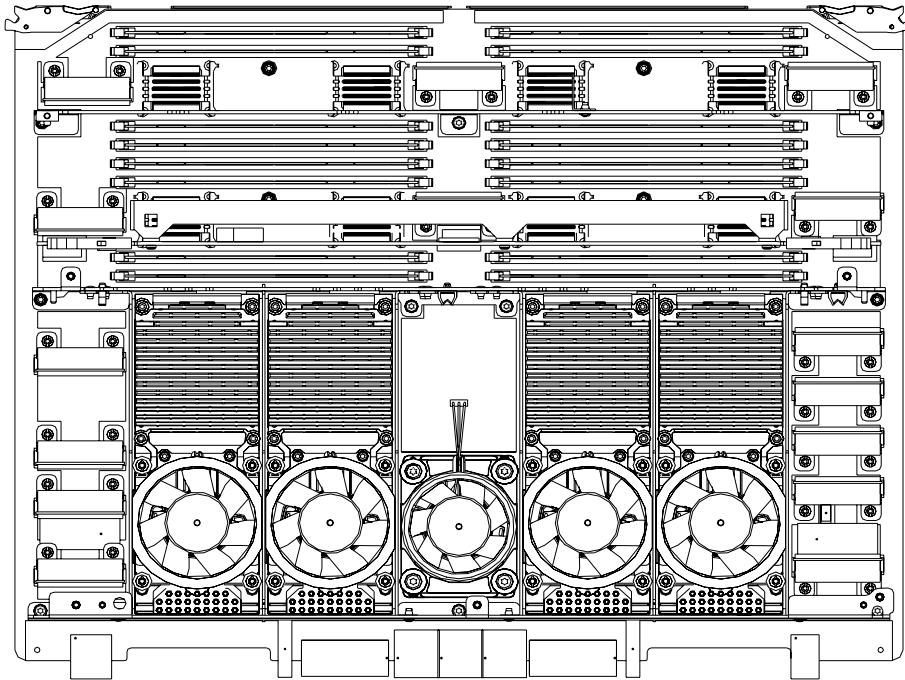
Figure 1-5 HP Integrity rx7620 Server 8-Socket Block Diagram



Cell Board

The cell board contains several hardware blocks connected by several data buses. The major hardware blocks are the Central Processor Units (CPUs), the Cache Coherency Controller (CC), the memory Controllers, and the Memory. Minor hardware blocks include Clock Distribution, Power Distribution, Reset Circuit, and PDH Riser Board Interface. The buses include two Front Side Buses (FBS0 and FBS1), a Memory (MID) bus, a Crossbar (XB) bus, and an I/O bus. All these blocks come together at the CC chip.

Figure 1-6 Cell Board

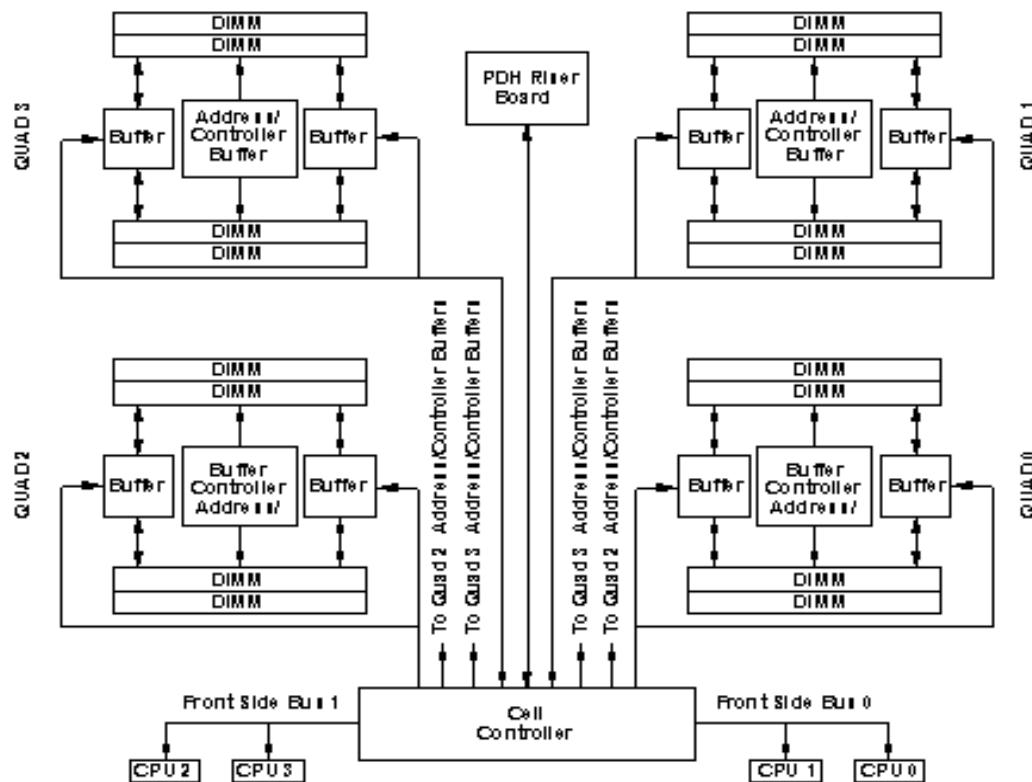


The HP Integrity rx7620 Server has a 48V distributed power system and receives the 48V power from the system backplane board. The cell board contains DC-to-DC converters to generate the required voltage rails. The DC-to-DC converters on the cell board do not provide N+1 redundancy.

Because of space limitations on the cell board, the PDH/PDHC circuitry resides on a riser board that plugs into the cell board at a right angle. The cell board also includes clock circuits, test circuits, and de-coupling capacitors.

Figure 1-7 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.

Figure 1-7 **Memory Subsystem**



PDH Riser Board

The Platform Dependant Hardware Riser board is a daughter card for the cell board. It contains a micro-processor memory interface microcircuit, processor-dependent hardware including the processor-dependent code (PDC), flash memory, and a manageability microcontroller, called the Platform Dependant Hardware Controller (PDHC) with associated circuitry. The PDH obtains cell board configuration information from cell board signals and from the cell's LPM.

The PDH riser board contains circuitry that the Cell board requires to function and, therefore, each cell board must have a PDH Riser installed before it is added to a server.

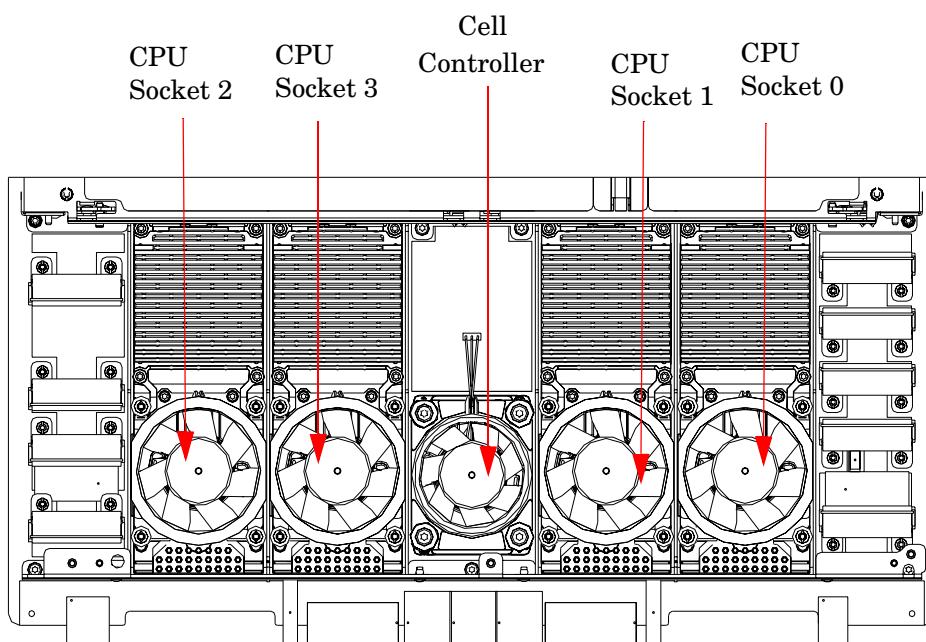
Central Processor Units

The cell board can hold up to four CPU modules and can be populated with CPUs 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. See Table 1-2 for the CPU load order that must be maintained when adding CPUs to the cell board. Refer to Figure 1-8 for the locations on the cell board for installing CPUs. A single CPU configuration is not available for the cell board.

Table 1-2 Cell Board CPU Load Order

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

Figure 1-8 CPU Locations on Cell Board



DIMMs

The memory DIMMs used by the HP Integrity rx7620 Server are custom-designed by HP and are identical to those used in the Superdome server. Each DIMM contains SDRAM memory components and is qualified to run at 125MHz. The CPU chip set will not support traditional DRAMs.

The HP Integrity rx7620 Server supports DIMMs with densities of 64, 128, 256, and 512 Mb for the SDRAM devices. Table 1-3 shows each supported DIMM size, the resulting total system capacity, and the memory component density. Each DIMM is connected to two buffer chips on the cell board.

DIMMs must be loaded in sets of four at specific locations. For best performance, HP recommends loading sets of eight DIMMs.

Table 1-3 HP Integrity rx7620 Server DIMMs

DIMM Size	Total Capacity	Memory Component Density
256 MB	8 GB	64 megabit
512 MB	16 GB	128 megabit
1 GB	32 GB	256 megabit
2 GB	64 GB	512 megabit
4 GB	128 GB	1024 megabit

Main Memory Performance

Latency to main memory is an important parameter in determining overall system performance. With memory buses running 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 HP Integrity rx7620 Server is capable of supporting as little as 0.5GB of main memory using two 256MB DIMMs installed on one of the cell boards and as much as 64 GB by filling all 16 DIMM slots on both cell boards with 2GB 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 1-9 shows the DIMM slot layout on the cell board. See Table 1-4 for DIMM load order.

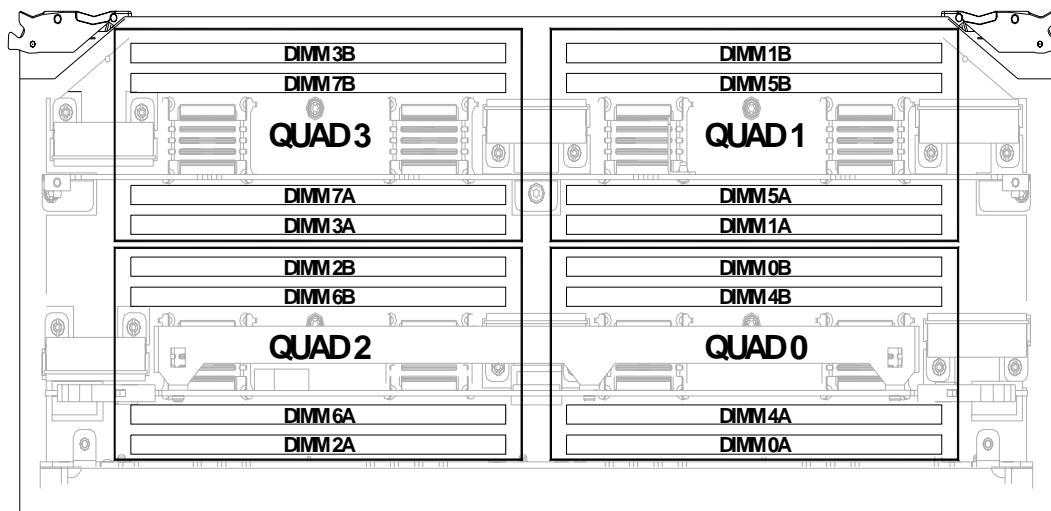
A quad seen in Figure 1-9 is a grouping of four DIMMs. Configurations with 8 or 16 DIMM slots loaded are recommended. The DIMM sizes in a quad can be different but the DIMMs in an echelon must be the same size.

Table 1-4 **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 1-9 **DIMM Slot Layout**

Front Edge of Cell Board



Rear Edge of Cell Board
(Plugs into the Server Backplane)

Cells and nPartitions

NOTE In the following discussion, the term “cell” refers to a cell board.

A cell board that has an I/O link to a bootable device and a console (usually supplied by an MP/SCSI Core I/O card) is a potential boot cell. The cell that contains the boot console I/O path is the called the root cell. Both cells are potential root cells. The primary or default root cell in a single nPartition system is the bottom cell (cell 1).

An nPartition (also called a Protection Domain) is a cell or cells running the same operating system and sharing processes and memory space among the components. Each nPartition must have one root cell and may have both. The HP Integrity rx7620 Server has only two possible nPartition configurations: single or dual. The additional cell that can be part of the nPartition does not require I/O links or MP/SCSI Core I/O cards.

In the single nPartition case, if two cells are present, either cell may be the root cell, assuming that both cells have MP Core I/O functionality present. If only one cell is present, that cell is the root cell (and should be cell 1).

In the dual nPartition case (two cells required), each nPartition consists of one cell, and each cell must be a root cell. The ability to interconnect two cells in one nPartition or isolate the cells in a dual nPartition system provides system configuration flexibility. System partitioning is configured by the system management processor.

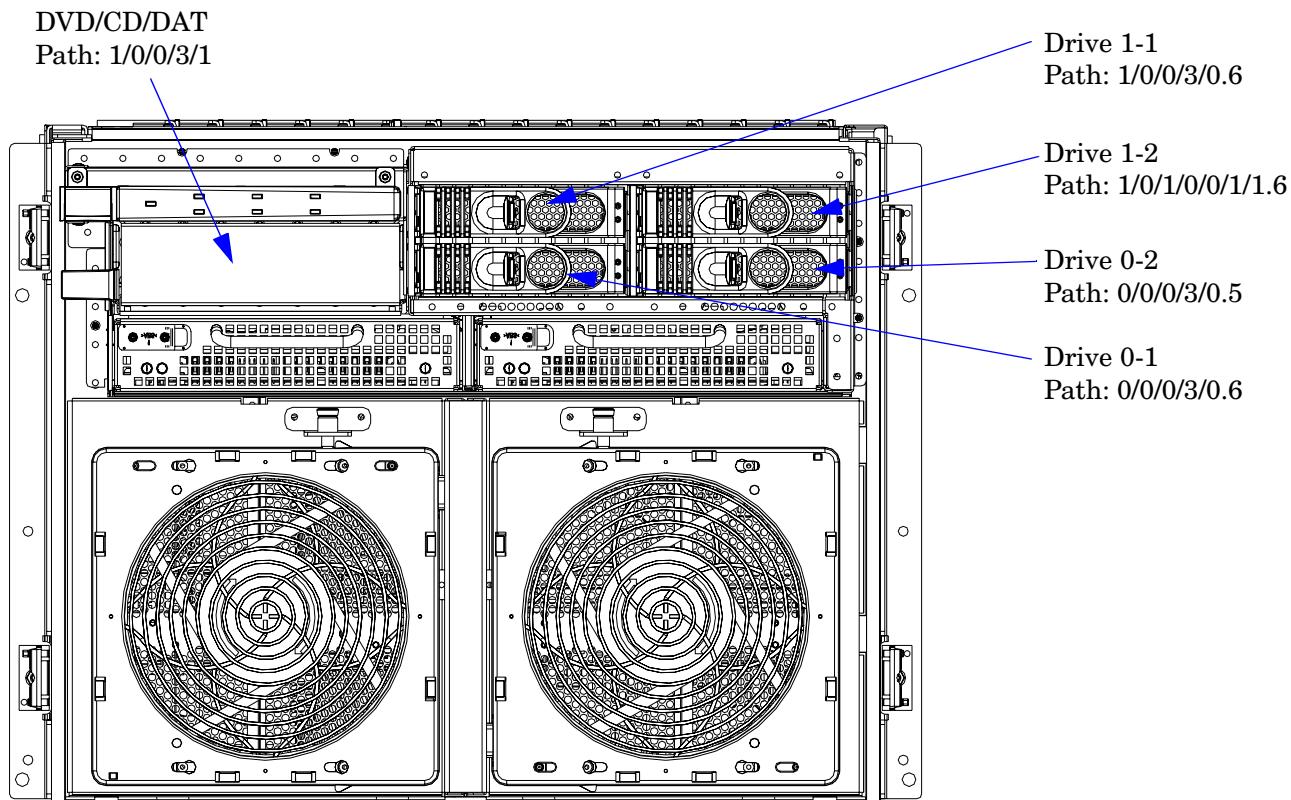
NOTE Partition configuration information is available on the Web at <http://docs.hp.com>
Refer to HP System Partitions Guide: Administration for nPartitions for details.

Internal Disk Devices for HP Integrity rx7620 Server

In an HP Integrity rx7620 Server, the top internal disk drives connect to cell 1 through the core I/O for cell 1. Both of the bottom disk drives connect to cell 0 through the core I/O for cell 0.

The CD/DVD/DAT drive connects to cell 1 through the core I/O card for cell 1.

Figure 1-10 Internal Disks



MP/SCSI Core I/O Board

The HP Integrity rx7620 Server accommodates two sets of MP/SCSI Core I/O functionality. Each MP/SCSI core I/O board set consists of a MP/SCSI board and a Procurium LAN/SCSI board. At least one MP/SCSI board is required (independent of partitions). An additional MP/SCSI board can be added as well (and is required in a dual partition system). Both MP/SCSI core I/O boards are oriented vertically and plug into the system backplane. The MP/SCSI core I/O board incorporates a dual channel Ultra160 SCSI controller and is hot-pluggable.

Procurium LAN/SCSI Board

At least one Procurium LAN/SCSI board is required for the minimum system configuration; two are required in a dual partition system. The Procurium board is a standard PCI form factor card with PCI card edge connectors. The PCI-X backplane has one slot location reserved for the required Procurium board and another that can accommodate either a Procurium board or any other supported add-in PCI-X card. The Procurium board is hot-pluggable.

Mass Storage (Disk) Backplane

Internal mass storage connections to disks are routed on the mass storage backplane, having connectors and termination circuitry. All disks are hot-pluggable. The HP Integrity rx7620 Server accommodates one internal removable media device. Therefore, only one power connector for a removable media device is required on the mass storage backplane. The mass storage backplane incorporates a circuit that allows power to the internal removable media device to be programmatically cycled.

Server Description

Dimensions

The dimensions of the HP Integrity rx7620 Server are as follows:

- Width: 44.45 cm (17.5 inches), constrained by EIA standard 19 inch racks.
- Depth: Defined by cable management constraints to fit into standard 36-inch deep racks (Rittal/Compaq, Rosebow I):
 - 25.5 inches from front rack column to PCI connector surface
 - 26.7 inches from front rack column to MP Core I/O connector surface
 - 30 inches overall package dimension, including 2.7 inches protruding in front of the front rack columns.
- Height: 10U – 0.54 cm = 43.91 cm (17.287 inches). This is the appropriate height for a product that consumes 10U of rack height while allowing adequate clearance between products directly above and below this product. Fitting four server units per 2 m rack and upgrade of current 10U height products in the future are the main height constraints.

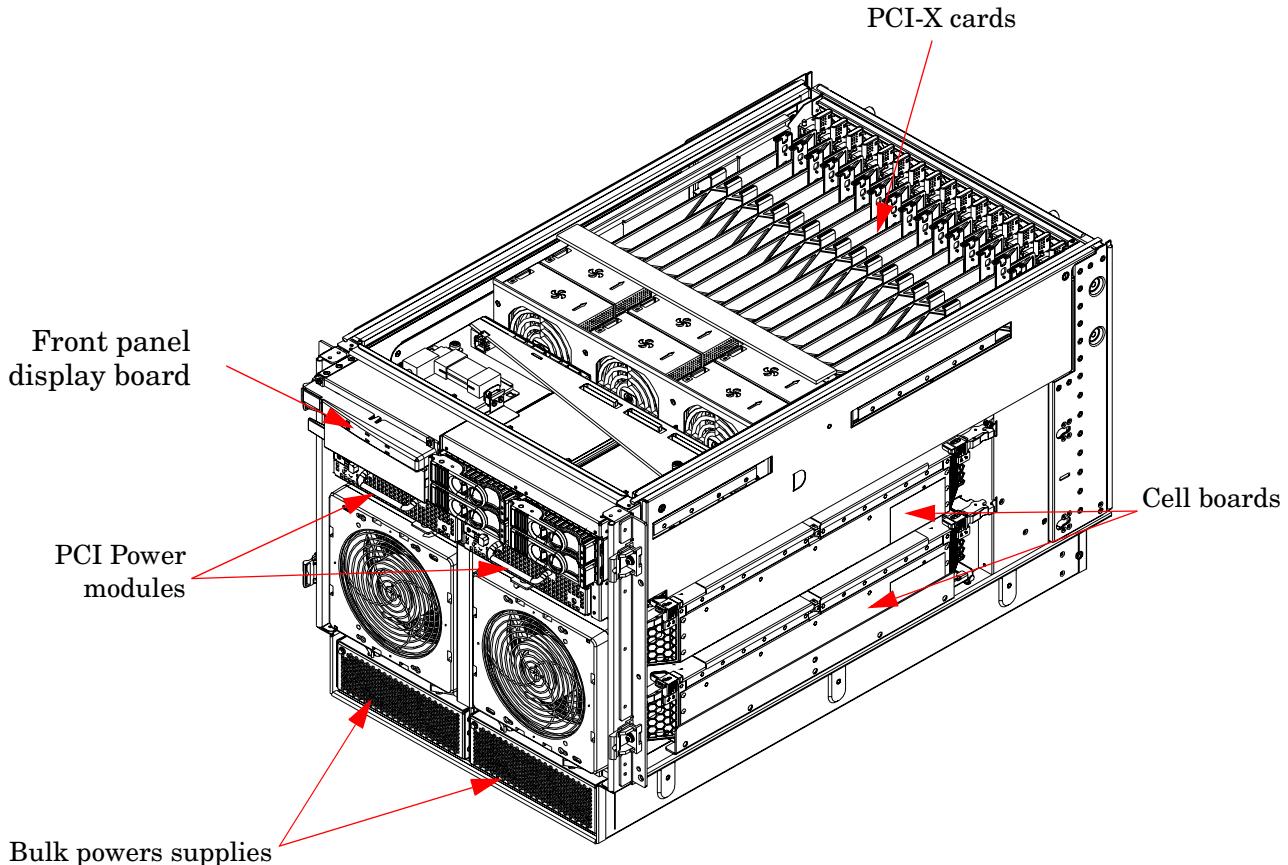
System Chassis

The mass storage section located in the front allows access to the 3.5-inch hard drives without removal of the bezel. This is especially helpful when the system is mounted in the lowest position in a rack. The mass storage bay also accommodates one 5.25-inch removable media device. The front bezel must be removed to gain access to this device. The front panel display board, containing LEDs and the system power switch, is located directly above the 5.25-inch removable media bay.

Below the mass storage section and behind a removable bezel are two PCI DC-to-DC power converters.

The bulk power supply section is partitioned by a sealed metallic enclosure located in the bottom of the package. This enclosure houses the N+1 fully redundant BPSs.

Figure 1-11 Right-Front View of HP Integrity rx7620 Server



The PCI-X 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-X cards. These six 9.2-cm fans are housed in plastic carriers. They are configured in two rows of three fans.

The MP/SCSI Core I/O boards are positioned vertically at the rear of the chassis.

The PCI-X card bulkhead connectors are located in the top rear portion of the chassis.

Four OLR system fan modules, externally attached to the chassis, are 15-cm (6.5-inch) fans. Two fans are mounted on the front surface of the chassis and two are mounted on the rear surface.

The two hot-pluggable N+1 redundant DC bulk power supplies provide a wide input voltage range. They are installed in the front of the chassis, directly under the front fans.

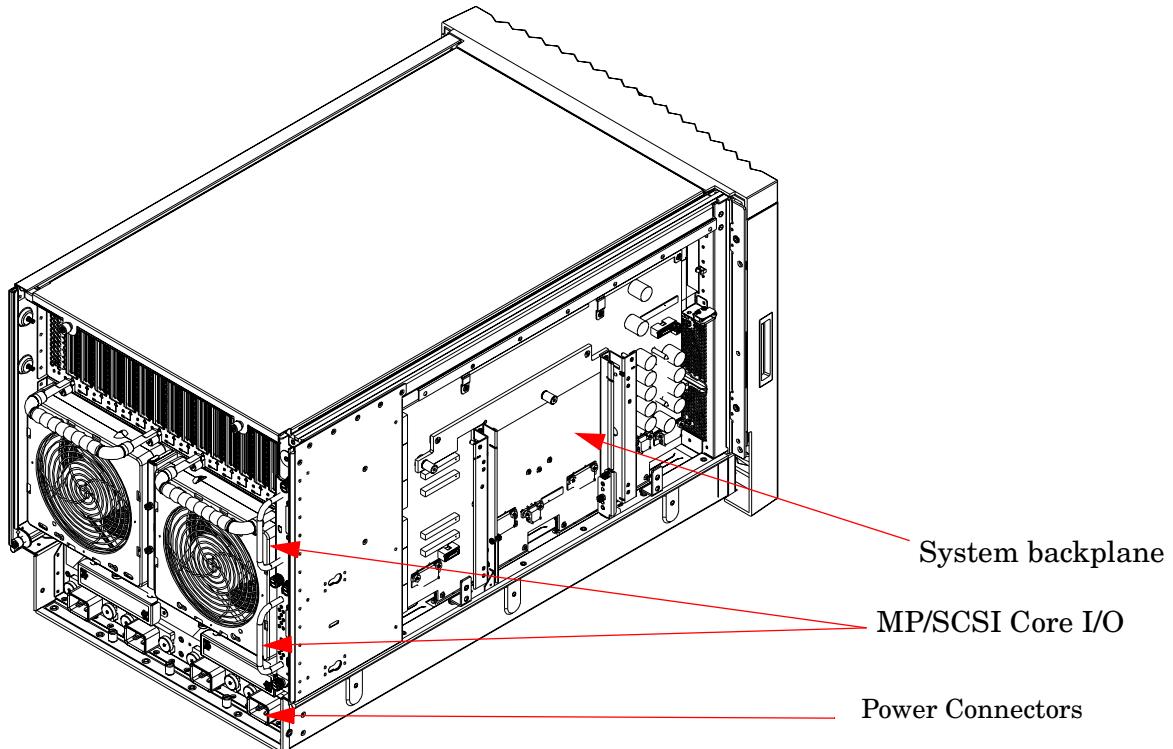
A cable harness that connects from the rear of the BPSs to the system backplane provides DC power distribution.

Access to the system backplane is accomplished by removing the left side cover. The system backplane inserts by a guide/insertion mechanism using a single large jack screw assembly.

SCSI ribbon-cable assemblies route from the mass storage area to the backside of the system backplane and to the Procurium PCI MP Core I/O card.

Cell boards are accessed from the right side of the chassis behind a removable side cover.

Figure 1-12 Left-Rear View of HP Integrity rx7620 Server



2 Unpacking the Server

HP shipping containers are designed to protect their contents under normal shipping conditions. After the equipment arrives, carefully inspect each carton for signs of shipping damage. A tilt indicator is installed on each carton shipped. The beads in the indicator will roll to the upper position if the container has been tilted to an angle that could cause equipment damage. The tilt indicator itself will have two windows, and each

window, under normal conditions, will show four beads present. If a carton has been mishandled or accidentally dropped, the tilt indicator will indicate missing beads. 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 might 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 server might come already racked or ready for rack installation.

Unpacking a Racked Server

This section contains information about unpacking the 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.

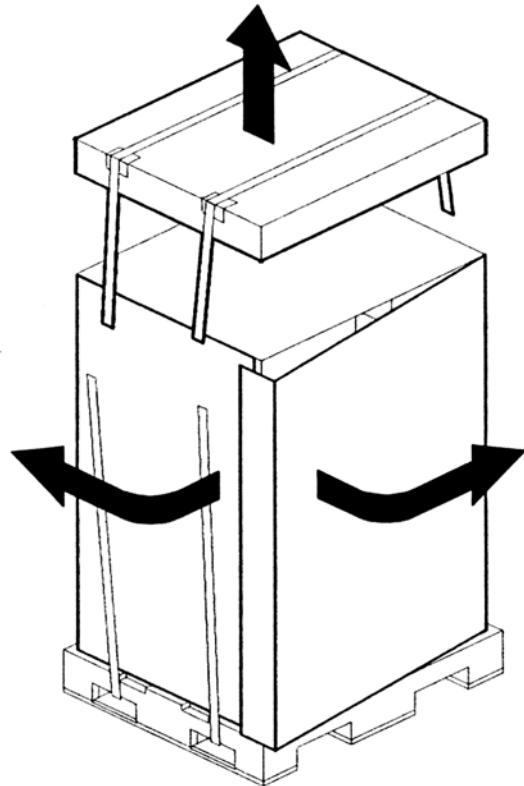
NOTE Position the pallet to allow for enough space to roll the cabinet off the pallet before unpacking.

Remove the cabinet using the following procedure:

1. Cut the polystrap bands around the shipping container.
2. Lift the cardboard top cap from the shipping box. See Figure 2-1.
3. Remove the corrugated wrap from the pallet.
4. Remove the packing materials.

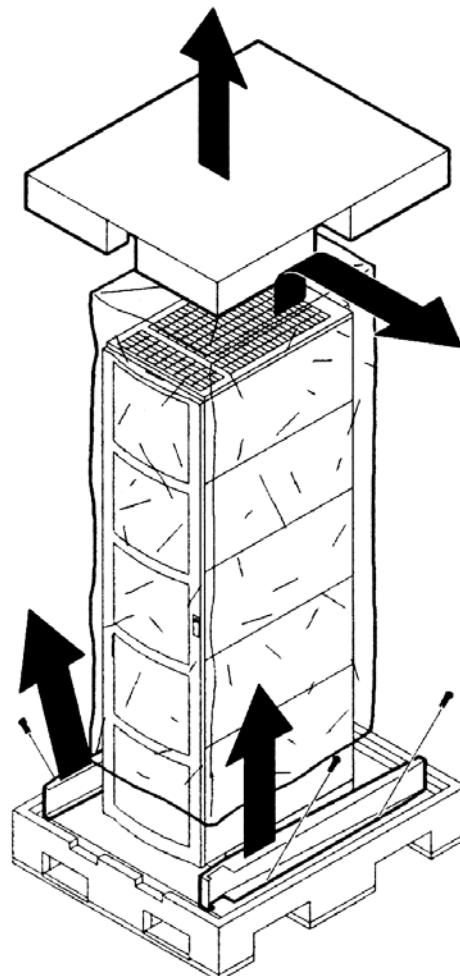
CAUTION The plastic wrapping material should be cut off rather than pulled off. Pulling the plastic covering off represents an ESD hazard.

Figure 2-1 **Removing the Polystraps and Cardboard**



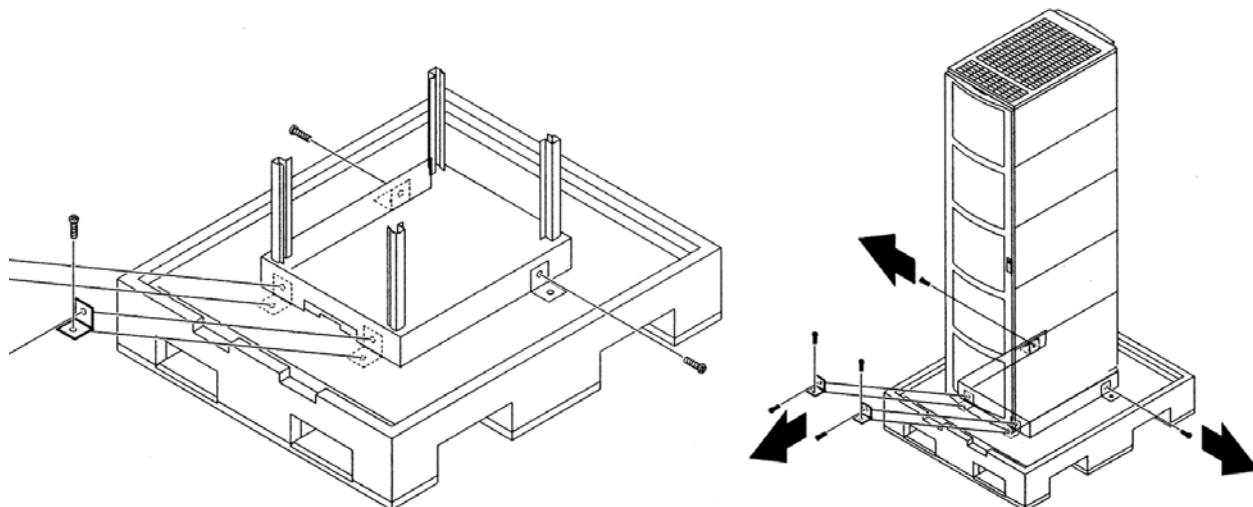
5. Remove the four bolts that hold the ramps to the pallet, and remove the ramps. See Figure 2-2.

Figure 2-2 Removing the Shipping Bolts and Plastic Cover



6. Remove the six bolts from the base that attaches the rack to the pallet. See Figure 2-3.

Figure 2-3 Preparing to Roll Off the Pallet

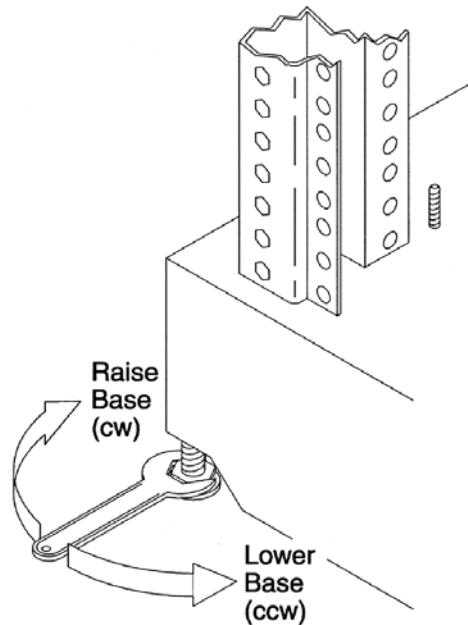


WARNING Be sure that the leveling feet on the rack are raised before you roll the rack down the ramp and any time you roll the rack on the casters. Use caution when rolling the cabinet off the ramp. A single server in the cabinet weighs approximately 665 pounds. HP strongly recommends that two people 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. Install the anti-tip mechanisms on the bottom front and rear of the rack.

Figure 2-4 Securing the Cabinet



Unpacking a Non-Racked Server

NOTE If this server was delivered with a wheel kit, proceed to Chapter 2, Installing Additional Components.

NOTE HP recommends the use of a lifter, such as a RONI Company model 17000 SP 400 lifting device, when moving a non-racked system, shown in Figure 2-5. If no lifter is available, install the lift handle panels provided with the system.

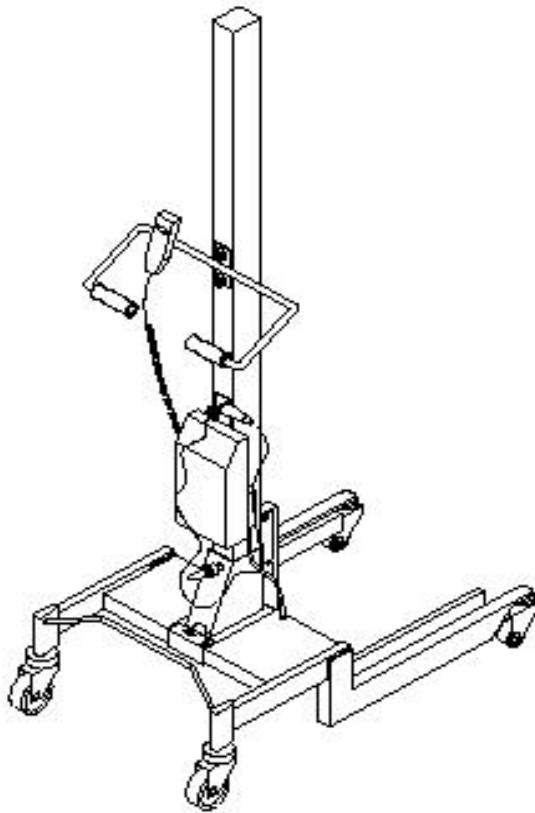
Unloading with a Lifter

Use the following procedure to unload the server from the pallet using a lifter.

WARNING **Use caution when using a 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.**

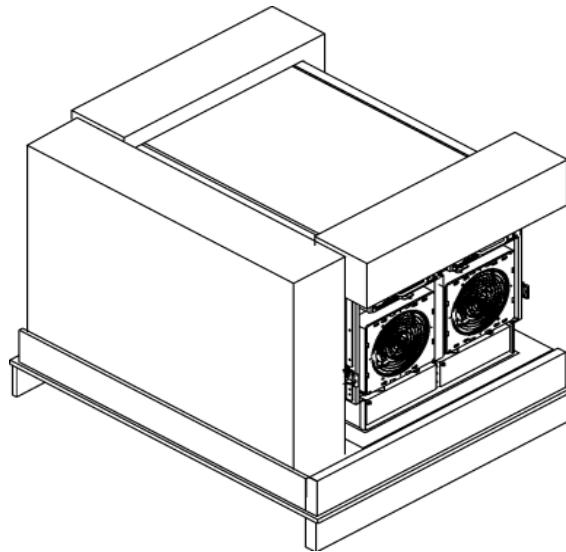
Never extend more than one server from the same cabinet while installing or servicing another server product. Failure to follow these instructions could result in the cabinet tipping over.

Figure 2-5 RONI Lifter



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

Figure 2-6 Server with Shipping Box Removed



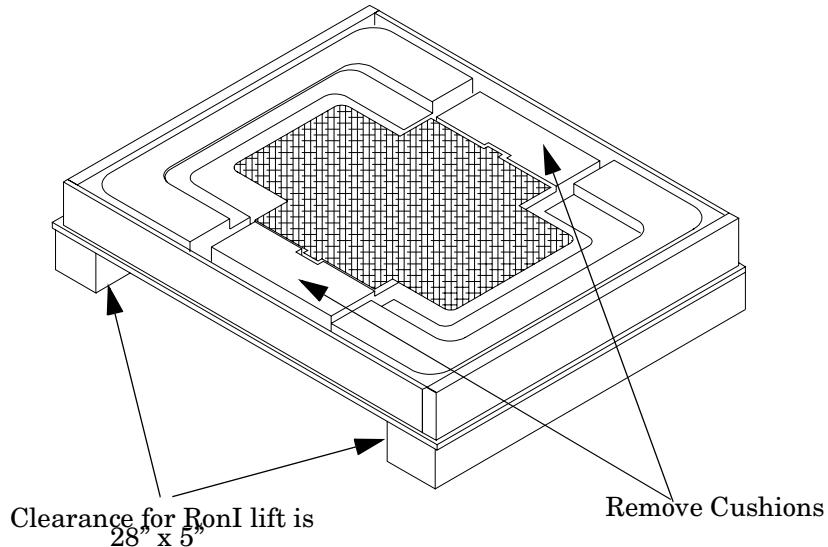
2. Remove all cartons from the pallet, leaving only the server.

[Unpacking the Server](#)

[Unpacking a Non-Racked Server](#)

3. Remove the two foam cushions for lift access as shown in Figure 2-7.

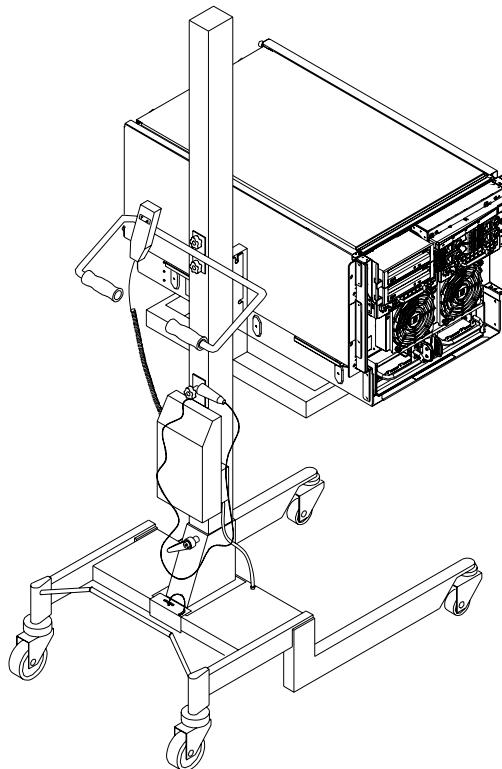
Figure 2-7 Remove Cushions for Lift Access



4. Insert the lifter forks under the server.
5. Carefully roll the lift forward until it is fully positioned against the side of the server.

- Slowly raise the server off the pallet until it clears the pallet cushions.

Figure 2-8 Raising a Server Off the Pallet



- Roll the lifter and server away from the pallet. Do not raise the server any higher than necessary when moving it over to the rack.

NOTE When installing the system in a rack, refer to the *HP J1530B Rack Integration Kit Installation Guide*.

Unloading with Lift Handle Panels

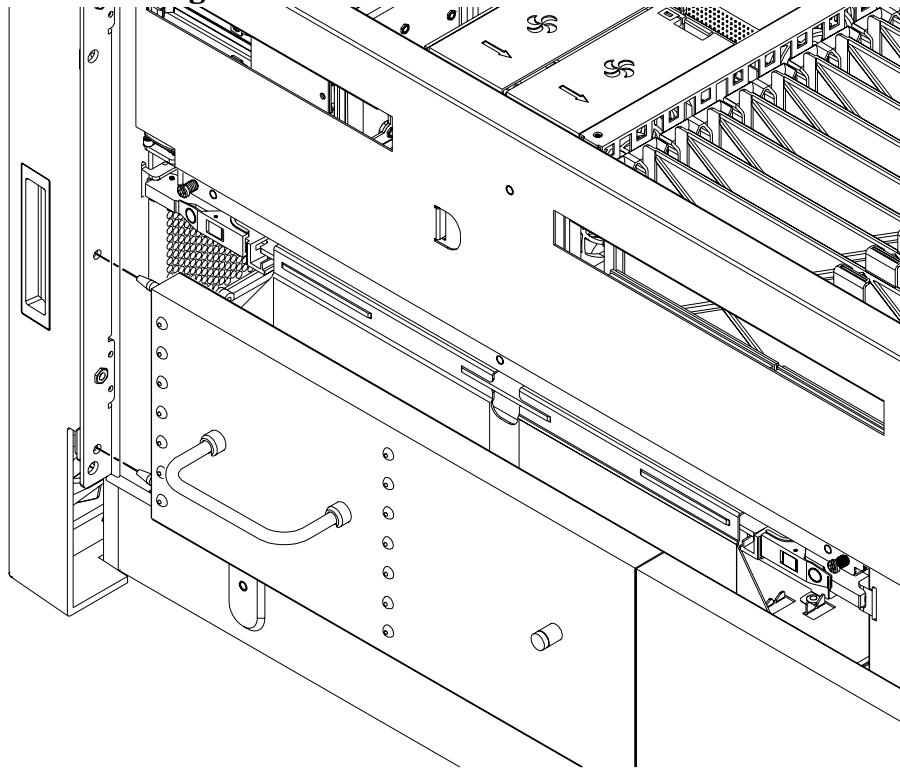
WARNING Use this procedure only if an HP approved lift is not available. This procedure should only be attempted by two authorized HP service technicians.
Before attempting this procedure, HP recommends that all cell boards and AC power supplies be removed. Instructions for removing these components can be found in the Removal and Replacement chapter of the service manual. Review local safety regulations before attempting to move the system, using the lift handle panels.
Failure to observe these precautions can cause serious injury to personnel or damage to equipment.

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

1. Remove both side covers. If present, remove the front panel.
2. Locate lift handles and remove from storage plate.
3. Orient lift handle panels such that when installed, the handles hang down at 90 degrees and lock in a horizontal position during lifting.

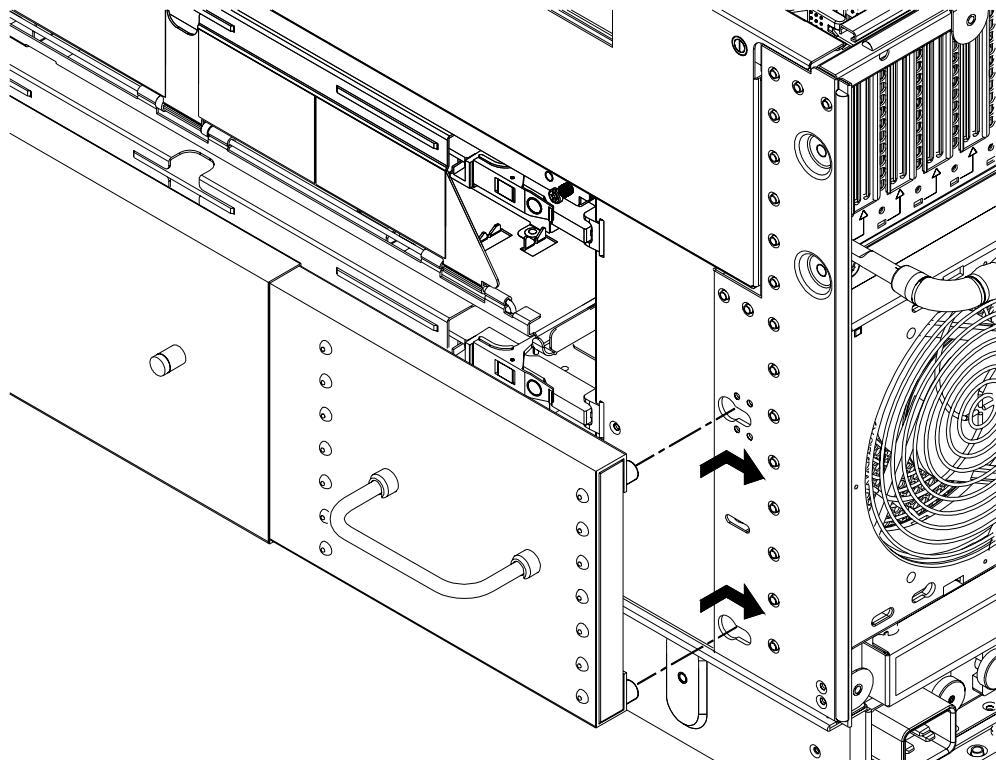
Figure 2-9

Positioning the Lift handles



- With one handle in each hand, install the pin end of the panel into the back side of the front rack mount ears on the chassis.

Figure 2-10 Inserting the Pins Into the Rack

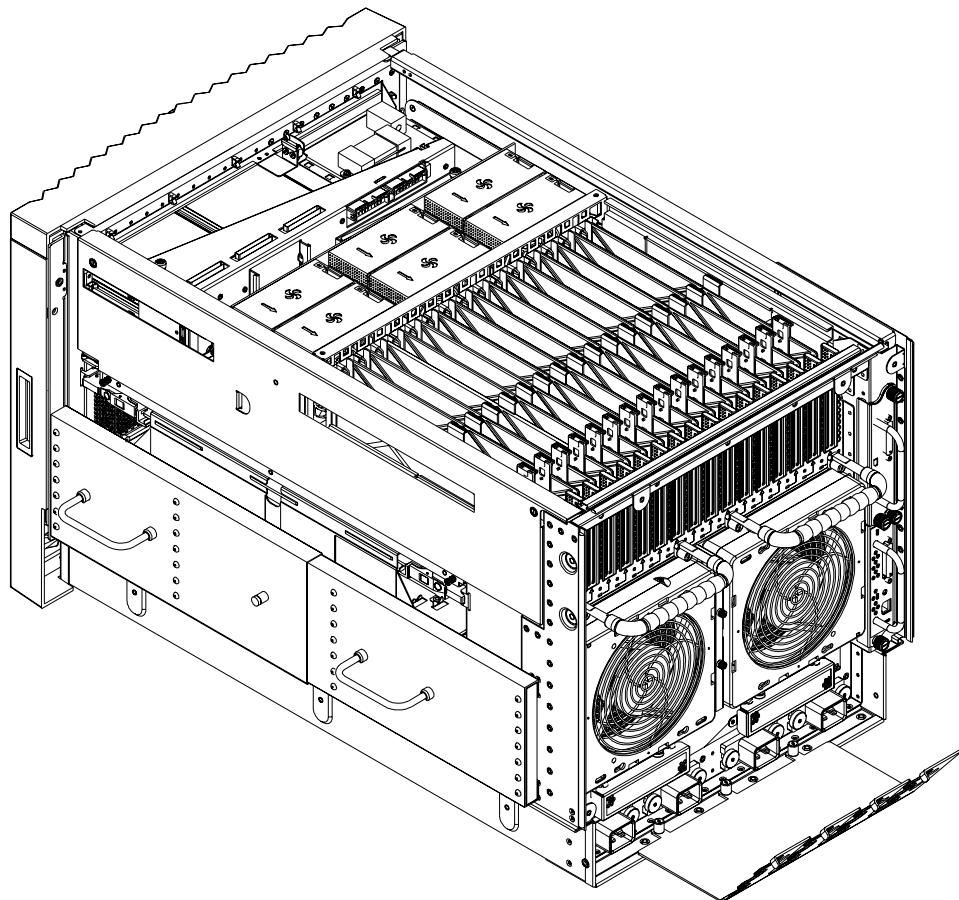


Unpacking the Server

Unpacking a Non-Racked Server

5. Pull the string plunger out, move the handles apart, and install the shoulder washer end of the panel into the keyway feature.

Figure 2-11 Lift Handles Mounted



6. Continue to pull the handles apart until the spring plunger snaps into final position. The spring plunger will drop down into the recess position.
7. Ensure that the handles are secure by pressing the handles together and moving back and forth.
8. Repeat steps above for the other handle.
9. To lift the server, rotate the handles 90 degrees to horizontal position.

NOTE

If installing the system in a rack, refer to the *Installation Guide, HP J1530B, Rack Installation Kit*.

10. After moving the server, remove the lift handle panels from the chassis and reinstall the server covers and front bezel. Refer to the *Installation Guide, HP J1530B Rack Installation Kit*.

Installing Server Into the Rack

Any server that is to be installed into a rack is shipped with equipment slides. With every set of slides comes an installation guide: *Installation Guide, HP J1530B, Rack Installation Kit*.

Unpacking the Server
Installing Server Into the Rack

3 **Installing Additional Components**

This chapter describes the installation of those components not installed at time of delivery.

Wheel Kit Installation

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

Table 3-1 Wheel Kit Packing List

Part Number	Description	Quantity
A6753-04013	Wheel Kit consisting of the following components:	1
A6753-04002	Side cover	1
A6753-04003	Side cover	1
A6753-04004	Top cover	1
A6753-00007	Caster cover	2
A6753-04001	Right front caster assembly	1
A6753-04005	Right rear caster assembly	1
A6753-04006	Left front caster assembly	1
A6753-04007	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)	4
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

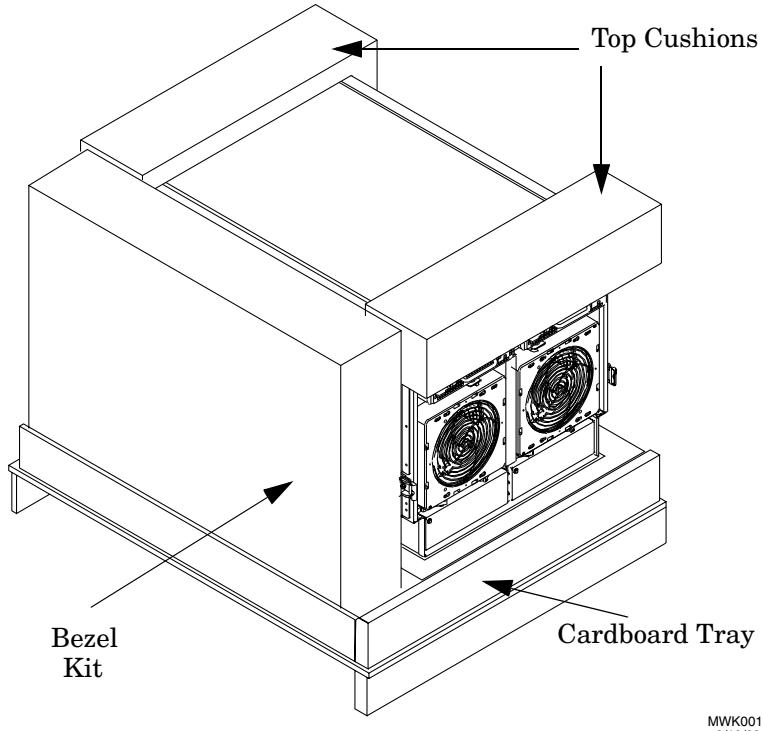
The following list provides the installer with the recommended tools to perform the wheel kit installation.

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

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

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

Figure 3-1 Component Locations



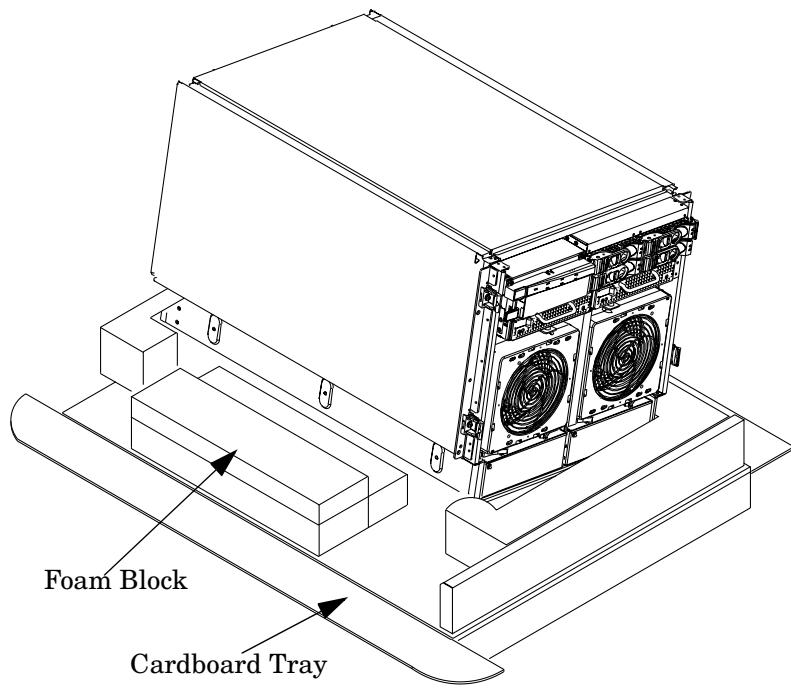
MWK001
3/10/03

Installing Additional Components

Wheel Kit Installation

4. Unfold bottom cardboard tray.
5. Carefully tilt the server and place one of the foam blocks (A6093-44002) under the left side of the server. Do not remove any other cushions until instructed to do so.

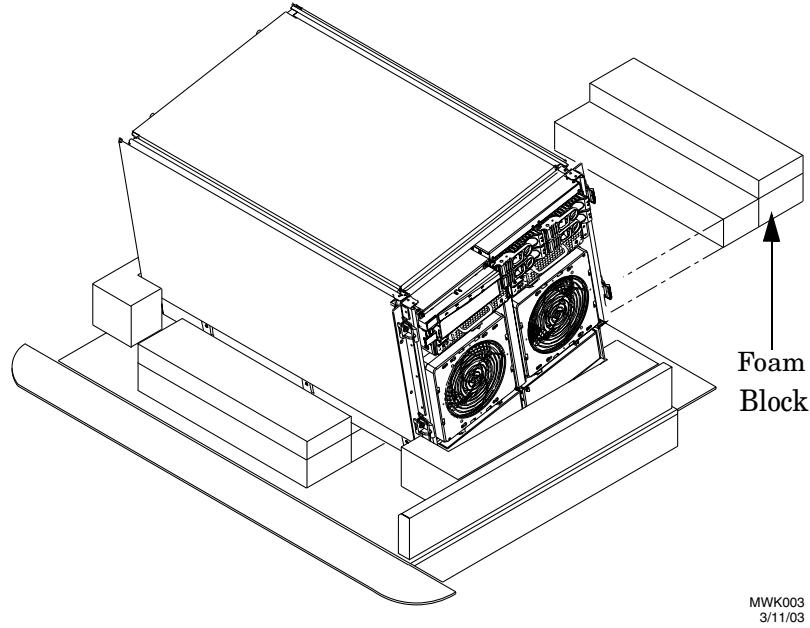
Figure 3-2 Left Foam Block Position



MWK002
3/11/03

6. Carefully tilt the server and place the other foam block provided in the kit under the right side of the server.

Figure 3-3 Right Foam Block Position



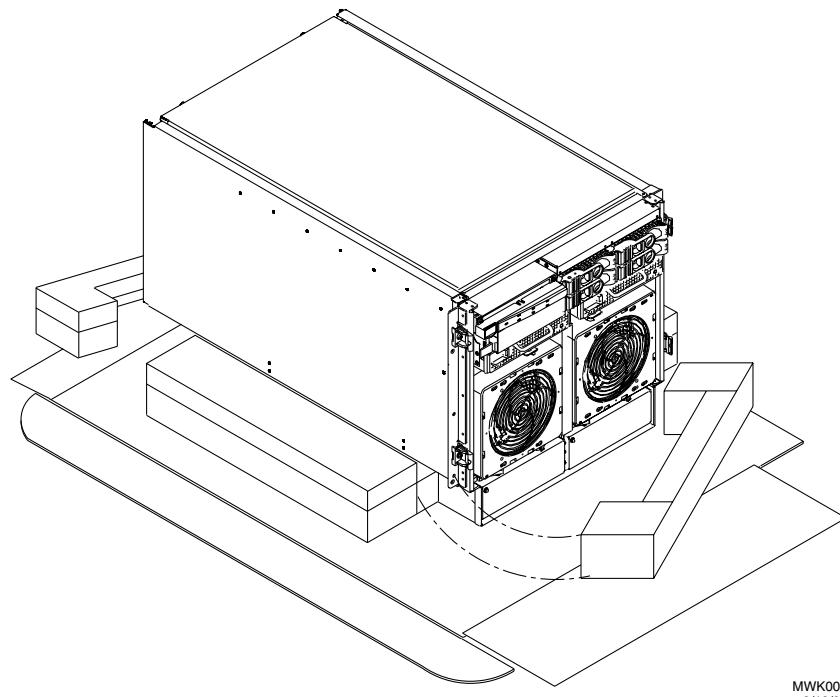
MWK003
3/11/03

Installing Additional Components

Wheel Kit Installation

7. Remove the cushions from the lower front and rear of the server. Do not disturb the side cushions.

Figure 3-4 Foam Block Removal



8. Locate and identify the caster assemblies. Use the following table to identify the casters.

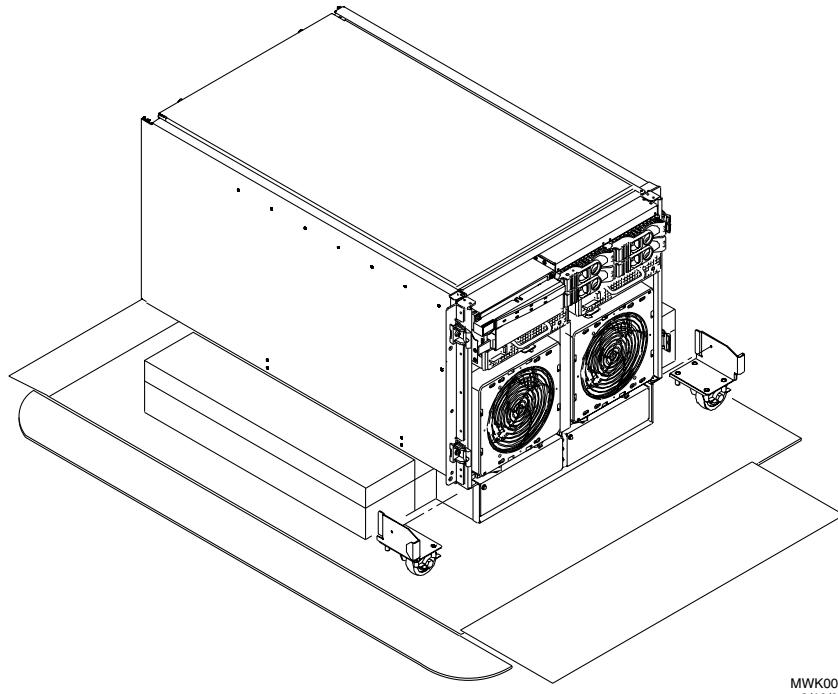
NOTE The caster part number is stamped on the caster mounting plate.

Table 3-2 Caster Part Numbers

Caster	Part Number
Right front	A6753-04001
Right rear	A6753-04005
Left front	A6753-04006
Left rear	A6753-04007

9. Locate and remove one of the four screws from the plastic pouch. Attach the a caster to the server.

Figure 3-5 Attaching a Caster to the Server



MWK005
3/12/03

10. Attach the remaining casters to the server using the screws supplied in the plastic pouch.
11. Remove the foam blocks from the left and right side of the server.
12. Locate the plywood ramp.
13. 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 to attach the ramp to the pallet.

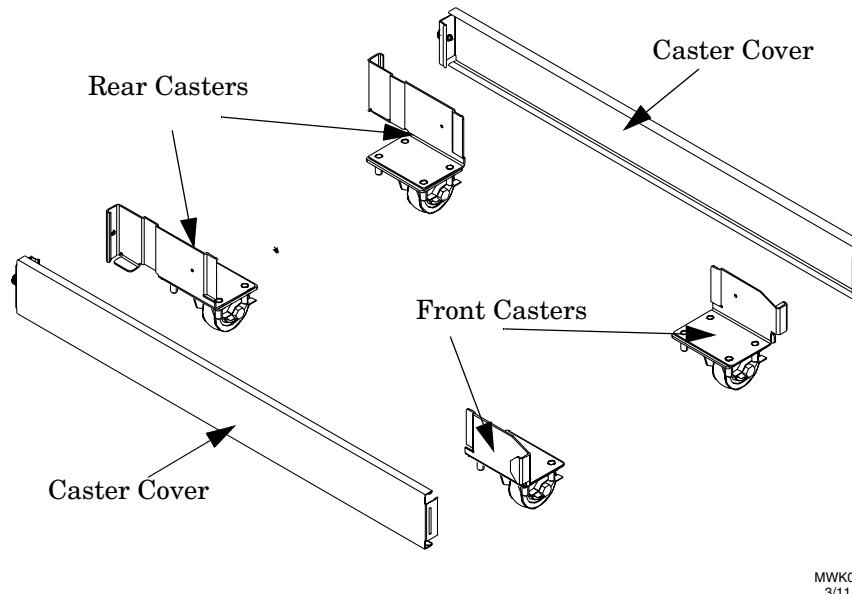
14. Carefully roll the server off the pallet and down the ramp.
15. Locate the caster covers.

NOTE

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 cover to the server by tightening the captive screw on the cover at the rear of the server.

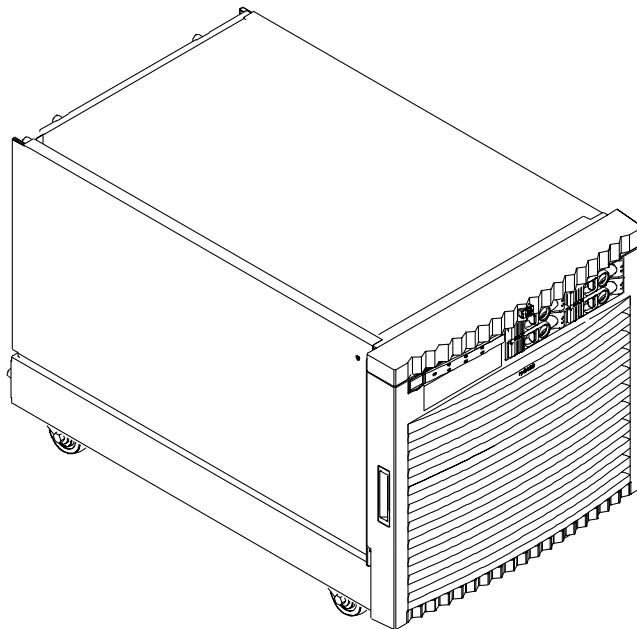
Figure 3-6 Securing Each Caster Cover to the Server



MWK006
3/11/03

17. Wheel kit installation is complete when both caster covers are attached to the server, and the front bezel and all covers are installed.

Figure 3-7 Completed Server



PCI-X Card Cage Assembly I/O Cards

A number of PCI and PCI-X I/O cards are supported in the HP Integrity rx7620 Server. Known cards supported at the release of this manual are shown in Tables 3-3 through 3-6.

Table 3-3 HP Integrity rx7620 Server - HP-UX Supported I/O Cards

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A5158A	PCI 1 port 2x Fibre Channel	15
A6795A	PCI 2 GB Fibre Channel	15B
AB378A	PCI-X 1 port 4 GB Fibre Channel	15B
A6794AX	Procurium GigE LAN/SCSI combo card	2B
A6828A	PCI 1 channel Ultra 160 SCSI	15B
A6829A	PCI 1 channel Ultra160 SCSI	15B
A7173A	Dual Channel Ultra320 SCSI Adapter	15B
A5149A	PCI 1 port Ultra2 SCSI	15
A5150A	PCI 2 port Ultra2 SCSI	15
A6826A	PCI X 2 channel 2 Gb/s Fibre Channel	15B
A9890A	PCI-X 2-channel Smart Array 6402	8B
A9891A	PCI-X 4 channel Smart Array 6404/256-MB	8B
AB287A	PCI-X 1-port 10 Gb Ethernet Fiber Adapter	2
AB545A	PCI-X 4 port 1000Base-T Gigabit Adapter	15
A6847A	PCI 1 port1000Base-SX	15B
A6825A	PCI 1port1000Base-T	15B
A4926A	PCI 1 port 1000Base-SX	15
A5230A	PCI 1 port10/100Base-T	15
A4929A	PCI 1 port1000Base-T	15
A5506B	PCI 4 port 10/100Base-T	15
A5783A	PCI 1 port 802.5 Token Ring 4/16/100	15
A6869A	Obsidian USB/VGA PCI card	1

Table 3-3 HP Integrity rx7620 Server - HP-UX Supported I/O Cards (Continued)

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A6869B	Obsidian USB/VGA PCI card	1
A7011A	PCI X 2 port 1000Base SX	8
A7012A	PCI X 2 port 1000Base T	8
AB286A	PCI-X 2-port 4X Fabric HCA (HPC)	2
AB286C	PCI X 2 port 4X Fabric HCA (HPC)	8
A3739B	PCI 1 port Universal FDDI	15
AB345A	PCI X 2 port 4X Fabric (HA and DB) Adapter	15
AB286C	PCI X 2 port 4X Fabric HCA (HPC)	8
A3739B	PCI 1 port Universal FDDI	15
AB345A	PCI X 2 port 4X Fabric (HA and DB) Adapter	15
AB286C	PCI-X 2-port 4X Fabric (HPC) Adapter	8
AB379A	PCI 2 port 4 Gb Fibre Channel	8B
A5838A	PCI 2 port 100Base T / 2 port Ultra2 SCSI	15B
A9782A	PCI X 2 Gb Fibre Channel/1000Base SX	15B
A9784A	PCI-X 2-Gb Fibre Channel, 1000Base-T	15B
AB465A	PCI-X 2-port 2Gb FC/ 2-port 1Gb Ethernet	15B
AB290A	PCI-X 2-port 1000BT/2-port U320 SCSI	15B
AD278A	8-port Terminal MUX	15
AD279A	64-port Terminal MUX	15
A5513A	PCI 1 port ATM 155 Mb/s MMF	15
J3525A	2-port Programmable Serial Interface (PSI) X.25/Frame Relay/SDLC	15
A6748A	PCI 8-port Terminal Multiplexer	15
A6749A	PCI 64-port Terminal Multiplexer	15

Table 3-3 HP Integrity rx7620 Server - HP-UX Supported I/O Cards (Continued)

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A6386A	Hyperfabric2 Fiber Adapter	4
Z7340A	8-port PCI ACC	16

Table 3-4 HP Integrity rx7620 Server - Windows I/O Cards

Part Number	Card Description	Number of Cards Supported
A7059A	PCI Windows and Linux Ultra160 SCSI	6
A7060A	PCI Windows and Linux 2 channel Ultra160 SCSI	6
A7173A	PCI 2 Channel Ultra 320 SCSI Adapter	6
337972-B21	PCI-X Smart Array P600 Serial Attached SCSI (SAS) Controller ^a	8
A9890A	PCI-X SmartArray 6402/128 MB	8
A9891A	PCI-X Smart Array 6404 256-MB	8
AB287A	10 G NIC	4
AB232A	PCI X 2 GB /s FCA2404 Fibre Channel	8
AB466A	PCI-X 2 channel 2-GB / s Fibre Channel	6
AB467A	PCI-C 1 channel 2-GB /s Fibre Channel	8
AD167A	Emulex 4 GB	8
AD168A	Emulex 4 GB - DC	6
A9900A	PCI 2-port Windows / Linux 1000Base-TX	8
A9899A	PCI 2-port Windows / Linux 1000Base-SX	8
A7061A	PCI 1 port 1000Base-T	8
A7073A	PCI 1 port 1000Base-SX	8
A6869A	Obsidian USB/VGA PCI card	1
A6869B	Obsidian USB/VGA PCI card	1

- a. For Windows, each 337972-B21 external port supports a maximum of two (2) MSA 50s, attached in series.

Table 3-5 HP Integrity rx7620 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 ^a	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
AD144A	PCI 1-port 10GbE SR (133Mhz)	2
AD145A	PCI 4-port 1000Base-T	4

a. Not supported with AD145A 10 GbE adapter

Table 3-6 HP Integrity rx7620 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

Table 3-6 HP Integrity rx7620 Server - Open VMS Supported I/O Cards

Part Number	Card Description	Number of Cards Supported (B-Bootable)
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

HP Integrity rx7620 Servers implement manual release latch (MRL) hardware for use in online add or replacement (OLAR) operations. If an MRL is left open while the server is booting, HP-UX can incorrectly cache PCI slot power status causing OLAR operations to fail. To prevent this situation, ensure all the MRLs are closed before booting the server.

If OLAR reports that a slot is present and powered off, but no OLAR operations to turn power on to that slot have succeeded even after the MRL is closed, the MRL may have been left open during boot. To clear this condition, close the MRL for the PCI slot then power off the PCI slot using the `rad -o` command. This will allow future OLAR operations to succeed on this PCI slot.

IMPORTANT The installation process varies depending on what method for installing the PCI card is selected. PCI I/O card installation procedures should be downloaded from the <http://docs.hp.com> Web site. 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:

- 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 in the **ON** state use the olrad command or the pdweb tool to power the slot **OFF**.
- The yellow attention LED is steady **OFF** or is blinking if a user has requested the slot location.
- Refer to the host bus adapter (HBA) documentation for details on card installation.
- Run the olrad -q command to determine the status of all the PCI I/O slots.
- Obtain a copy of the interface card guide for instructions on preparing the operating system for the online addition of the PCI I/O card before attempting to insert a PCI I/O card into the PCI-X card cage assembly backplane slot.

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

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.

Step 1. Remove the top cover.

Step 2. Remove the PCI bulkhead filler panel.

Step 3. Flip the PCI manual retention latch (MRL) for the card slot to the open position. Refer to Figure 3-8.

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

NOTE A slow, firm pressure is needed to properly seat the card into the backplane.

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

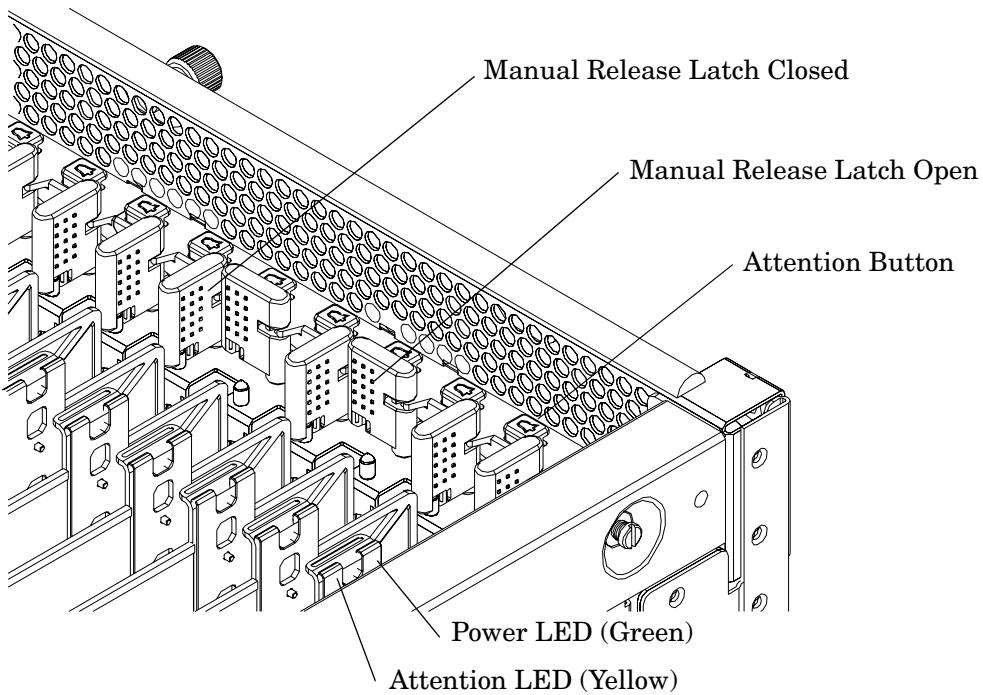
CAUTION Working out of sequence or not completing the actions within each step could cause the system to crash.

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

Step 6. Press the attention button.

The green power LED will start to blink.

Figure 3-8PCI I/O Slot Details



Step 7. Wait for the green power LED to stop blinking.

Step 8. Check for errors in the hotplug 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. Refer to the Interface Card OL* Support Guide located on the Web at <http://docs.hp.com> for details.

Step 9. Replace the top cover.

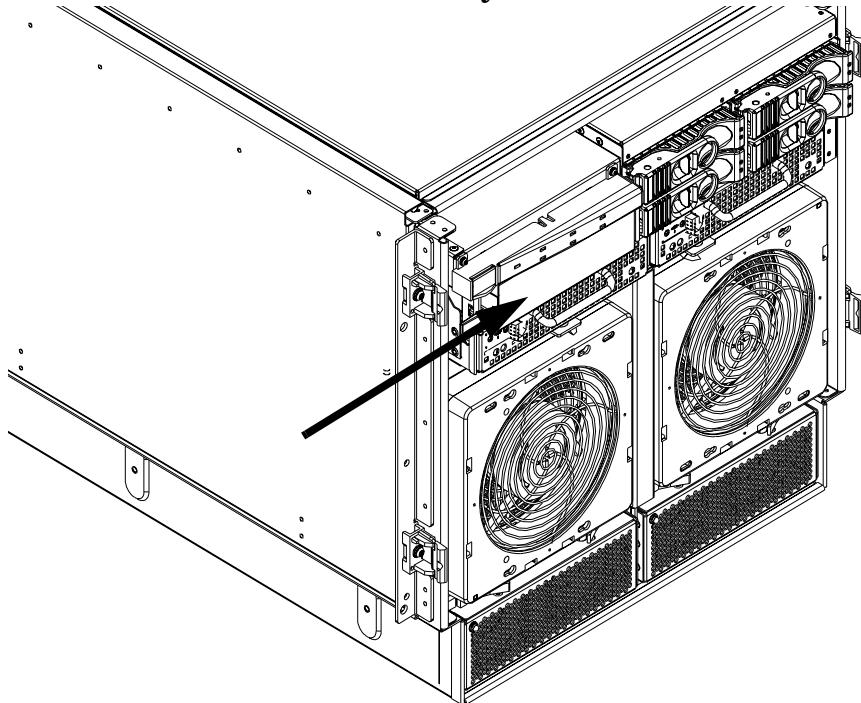
Step 10. Connect all cables to the installed PCI card.

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. See “Shutting Down nPartitions and Powering Off Hardware Components” on page 125. Follow the procedures below to install the DVD+RW drive.

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

Figure 3-9 Removable Media Bay Location



- Step 1.** Remove the front bezel and top cover. See “Removing and Replacing the Front Bezel” on page 128 and See “Removing and Replacing the Top Cover” on page 129 in the Remove and Replace Procedures.
- Step 2.** Remove the drive bay blank or removable media drive.
- Step 3.** Verify that the SCSI and power cables have the appropriate service length required.

IMPORTANT For the DVD+RW installation, the SCSI cable length must equal 1.5 inches, +/- 0.25 in. The power cable length must equal 3.5 inches, +/- 0.25 in.

Figure 3-10 SCSI cable length

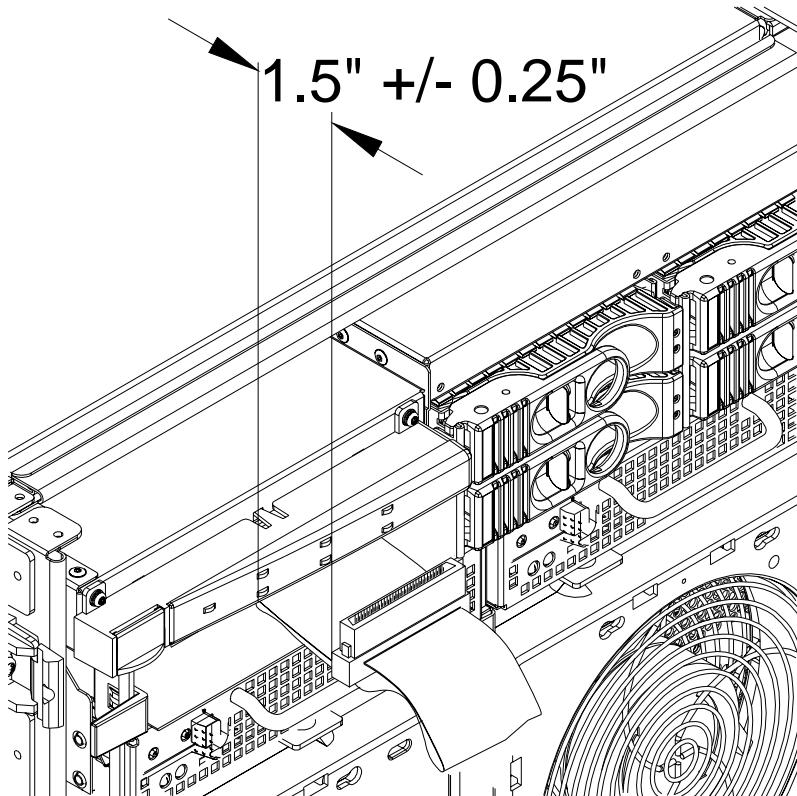
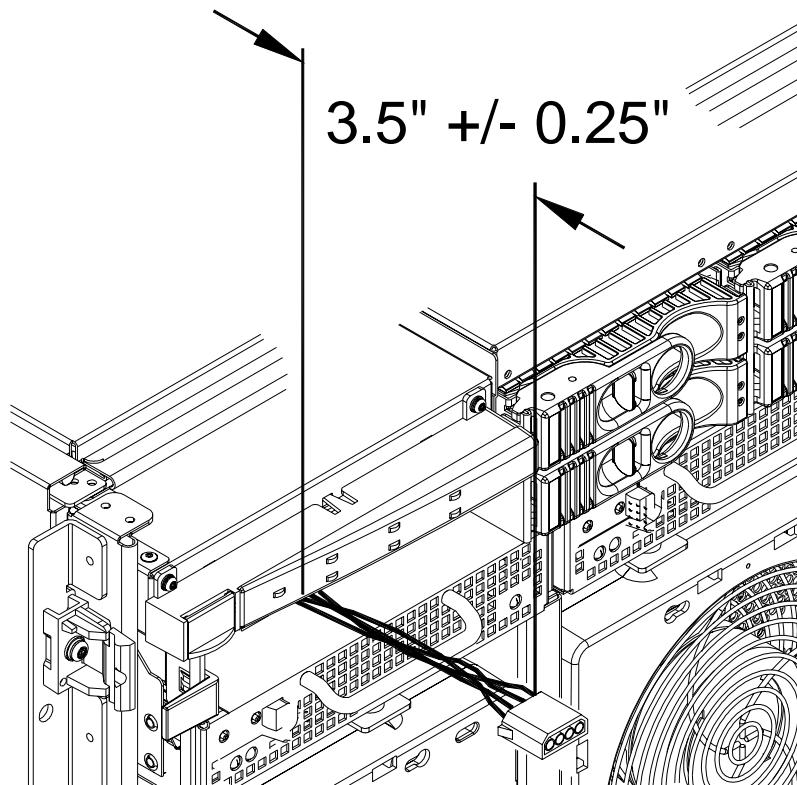


Figure 3-11 Power cable length



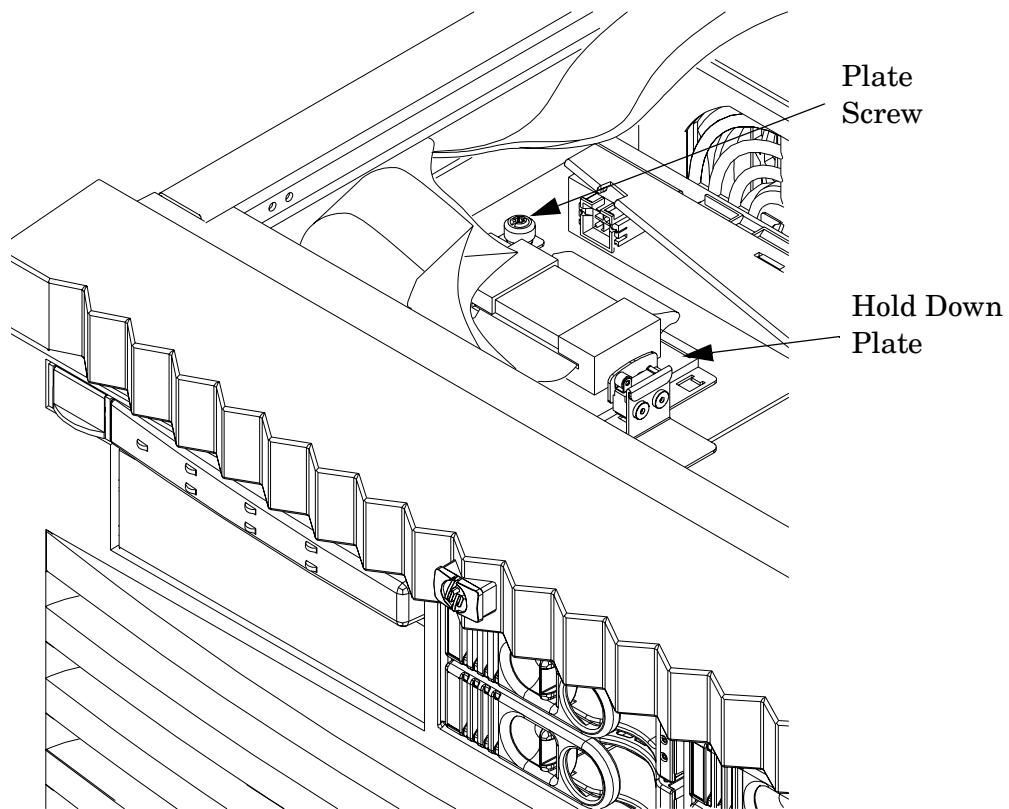
Step 4. Disconnect the three SCSI cables from the Mass Storage Backplane (MSBP). Drape the disconnected cables over to the side of the chassis.

If the removable media bay power cable and the corresponding SCSI cable are taped together, separate the cables.

Step 5. Disconnect the four-pin power connector from the MSBP.

Step 6. Loosen the screw on the hold-down plate to adjust the length of the cable.

Figure 3-12 Hold-down plate and screw



Step 7. Slide the hold-down plate toward the rear of the chassis until the tabs disengage. Do not move the plate further than necessary to disengage the tabs.

Step 8. Adjust the length of the SCSI and power cables to the appropriate service length described in Step 3.

Step 9. Pull any excess cable length into the main chassis, and store it between the MSBP and the SCSI Ferrite.

Step 10. Replace the hold-down plate by pushing down, while sliding it toward the front of the chassis.

Step 11. Engage the tabs into the slots. Verify that all the tabs are captured in their slots.

Step 12. Remove the DVD+RW drive from package.

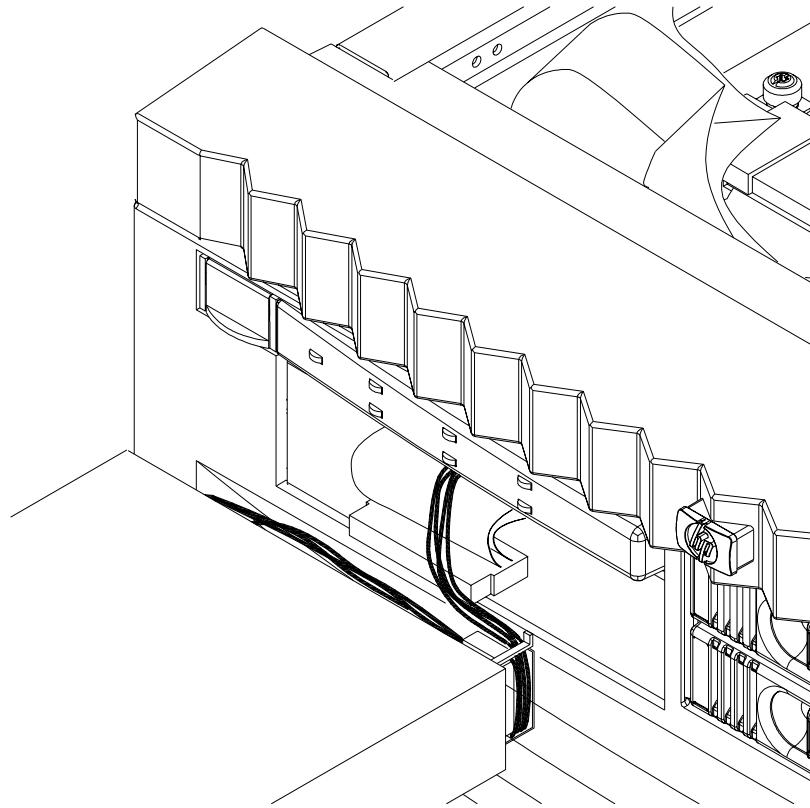
Step 13. Install the side rails onto the drive.

Step 14. 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.

Step 15. Route the removable media bay power cable into the ruggedizer cable clip.

- Step 16.** Connect the SCSI cable to the DVD+RW drive. Ensure that the power cable passes over the top of the SCSI cable.

Figure 3-13 SCSI and Power cable routing



- Step 17.** Slide the DVD+RW drive and cable into the removable media drive bay. Push the drive until it is fully seated in the bay.
- Step 18.** Replace the front bezel and top cover. See “Replacing the Front Bezel” and Replacing the Top Cover” in the Remove and Replace Procedures.
- Step 19.** Power on the server.
- Step 20.** Boot the operating system. See “Powering On the System” in the Remove and Replace Procedures.
- Step 21.** Install the appropriate device drivers. Use the installation instructions that come packaged with the drive to install device drivers.

4 Cable Connections

This chapter describes cable connections within the server.

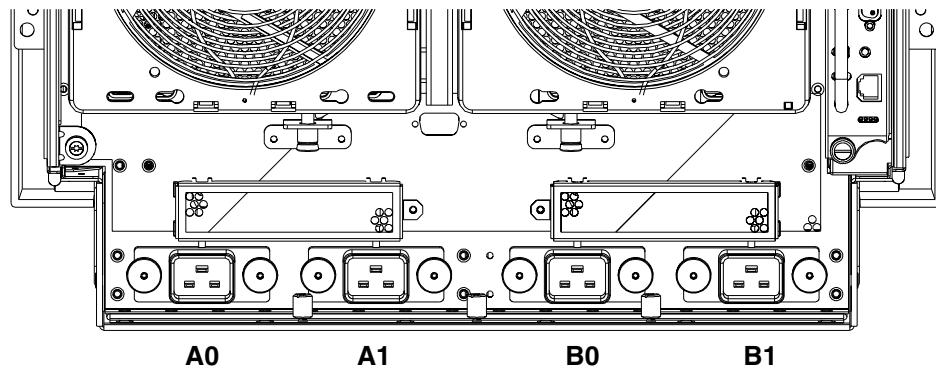
AC Input Power

The server has five line cord configurations:

- All four line cords (preferred configuration)
- Cords A0 and A1 only
- Cords B0 and B1 only
- Cords A0 and B0 only
- Cords A1 and B1 only

A single-line-cord configuration is not allowed.

Figure 4-1 Power Cord Configuration

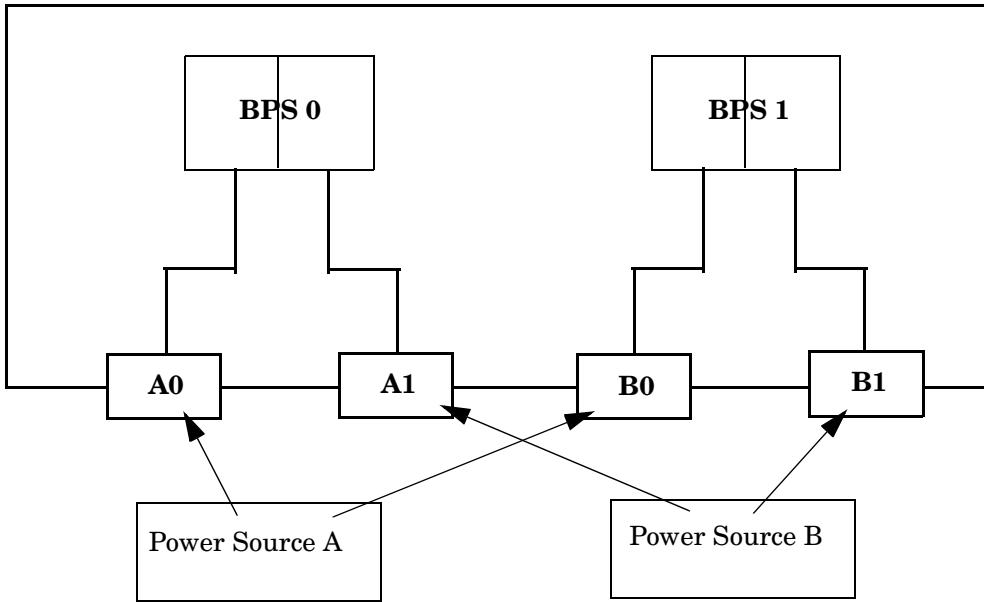


The power cord configuration is passed to the operating system using the pwrgrd (Power Grid) command. Each of the five selections in the pwrgrd command matches one of the configurations. The appropriate option should be selected for the actual line cord configuration. With the correct configuration selected, the LEDs should be green. When the pwrgrd command is invoked, the following menu is displayed.

```
prompt> pwrgrd
Power grid configuration preference.
1. Grid A only (Cords A0,B0 required)
2. Grid B only (Cords A1,B1 required)
3. Grids A & B (Cords A0,A1,B0,B1 required)
4. Cords A0 & B0 only
5. Cords A1 & B1 only
Select Option:
```

If two separate power sources are available, the two power supplies can be plugged into the separate power sources, increasing system reliability should one power source fail.

Figure 4-2 Power Source vs. Power Distribution



*180-269 VAC

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

NOTE System firmware will prevent boot when a single power cord configuration is detected.

DC Input Power

The HP Integrity rx7620 Server has two fast hot-pluggable DC bulk power supplies that provide 2N redundancy.

The power configuration is passed to the operating system using the pwrgrd (Power Grid) command. Each of the four selections in the pwrgrd command matches one of the configurations. The appropriate option should be selected for the actual line cord configuration. With the correct configuration selected, the LEDs should be green. When the pwrgrd command is invoked, the following menu is displayed.

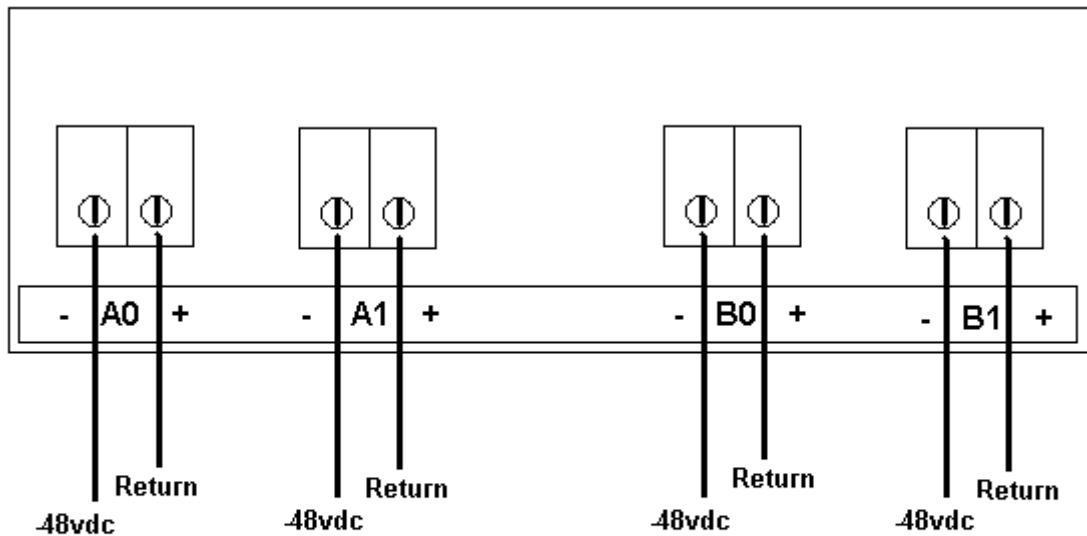
IMPORTANT Options 1 and 2 are for HP internal use only. Do not select these options.

```
prompt> pwrgrd
Power grid configuration preference.
1. Grid A only (Cords A0,A1 required)
2. Grid B only (Cords B0,B1 required)
3. Grids A & B (Cords A0,A1,B0,B1 required)
4. Cords A0 & B0 only
5. Cords A1 & B1 only
Select Option:
```

If two separate power sources are available, the two power supplies can be plugged into the separate power sources, increasing system reliability.

Below is an illustration of the input power wiring.

Figure 4-3 HP Integrity rx7620 Server - DC Power Input



Connect -48vdc to the "-" terminals.

Connect Return to the "+" terminals.

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

NOTE System firmware will prevent booting when a single power cord configuration is detected.

AC Voltage Check

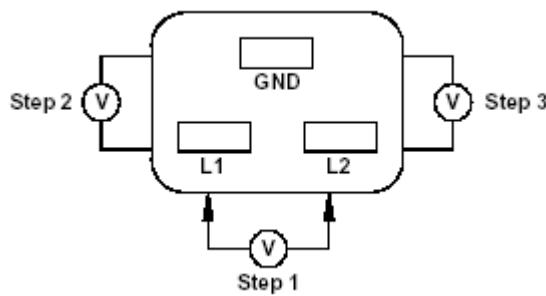
This section provides voltage check information for use on the customer site. The emphasis focuses on measuring the voltages at the power cord plug end specified as an IEC 320 C19 type plug. This end plugs directly into the back of the HP Integrity rx7620 Server chassis.

NOTE These procedures must be performed for each power cord that will be plugged directly into the back of the HP Integrity rx7620 Server. If the expected results from this procedure are not observed during the voltage check, refer to the next section titled “Voltage Check (Additional Procedure).”

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. Refer to Figure 4-4 for voltage reference points when performing the following measurements.

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



IMPORTANT These measurements must be performed for every power cord that plugs into the HP Integrity rx7620 Server.

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

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

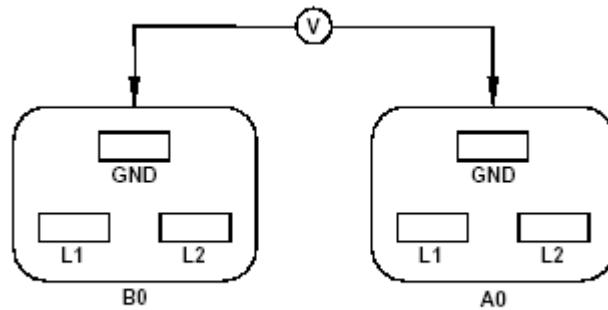
Table 4-1 Single Phase Voltage Examples

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

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

Safety Ground Verification

This measures the voltage level between B0 and A0. The measurement is taken between ground pins of the two power cords. Refer to Figure 4-5 for ground reference points when performing this measurement.

Figure 4-5 Safety Ground Reference Check

- Step 1.** Measure the voltage between B0 and A0. Take the AC voltage down to the lowest scale on the voltmeter.
- Step 2.** Insert one probe into the ground pin for B0.
- Step 3.** Insert the other probe into the ground pin for A0.
- Step 4.** Verify that the measurement is between 0–5V AC. If the measurement is 5V or greater, escalate the situation. Do not attempt to plug the power cords into the HP Integrity rx7620 Server.

AC Voltage Check (Additional Procedure)

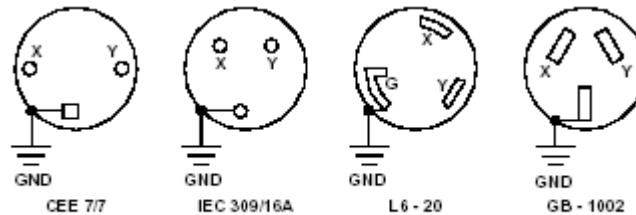
The voltage check ensures that all phases (and neutral, for international systems) are connected correctly to the cabinet and that the AC input voltage is within limits.

This procedure must be performed 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 to connect the server and to check the UPS output voltage. UPS User Manual documentation is shipped with the UPS. Documentation may also be found at <http://www.hp.com/racksolutions>

- Step 1.** Verify that site power is **OFF**.
- Step 2.** Open the site circuit breakers.
- Step 3.** Verify that the receptacle ground connector is connected to ground. Refer to Figure 4-6 for connector details.
- Step 4.** Set the site power circuit breaker to **ON**.

Figure 4-6 Wall Receptacle Pinouts



WARNING There is a risk of shock hazard while testing primary power. Use properly insulated probes.

- Step 5.** Verify that the voltage between receptacle pins x and y is between 200 and 240V AC.
- Step 6.** Set the site power circuit breaker to **OFF**.
- Step 7.** Ensure that power is removed from the server.
- Step 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 may result in injury to personnel or damage to equipment when AC power is applied to the cabinet.**

Step 9. Set the site power circuit breaker to **ON**.

Step 10. Set the server power to **ON**.

Step 11. Check that the indicator light on each power supply is lit.

MP Core I/O Connections

Each HP Integrity rx7620 Server can have up to two MP Core I/O board sets installed. This allows for two partitions to be operating, or allows MP Core I/O redundancy in a single partition configuration. Each MP Core I/O board set consists of two boards: the MP/SCSI board and the LAN/SCSI board. The MP/SCSI board is oriented vertically and accessed from the back of the server. The LAN/SCSI is accessed from the PCI expansion card bay. Only the primary MP core I/O board set (MP/SCSI slot 1 and LAN/SCSI slot 8, chassis 1) is required for a single partition implementation. The secondary MP/SCSI board is not necessary for full operation; however, without the secondary MP/SCSI board, only two internal disks can be accessed.

MP/SCSI Connections

The MP/SCSI board is required to update firmware, access the console, turn partition power on/off, access all but two of the internal peripherals, and utilize other features of the system.

Connections to the MP/SCSI board include the following:

- DB25 Connector, by way of the M cable

This RS232 connector provides connections for a local console, external modem, and a UPS. The server end of the M cable terminates in a DB25 connector. The opposite side of the cable terminates in three DB9 connectors labeled CONSOLE, UPS, and REMOTE.

- 10/100 Base-T LAN RJ45 connector (for LAN and Web Console access)

This LAN uses standby power and is active when AC is present and the front panel power switch is off.

- Internal LVD Ultra 160 SCSI channel for connections to internal mass storage

- Internal SE Ultra SCSI channel for connection to an internal removable media device.

LAN/SCSI Connections

The LAN/SCSI board is a PCI form factor card that provides the basic external I/O connectivity for the system.

Connections to the LAN/SCSI board include the following:

- PCI-X to PCI-X bridge for multi-device compatibility
- Internal LVD Ultra 160 SCSI channel for connections to internal mass storage
- External LVD Ultra 160 SCSI channel connected to a 68-pin VHDCI connector
- 10/100/1000 Base-T LAN RJ45 connector.

The primary LAN interface is located on the LAN/SCSI board installed in the rightmost slot when viewing the system from the back.

Management Processor Access

NOTE	To access the Management Processor for the initial installation, the M cable must first be connected to the DB25 connector located on the primary MP/SCSI board. The primary MP/SCSI board is located in the lower MP/SCSI board slot.
-------------	--

[Cable Connections](#)

[MP Core I/O Connections](#)

Setting Up the Customer Engineer Tool (PC)

The Customer Engineer (CE) Tool is usually a laptop. It allows communication with the Management Processor (MP) in the HP Integrity rx7620 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 MP 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
- na (Receive)
- na (Transmit)

If the CE Tool is a laptop using Reflection, ensure communications settings are in place, using the following procedure:

1. From the Reflection 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. Click **OK** to close the More Settings window.
5. Click **OK** to close the Connection Setup window.
 6. Pull down the **Setup** menu and select **Terminal** (under the **Emulation** tab).
 7. Select any terminal type VT100.
 8. Click **Apply**.

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

9. Click **OK**.

Connecting the CE Tool to the Local RS232 Port on the MP

This connection allows 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.

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

1. Connect one end of a null modem cable (9-pin to 9-pin) (Part Number 5182-4794) to the M cable connector labeled CONSOLE.
2. Connect the other end of the RS-232 cable to the CE Tool.

Standby Power and Logging in to the MP

After connecting the serial device, it is possible to log in to the Management Processor (MP). Housekeeping power (also known as standby power) is generated as soon as AC power is applied to the server. Because the MP uses standby power, it is possible to log in to the MP even when the power switch is in the OFF position. The power switch is a DC power switch that controls +48V DC.

Before powering up the HP Integrity rx7620 Server for the first time:

1. Verify that the AC voltage at the input source is within specifications for each server being installed.
2. If not already done so, power on the serial display device.

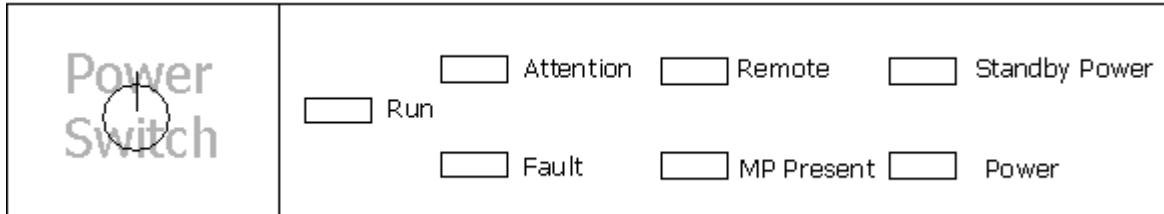
The preferred tool is the CE tool running Reflection.

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

1. Connect the server to AC power.

On the front of the HP Integrity rx7620 Server, a solid green **Standby Power** LED, a solid green **MP Present** LED, and a flashing amber **Attention** LED will illuminate after about 30 seconds.

Figure 4-7 Front Panel Display



2. Check the bulk power supply LED for each BPS.

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

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

Refer to power cord policies to interpret LED indicators.

3. Log in to the MP:

- a. Enter **Admin** at the login prompt. The login is case sensitive.

It takes a few moments for the MP prompt to display. If it does not, be sure the laptop serial device settings are correct: 8 bits, no parity, 9600 baud, and na for both Receive and Transmit. Then, try again.

- b. Enter **Admin** at the password prompt. The password is case sensitive.

The MP Main Menu is displayed:

Figure 4-8 MP Main Menu

```
MP login: Admin
MP password:

Welcome to the
rx7620 Management Processor
(c) Copyright 1995-2003 Hewlett-Packard Co., All Rights Reserved.
Version A.5.011

MP MAIN MENU:
CO: Consoles
UFP: Virtual Front Panel <partition status>
CM: Command Menu
CL: Console Logs
SL: Show Event Logs
HE: Help
X: Exit Connection

MP>
```

Configuring LAN Information for the MP

To set the MP LAN IP address:

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

The default values are displayed, and a prompt, asking if default values are to be modified, is displayed. It is a good idea to write down the information, because it might 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**.

Enter **lc** and press the **Return** key. The following screen is displayed:

Figure 4-9 The lc Command Screen

```
MP:CM> LC

This command modifies the LAN parameters.

Current configuration of MP LAN interface
MAC address : 00:30:6e:05:09:24
IP address  : 15.99.83.215 (0x0f6353d7)
Hostname    : quartz-s
Subnet mask : 255.255.255.0      (0xfffffff0)
Gateway    : 15.99.83.254 (0x0f6353fe)
Status      : UP and RUNNING
AutoNegotiate : Enabled
Data Rate   : 100 Mb/s
Duplex     : Half
Error Count : 0
Last Error  : none

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

NOTE

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

2. At the prompt, *Do you want to modify the configuration for the customer LAN?*, enter **y**.

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

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

The customer must provide this address for network interface 0.

5. Confirm the new address.
6. Enter the MP Network name.

This is the host name for the customer LAN. The name can be as many as 64 characters in length, and include alphanumeric characters, - (dash), _ (under bar), . (period), or a space. HP recommends that the name be a derivative of the complex name. For example, Acme.com_MP.

7. Enter the LAN parameters for the *Subnet mask* and *Gateway address* fields.
- This information must come from the customer.
8. The system indicates the parameters have been updated and returns to the MP Command Menu prompt (MP:CM>).
 9. Enter the **ls** command at the MP Command Menu prompt (MP:CM>) to check the LAN parameters and status.

10. A screen similar to the following is displayed, allowing verification of the settings:

Figure 4-10 The ls Command Screen

```
MP:CM> LS

Current configuration of MP LAN interface
  MAC address : 00:30:6e:05:09:24
  IP address  : 15.99.83.215  (0x0f6353d7)
  Hostname    : quartz-s
  Subnet mask : 255.255.255.0      (0xfffffff0)
  Gateway     : 15.99.83.254  (0x0f6353fe)
  Status       : UP and RUNNING
  AutoNegotiate : Enabled
  Data Rate   : 100 Mb/s
  Duplex      : Half
  Error Count : 0
  Last Error  : none

MP:CM>
```

To return to the MP main menu, enter **ma**.

To exit the MP, enter **x** at the MP main menu.

Accessing the Management Processor via a Web Browser

Web browser access is an embedded feature of the MP. The Web browser allows 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
- Host name (this is used when messages are logged or printed)

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

- Step 1.** Connect to the MP using a serial connection.
- Step 2.** Configure the MP LAN. Refer to “Configuring LAN Information for the MP”.
- Step 3.** Type **CM** to enter the Command Menu.

Cable Connections

MP Core I/O Connections

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

Figure 4-11 Example sa Command

```
MP:CM> sa
This command displays and allows modification of access parameters.

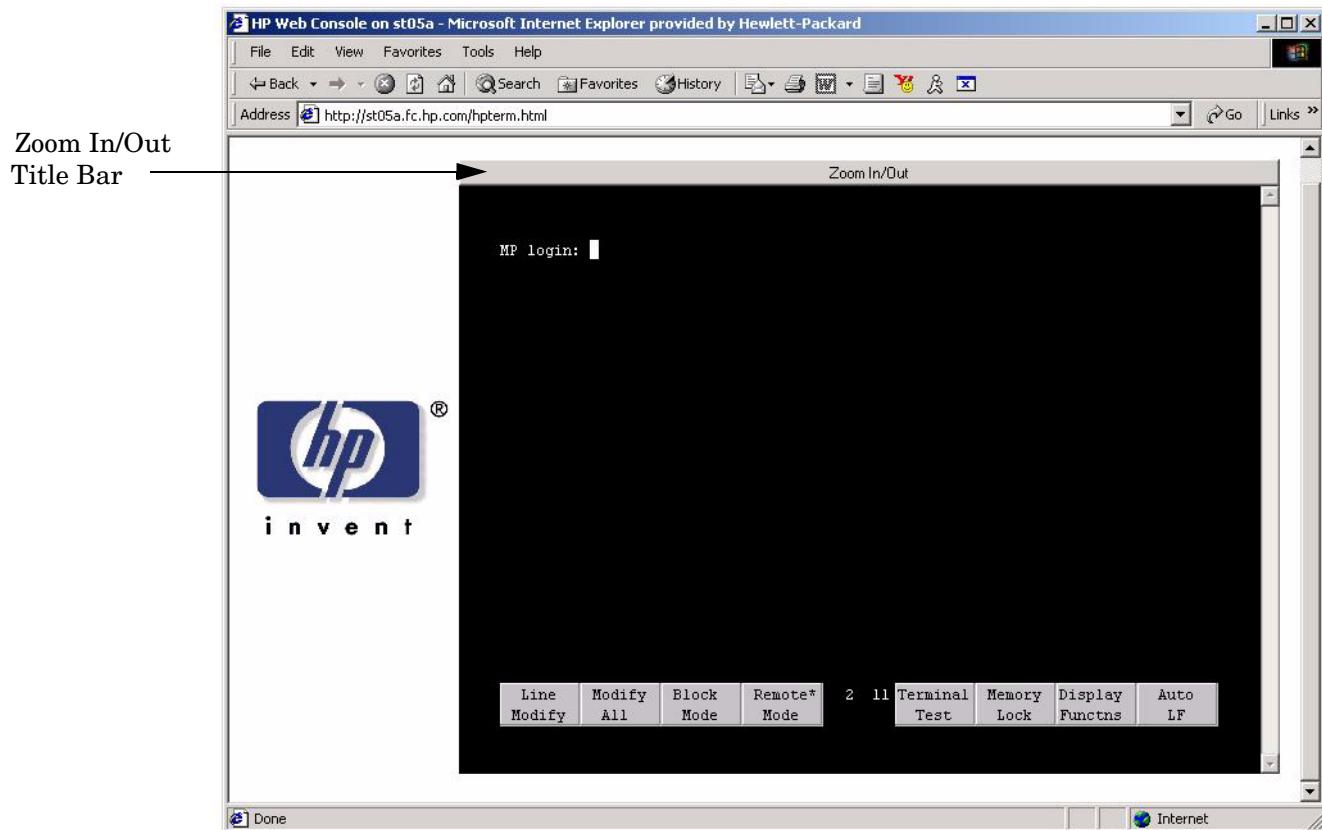
T - Telnet access      : Enabled.
M - Modem access       : Enabled.
W - Web Console         : Enabled (SSL NOT active).
N - Network Diagnostics : Disabled.
I - IPMI Lan access     : Disabled.

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:
```

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

Figure 4-12 Browser Window



Step 6. Click anywhere on the Zoom In/Out title bar to generate a full screen MP window.

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

Step 8. Login to the MP when the login window appears.

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

Verifying Presence of the Cell Boards

To perform this activity, either connect to the Management Processor (MP) using a 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 cabinet. It is important for the MP to detect the cell boards. If it does not, the partitions will not boot.

To determine if the MP detects the cell boards:

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

This displays the Command Menu. The Command Menu enables viewing or modifying the configuration and viewing the utilities controlled by the MP.

To view a list of the commands available, enter **he**. 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 is displayed:

Figure 4-13 The du Command Screen

```
MP:CM> du
The following MP bus devices were found:
+-----+-----+-----+-----+-----+
| Cab | MP  | LAN  | Sys  | IO   | | |
| #   | M   | SCSI | Bkpln| Cells| Chassis| BPS |
|     | S   | 0    | 1    | 0    | 0     | 1    |
+-----+-----+-----+-----+-----+
| 0  | *  | *  | *  | *  | *  | *  |
+-----+-----+-----+-----+-----+
MP:CM>
```

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

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

Figure 4-13 shows that cells are installed in slots 0 and 1. In the cabinet, cells should be physically located in slots 0 and 1.

System Console Selection

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

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

Step 1. Determine the console you want to use.

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

- System Serial Port
- Management Processor (MP) Serial Port
- VGA device

Step 2. Use the EFI menus and select the appropriate console device (deselect unused devices):

- a. Choose the “Boot option maintenance menu” choice from the main Boot Manager Menu.
- b. Select the Console Output, Input or Error devices menu item for the device type you are modifying:
 - “Select Active Console Output Devices”
 - “Select Active Console Input Devices”
 - “Select Active Console Error Devices”
- c. Available devices will be displayed for each menu selection. Figure 4-14 shows a typical output of selecting the Console Output Devices menu.

Figure 4-14 Console Output Device menu

EFI Boot Maintenance Manager ver 1.10 [14.61]

Select the Console Output Device(s)

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

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

VGA Consoles

Any device that has a Pci section in its path and does not have a Uart section will be a VGA device. If you require a VGA console, choose the device and unmark all others. Figure 4-14 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 rx7620 Server

After powering on the Management Processor (MP), +3.3 V Housekeeping power, and verifying that the MP detects the presence of the cell boards, power up the server.

If using a LAN crossover cable with the laptop, review server activity for each partition configured, while the server powers up and boots. Windows can be opened 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:

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:

1. Switch the power switch at the front of the server to **On**. 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. When activity on the Reflection screen stops, return to the MP Main Menu by entering **Ctrl-B**.
3. Enter **co** to enter console mode.
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 Management Processor (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. Exit the MP by entering **co** at the MP Main Menu.

Exiting the MP should automatically return to the Extensible Firmware Interface (EFI) shell menu.

Verifying the System Configuration using the EFI shell

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

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

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

Booting HP-UX Using the EFI Shell

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

Step 1. Type **cm** to enter the Command Menu from the Main Menu.

Step 2. MP:CM> **bo** (This command boots the selected partition.)

Select a partition to boot.

Step 3. Return to the Main Menu. MP:CM> **ma**

Step 4. From the Main Menu, go to the Consoles menu MP> **co**

Select partition number.

Step 5. Go back to the Main Menu by entering **ctrl+b**.

Step 6. Once at the EFI Shell prompt, select the file system to boot. Generally this is “fs0”.

Shell> **fso:**

Step 7. At the fs0 prompt, type HPUX to boot the HP-UX operating system.

fso:\> hpx

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.
-------------	---

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 allows you to comment on the current status of a procedure

COMPLETED The final check to ensure that a step has been completed and comments

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

Table 4-2 Factory-Integrated Installation Checklist

PROCEDURE	IN-PROCESS		COMPLETED	
	Initials	Comments	Initials	Comments
Obtain LAN information				
Verify site preparation				
Site grounding 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)				

Table 4-2 Factory-Integrated Installation Checklist (Continued) (Continued)

PROCEDURE		IN-PROCESS		COMPLETED	
Unpack other equipment					
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 (approximately 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)					

Table 4-2 Factory-Integrated Installation Checklist (Continued) (Continued)

PROCEDURE		IN-PROCESS		COMPLETED	
Select PCI card slot					
	Install PCI card				
	Verify installation				
Route cables using the cable management arm					
Install other peripherals (if required)					
Perform visual inspection and complete installation					
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					
Account for tools					
Dispose of parts and other items					
Make entry in Gold Book (recommended)					
Customer acceptance and signoff (if required)					

5 Troubleshooting

Common Installation Problems

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

CAUTION Replace the top cover before operating the server, even for a short time. Otherwise, overheating can damage chips, boards, and mass storage devices. However, you can safely remove the PCI access panel while the server is running to remove and replace PCI hot-plug boards. For any other service activity requiring access to the processor baseboard or I/O backplane, power down the server and observe all safety precautions.

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

To troubleshoot an installation problem, perform the following checks in the order given:

1. Check all cable and power connections, including those in the rack, etc.
2. Ensure the server is configured properly.

Check the Setup Utility. If the error is a network-related problem, determine if the server has enough memory and hard disk drive capacity.

3. Verify all cables and boards are securely plugged in to the appropriate connectors or slots.
4. Remove all extra options, such as disk drives, one at a time, checking the affect of each on the server.
5. Unplug the power cord, wait 20 seconds, plug-in the power cord and restart the server.
6. If a hardware error is suspected, follow these steps:
 - a. Log users off the LAN and power down the server.
 - b. Extend the server out of the rack and remove the top cover.
 - c. Simplify the server to the minimum configuration.

The minimum configuration consists of the following:

- One cell
- Two processors
- One quad of memory DIMMS (size 256 MB or larger)
- One MP/SCSI card
- One LAN/SCSI card
- System backplane
- PCI-X backplane
- One BPS
- Two PCI power modules
- Two power cords

7. Remove all third-party options and reinstall each one, one at a time, checking the server after each installation.
8. Replace the top cover and reconnect the power cord and other cables. Boot the server. If it does not function properly, refer to the procedures in the following section.

The Server Does Not Power On

Use these steps to check for power related problems:

1. Check each BPS LED.

The LED is located in the lower left hand corner of the power supply face. Table 5-3 shows the states of the LEDs.

A yellow LED indicates that the line cord connections are not consistent with the pwrgrd settings.

2. Verify that power is making it to the server and that the power lines are properly connected to the chassis.

The Server Powers On, Then Shuts Down with a Fault Light

Use this checklist to check for the following problems when the server powers on and then off:

1. Ensure that a conductive item has not been dropped or left inside the server chassis.
2. Check the connections on all boards.
3. Check the system backplane for bent pins.

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 in order for the MP to recognize that the cell board is powered up and functioning 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 will stay powered on. However, if the cell board is powered off, it will not power on again until the cell board is extracted, then reinserted and 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 will only be 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 5-1 for a sample of the output. If the state is “**RDY**” (all caps), it means that the “ready bit” is true. If the state is “**rdy**” (lower case) it means that the “ready bit” is false. The meaning of each of these states is listed below.

Figure 5-1 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 : 3.006 built FRI AUG 15 12:01:54 2003
MICE Revision : 1.0

PDHC state      : 0x3b <err bib SMG CCO cci I2C PWR>
Attention Led is off
Power Status : 0x7c <12VSTBY(RDY)EN PWR vflt tflt fanflt>          Ready Bit
                                                               (RDY) is
                                                               set to true
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          : 0x81 <cabinet=0, cell=1, Valid>

Temp Fault Status : 0x00 <cpu0 cpu1 cpu2 cpu3 mmu cell>
CPU 0 Temp          : 47 deg C
CPU 1 Temp          : 0 deg C
CPU 2 Temp          : 59 deg C
CPU 3 Temp          : 0 deg C
MMU Temp            : 30 deg C
Cell Board Temp     : 28 deg C

Fan Status          : 0x00cc <See PS command for detail>
Local I2C Bus Status : 0x00 <OK>

MP:CM>
```

Table 5-1 Ready Bit States

Ready Bit State	MP:>CM DE command status	Meaning
True	“RDY” (upper case)	All cell VRMs installed, and both cell latches are locked.
False	“rdy” (lower case)	One or more VRMs not installed or failed, and/or one or more cell latches not locked.

HP Integrity rx7620 Server LED Indicators

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

Front Panel LEDs

There are seven LEDs located on the front panel.

Figure 5-2 **Front Panel with LED Indicators**



Table 5-2 **Front Panel LEDs**

LED	Driven By	State	Description
Power	GPM ^a	On Green	48V Good (LED works even if MP is not installed, or installed and not active)
		Off	48V Off
Standby Power	GPM	On Green	3.3V standby good (LED works even if MP is not installed, or installed and is not active)
		Off	3.3V Off
MP ^b 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 via 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 via GPM	Flash Yellow	Chassis log alert unread
		Off	No alert, or MP not installed, or MP installed and not active
Run	PDC ^c /MP via 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 via 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

- a. GPM stands for global power monitor
- b. MP stands for manageability processor
- c. PDC stands for processor dependent code

Bulk Power Supply LEDs

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

Figure 5-3 BPS LED Locations

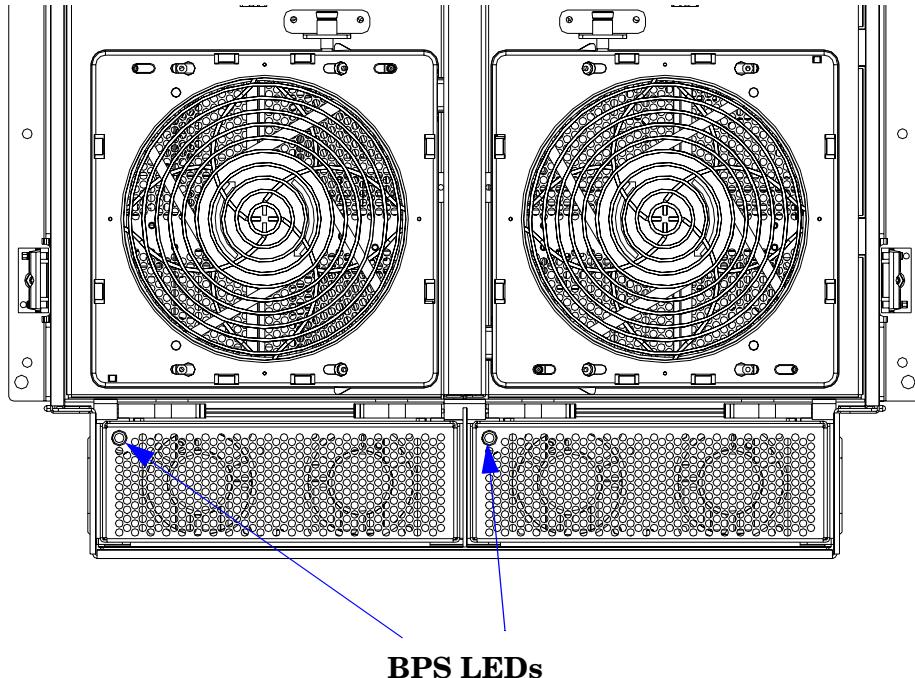


Table 5-3 BPS LEDs

LED Indication	Description
Blinking Green	BPS is in standby state with no faults or warnings
Green	BPS is in run state (48 volt output enabled) with no faults or warnings
Blinking Yellow	BPS is in standby or run state with warning(s) present but no faults
Yellow	BPS is in standby state with recoverable fault(s) present but no non-recoverable faults
Blinking RED	BPS state might be unknown, non-recoverable fault(s) present
Red	Not Used

Table 5-3 BPS LEDs (Continued)

LED Indication	Description
Off	BPS fault or failure, no power cords installed or no power to the chassis

PCI-X Power Supply LEDs

There are three LEDs on the PCI-X power supply. Green and yellow LEDs follow OL* operation. A multi-color LED reports warnings and faults.

Figure 5-4 PCI-X Power Supply LED Locations

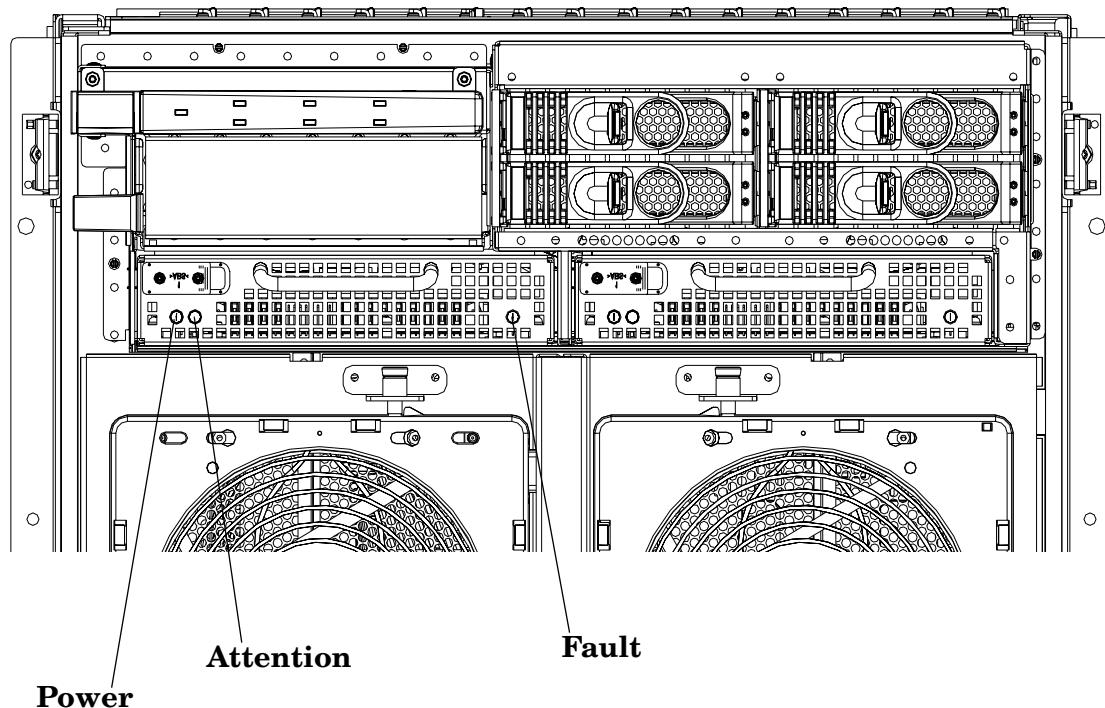


Table 5-4 PCI-X Power Supply LEDs

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 ^a	Yellow	See Table 5-9 for LED status in combination with the green power LED for PCI-X slot 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 due to an over temperature condition, a failure to regulate the power within expected limits, or a current-limit condition.
		Off	Normal operation.

a. LPM stands for local power monitor

System and PCI I/O Fan LEDs

There is a single three-color LED on each system and PCI I/O fan.

Figure 5-5 Front, Rear and PCI I/O Fan LEDs

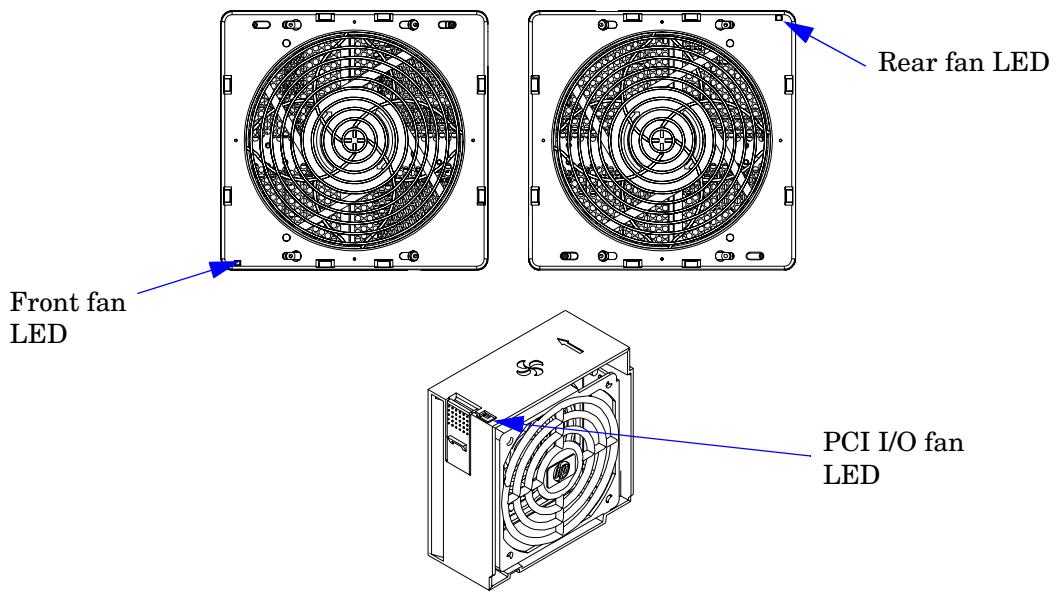


Table 5-5 System and PCI I/O Fan LEDs

LED	Driven By	State	Description
Fan Status	Fan	On Green	Normal
		Flashing Yellow	Predictive failure
		Flashing 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 that indicates when it is safe to remove the cell board from the server. When the LED is flashing yellow, it is safe to remove the cell board from the server.

Figure 5-6 Cell Board LED Locations

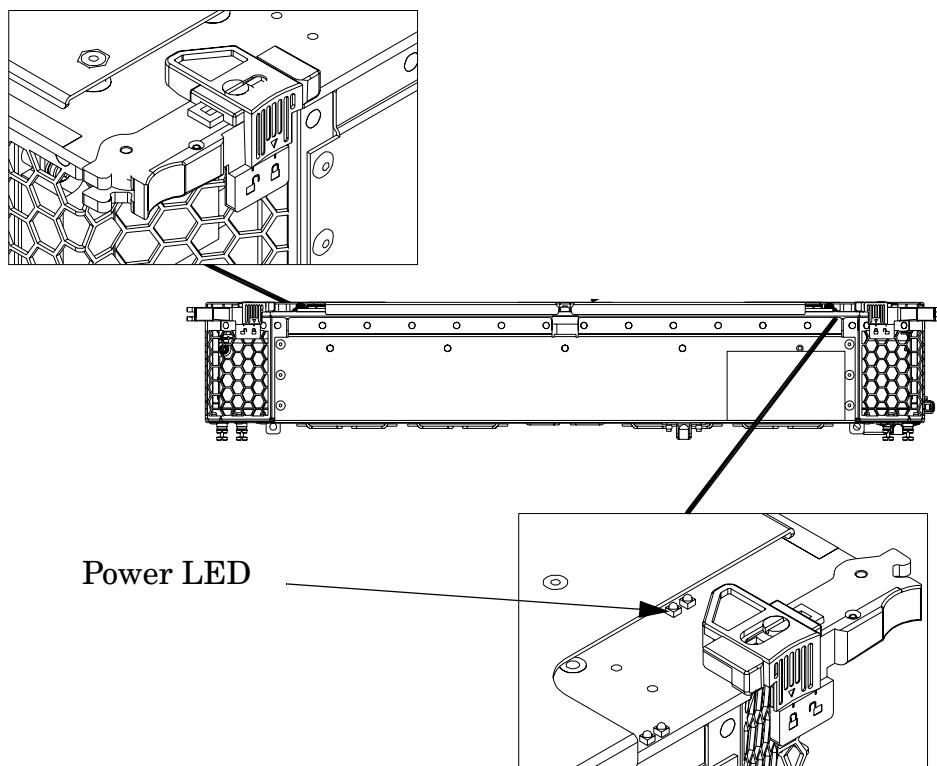


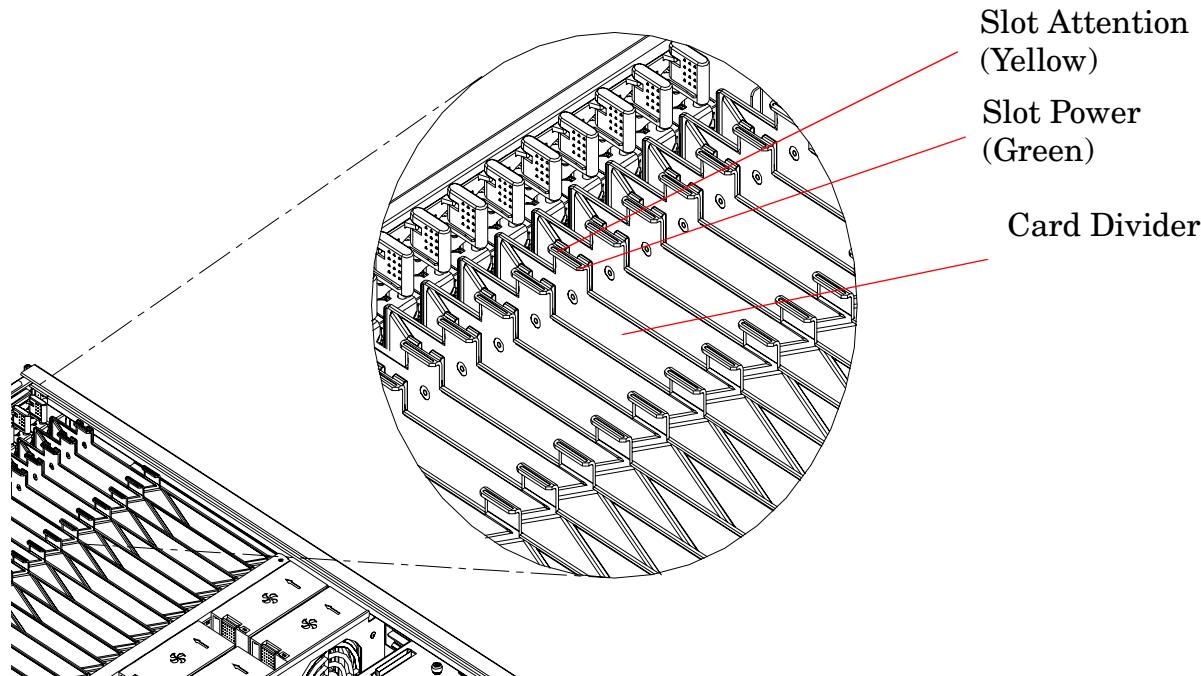
Table 5-6 Cell Board OL* LED Indicators

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

PCI-X OL* Card Divider LEDs

The PCI-X OL* card LEDs are located on each of the 16 PCI-X 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 5-9.

Figure 5-7 **PCI-X OL* LED Locations**



Core I/O LEDs

The core I/O LEDs in Table 5-7 on page 109 are located on the bulkhead of the installed core I/O PCA.

Figure 5-8 Core I/O Card Bulkhead LEDs

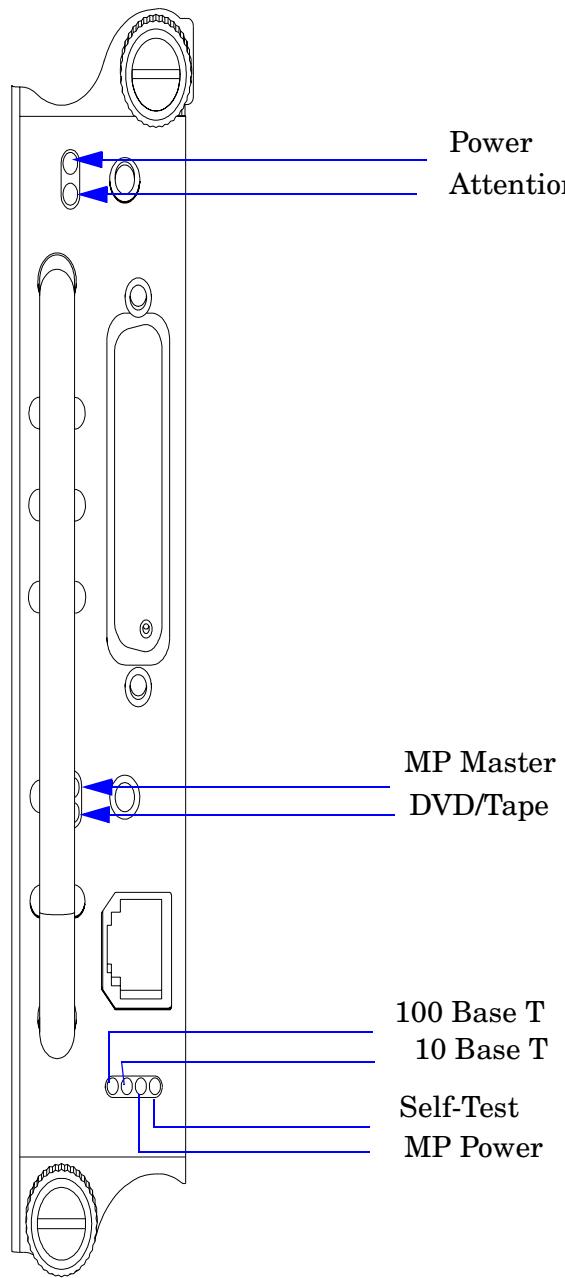


Table 5-7 Core I/O LEDs

LED (as silk-screened on the bulkhead)	State	Description
Power	On Green	I/O power on
Attention	On Yellow	PCI attention
MP Master	On Green	Core I/O is managing the system
DVD/Tape	On Green	Core I/O is managing the DVD/Tape
Self-Test	On Yellow	Failure during POST
MP LAN Act	On Green	MP LAN activity
MP LAN 10 BT	On Green	MP LAN in 10 BT mode
MP LAN 100 BT	On Green	MP LAN in 100 BT mode

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 5-9 Core I/O Button Locations

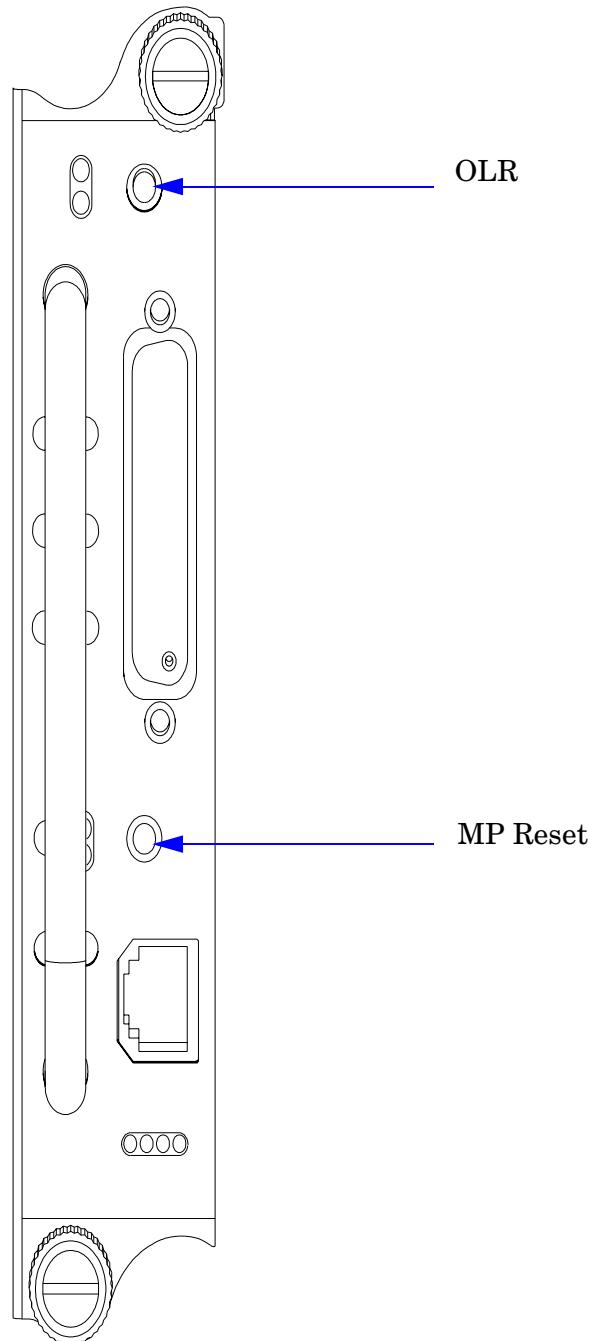


Table 5-8 Core I/O Buttons

Button Identification (as silk-screened on the bulkhead)	Location	Function
MP RESET	Center of the core I/O card	<p>Resets the MP</p> <p>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.</p> <p>LAN Default Parameters</p> <ul style="list-style-type: none"> IP Address—192.168.1.1 Subnet mask—255.255.255.0 Default gateway—192.168.1.1 Hostname—gsp0 <p>RS-232 (Serial Port) Default Parameters</p> <ul style="list-style-type: none"> 9600 baud 8 bits No parity <p>Remote/Modem Port Parameters</p> <ul style="list-style-type: none"> Disabled
OLR (Symbol next to button is shown below) 	Top end of the core I/O card	<p>Request OL* for this core I/O slot</p> <p>NOTE: The OLR function is not enabled for the core I/O card.</p>

PCI-X Hot-Plug LED OL* LEDs

Table 5-9 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

Table 5-9 OL* LED States (Continued)

State	Power (Green)	Attention (Yellow)
Ready for OL*, slot power off	Off	Flashing
Fault detected, slot power off	Off	On
Slot powering down or up	Flashing	Off

Disk Drive LEDs

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

Figure 5-10 Disk Drive LED Location

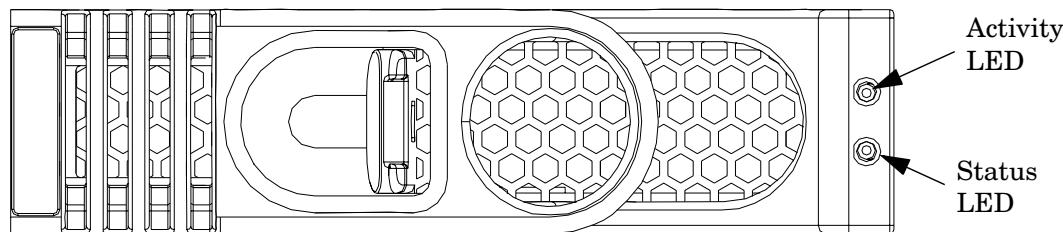


Table 5-10 Disk Drive LEDs

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 rx7620 Server 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.

The MP communicates with the server subsystems, sensors, and 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 management processor 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 will also contain 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 will be disabled.

For high availability (HA), the server powers up and powers down 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 might not boot, since the MP provides the console getty.

The server configuration cannot 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:

Step 1. 1. Enter **Admin** (case sensitive) and press < **enter** > < **ctrl + enter** > keys.

Step 2. A new Login prompt is created.

Step 3. Re-enter **Admin** < **ctrl + enter** > to move on to the Password prompt.

Step 4. Enter **Admin** < **ctrl + enter** > to reach the Main Menu.

Afterwards, the ^M will not return when the **enter** key is pressed. The issue will return 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 allows the console and session terminals to be connected over RS-232, a modem, or a LAN connection (Web console).

Service Access

Service access allows 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

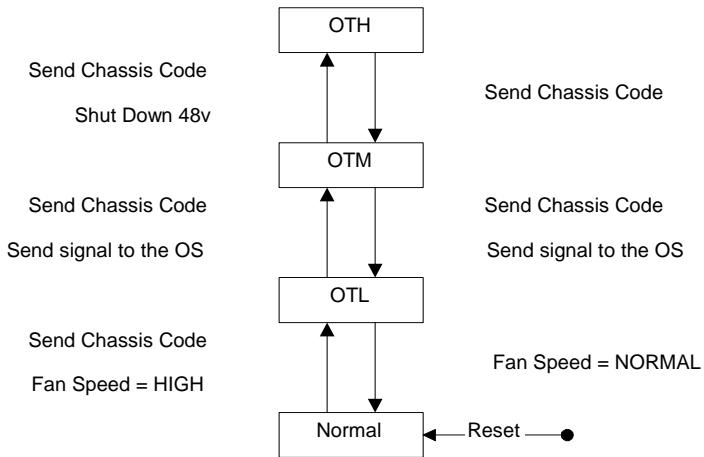
Server Management Behavior

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 5-11 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 5-11 Temperature States



On large temperature swings, the server will transition through all states in order. It might go to the following state immediately, but each of the preceding actions will occur. If the temperature reaches the highest range, the server will be 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 in Figure 5-11, the fan behavior is related to the temperature state. The fans will be set to high speed when the ambient temperature is anywhere above the normal operating range. The front and rear fans will be 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 two front fans, two 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 will be 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 will adjust the fan speeds for sea-level operation.

NOTE	Fans driven to a high RPM in dense air cannot maintain expected RPM and will be 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 5-11 lists the server management commands.

Table 5-11 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 5-12 lists the server status commands

Table 5-12 Status Commands

Command	Description
CP	Display partition cell assignments
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 5-13 lists the server system and access configuration commands

Table 5-13 System and Access Configuration Commands

Command	Description
CA	Configure Asynchronous and Modem parameters
CC	Initiate a Complex Configuration

Table 5-13 System and Access Configuration Commands (Continued)

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
PARPERM	Enable/Disable Interpartition Security
PD	Modify default Partition for this login session
PWRGRD	Allows user to configure the power grid
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

6 Removing and Replacing Components

This chapter describes how to shut down nPartitions, power off the server and remove and replace hardware components in the server.

HP Integrity rx7620 Server Customer Replaceable Units (CRUs)

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

Hot-plug CRUs

A CRU is defined as hot-plug if it can be removed from the chassis while the system remains operational but requires software intervention prior to removing the CRU.

The following CRUs are hot-plug:

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

Hot-swap CRUs

A CRU is hot-swap if it can be removed from the chassis while the server remains operational and requires no software intervention prior to removing the CRU.

The following list identifies the hot-swap CRUs in the HP Integrity rx7620 Server.

- Removing and Replacing a Front Smart Fan Assembly
- Removing and Replacing a Rear Smart Fan Assembly
- Removing and Replacing a PCI Smart Fan Assembly
- Removing and Replacing a Bulk Power Supply

Other CRUs

To remove and replace the CRUs that are neither hot-plug nor hot-swap, HP-UX must be shut down in the nPartition where the CRU resides, and power to the CRU must be turned off before removing it. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” on page 125 and Appendix D “Operating System Boot and Shutdown” for complete instructions.

These CRUs include:

- Removing and Replacing a CD/DVD/DAT Drive
- Removing and Replacing PCA Front Panel Board

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's 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 these 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

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.

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.

Take these 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 can not 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.

Removing and Replacing Components
Safety and Environmental Considerations

- 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.

Shutting Down nPartitions and Powering Off Hardware Components

When you remove and replace hardware, you may need to shut down one or more nPartitions on the server. In some cases, you will also need to power off hardware components as part of the remove and replace procedure.

This section gives details on how to ensure that the nPartition is properly shut down, and it also describes how to power off and on hardware components.

Shutting Down an nPartition

This procedure is for checking an nPartition's boot status and, if needed, shutting down HP-UX on the nPartition.

Step 1. Advise the customer that the system (one or more nPartitions) must be shut down for repairs.

Ensure that the customer has a current backup and inform the customer of the anticipated downtime.

Step 2. Log in to the server's service processor (MP).

Step 3. Use the Virtual Front Panel (VFP) to view the current state of the nPartition to be shut down.

From the MP Main menu, enter **VFP** to access the Virtual Front Panel menu, and select the nPartition whose boot state you want to view.

Enter **Control-b (^B)** to exit the VFP display.

- If an nPartition has booted HP-UX or if it is in the process of launching HP-UX, you must shut down HP-UX on the nPartition.

When HP-UX is running on an nPartition, its VFP displays "HP-UX heartbeat" with a blinking asterisk (*) to indicate its interactivity.

In this case, proceed with the next step.

- If the nPartition is at its Boot Console Handler (BCH) interface, then HP-UX has already been shut down.
- If the nPartition currently is booting, then you should wait for it to reach the BCH interface and, if necessary, interrupt auto-boot when you see the "Attempting to boot" and "To discontinue, press any key within 10 seconds" messages.
- If the nPartition is at the BCH menu interface, then HP-UX is shut down. Otherwise, proceed with the next step to shut down HP-UX.

Step 4. From the MP Main menu, enter **co** and select the console for the nPartition you plan to shut down.

You should have access to the HP-UX login prompt (or command line) when using the nPartition's console. If you have no interactivity at the console, HP-UX might be halted or hung.

Step 5. At the nPartition's console, log in to HP-UX and shut down the operating system.

After making arrangements with the customer, issue the **shutdown** command to shut down and halt HP-UX on the nPartition.

For example, the **shutdown -h 240** command will shut down and halt HP-UX on the nPartition after waiting for a grace period of four minutes (240 seconds).

To reboot the nPartition after it is halted, use the MP Command menu's RS command to restart the nPartition. (This allows the nPartition to reset and boot to its BCH interface. If auto-boot is configured, it also boots HP-UX.)

Powering Off Hardware Components

To power off individual components or the entire cabinet:

Step 1. Log in to the management processor (MP) of the server.

Step 2. If the component you will power off is assigned to an nPartition, then use the Virtual Front Panel (VFP) to view the current boot state of the nPartition.

HP-UX on the nPartition must be shut down before you power off any of the hardware assigned to the nPartition. See Appendix D "Operating System Boot and Shutdown".

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

Refer to Appendix D "Operating System Boot and Shutdown" for details on determining the nPartition boot state and shutting down HP-UX.

Step 3. Access the MP Command menu.

From the MP Main menu, enter **CM** to access the Command menu.

Step 4. Use the MP Command menu **PS** command to check details about the hardware component you plan to power off.

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.

Step 5. Use the MP Command menu **PE** command to power off the hardware component.

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.

Step 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.

Step 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:

Step 1. If needed, reconnect all power cords to the appropriate receptacles and power on the system.

- Step 2.** Use the MP Command menu PE command to power on the hardware component that was powered off and replaced.
- Step 3.** Use the PS command to verify that power is enabled to the newly replaced part. For example: Enter **C** from within the PS command to select cell.

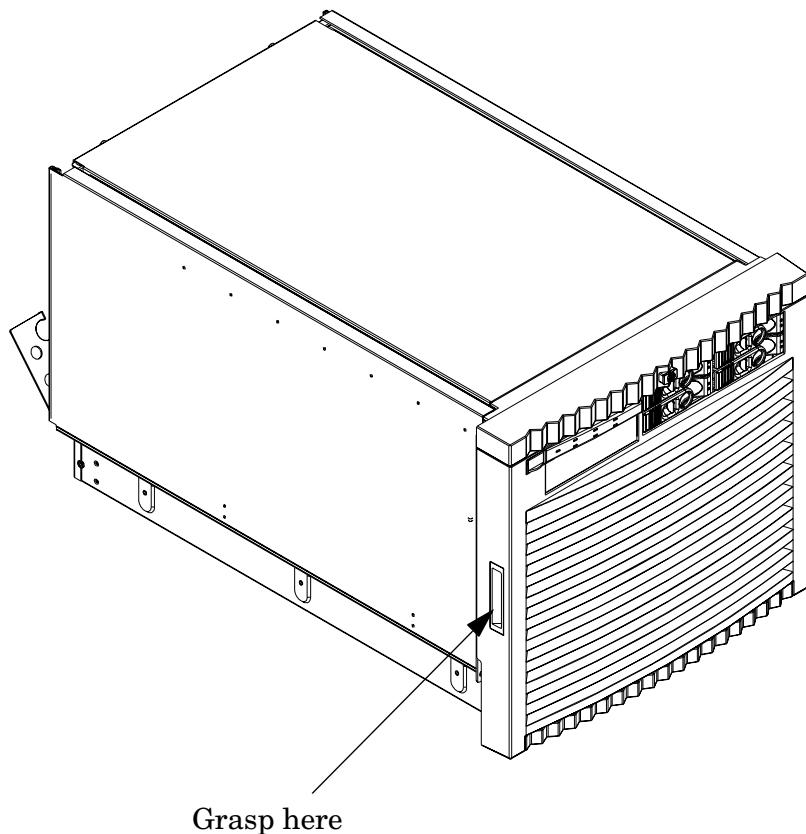
If power is absent from the part, enter the **PE** command and select **T** to power on the entire cabinet.

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

- Step 4.** Reboot each nPartition. See Appendix D “Operating System Boot and Shutdown”.
- Step 5.** Verify system functionality by using the On-line Diagnostic Support Tools Manager (STM) exerciser.

Removing and Replacing the Front Bezel

Figure 6-1 **Bezel hand slots**



Removing the Front Bezel

Step 1. From the front of the server, grasp both sides of the bezel and pull firmly toward you. The catches will release and the bezel will pull free.

Replacing the Front Bezel

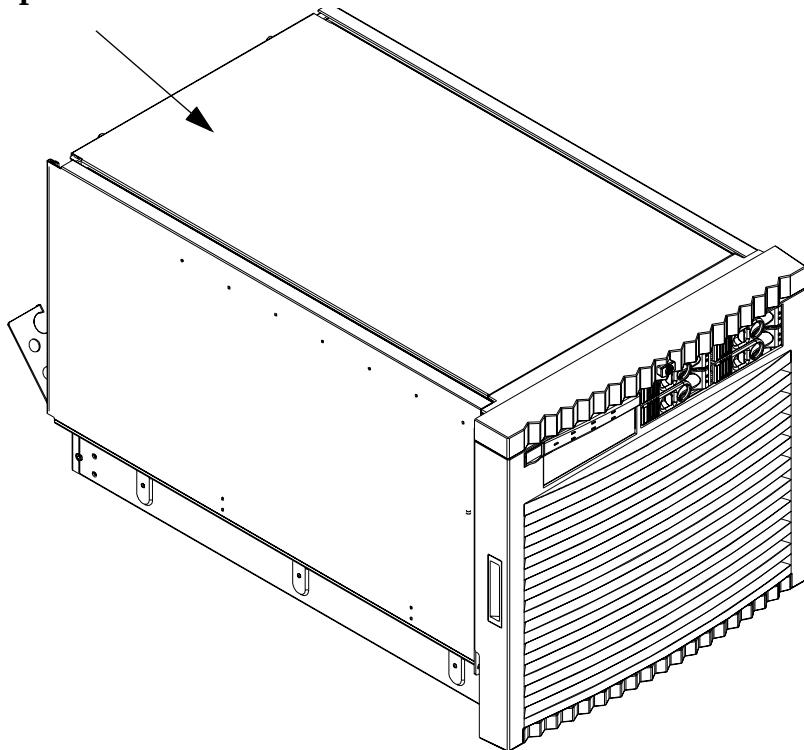
Step 1. From the front of the server, grasp both sides of the bezel and push toward the server. The catches will secure the bezel to the chassis.

Removing and Replacing the Top Cover

It is necessary to remove and replace one or more of the covers to access the components within the server chassis.

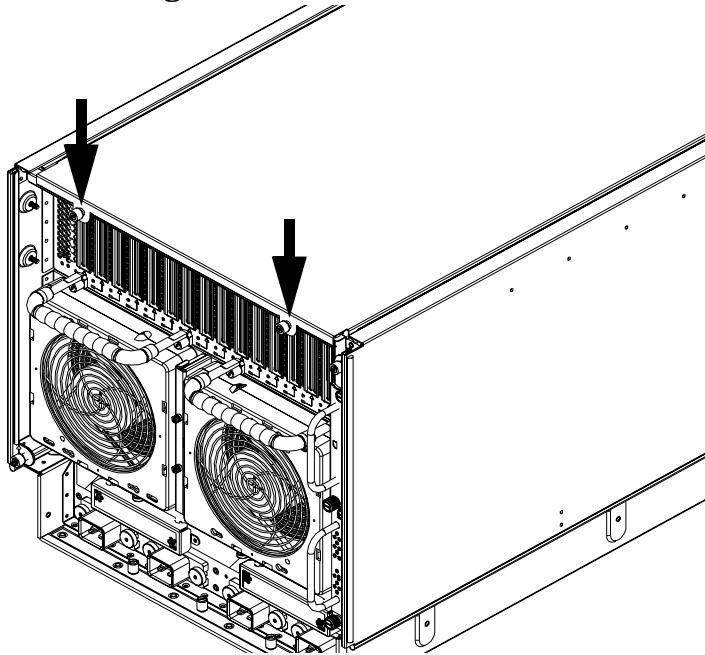
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 6-2 **Top Cover**



Removing the Top Cover

Figure 6-3 **Top Cover Retaining Screws**



- Step 1.** Loosen the retaining screws securing the cover to the rear of the chassis.
- Step 2.** Slide the cover toward the rear of the chassis.
- Step 3.** Lift the cover up and away from the chassis.

Replacing the Top Cover

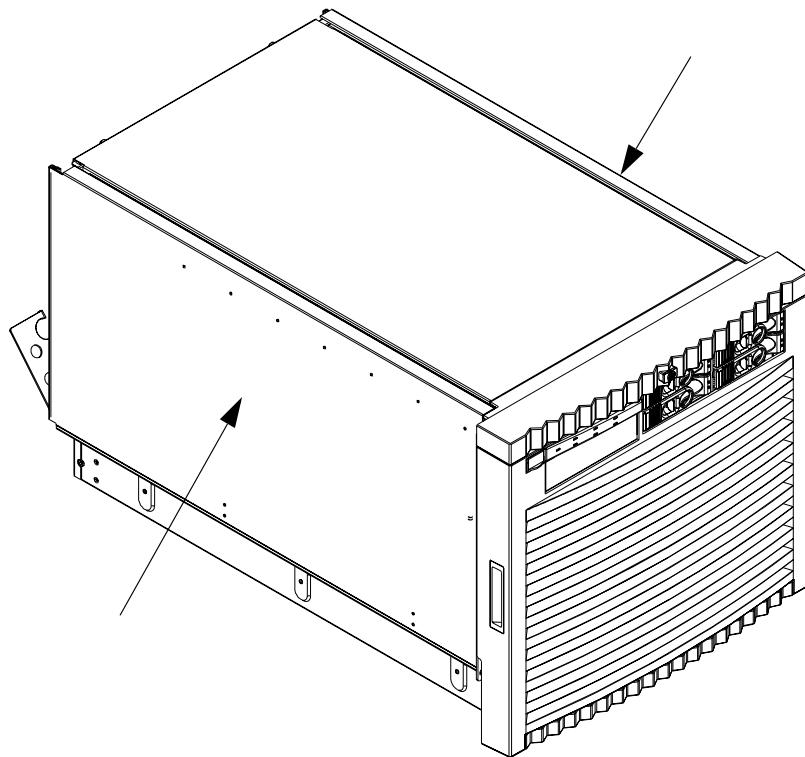
- Step 1.** Slide the cover into position. It should easily slide into position. Use a slow firm pressure to properly seat the cover.
- Step 2.** Tighten the retaining screws to secure the cover to the chassis.

Removing and Replacing a Side Cover

It is necessary to remove and replace one or both of the side covers to access the components within the server chassis.

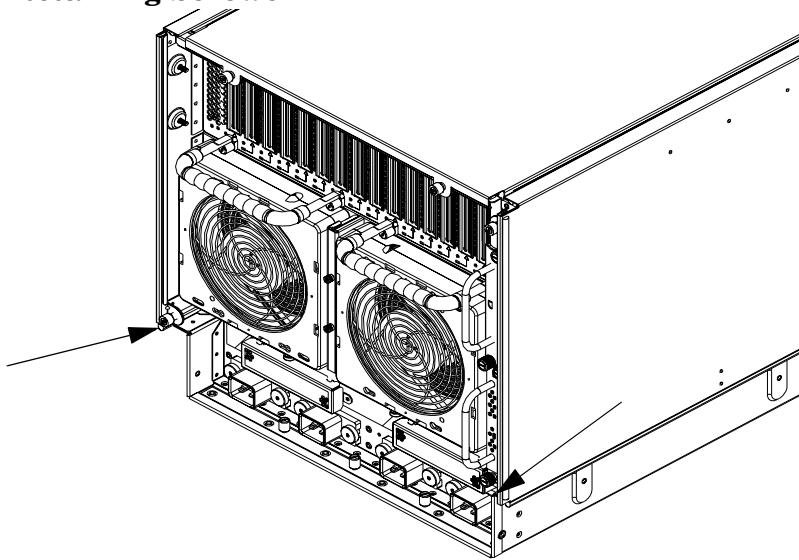
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 6-4 Side Cover Locations



Removing a Side Cover

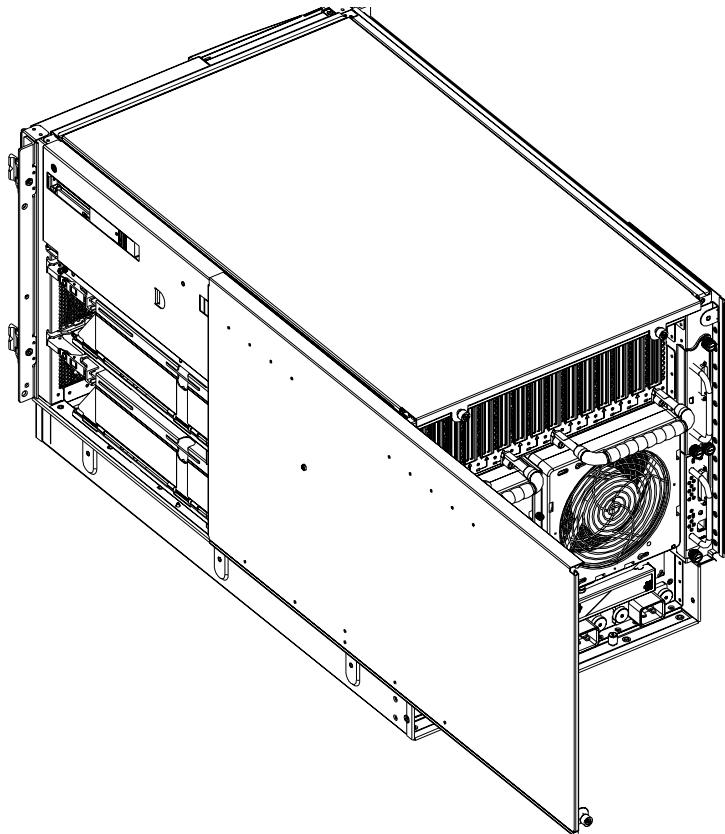
Figure 6-5 Side Cover Retaining Screws



Step 1. Loosen the retaining screw securing the cover to the chassis.

Step 2. Slide the cover from the chassis.

Figure 6-6 Side Cover Removal Detail



Replacing a Side Cover

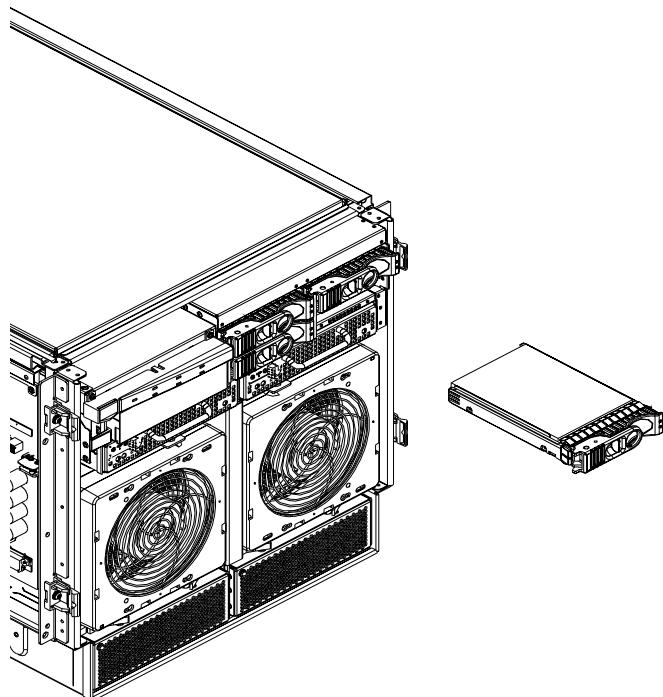
- Step 1.** Slide the cover in position.
- Step 2.** The cover easily slides into position. Use a slow firm pressure to properly seat the cover.
- Step 3.** Tighten the retaining screw to secure the cover to the chassis.

Removing and Replacing a Disk Drive

The disk drives are located in the front of the chassis. The nPartition must be shut down to remove or replace the drive that serves as the boot disk, if the boot disk is not mirrored. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” on page 125 for more information. The remainder of the internal disk drives are hot-pluggable.

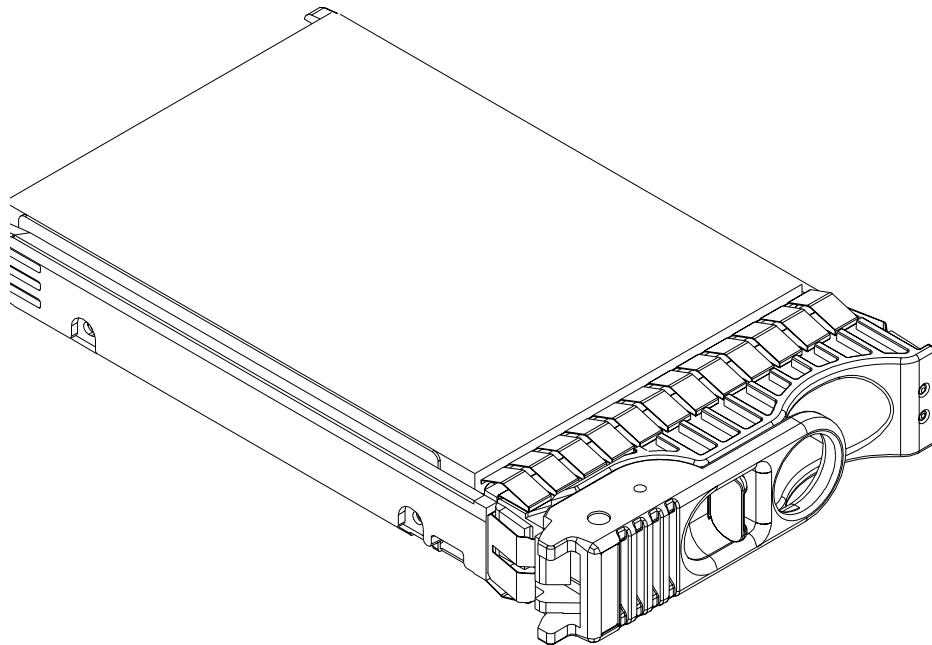
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 6-7 Disk Drive Location



Removing a Disk Drive

Figure 6-8 **Disk Drive Detail**



- Step 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.
- Step 2.** Pull forward on the front locking latch and carefully slide the disk drive from the chassis.

Replacing a Disk Drive

NOTE Sometimes using the `diskinfo` and `ioscan` commands will produce cached data. To resolve this, these commands should be run when the disk drive is removed.

- Step 1.** Before installing the disk drive, enter the following command:

```
#diskinfo -v /dev/rdsck/cxtwdx
```

- Step 2.** Enter the following command:

```
#ioscan -f
```

The response message after running this command is:

NO_HW

- Step 3.** Be sure the front locking latch is open, then position the disk drive in the chassis.

- Step 4.** Slide the disk drive into the chassis. Use a slow firm pressure to properly seat the connection.

- Step 5.** Depress the front locking latch to secure the disk drive in the chassis.

- Step 6.** Spin up the disk by entering one of the following commands:

Removing and Replacing Components

Removing and Replacing a Disk Drive

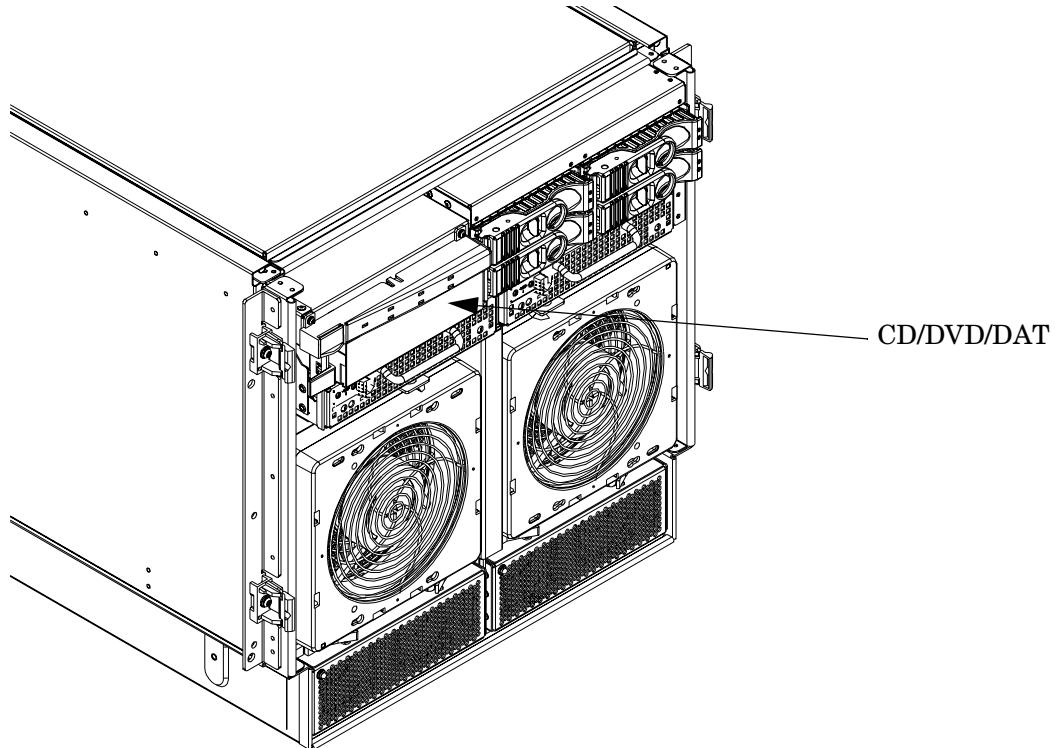
```
#diskinfo -v /dev/rdsk/cxtxdx  
#ioscan -f  
#pvcreate  
#vgcfgrestore
```

Removing and Replacing a CD/DVD/DAT Drive

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. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” on page 125 for more information.

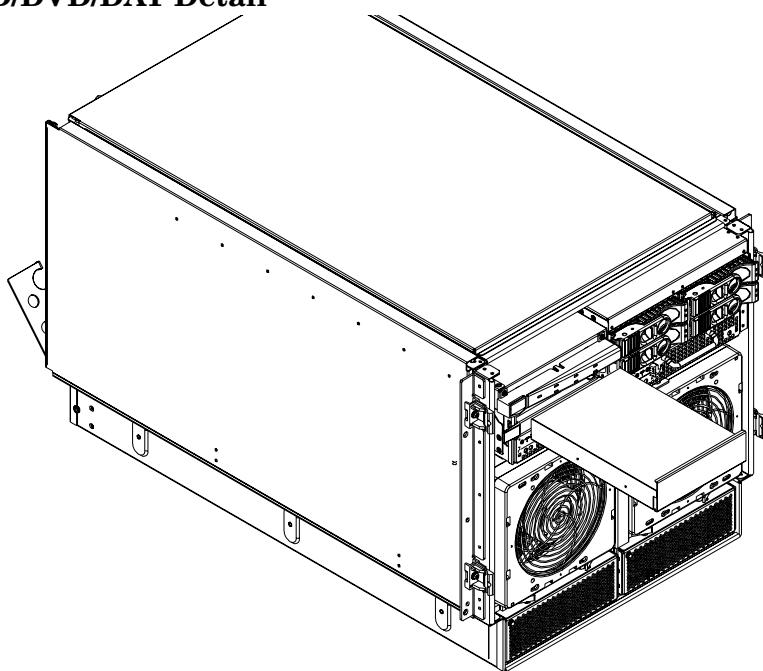
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 6-9 **CD/DVD/DAT Location**



Removing a CD/DVD/DAT Drive

Figure 6-10 **CD/DVD/DAT Detail**



- Step 1.** To remove the CD/DVD/DAT, depress the front locking latch to loosen the drive from the chassis.
- Step 2.** Disengage the cables from the rear of the CD/DVD/DAT.
- Step 3.** Remove the rails and clips from the drive.
- Step 4.** Slide the drive from the chassis.

Replacing a CD/DVD/DAT Drive

- Step 1.** Attach the rails and clips to the drive.
- Step 2.** Connect the cables to the rear of the CD/DVD/DAT.
- Step 3.** Slide the drive into the chassis.

CAUTION Before attempting to install the drive into the chassis, position the data cable over the top of the drive to avoid pinching the cable during installation.

- Step 4.** The drive easily slides into the chassis. Use a slow firm pressure to properly seat the drive.

Removing and Replacing a 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.

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

Figure 6-11 Front Smart Fan Assembly Locations

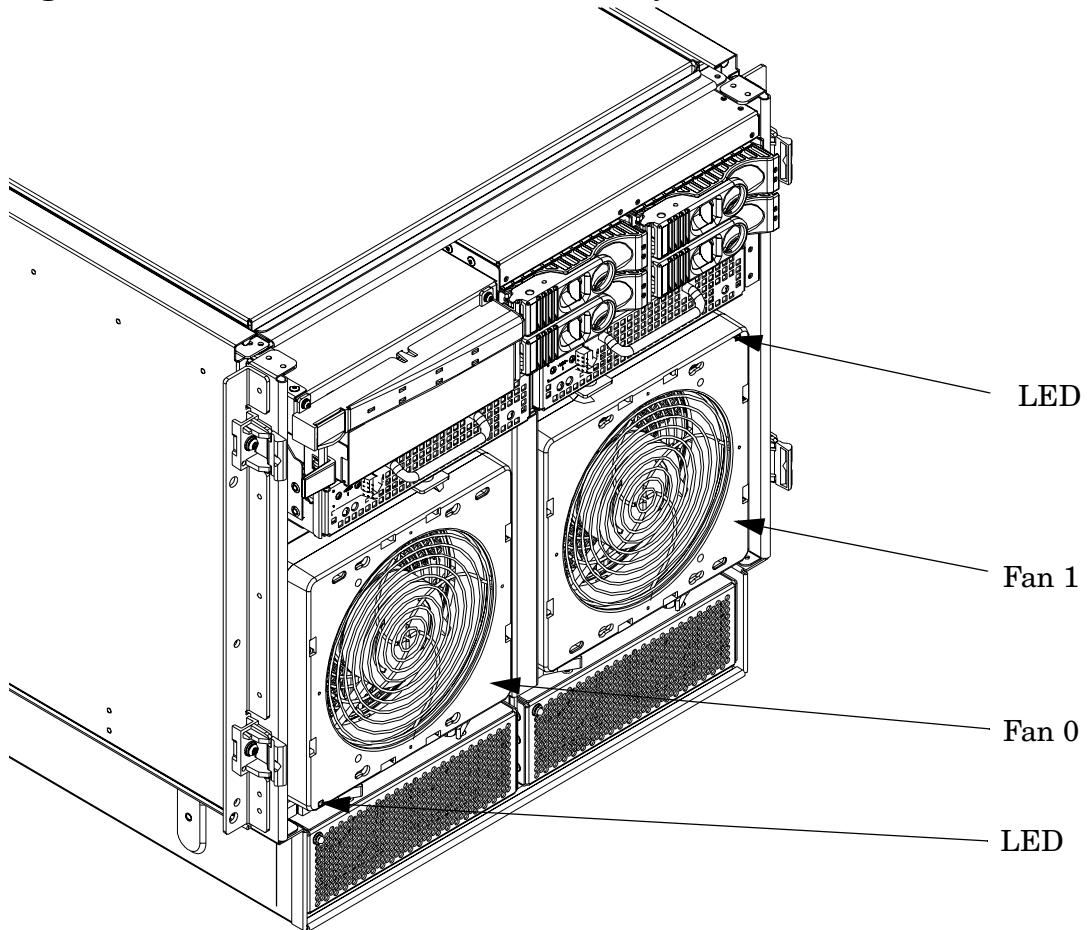


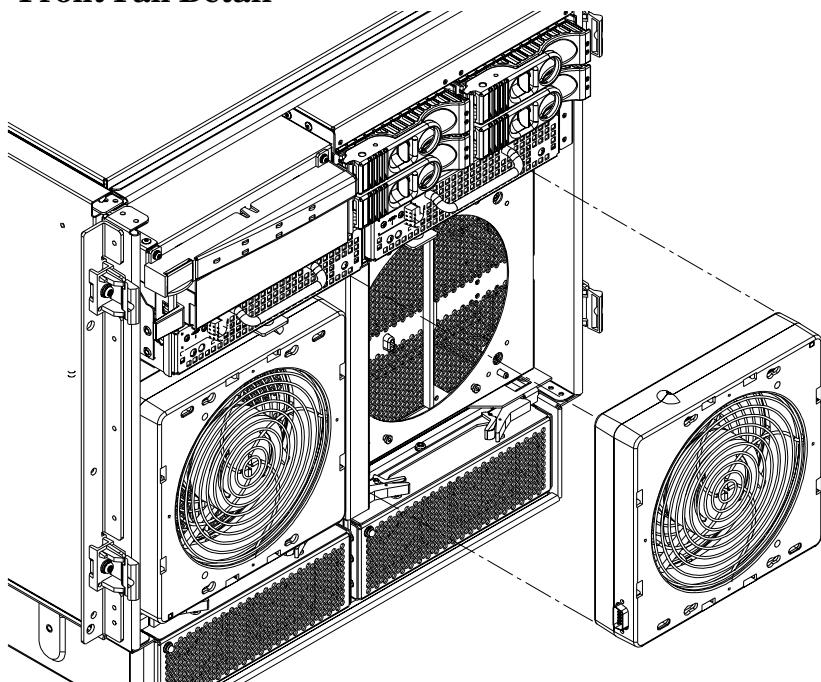
Table 6-1 Front Smart Fan Assembly LED Indications

LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than six seconds
Flashing Yellow	Fan is not keeping up with speed/sync pulse for greater than six seconds

Table 6-1 **Front Smart Fan Assembly LED Indications (Continued)**

LED State	Meaning
Flashing Red	Fan failed/stalled or has run slow or fast for greater than six seconds
Off	Fan is not installed or no power is applied to fan

Removing a Front Smart Fan Assembly

Figure 6-12 **Front Fan Detail**

- Step 1.** Remove the front bezel.
- Step 2.** Push the Fan Release Pin away from the fan.
- Step 3.** Slide the fan away from the connector.
- Step 4.** Pull the fan away from the chassis.

Replacing a Front Smart Fan Assembly

- Step 1.** Position the fan assembly on the chassis fan guide pins.
- Step 2.** Slide the fan into the connector.
- Step 3.** Verify that the fan release pin is in the locked position.
- Step 4.** Replace the front bezel.

NOTE The fan LED should show fan is operational (green).

Removing and Replacing a Rear Smart Fan Assembly

The Rear Smart Fan Assembly is located in the rear of the chassis. The fan assembly is a hot-swap component.

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

Figure 6-13 Rear Smart Fan Assembly Locations

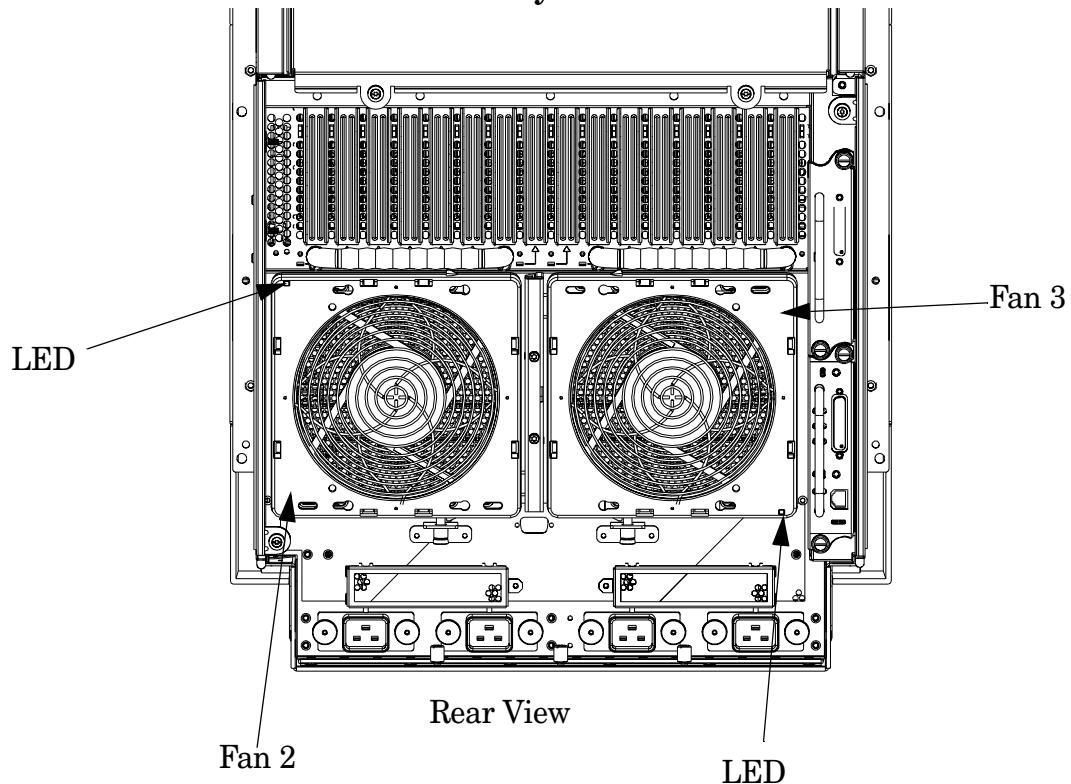


Table 6-2 Rear Smart Fan Assembly LED Indications

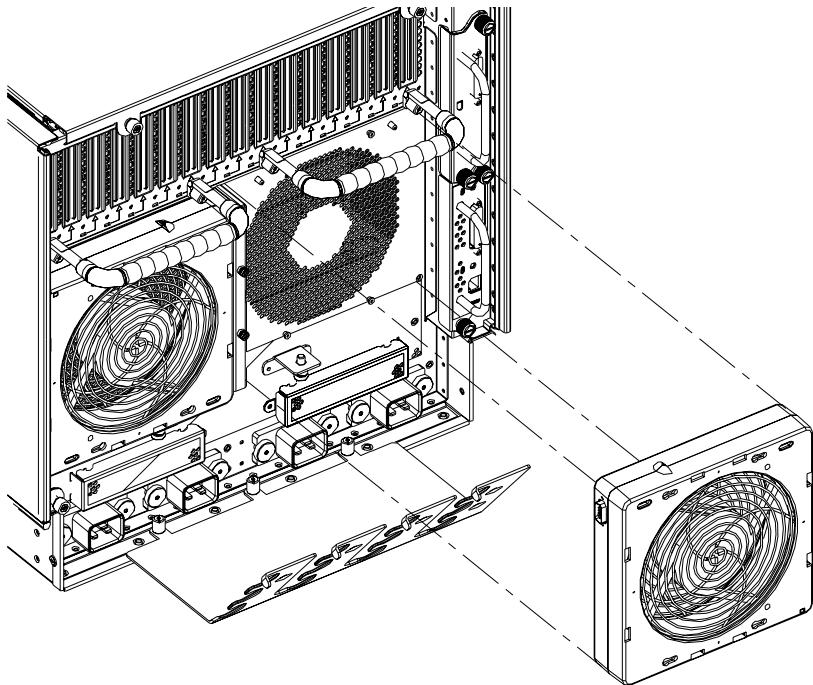
LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than six seconds
Flashing Yellow	Fan is not keeping up with speed/sync pulse for greater than six seconds

Table 6-2 Rear Smart Fan Assembly LED Indications (Continued)

LED State	Meaning
Flashing Red	Fan failed/stalled or has run slow or fast for greater than six seconds
Off	Fan is not installed or no power is applied to fan

Removing a Rear Smart Fan Assembly

Figure 6-14 Rear Fan Detail



Step 1. Push the fan release pin away from the fan.

Step 2. Slide the fan away from the connector.

Step 3. Pull the fan away from the chassis.

Replacing a Rear Smart Fan Assembly

Step 1. Carefully position the fan assembly on the chassis fan guide pins.

Step 2. Slide the fan into the connector.

Step 3. Verify that the fan release pin is in the locked position.

NOTE A green fan LED indicates the fan is operational.

Removing and Replacing a PCI Smart Fan Assembly

The PCI Smart Fan Assembly is located at the front of the PCI cardcage, toward the middle top portion of the server. The fan assembly is a hot-swap component.

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

Figure 6-15 PCI Smart Fan Assembly Location

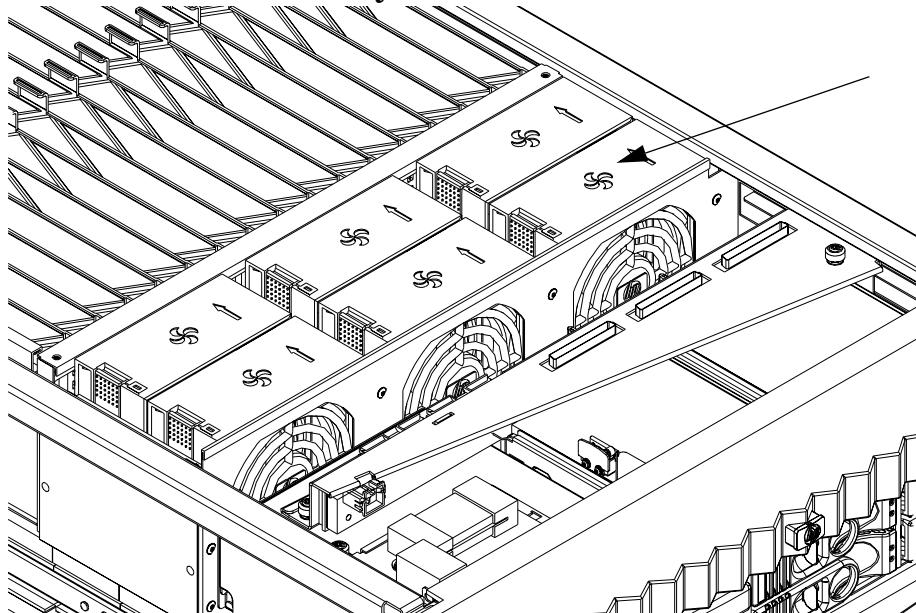
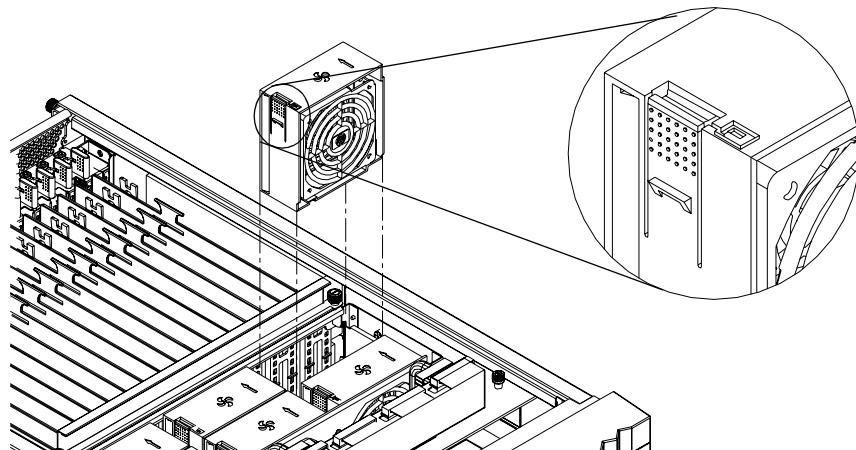


Table 6-3 Smart Fan Assembly LED Indications

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

Removing a PCI Smart Fan Assembly

Figure 6-16 PCI Smart Fan Assembly Detail



Step 1. Remove the top cover.

Step 2. Grasp the fan with thumb and forefinger while depressing the locking tab.

NOTE The two right side fans, as viewed from the front, are located very close to the chassis. It might be necessary to use a tool, such as a flatblade screwdriver, to assist in removing them.

Step 3. Slide the fan upward from the chassis.

Replacing a PCI Smart Fan Assembly

Step 1. Carefully position the fan assembly in the chassis.

Step 2. The fan easily slides into the chassis. Use a slow firm pressure to properly seat the connection.

Step 3. Replace the top cover.

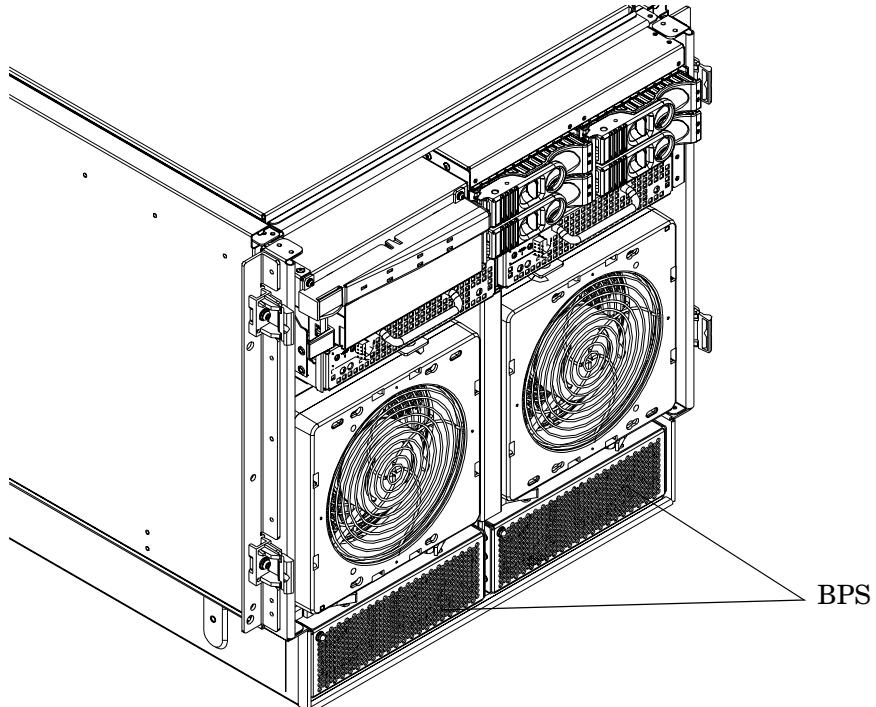
NOTE A green fan LED indicates the fan is operational.

Removing and Replacing a Bulk Power Supply

The bulk power supply is located in the front of the chassis. The BPS is a hot swappable component.

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

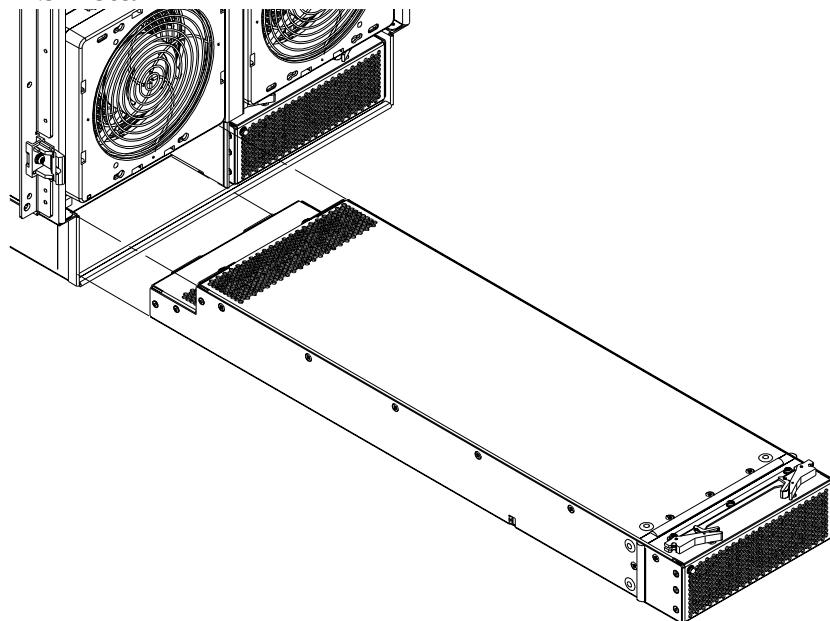
Figure 6-17 BPS Location



IMPORTANT When a BPS is pulled from the server and then immediately re-inserted, the server might report an overcurrent condition and shut down.

Removing a BPS

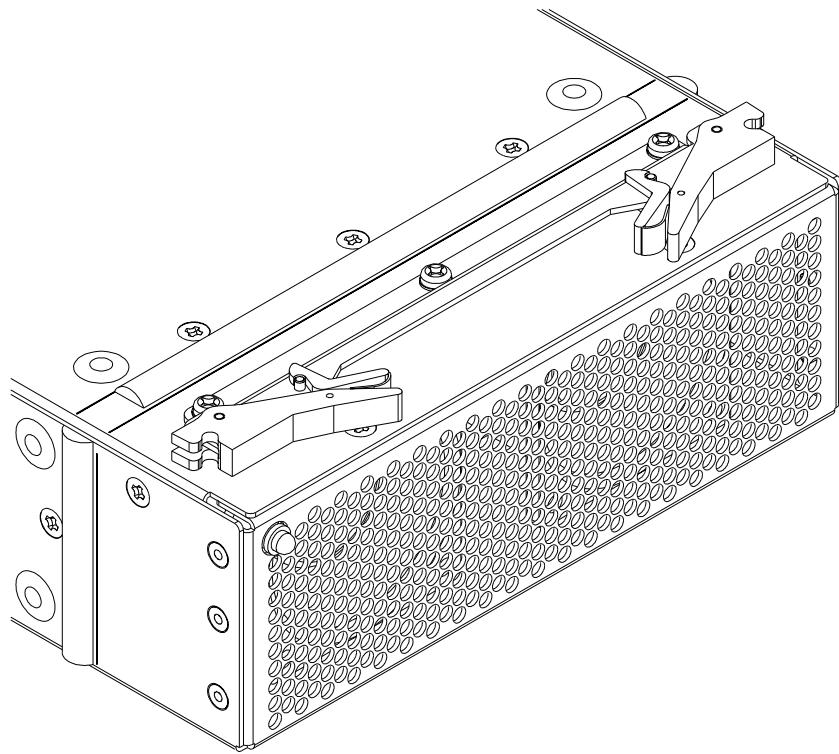
Figure 6-18 **BPS Detail**



Step 1. Remove the front bezel.

Step 2. Open the extraction levers by pulling them outward.

Figure 6-19 Extraction Levers



Step 3. Slide the BPS forward using the extraction levers to remove it from the chassis.

CAUTION Use caution when handling the BPS. A BPS weighs 18 lbs.

Replacing a BPS

Step 1. Verify that the extraction levers are in the open position, then insert the BPS into the empty slot.

Step 2. The BPS easily slides into the chassis. Use a slow firm pressure to properly seat the connection.

Step 3. Ensure the BPS has seated by closing the extraction levers.

Step 4. Replace the front bezel.

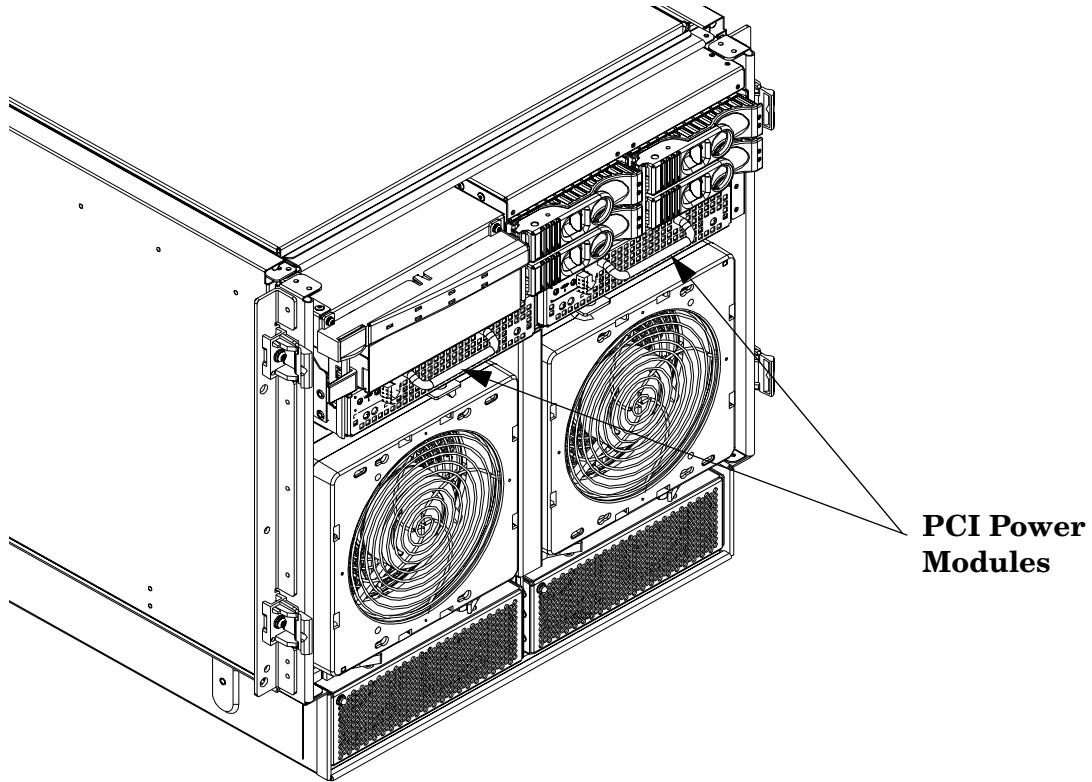
NOTE The BPS LED should show BPS operational and no fault. The BPS LED should be GREEN.

Removing and Replacing a PCI Power Module

The PCI power module is located in the front of the chassis. The system power must be turned off to replace this CRU. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” on page 125.

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

Figure 6-20 PCI Power Module Location



Preliminary Procedures

- Step 1.** Identify the failed power supply. Table 6-4 identifies the meaning of the PCI-X Power Supply LED state.
- Step 2.** Connect to ground with a wrist strap.
- Step 3.** Visually inspect the replacement part for proper number and revision.
- Step 4.** Shut down the partition and power off the PCI domain.
- Step 5.** Remove the front bezel.

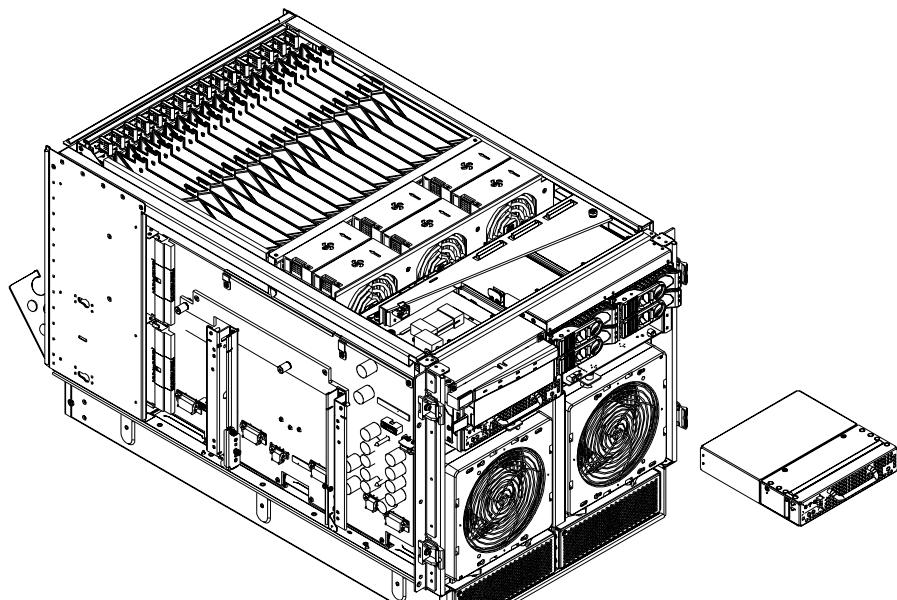
Table 6-4 PCI-X Power Supply LEDs

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 ^a	Yellow	See Table 5-8 for LED status in combination with the green power LED for PCI-X slot 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 due to an over temperature condition, a failure to regulate the power within expected limits, or a current-limit condition.
		Off	Normal operation.

a. LPM stands for local power monitor

Removing a PCI Power Module

Figure 6-21 PCI Power Module Detail



Step 1. Securely grasp the handle on the front of the power module.

Step 2. Slide and hold the locking tab to the right and pull the PCI module from the chassis.

Replacing a PCI Power Module

Step 1. Slide the PCI power module into the chassis until the locking tab clicks and locks.

Step 2. Power on the system. Use PE and PS commands to confirm success.

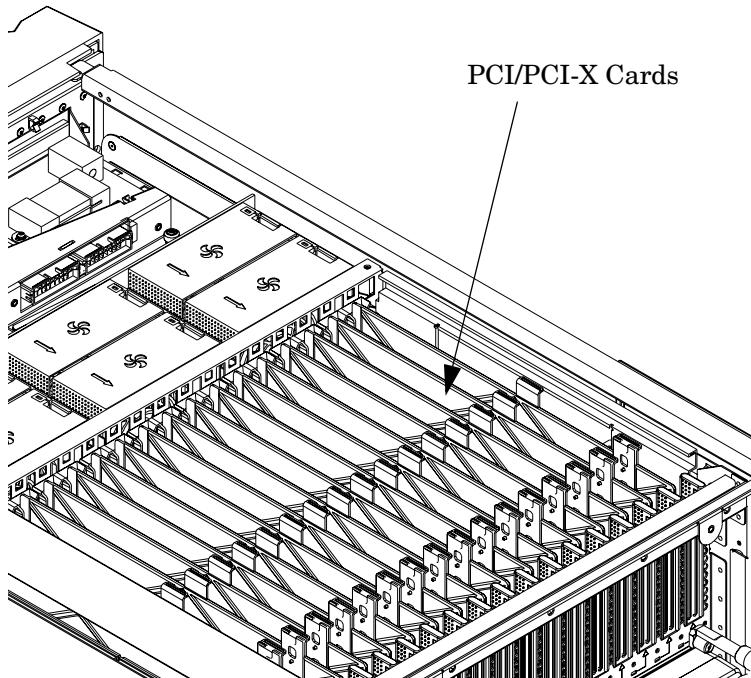
Step 3. Note status of Power Supply LEDs. Green LED should be on, and the fault LED should be off.

Removing and Replacing a PCI/PCI-X Card

The PCI/PCI-X cards are located in the rear of the chassis in the PCI-X card cage. PCI/PCI-X cards are hot pluggable components.

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

Figure 6-22 PCI/PCI-X Card Location



PCI/PCI-X I/O cards can be removed and replaced by using the SAM (/usr/sbin/sam) application or by using Partition Manager (/opt/parmgr/bin/parmgr).

This procedure describes how to perform an *online replacement* of a PCI/PCI-X card using SAM, for cards whose drivers support online add or replacement (OLAR).

IMPORTANT Some PCI/PCI-X I/O cards cannot be added or replaced online (while HP-UX remains running). For these cards, you must shut down HP-UX on the nPartition before performing the card replacement or addition. See “Shutting Down nPartitions and Powering Off Hardware Components” on page 125.

- Step 1.** Run SAM (/usr/sbin/sam) and from the main SAM Areas screen select the **Peripheral Devices** area, then select the **Cards** area.
- Step 2.** From the I/O Cards screen, select the card you will replace and then select the **Actions->Replace** menu item.

Step 3. Wait for SAM to complete its critical resource analysis for the selected card and then review the analysis results.

If no critical resources will be disabled by taking the selected card offline, click the **OK** button to suspend the card's driver and power off the card's PCI-X slot. Proceed with the next step.

If SAM detected that the selected PCI/PCI-X card cannot be taken offline, you will not be able to click the **OK** button and cannot replace the card while HP-UX remains running. In this case, you must shut down HP-UX on the nPartition before replacing the defective card.

Step 4. Locate the PCI-X slot where the selected card resides.

On the server, you can view the PCI-X slots and slot LEDs from the rear of the cabinet.

The selected slot will be powered off (its green power LED will be off), and the slot's amber attention indicator (a dark orange yellow LED) will be blinking.

Step 5. Label and remove the cable(s) connected to the PCI/PCI-X card to be removed.

Step 6. Remove the top cover.

Step 7. Flip the card slot's PCI MRL to the open position.

Step 8. Firmly pull up on the tabs on the card separator.

Step 9. Remove the card from the PCI slot.

Replacing the PCI/PCI-X Card

Step 10. Position the replacement PCI/PCI-X card in the slot.

NOTE Use a slow firm pressure to properly set the card into its connection. PCI/PCI-X cards tend to be difficult to install.

Step 11. Flip the card slot's PCI MRL to the closed position.

Step 12. Replace the top cover.

Step 13. Connect all cables to the replacement PCI/PCI-X card.

Step 14. In SAM's Replace Card window, click the **OK** button.

SAM powers the PCI slot back on and turns off the slot's attention indicator. SAM also resumes the card's driver operations.

Step 15. Confirm that the replacement card is online and powered on, using SAM's I/O Cards screen.

Step 16. Exit SAM

Option ROM

To allow 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, it must be added to the table of boot devices as follows:

Step 1. Install the I/O card into the chassis.

Step 2. Boot the server to the EFI shell.

Removing and Replacing Components

Removing and Replacing a PCI/PCI-X Card

Step 3. Execute the EFI search command.

To add a single card:

```
search <cell> <pci_slot #>
```

To add all cards:

```
search all
```

Step 4. Execute the following EFI command:

```
map -r
```

Step 5. Enter the Boot Manager by executing the following command:

```
exit
```

Step 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. The procedure to flash an I/O card follows.

Step 1. Install the I/O card into the chassis.

Step 2. Boot the server to the EFI shell.

Step 3. Execute the EFI search command.

To add a single card:

```
search <cell> <pci_slot #>
```

To add all cards:

```
search all
```

Step 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 <i>HP IPF Offline Diagnostic & Utilities</i> CDROM.
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Step 5. Load the *HP IPF Offline Diagnostic & Utilities* CDROM.

The CDROM will contain the flash utility for IO each card type, firmware images, and a .txt file that will include instructions and information about updating the firmware images.

Configuring Management Processor (MP) 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's **LC** command. To *list* the current management processor (MP) network configuration, use the **LS** command.

Default Management Processor Network Settings

Table 6-5 lists an example of the default customer LAN network settings for the server.

Table 6-5 Default Configuration for Management Processor 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 management processor's customer LAN network settings from the management processor Command menu.

Step 1. Connect to the server complex management processor and enter **CM** to access the Command menu.

Use telnet to connect to the management processor, if possible.

If a management processor 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 management processor local RS-232 port.
- Access a PC or workstation on the same subnet as the management processor, modify its network routing tables to include the default customer LAN IP address, then telnet to the management processor. The procedure to modify networking and connect is:
 1. Access a PC or workstation on the management processor subnet.
 2. 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 management processor networking, remove these network routing table changes with the **route delete** command.

3. Enter this command to confirm the new network connection to the management processor:

```
ping 198.168.1.1 -n 2
```

4. Use the

```
telnet 192.168.1.1
```

command from the PC or workstation to connect to the management processor.

- Step 2.** From the management processor Command menu, enter **LS** to *list* the current network settings, and, if needed, use the **LC** command to *reconfigure* the network settings for the management processor.

The **LC** command enables modifications to the customer LAN and/or the private LAN configuration.

Cancel all changes to the management Processor LAN configuration at any time by replying **Q** to any of the **LC** command prompts.

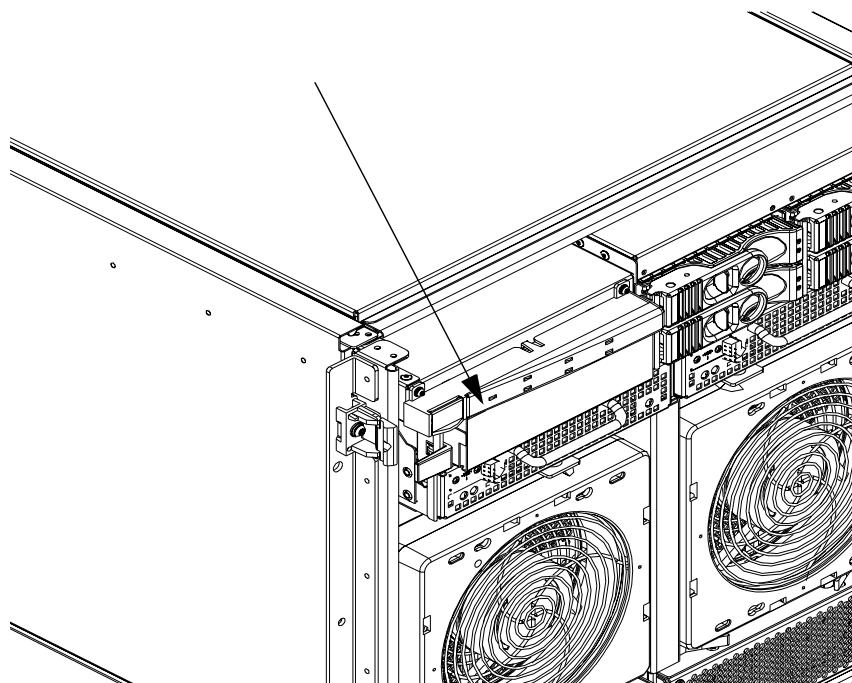
- Step 3.** Ensure that the MP networking configuration is correct.

Removing and Replacing PCA Front Panel Board

The front panel board is located in the front of the chassis. All system power must be removed before attempting to remove or replace this component.

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

Figure 6-23 Front Panel Assembly Location



Removing the PCA Front Panel Board

- Step 1.** Follow proper procedures to power off the server.
- Step 2.** Remove the front bezel and the top and left side covers.
- Step 3.** Disconnect the DVD power cable from the mass storage backplane.
- Step 4.** Disconnect the front panel cable from the system backplane.
- Step 5.** Unscrew the captive fastener on the common tray cage cover. The cover has two ferrites with cables attached to it.
- Step 6.** Slide the common tray cage cover to the rear and lift. Place the cable as far back as possible to enhance access to the front panel.

Step 7. Remove the front panel bezel by removing the two M3 screws. After the screws are removed, press the tab in the center of the bezel to release the bezel.

Step 8. Remove the two screws revealed upon removing the bezel.

Step 9. Place your right hand on the PCA front panel cable near the entrance to the cavity. With your left hand, reach over the top of the chassis and by curling your fingers, reach into the cavity containing the PCA front panel.

Step 10. The PCA front panel bracket has a small sheet metal wall that acts as a handle. This handle is located at the center of the height and width relative to the cavity.

Place your left hand under the handle and simultaneously, gently lift the handle upward and pull on the cable. This action disengages the tabs on the PCA front panel from the slots on the common tray cage.

Step 11. Gently pull the cable and handle toward the rear of the chassis until the steel power button that was initially protruding through the chassis clears the hole.

Step 12. Rotate the top edge of the board toward you about 30 degrees by lifting on the handle with your left hand.

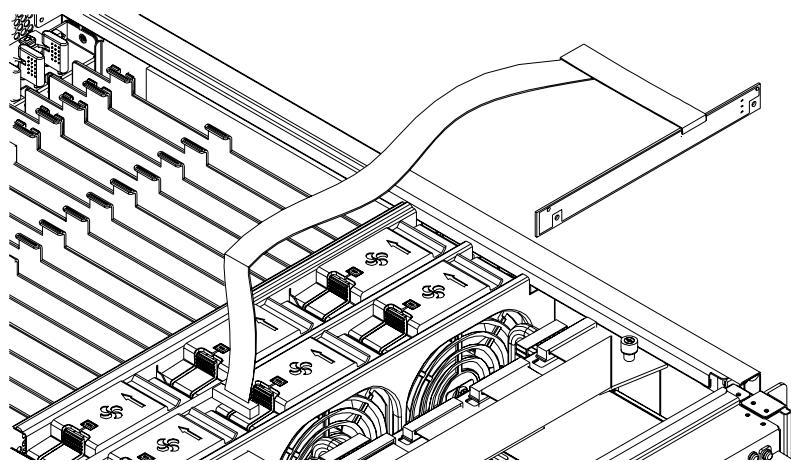
Step 13. Angle the board such that the right side with the cable moves away from you and the opposite side with the power connector moves towards you.

Ensure that the power switch does not get stuck in one of the many holes in the front of the chassis. This rotation is best accomplished by gently pulling the cable with your right hand toward the rear of the cabinet.

Step 14. Remove the cable end of the board first by gently pulling the cable with your right hand and adjusting the angle of the board with your left hand.

After the first tab on the board is outside the cavity, removal should proceed easily.

Figure 6-24 **Front Panel Board Detail**



Replacing the Front Panel Board

Step 1. Slide the front panel into its slot from inside the server.

Step 2. Angle the board so that the right side is at an angle.

Ensure that the power switch does not get caught in one of the many holes in the front of the chassis. Push the panel forward until the lock tabs click.

Step 3. Attach the front panel bezel and tighten the two screws.

Step 4. Replace the common tray cage cover.

Step 5. Tighten the captive fastener on the common tray cage cover.

Step 6. Attach the front panel cable to the system backplane.

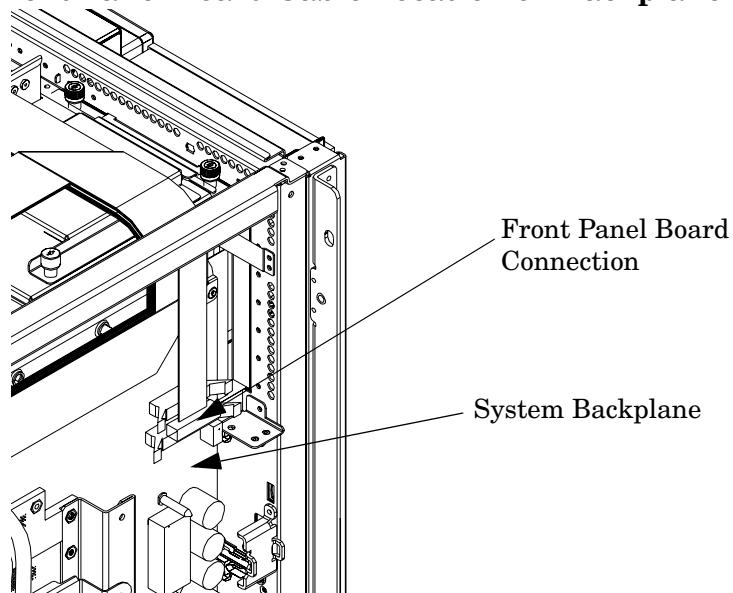
Step 7. Attach the DVD power cable.

Step 8. Attach the data cable.

Step 9. Replace the front bezel and the top and left side covers.

Step 10. Follow proper procedures to power on the server.

Figure 6-25 **Front Panel Board Cable Location on Backplane**



Removing and Replacing Components
Removing and Replacing PCA Front Panel Board

A Parts and Accessories

Table A-1 HP Integrity rx7620 Server Customer Replaceable Unit (CRU) List

CRU Description	Replacement Part Number	Exchange Part Number
36 GB 15K RPM SCSI Disk	A9896-64001	A9896-69001
73 GB 15K RPM SCSI Disk	A9897-64001	A9897-69001
146 GB 10K RPM SCSI Disk	A9898-64001	A9898-69001
AC Power Supply (qty 2 per system)	0950-4173	A6752-69113
Assembly, Cover, Left Side	A9903-04007	None
Assembly, Cover, Right Side	A9903-04006	None
Assembly, Cover, Top	A9903-04008	None
Assembly, Front Bezel	A7025-04001	None
Assembly, Front Panel Plastic	A7025-04002	None
Assembly, Lift handle, left panel	A6752-04045	None
Assembly, Lift handle, right panel	A6752-04048	None
Assembly, Smart Fan (Front/Rear) (4)	A6752-67029	None
Assembly, Smart Fan (PCI C/C) (6)	A6752-67030	None
Assembly, Front Bezel, No NamePlate	A7025-04001	
Filler, Internal Disk	A6198-60003	None
Kit, Removable Media Rail	A6752-67011	None
M-Cable	A6144-63001	None
Nameplate, HP Integrity rx7620 Server	A7027-40001	None
Panel, PCI, Upper Right Side	A6752-67036	None
PCI Power Module (Brick)	0950-3819	A6093-69123
Power Cord, C19/GB 1002 4.5m Black CA Assembly	8121-0070	None
Power Cord, C19/IEC-309 4.5m Black CA Assembly	8120-6897	None
Power Cord, C19/L6-20 4.5m Black CA Assembly	8120-6903	None
Power Cord, C19/unterminated International-Europe	8120-6895	None
Removable DAT Tape Drive (DDS4)	C5686-67204	C5686-69204
Removable DVD Drive	A9879-67001	None
240 V N. American UPS 4.5m C19/L6-30P	8120-8494	None
Static Mat, size 24" x 36" w/grnd strip	A5201-68004	None

B System Specifications

This chapter describes the basic server configuration and its physical specifications and requirements.

Dimensions and Weights

This section provides dimensions and weights of the system components.

Table B-1 HP Integrity rx7620 Server Dimensions and Weights

	Standalone	Packaged
Height	17.3 in / 43.9 cm	35.75 in / 90.8 cm
Width	17.5 in / 44.4 cm	28.0 in / 71.1 cm
Depth	30.0 in / 76.2 cm	28.38 in / 72.0 cm
Weight - Pounds (kilograms)	220 lb / 100 kg	N/A

The shipping box, pallet, ramp, and container adds approximately 50 lb to the total system weight. The size and number of miscellaneous pallets will be determined by the equipment ordered.

Table B-2 HP Integrity rx7620 Server Component Weights

Quantity	Description	Weight (lb/kg.)
1 or 2	Cell board	27.80 lb / 12.61 kg
1	System backplane	12 lb (estimate) / 5.44 kg (estimate)
1	PCI-X backplane	20.4 lb / 9.25 kg
2	Bulk power supply	18 lb / 8.2 kg
1	Mass storage backplane	1 lb / 0.45 kg
2	PCI DC-to-DC converters	5 lb / 2.27 kg

Electrical Specifications

This section provides electrical specifications for HP Integrity rx7620 Servers.

Grounding

The site building shall provide a safety ground for each AC service entrance to all cabinets.

Install a protective earthing 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 must 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.

AC-Powered Systems

Circuit Breaker

The Marked Electrical for the HP Integrity rx7620 Server is 12 amps. 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 rx7620 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 HP Integrity rx7620 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 HP Integrity rx7620 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 a HP Integrity rx7620 Server. Each power cord is 15 feet (4.5 meters) 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-Europe
8121-0070	Male GB-1002, 240 volts	China
8120-6903	Male NEMA L6-20, 240 volt	North America/Japan

System Power Specifications Table B-4 lists the AC power requirements for an HP Integrity rx7620 Server. These tables provide information to help determine the amount of AC power needed for your computer room.

Table B-4 AC Power Specifications

Requirements	Value	Comments
Nominal input voltage	200/208/220/230/240 (VAC rms)	
Frequency range (minimum - maximum)	50 - 60 (Hz)	
Number of phases	1	
Maximum input current	12 amps	Per line cord
Maximum inrush current	30 A peak for 15 ms	Per line cord
Power factor correction	>0.98 >0.95	At all loads of 50% - 100% of supply rating At all loads Of 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	3156	3220	See #1 below
Marked Electrical Power	---	2640	12A @ 220 VAC, see note #2
Typical Maximum Power	1989	2030	See note #3

1. “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.
2. “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.
3. “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.

DC-Powered Systems

DC-powered systems must be powered by a -48 VDC Telco power source. Follow your site-specific procedures for connecting the power and return lines to the server.

Environmental Specifications

This section provides the environmental, power dissipation, noise emission, and airflow specifications for HP Integrity rx7620 Servers.

Temperature and Humidity

The cabinet is actively cooled using forced convection in a Class C1-modified environment.

Operating Environment

The system is designed to run continuously and meet reliability goals in an ambient temperature of 5° to 35° C at sea level. The maximum allowable temperature is derated 1° C per 1000 feet of elevation above 5000 feet above sea level up to 30° C at 10,000 feet. For optimum reliability and performance, the recommended operating range is 20° to 25° C

Environmental Temperature Sensor

To ensure that the system is operating within the published limits, the ambient operating temperature is measured using a sensor placed near the chassis inlet, between the cell boards. Data from the sensor is used to control the fan speed and to initiate system overtemp shutdown. (For more details see the platform management section.)

Non-Operating Environment

The system is designed to withstand ambient temperatures between -40° to 70° C under non-operating conditions.

Cooling

Cell Section Cooling

The cabinet incorporates front to back airflow across the cell boards and system backplane. Two 150 mm fans, mounted externally on the front chassis wall behind the cosmetic front bezel, push air into the cell section; and two 150 mm fans housed in cosmetic plastic fan carriers and mounted externally to the rear chassis wall, pull air through the cell section.

Each cell area fan cooling 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 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 through upward facing vents near the rear of the supply. The air is then ducted out of the rear of the chassis with minimal leakage into the cell airflow plenum.

[System Specifications](#)

[Environmental Specifications](#)

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 with 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. Perforation 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 run at 1541 rpm, or 38% 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 Typical HP Integrity rx7620 Server Configurations

Cell Boards	Memory Per Cell Board	PCI Cards (assumes 10 watts each)	DVDs	Hard Disk Drives	Core I/O	Bulk Power Supplies	Typical Power	Typical Cooling
Qty	GBytes	Qty	Qty	Qty	Qty	Qty	Watts	BTU/hr
2	16	16	2	4	2	2	2030	6930.42
2	8	8	0	2	2	2	1733	5916.46
2	4	8	0	2	2	2	1678	5728.69
1	4	8	0	1	1	2	1047	3574.46

The air conditioning data 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 that will be installed during initial installation or as a later update. Refer to the applicable documentation for such devices to determine the power and air-conditioning that is required to support these devices.
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Acoustic Noise Specification

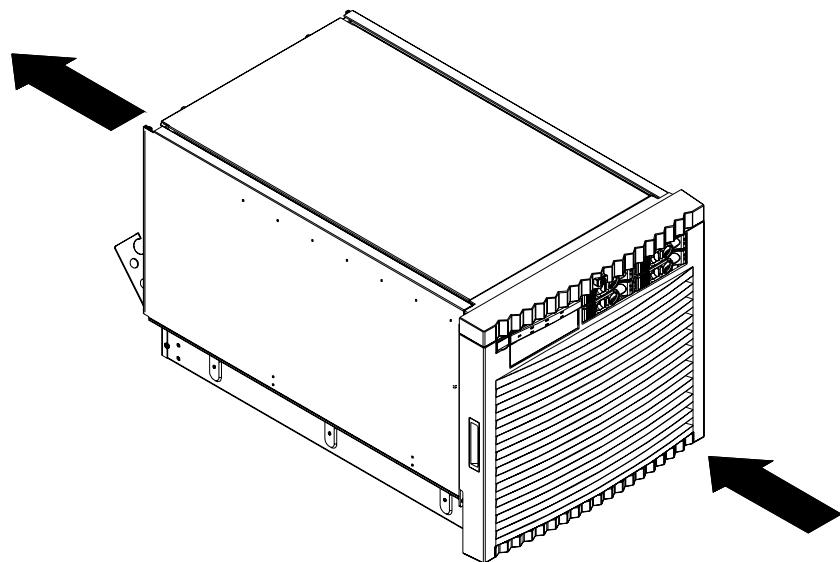
The acoustic noise specification for the HP Integrity rx7620 Server is 57.3 db (sound pressure level at bystander position) It is appropriate for dedicated computer room environments but not office environments. The LwA is 7.5 Bels. Be sure to understand the acoustic noise specifications relative to operator positions within the computer room or when adding servers to computer rooms with existing noise sources.

Airflow

The HP Integrity rx7620 Server requires that the cabinet air intake temperature be between 68° and 77° F (20° and 25° C) at 960 CFM.

Figure B-1 illustrates the location of the inlet and outlet airducts on a single cabinet.

Figure B-1 **Airflow Diagram**



System Requirements Summary

This appendix summarizes the requirements that must be considered in preparing the site for the HP Integrity rx7620 Server.

Power Consumption and Air Conditioning

To determine the power consumed and the air conditioning required, follow the guidelines in Table B-5.

NOTE When determining power requirements, consider any peripheral equipment that will be installed during initial installation or as a later update. Refer to the applicable documentation for such devices to determine the power and airconditioning that is required to support these devices.

Maximum power is the sum of the worst case power consumption of every subsystem in the box and should be used to size worst case power consumption. Typical power consumption numbers are what HP engineers have measured when running power-intensive applications. These are generally lower than maximum power numbers because all of the subsystems in the box to simultaneously drawing maximum power for long durations is uncommon.

Weight

To determine overall weight, follow the examples in Table B-6, then complete the entries in Table B-7.

Table B-6 Example Weight Summary

Component	Quantity	Multiply By	Weight
Cell Boards	2	27.80 lb / 12.61 kg	55.6 lb / 25.22 kg
PCI Card (varies - used A3739B here)	4	0.34 lb / 0.153 kg	1.36 lb / 0.61 kg
Power Supply (BPS)	2	18.0 lb / 8.2 kg	36 lb / 16.40 kg
DVD	1	2.2 lb / 1.0 kg	2.2 lb / 1.0 kg
Disk Drive	4	1.6 lb / 0.73 kg	6.40 lb / 2.90 kg
Chassis with skins and front bezel cover	1	131 lb / 59.42 kg	131 lb / 59.42 kg
		Total weight	244.56 lbs (111.75)

Table B-7 Weight Summary

Component	Quantity	Multiply By	Weight (kg)
Cell Boards		27.8 lb / 12.61 kg	
PCI Card		weight varies	
Power Supply (BPS)		18 lb / 8.2 kg	

Table B-7 Weight Summary (Continued)

Component	Quantity	Multiply By	Weight (kg)
DVD		2.2 lb / 1.0 kg	
Disk Drive		1.6 lb / 0.73 kg	
Chassis with skins and front bezel cover		131 lb / 59.42 kg	
Total weight			

C MP Commands

This appendix contains a list of the Server Management Commands.

Server Management Commands

Table C-1 lists the server management 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
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

MP Commands

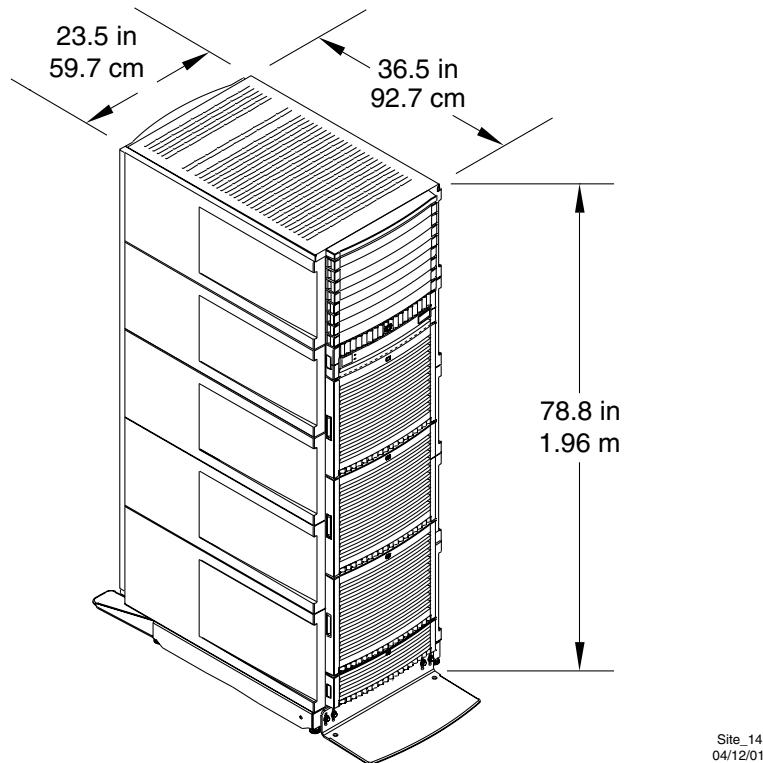
Server Management Commands

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 an HP 9000 rp8420 server.

Figure D-1 HP 9000 rp8420 server Space Requirements



Site_14
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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.

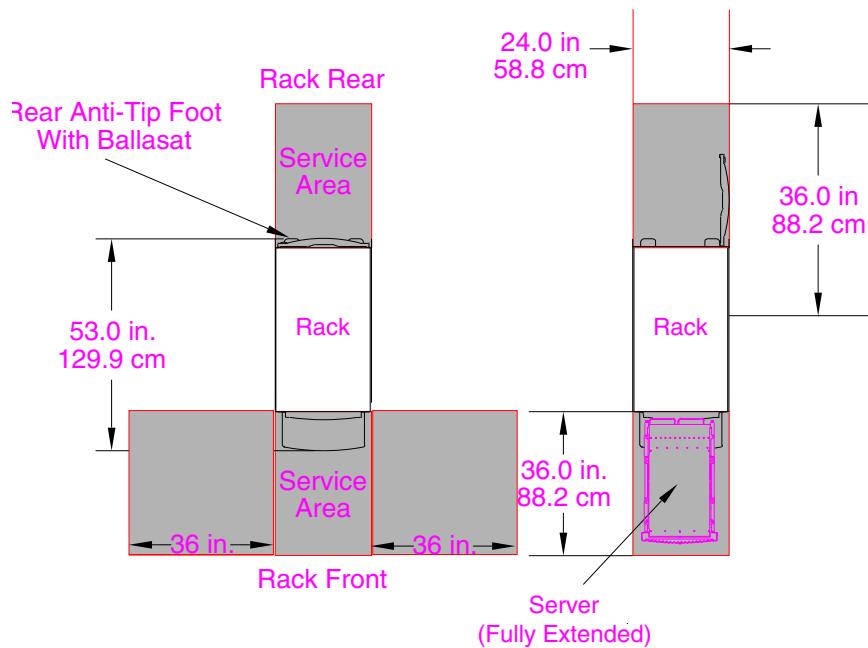
Computer Room Layout Plan

Use the following procedure to create a computer room layout plan:

- Step 1.** Remove several copies of the floor plan grid.
- Step 2.** Cut and join them together (as necessary) to create a scale model floor plan of your computer room.
- Step 3.** Remove a copy of each applicable equipment footprint template.
- Step 4.** Cut out each template selected in step 3; then place it on the floor plan grid created in step 2.
- Step 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.

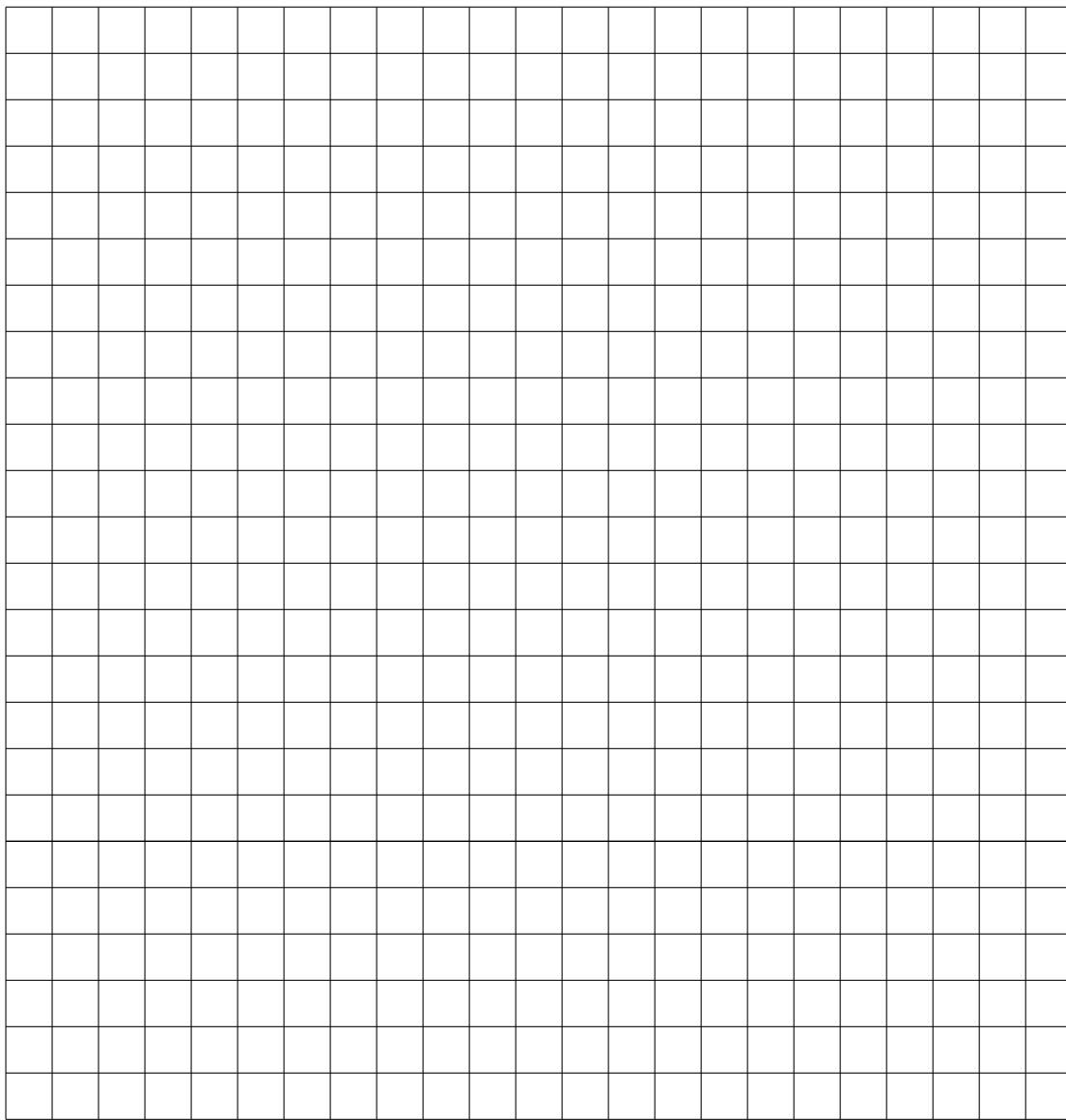
Figure D-2 HP 9000 rp8420 server Cabinet Template



Site_011
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Figure D-3 Planning Grid

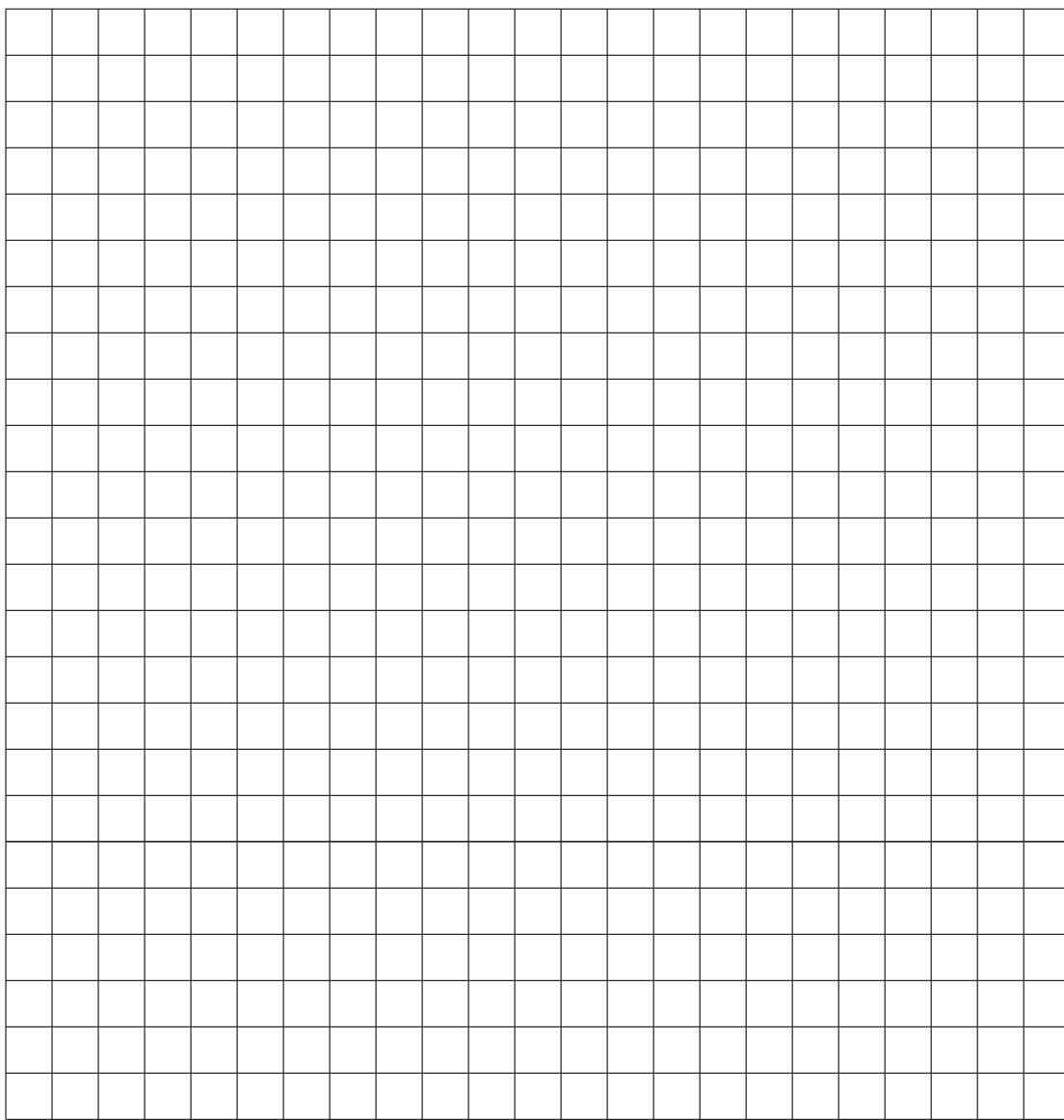
Scale: 1/4 inch = 1 foot



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Figure D-4 Planning Grid

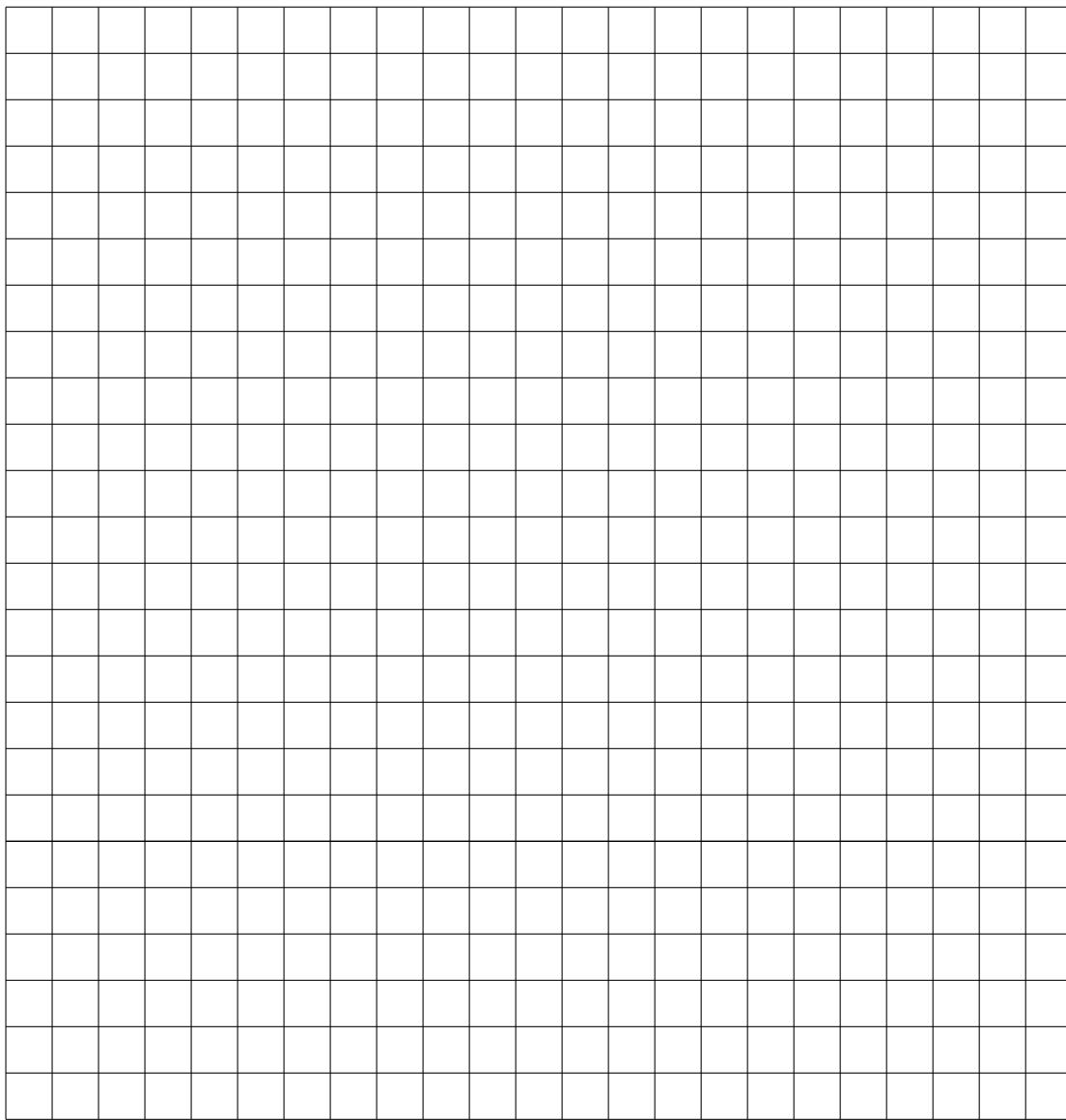
Scale: 1/4 inch = 1 foot



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Figure D-5 Planning Grid

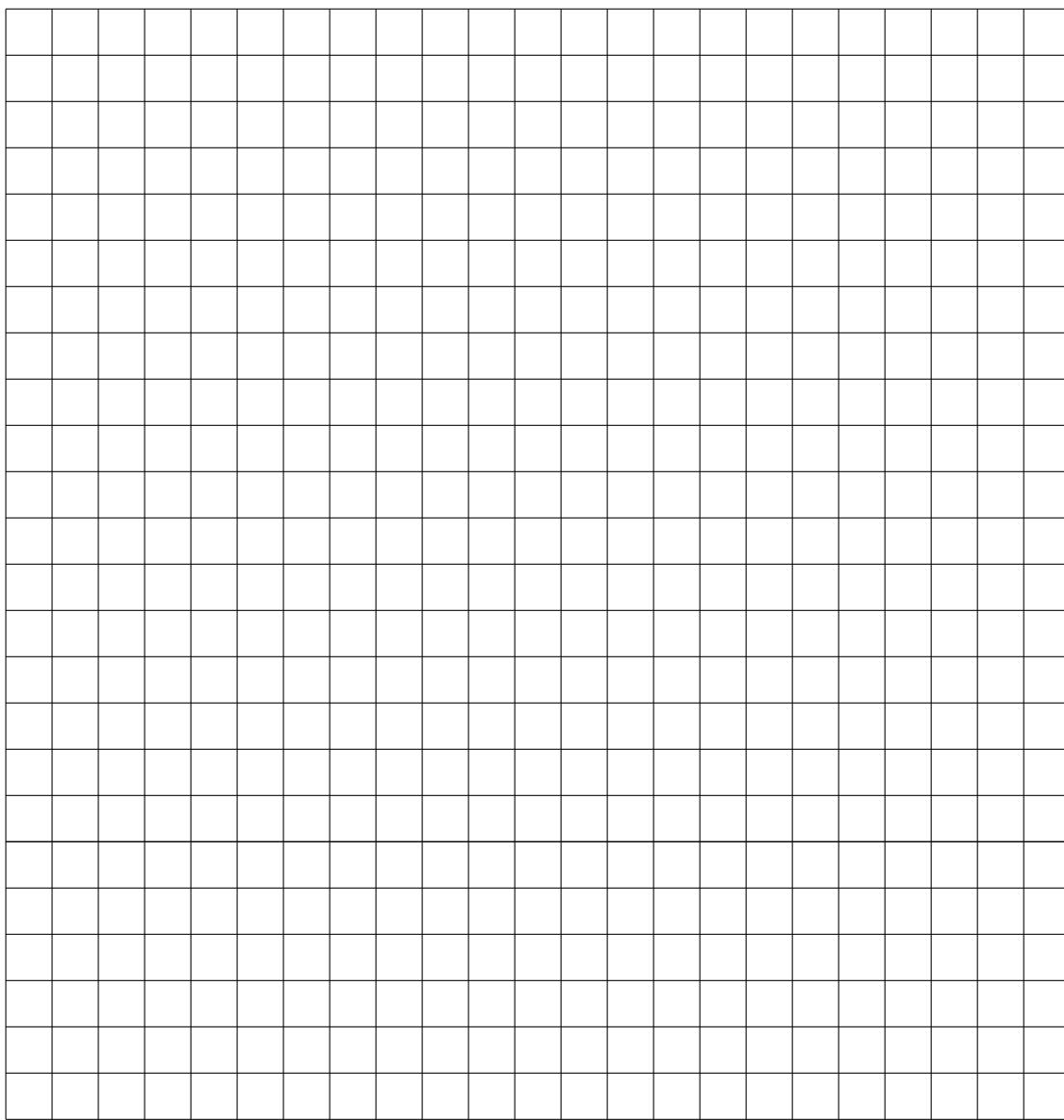
Scale: 1/4 inch = 1 foot



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Figure D-6 Planning Grid

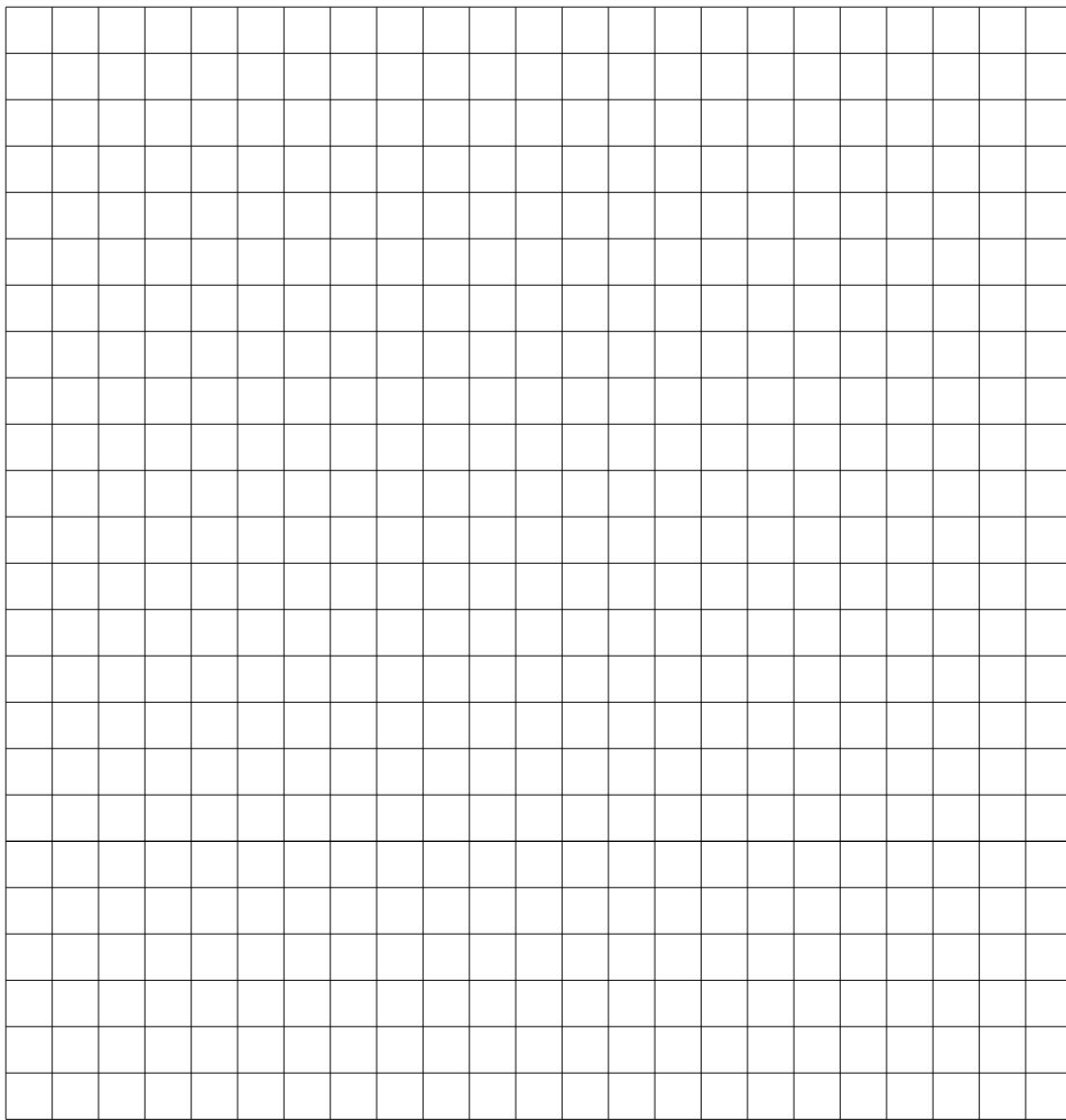
Scale: 1/4 inch = 1 foot



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Figure D-7 Planning Grid

Scale: 1/4 inch = 1 foot



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