

Installation Guide, HP 9000 rp7420

Fourth Edition



i n v e n t

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Revision History

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| Sixth Edition | Minor edits. Added warranty information. May 2007. |



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1 Introduction

The HP 9000 rp7420 Server is a member of the HP business-critical computing platform family: a mid-range, mid-volume server, positioned as an upgrade to the HP 9000 rp7410 product in the PL-1X product line. The HP 9000 rp7420 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 9000 rp7420 Server provides increased performance over its predecessor.

Overview

The HP 9000 rp7420 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 uses dual core, PA-RISC processors.

Figure 1-1 **HP 9000 rp7420 Server (front view)**

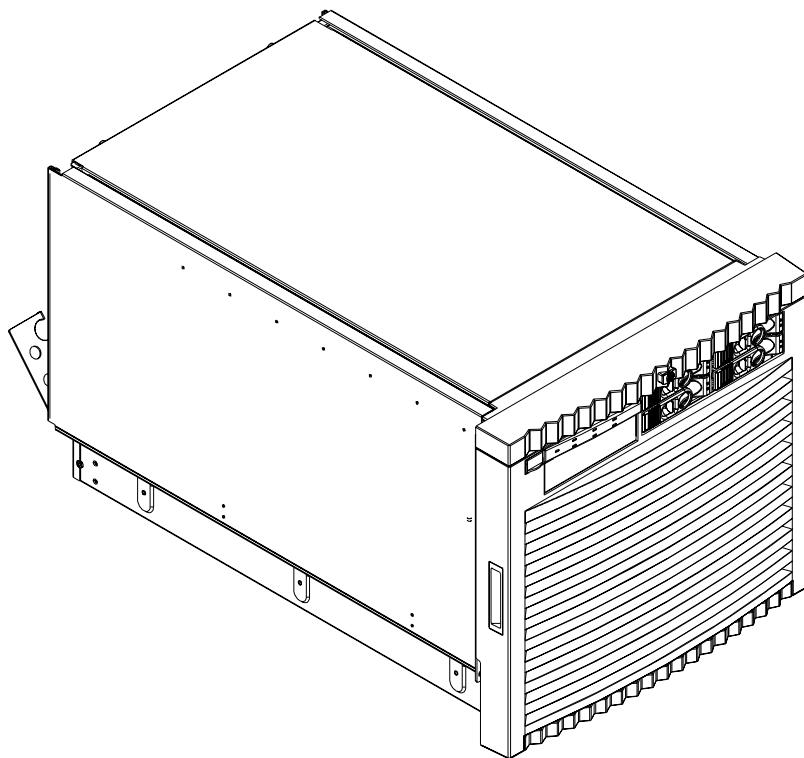
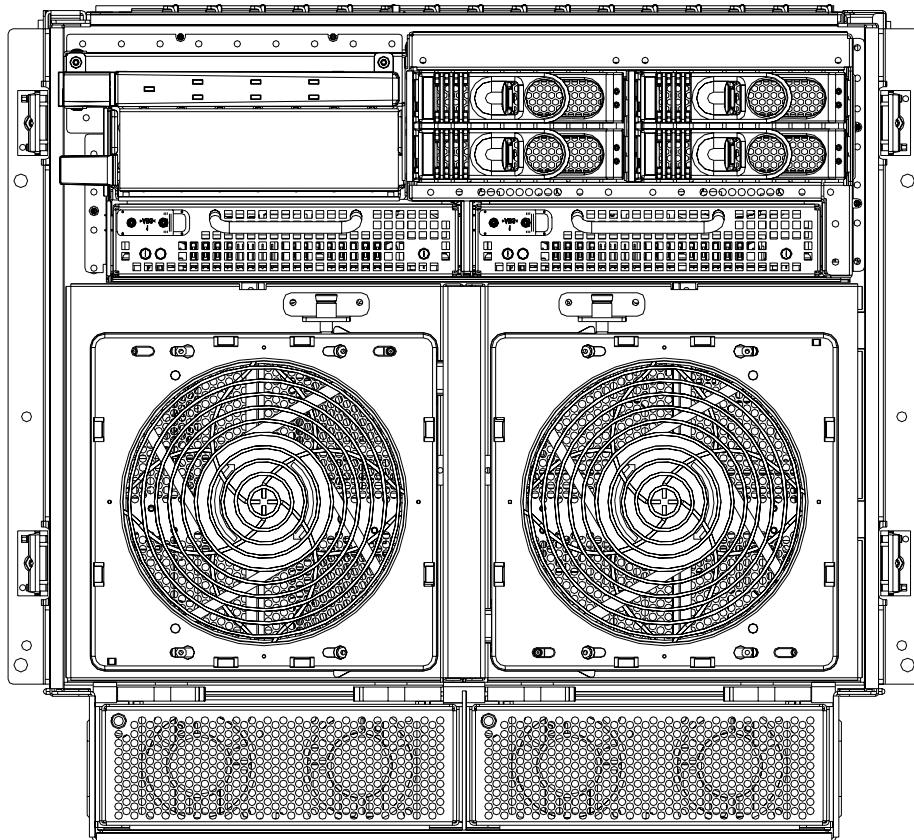


Figure 1-2 HP 9000 rp7420 Server (without front bezel)

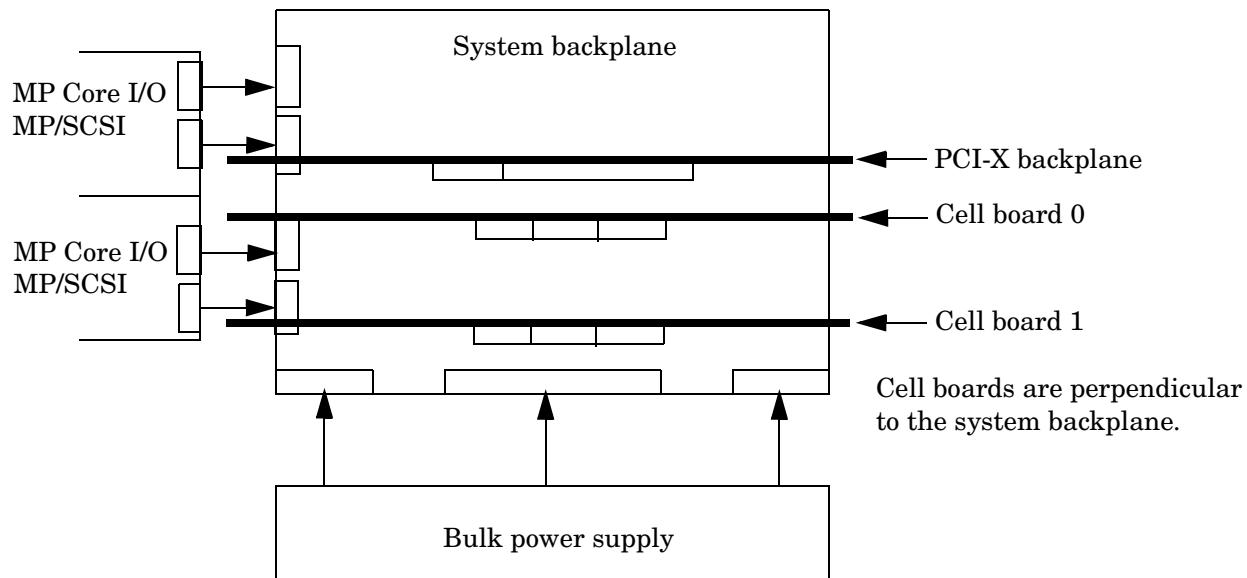


System Backplane

The system backplane is comprised of 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, Management Processor (MP) Core I/O MP/SCSI 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 Cell Controller (CC) connection increases performance and reduces costs.

Only half of the MP 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 Bacplane to PCI-X Backplane Connectivity

The PCI-X backplane uses two connectors for the System Bus Adapter (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 CC 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

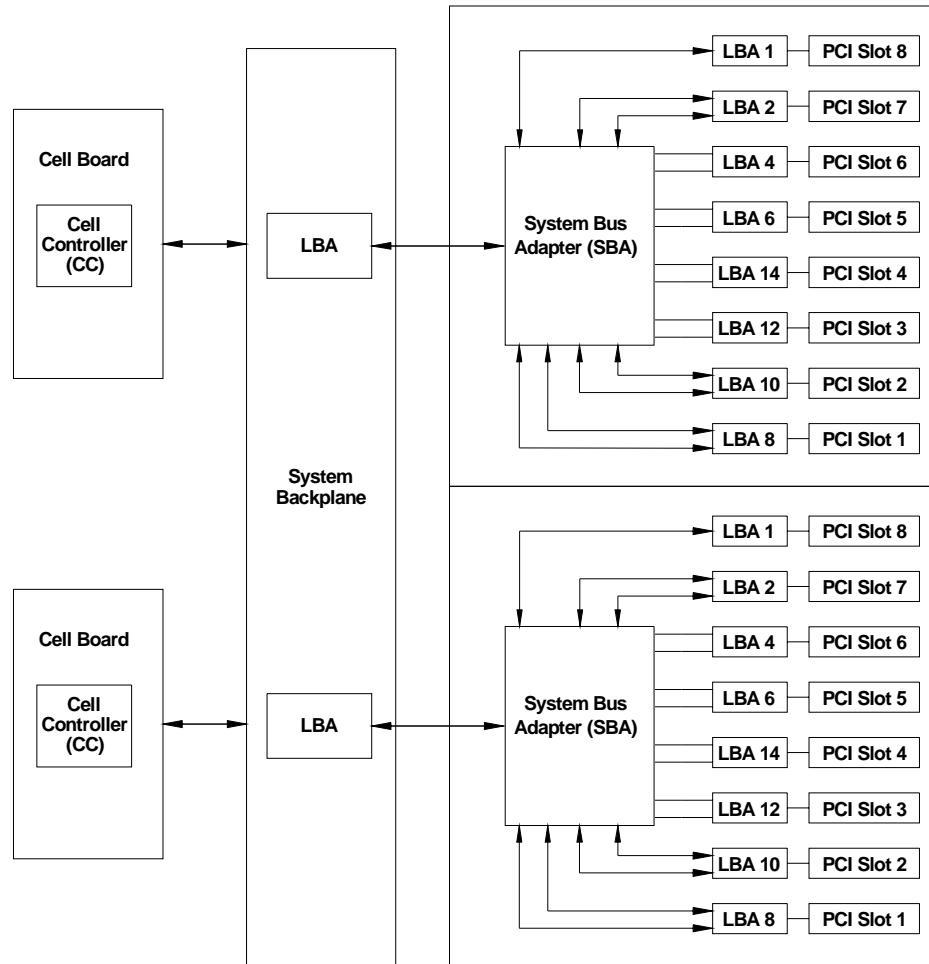
The system backplane contains reset and clock circuitry that propagates through the whole system. The central clocks drive all major chip set clocks. Therefore, these circuits represent a system wide single point of failure.

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 each communicate with individual SBAs 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 through 7 are dual rope slots, while slot 8 is a single rope slot.

The PCI-X backplane is the primary I/O interface for HP 9000 rp7420 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 66 MHz/33 MHz PCI or 133 MHz/66 MHz 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 separate from the other I/O partition.

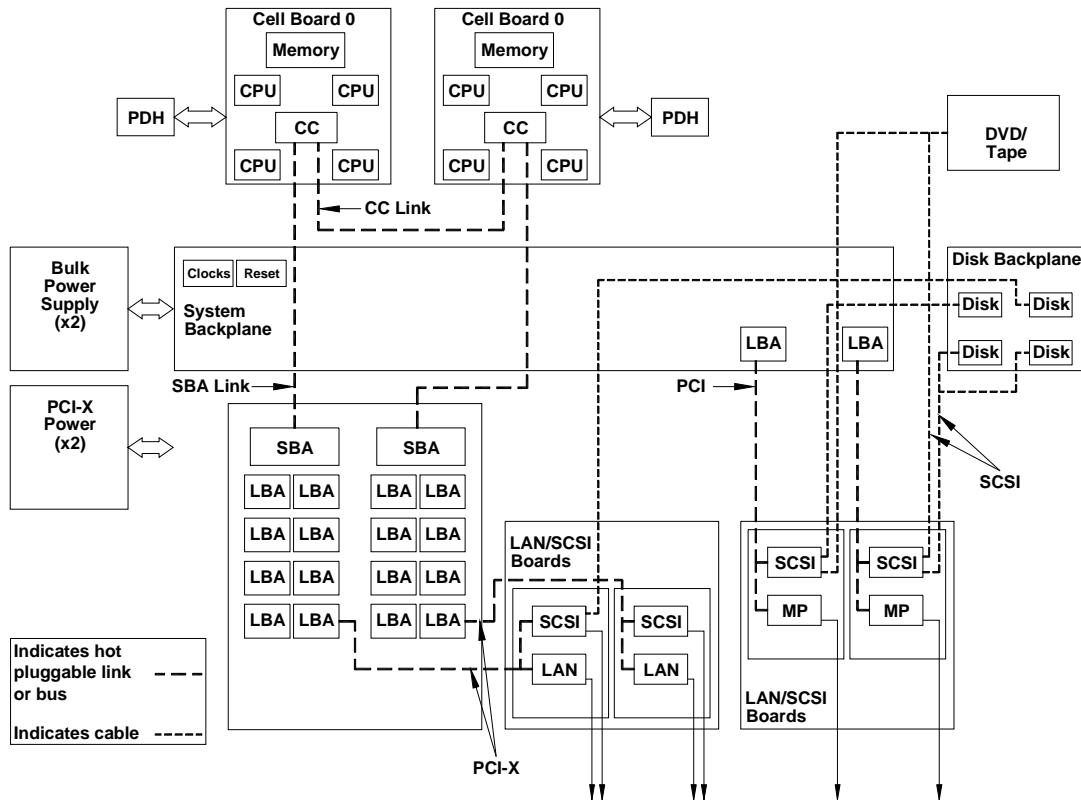
Table 1-1 PCI-X Slot Types

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

Detailed HP 9000 rp7420 Server Description

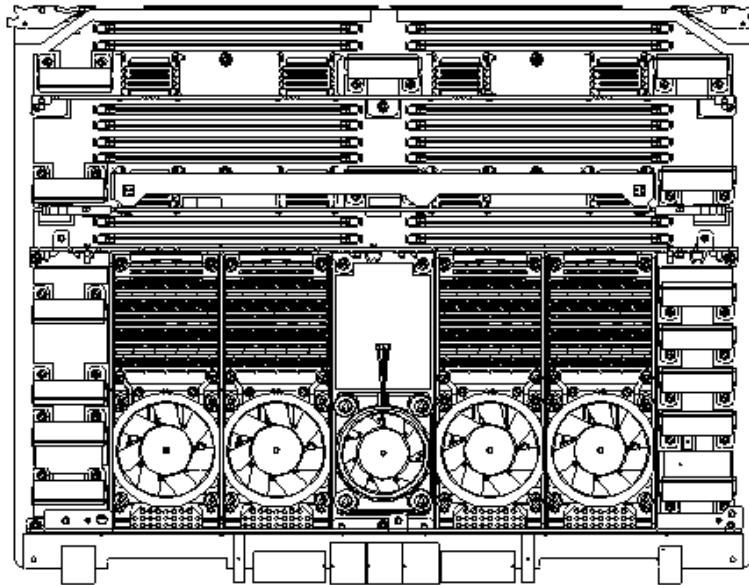
Figure 1-5 HP 9000 rp7420 Server 8-Socket Block Diagram



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 Cell Controller, the Memory Controllers, and the Memory. Minor hardware blocks include Clock Distribution, Power Distribution, Reset Circuit, and Platform Dependent Hardware (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**

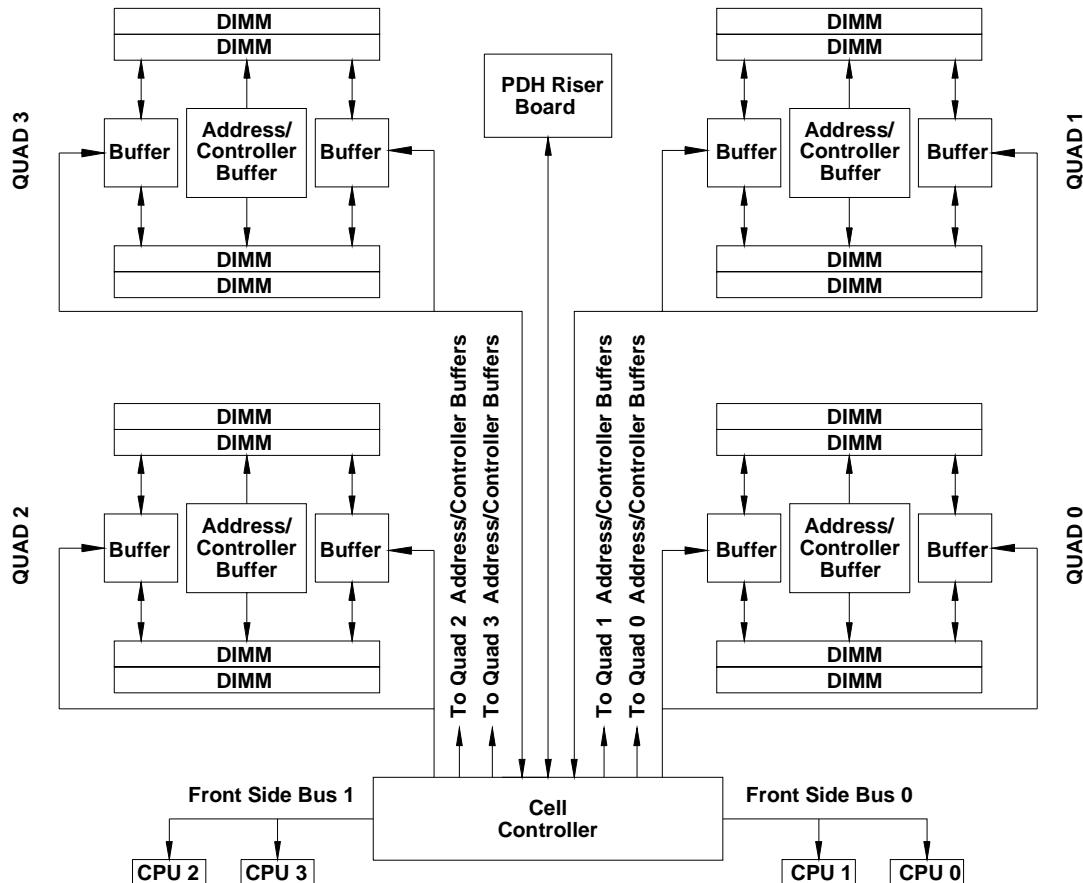


The HP 9000 rp7420 Server has a 48-V distributed power system and receives the 48-V power from the system backplane board. The cell board contains DC-to-DC converters to generate the required voltage rails. The DC-to-DC converters on the cell board do not provide N+1 redundancy.

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 LPM on the cell.

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

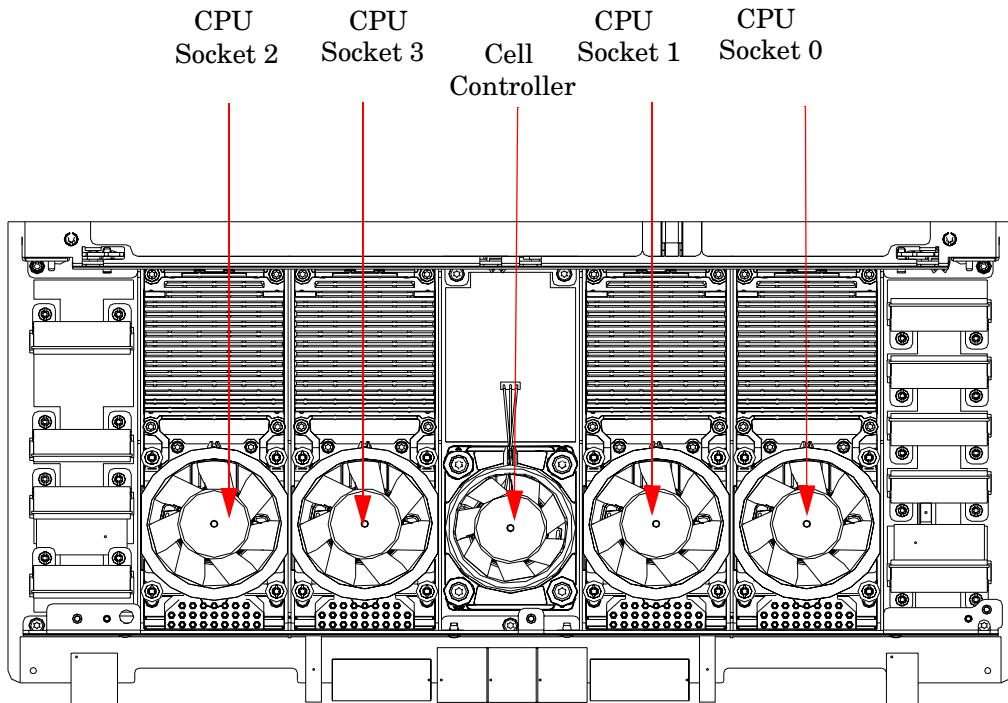
The cell board can hold up to eight (four dual-core) CPUs and can be populated with CPUs in increments of two CPUs. On a cell board, the processors must be the same type and speed. Two CPUs is the minimum configuration allowed on the HP 9000 rp7420 Server. There are two Frontside Buses (FBS), one for sockets 0 and 1, and one for sockets 2 and 3. Each FBS must have either a CPU or a terminator at the end of the bus or

the board will not operate properly. There cannot be a terminator board in socket 1 or socket 3 locations. See Table 1-2 for the CPU load order that must be maintained when adding CPUs to the cell board. See Figure 1-8 for the locations on the cell board for installing CPUs.

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

Custom designed by HP, each DIMM contains 36 x 4 SDRAM memory components similar to PC-133 memory, but qualified to run at 125 MHz. They have a low-voltage TTL interface. The CEC does *not* support traditional DRAMs.

The HP 9000 rp7420 Server supports DIMMs with 256 MB, 512 MB 1 GB, and 2 GB capacity. Table 1-3 shows each DIMM supported with its associated capacity, the resulting total system capacity, and the memory component density.

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

Table 1-3 HP 9000 rp7420 Server DIMMs

| DIMM Capacity | Total Capacity | Memory Component Density |
|----------------------|-----------------------|---------------------------------|
| 256 MB | 8 GB | 32 Mb |
| 512 MB | 16 GB | 64 Mb |
| 1 GB | 32 GB | 128 Mb |
| 2 GB | 64 GB | 256 Mb |
| 4 GB | 128 GB | 512 Mb |

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 9000 rp7420 Server is capable of supporting as little as 0.5 GB of main memory using two 256 MB DIMMs installed on a single cell board and as much as 128 GB by filling all 16 DIMM slots on both cell boards with 4 GB DIMMs.

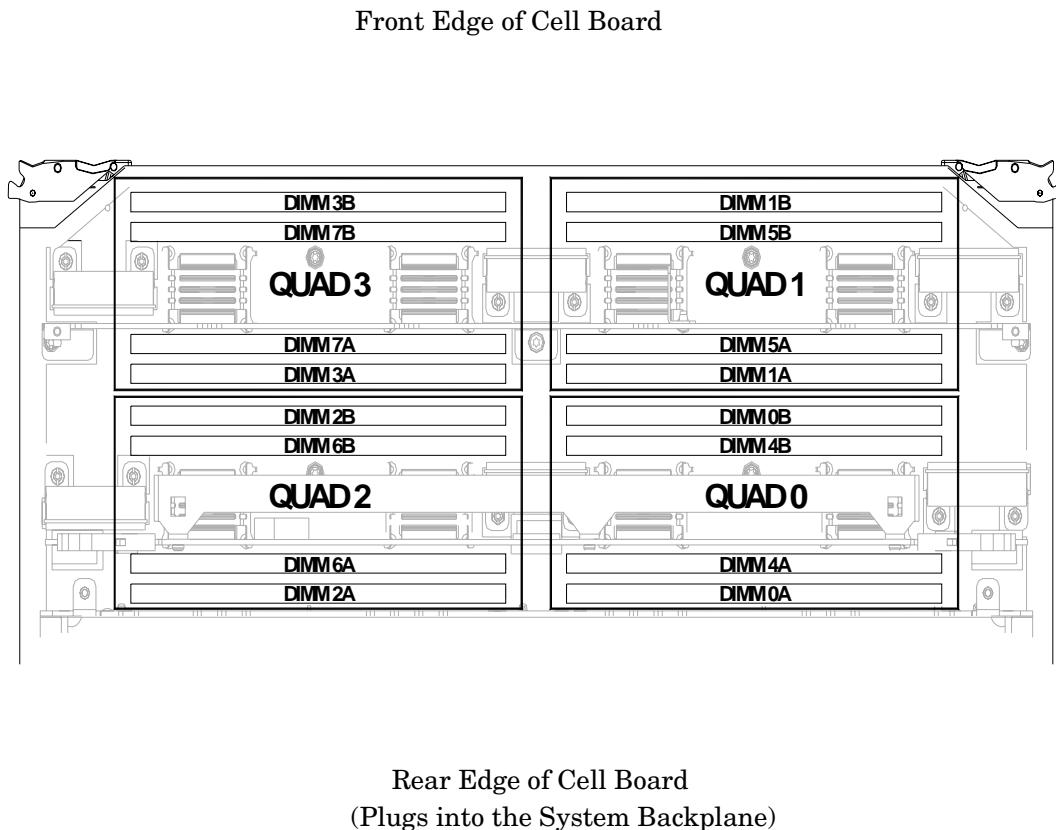
DIMMs must be loaded in sets of two at specified locations on the cell board. Two DIMMs are called a rank, so two ranks would be equivalent to four DIMMs, three ranks would be six DIMMs, and so on. The DIMMs must be the same size in a rank. The DIMMs across all cells in a partition should have identical 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 a rank 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 Rank | Install First | 0A and 0B | Quad 0 |
| 4 DIMMs = 2 Ranks | Add Second | 1A and 1B | Quad 1 |
| 6 DIMMs = 3 Ranks | Add Third | 2A and 2B | Quad 2 |
| 8 DIMMs = 4 Ranks | Add Fourth | 3A and 3B | Quad 3 |
| 10 DIMMs = 5 Ranks | Add Fifth | 4A and 4B | Quad 0 |
| 12 DIMMs = 6 Ranks | Add Sixth | 5A and 5B | Quad 1 |
| 14 DIMMs = 7 Ranks | Add Seventh | 6A and 6B | Quad 2 |
| 16 DIMMs = 8 Ranks | Add Last | 7A and 7B | Quad 3 |

Figure 1-9 **DIMM Slot Layout**



Cells and nPartitions

A cell board that has an I/O link to a bootable device and a console (usually supplied by an MP 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 can contain both cells. The HP 9000 rp7420 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 Core I/O cards.

In the single nPartition case, if two cells are present, either cell can be the root cell, assuming 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.

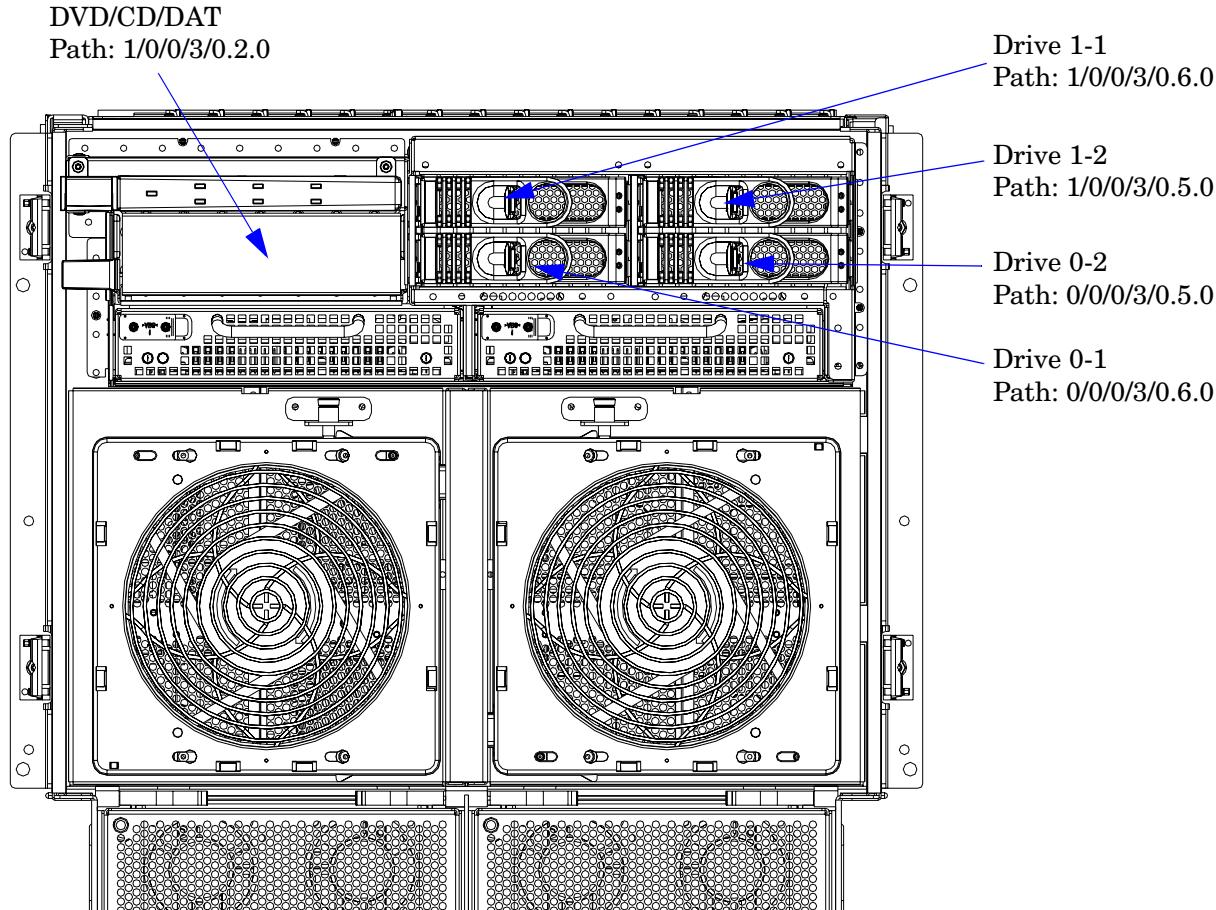
NOTE Partition configuration information is available at <http://docs.hp.com>. Refer to *HP Systems Partition Guide: Administration for nPartitions* for more detail.

Internal Disk Devices for the HP 9000 rp7420 Server

In an HP 9000 rp7420 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 MP Core I/O Board

The HP 9000 rp7420 Server accommodates two sets of MP 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 boards are oriented vertically and plug into the system backplane. The MP/SCSI board incorporates a dual channel Ultra160 SCSI controller.

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 9000 rp7420 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 9000 rp7420 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.

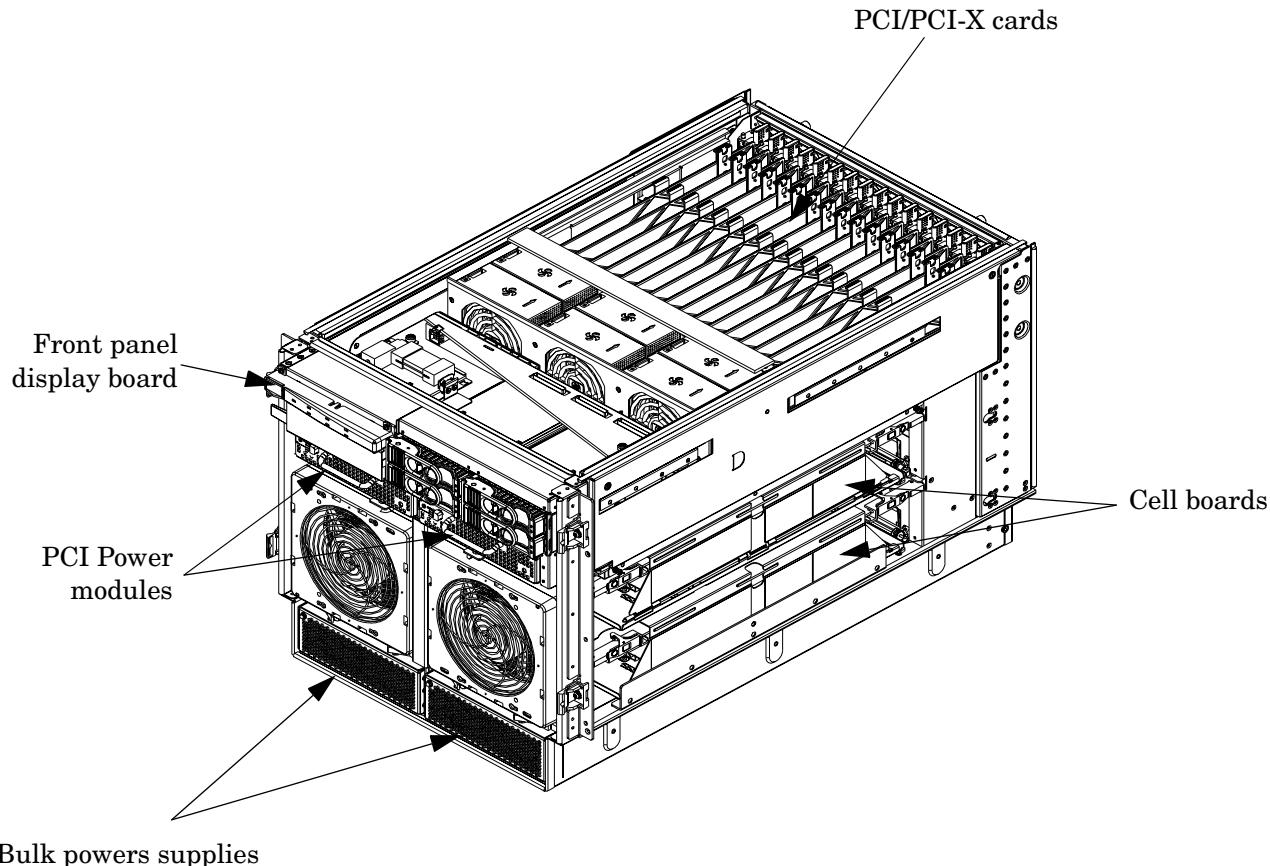
System Chassis

The mass storage section located in the front allows access to removable mass storage devices without removal of the bezel (not shown). This is especially helpful when the system is mounted in the lowest position in a rack. The mass storage bay accommodates one 5.25-inch removable media device and up to four 3.5-inch hard drives. 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 BPS section is partitioned by a sealed metallic enclosure located in the bottom of the package. This enclosure houses the N+1 fully redundant BPS.

Figure 1-11 Right-Front View of HP 9000 rp7420 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 MP 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 BPS provide a wide input voltage range. They are installed in the front of the chassis, directly under the front fans.

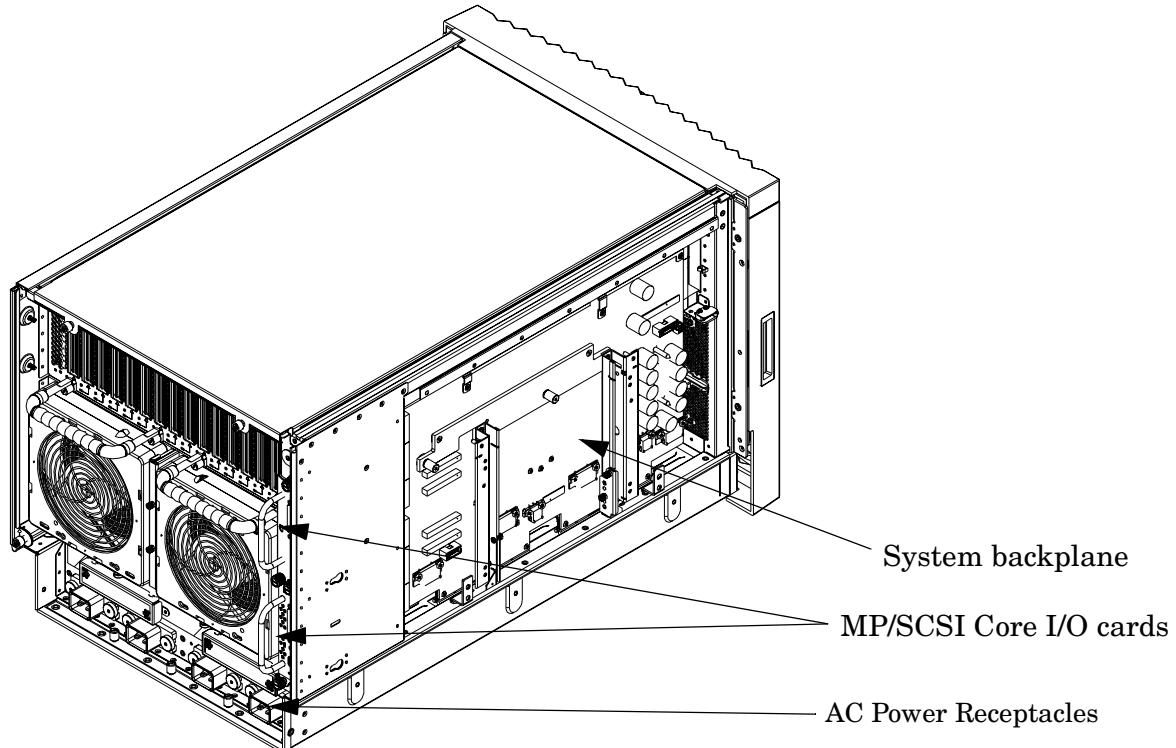
A cable harness that connects from the rear of the BPSs to the system backplane provides DC power distribution.

Access 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 9000 rp7420 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 has two windows, and each window,

under normal conditions, shows four beads present. If a carton has been mishandled or accidentally dropped, the tilt indicator indicates 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.

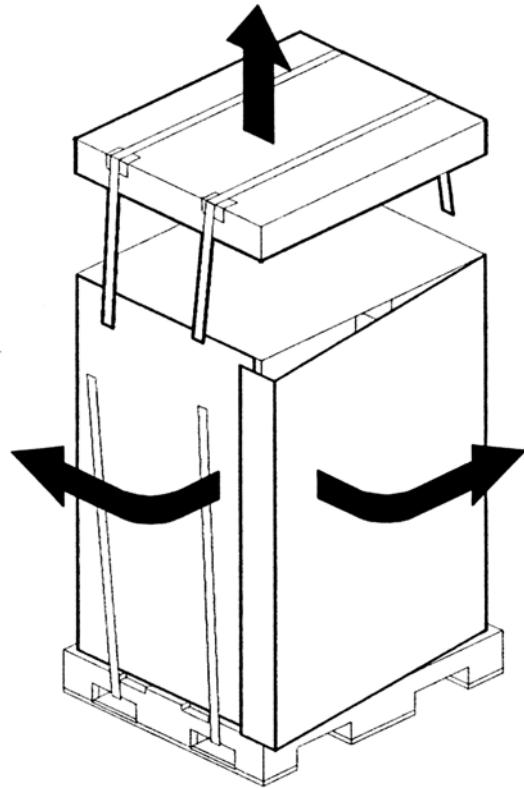
NOTE Position the pallet to allow for enough space to roll the cabinet off the pallet before unpacking.

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.

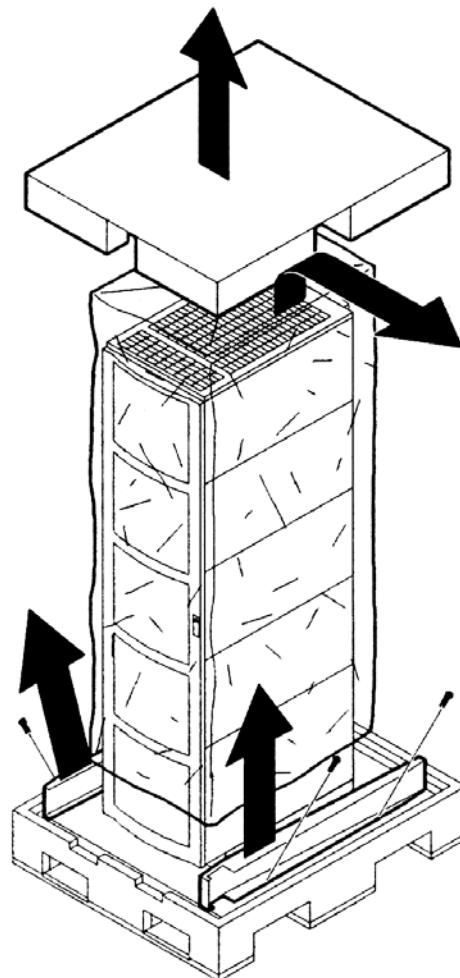
CAUTION The plastic wrapping material should be cut off rather than pulled off. Pulling the plastic covering off represents an electrostatic discharge (ESD) hazard.

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

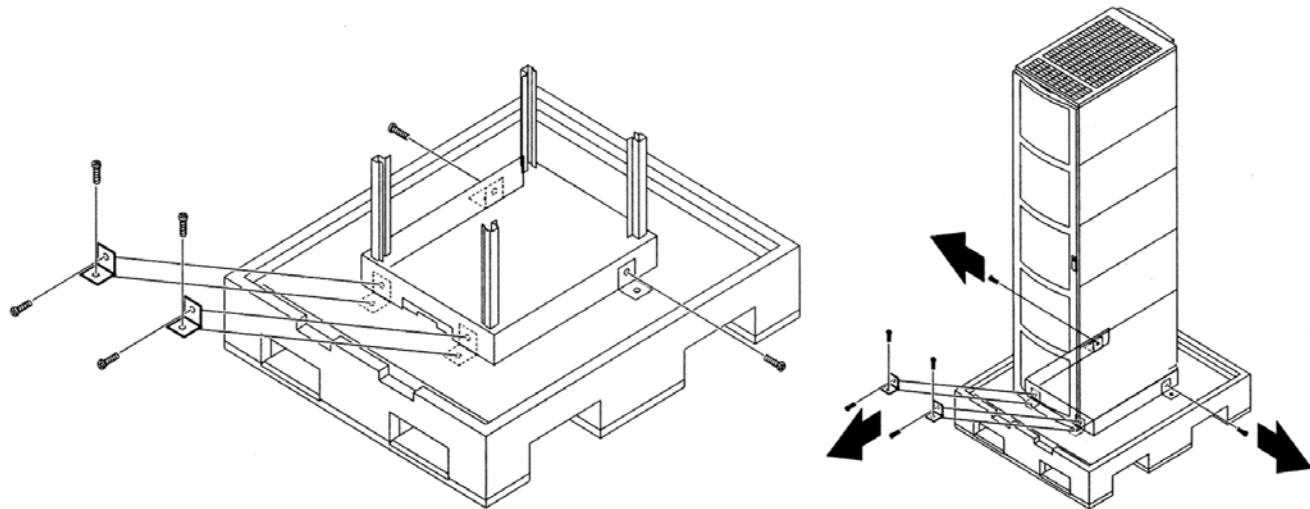


[Unpacking the Server](#)

[Unpacking a Racked Server](#)

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

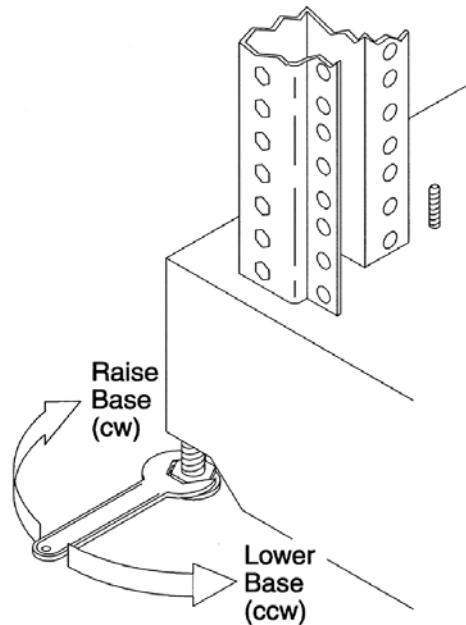


WARNING Be sure that the leveling feet on the rack are raised before you roll the rack down the ramp and any time you roll the rack on the casters. Use caution when rolling the cabinet off the ramp. A single server in the cabinet weighs approximately 665 pounds. HP strongly recommends that two people 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 the chapter titled “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.

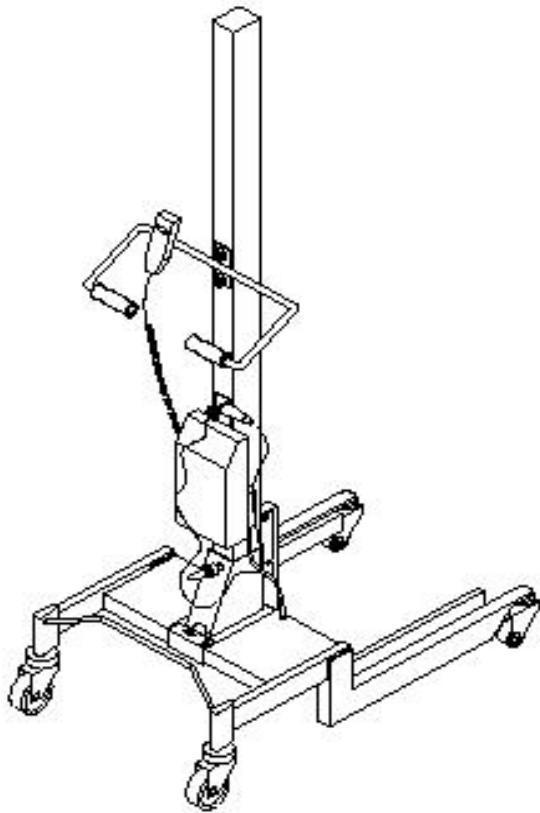
Unloading with a Lifter

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.**

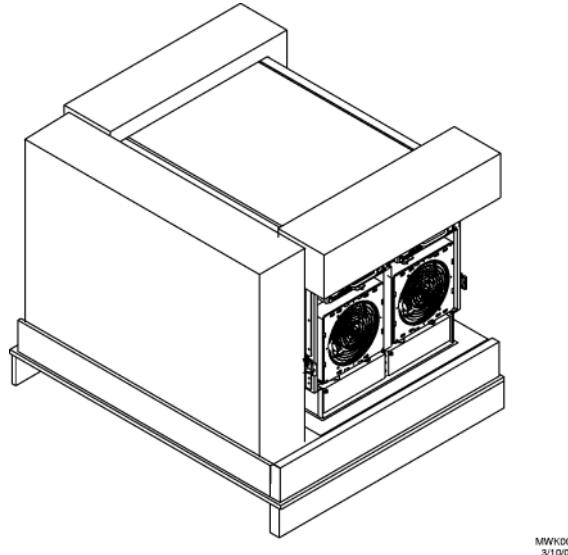
Never extend more than one server from the same cabinet while installing or servicing another server product. Failure to follow these instructions could result in the cabinet tipping over.

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



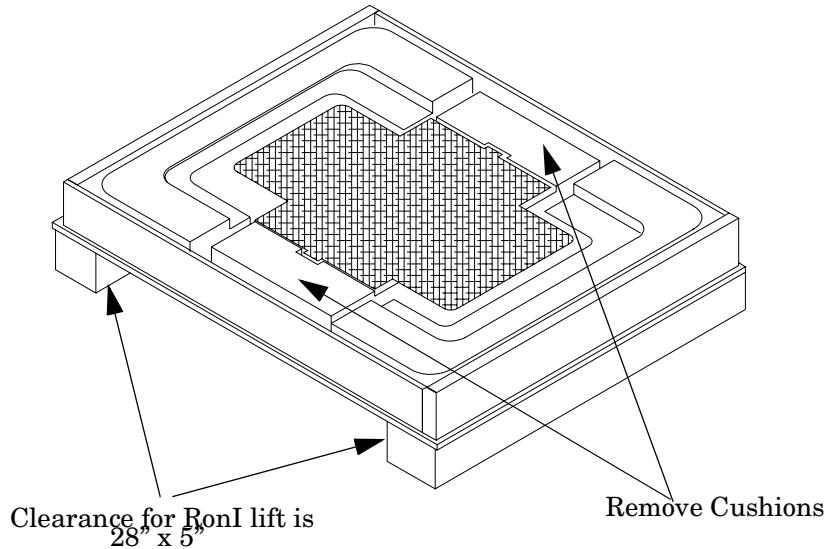
2. Remove all cartons from the pallet, leaving only the server.

[Unpacking the Server](#)

[Unpacking a Non-Racked Server](#)

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

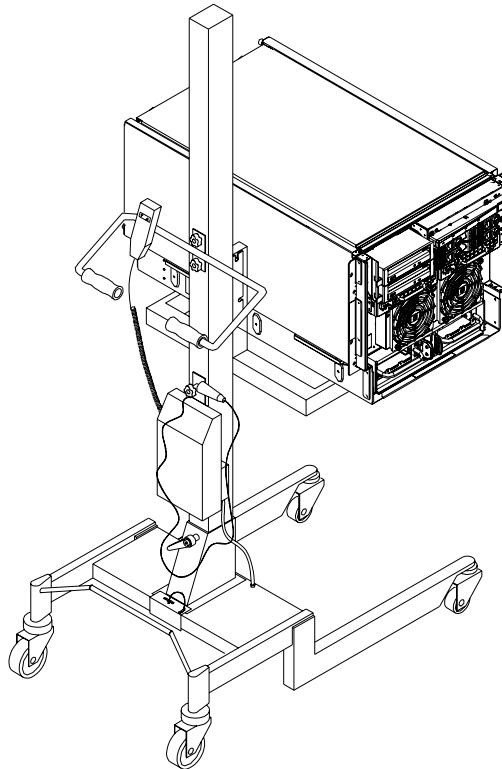
Figure 2-7 Remove Cushions for Lift Access



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*.

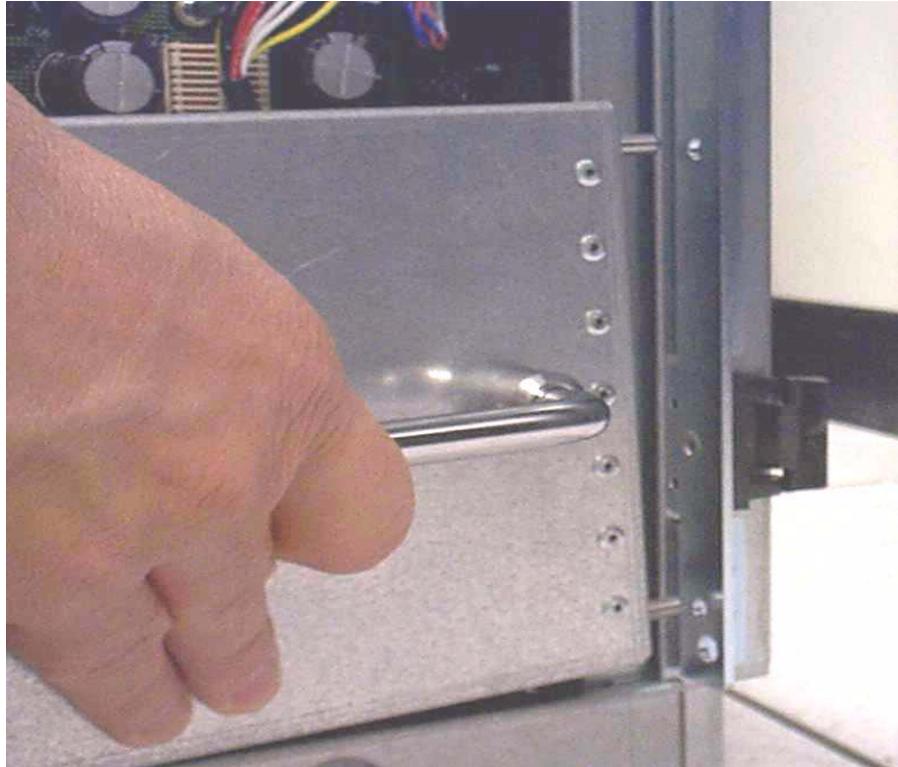
Unloading with Lift Handle Panels

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.

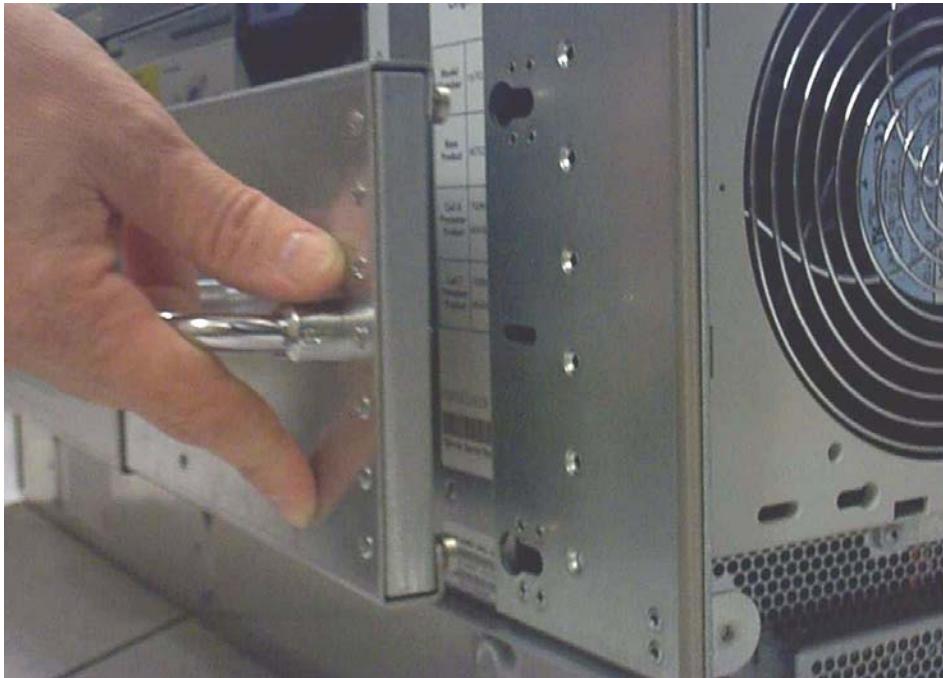
1. Remove both side covers. If present, remove the front panel.
2. Locate lift handles and remove from storage plate.
3. Orient lift handle panels such that when installed, the handles hang down at 90 degrees and lock in a horizontal position during lifting.

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 3 through 7 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 Accessories

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 | Right side caster cover | 1 |
| A6753-04003 | Left side caster 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

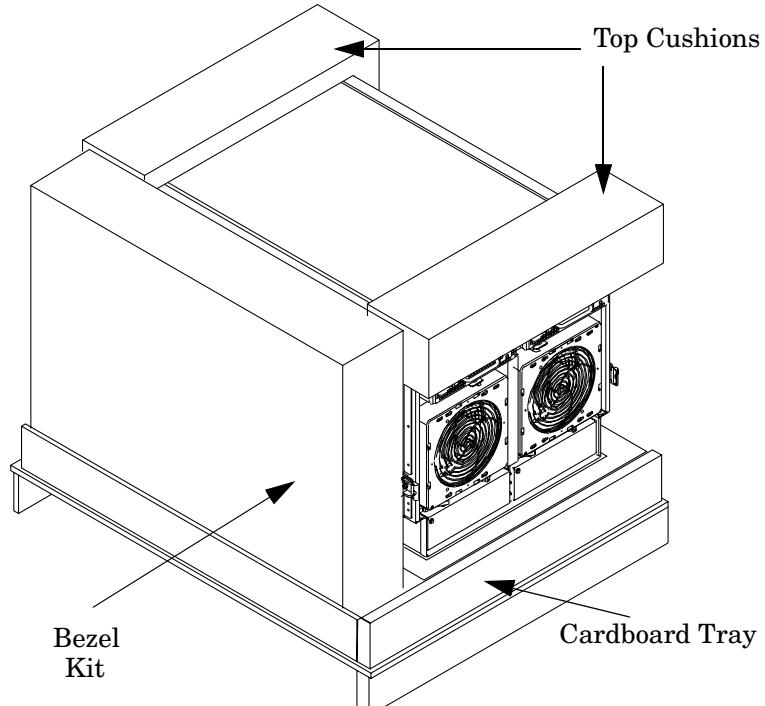
The following list provides the installer with the recommended tools to perform the wheel kit installation.

- 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

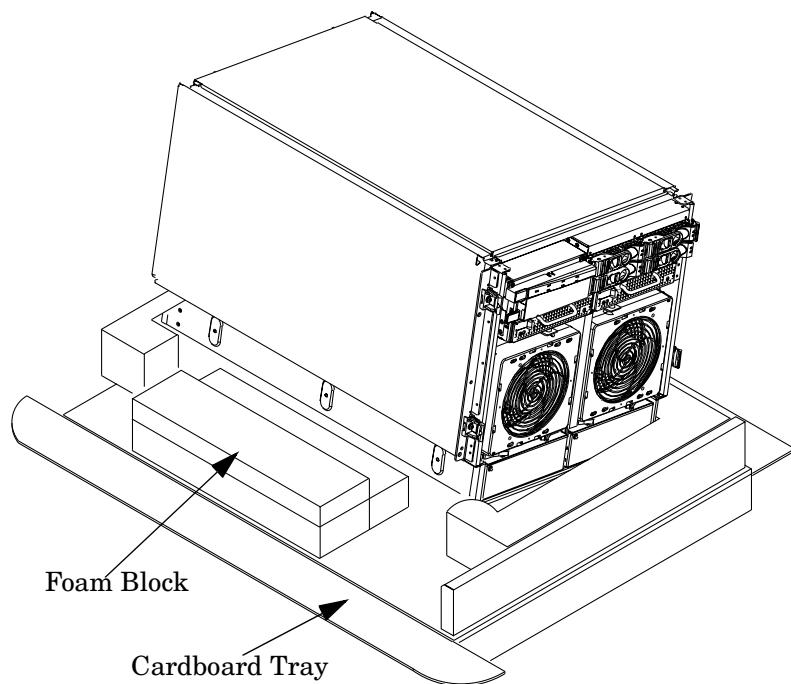


Installing Accessories

Wheel Kit Installation

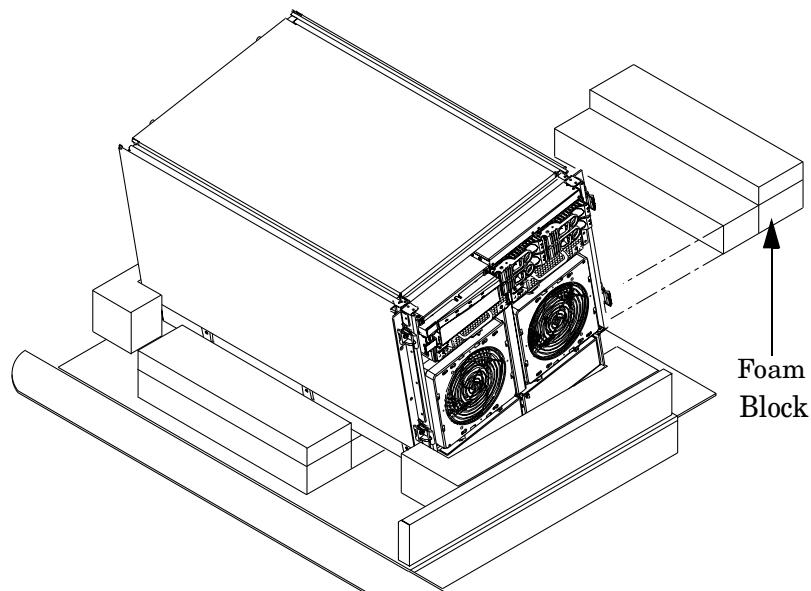
4. Unfold bottom cardboard tray.
5. Carefully tilt the server and place one of the foam blocks (A6093-44002) under the left side of the server. Do not remove any other cushions until instructed to do so.

Figure 3-2 Left Foam Block Position



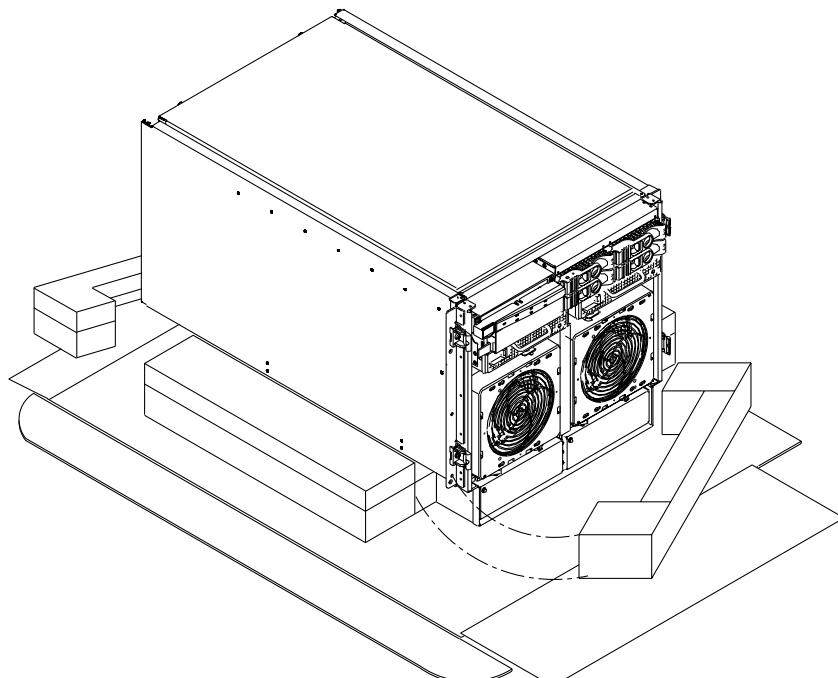
6. Carefully tilt the server and place the other foam block provided in the kit under the right side of the server.

Figure 3-3 Right Foam Block Position



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

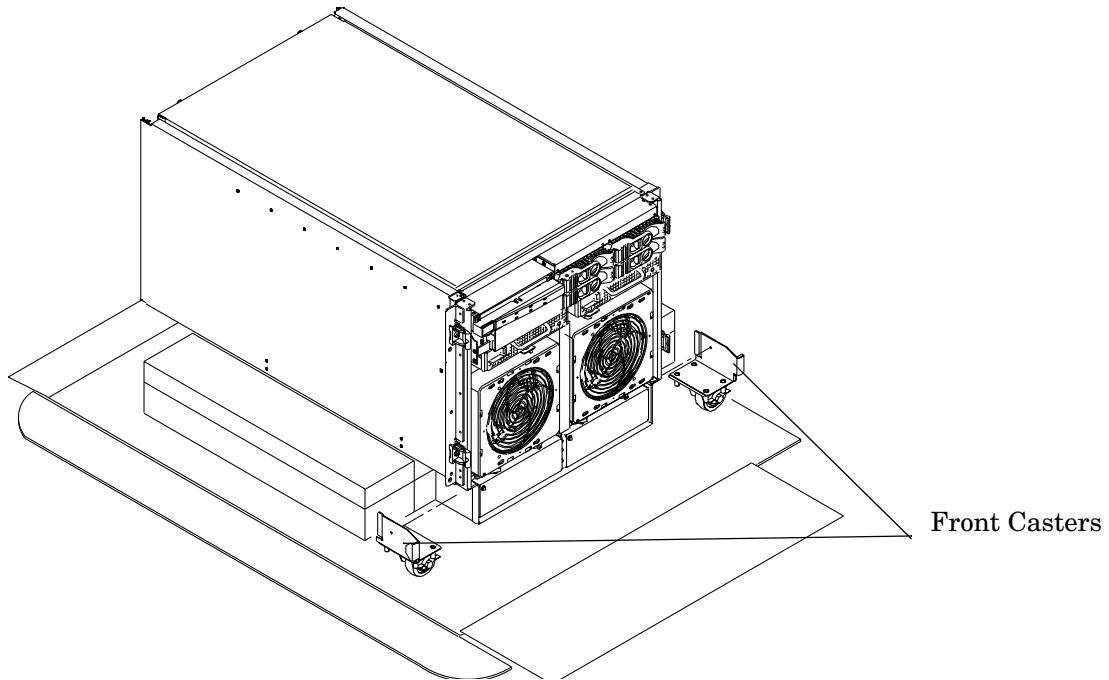
| Caster | Part Number |
|-------------|-------------|
| Right front | A6753-04001 |
| Right rear | A6753-04005 |
| Left front | A6753-04006 |
| Left rear | A6753-04007 |

[Installing Accessories](#)

[Wheel Kit Installation](#)

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



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.

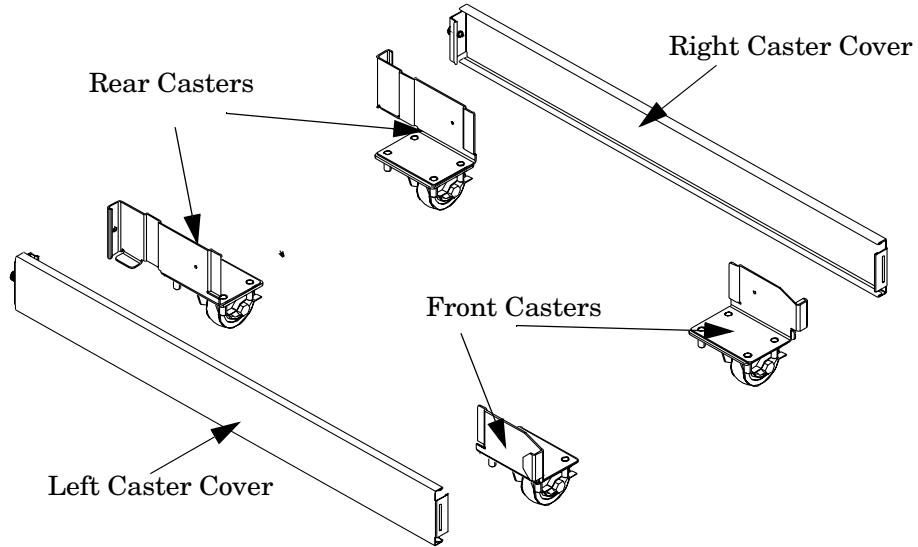
14. Carefully roll the server off the pallet and down the ramp.

15. Locate the caster covers.

NOTE The caster covers are designed to fit on either side of the server.

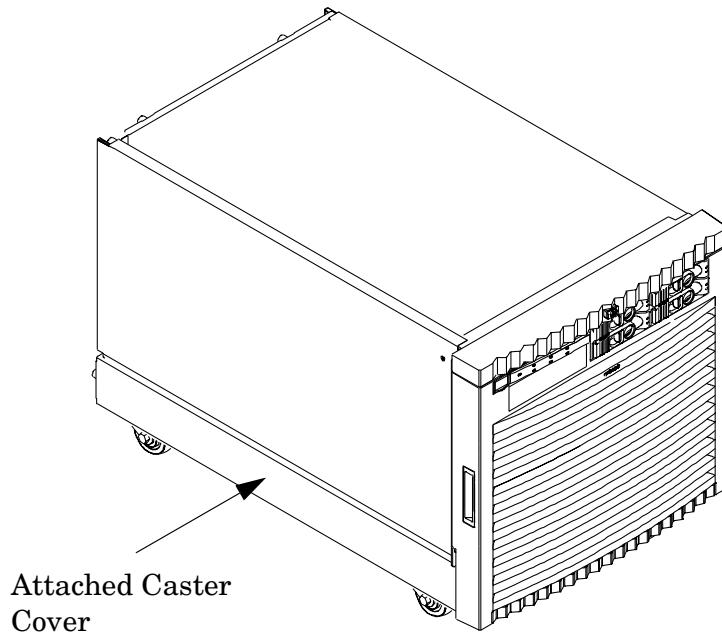
16. Insert the slot on the caster cover into the front caster. Secure the cover to the server by tightening the captive screw on the cover at the rear of the server.

Figure 3-6 Securing Each Caster Cover to the Server



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 9000 rp7420 Server. Known cards supported at the release of this manual are shown in Table 3-3.

Table 3-3 **HP 9000 rp7420 Server I/O Cards**

| Part Number | Card Description | Number of Cards Supported (B - Bootable) |
|-------------|------------------------------------|--|
| A3739B | FDDI Dual Attach | 15 |
| A6847A | Next Generation 1000B-SX | 15 |
| A6825A | Next Generation 1000B-T | 15 |
| A5149A | Ultra2 SCSI | 15B |
| A5150A | 2-port Ultra2 SCSI | 15B |
| A5159B | 2-port FWD SCSI | 15B |
| A5230A | 10/100B-TX (RJ45) | 15 |
| A5483A | ATM 622 (MMF connector) | 15 |
| A5506B | 4-port 10/100B-TX | 15 |
| A5513A | ATM 155 (MMF connector) | 15 |
| A5515A | ATM 155 (UTP5 connector) | 15 |
| A5783A | Token Ring (4/16/100 Mb/s) | 15 |
| A5838A | 2-port Ultra2-SCSI + 2-port 100T | 15B |
| A5856A | RAID 4Si | 12B |
| A6386A | Hyperfabric II | 8 |
| A6748A | 8-port Terminal MUX | 15 |
| A6749A | 64-port Terminal MUX | 15 |
| A6794AX | Procurium GigE LAN/SCSI combo card | 2B |
| A6795A | 2G FC Tachlite | 15B |
| A6826A | 2-port 2 Gb FC | 15B |
| A6828A | 1-port U160 SCSI | 15B |
| A6829A | 2-port U160 SCSI | 15B |
| A7011A | 1000BaseSX Dual Port | 15 |
| A7012A | 1000 BaseT Dual Port | 15 |
| A7143A | U160 RAID - SmartArray 5304 | 12B |

Table 3-3 HP 9000 rp7420 Server I/O Cards (Continued)

| Part Number | Card Description | Number of Cards Supported (B - Bootable) |
|-------------|--|--|
| A7173A | 2 port U320 SCSI | 15B |
| J3525A | 2-port serial (X25/FR/SDLC) | 15 |
| J3526A | 4-port serial (X25/FR) | 15 |
| Z7340A | 8-port ACC | 16 |
| A4800A | FWD SCSI | 15B |
| A4926A | Gigabit Ethernet (1000B-SX) | 15 |
| A4929A | Gigabit Ethernet (1000B-T) | 15 |
| A5158A | Fibre Channel PCI Adapter | 15B |
| A6092A | Hyperfabric (PCI 4X) | 4 |
| A9782A | PCI-X 1000Base-T GigE/2Gb Combo | 15B |
| A9784A | PCI-X 1000Base-T GigE/2G FC Combo | 15B |
| A9890A | SmartArray 6402 2-channel RAID | 12B |
| A9891A | SmartArray 6404 4-channel RAID | 12B |
| AB286A | PCI-X 2-Port 4X InfiniBand HCA (HPC) | 1 |
| AB287A | 10G Ethernet | 2 |
| AB290A | U320 SCSI/GigE Combo Card | 15B |
| AB378A | 1-port 4Gb FC card PCI-X | 15B |
| AB379A | 2-port 4Gb FC card PCI-X | 15B |
| AB465A | PCI-X 2-port 1000B-T/2-port 2Gb FC Combo | 15B |
| AB545A | 4-port 1000B-T Ethernet | 15 |
| AD278A | 8-port Terminal MUX | 15 |
| AD279A | 64-port Terminal MUX | 15 |

PCI I/O Card Installation

HP 9000 rp7420 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 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*.

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 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 MRL for the card slot to the open position. See 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.

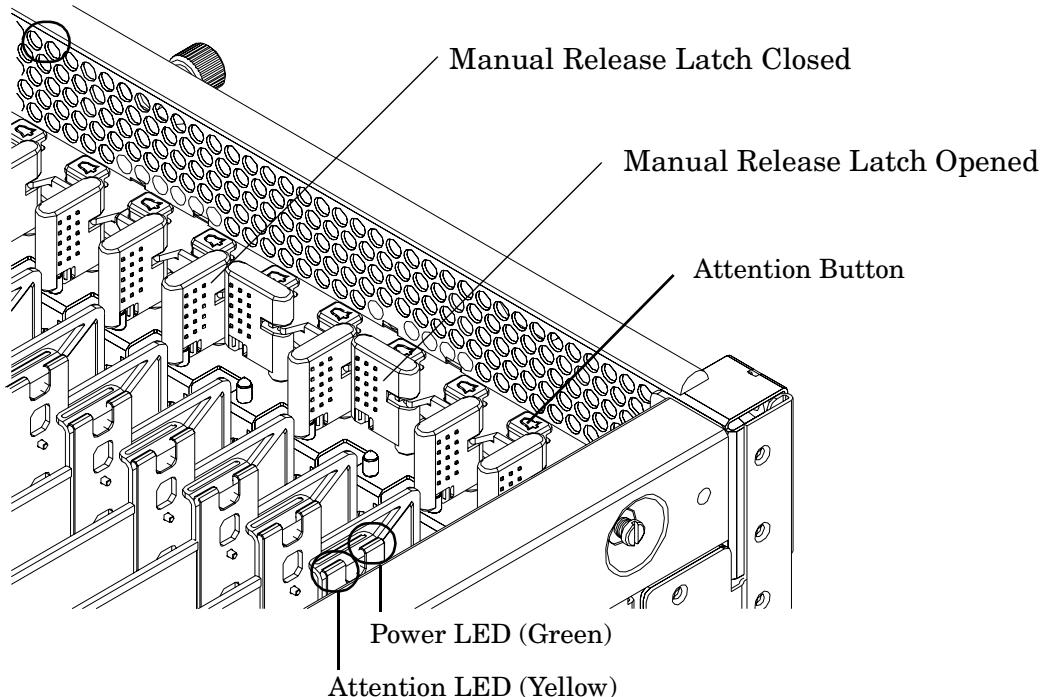
CAUTION Working out of sequence or not completing the actions within each step could cause the system to crash.

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 3-8 PCI I/O Slot Details



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

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

Installing Accessories

PCI-X Card Cage Assembly I/O Cards

4 Cabling and Power Up

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

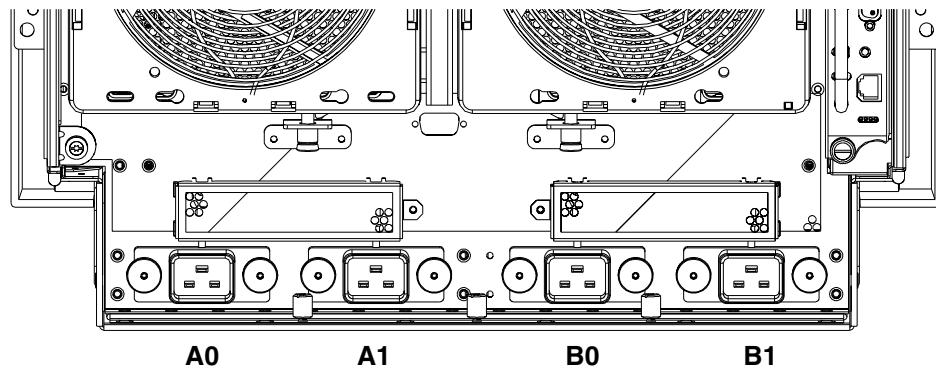
AC Input Power

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

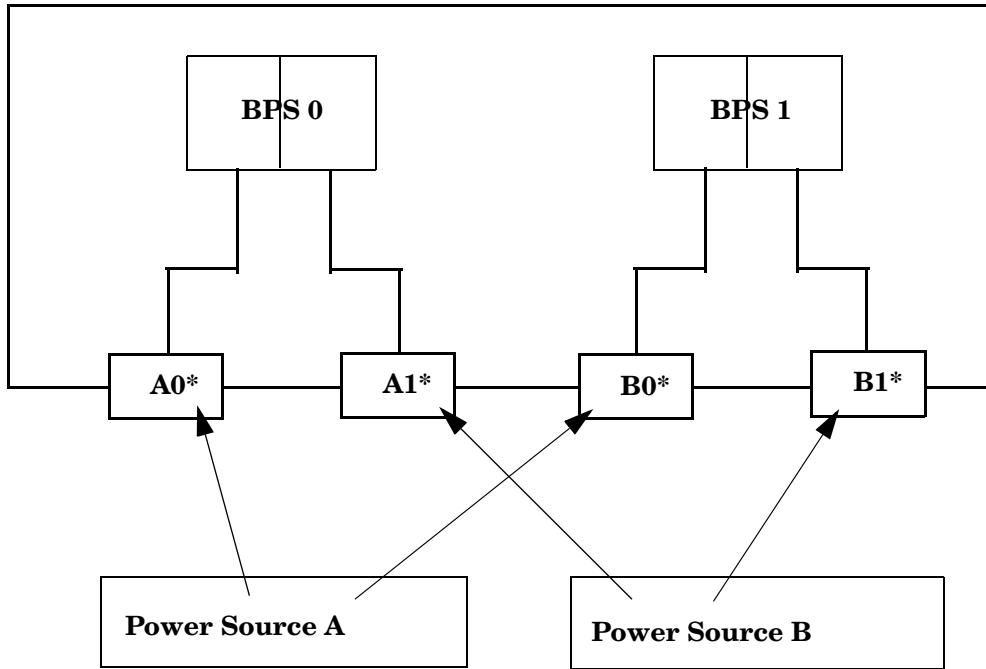


The power cord configuration is passed to the operating system using the **pwrgrd** (Power Grid) command. Each of the five selections in the **pwrgrd** command matches one of the configurations. The appropriate option should be selected for the actual line cord configuration. With the correct configuration 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 versus. 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 prevents boot when a single power cord configuration is detected.

Voltage Check

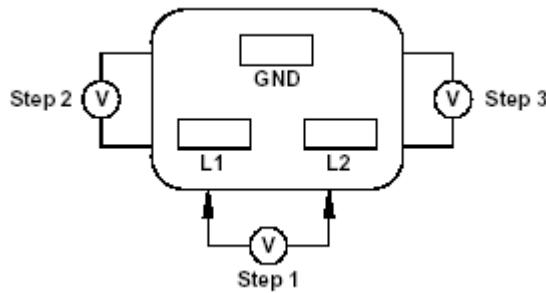
This section provides voltage check information for use on the customer site. The emphasis focuses on measuring the voltages at the power cord plug end specified as an IEC 320 C19 type plug. This end plugs directly into the back of the HP 9000 rp7420 Server chassis.

NOTE These procedures must be performed for each power cord that will be plugged directly into the back of the HP 9000 rp7420 Server. If the expected results from this procedure are not observed during the voltage check, see 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. See Figure 4-3 for voltage reference points when performing the following measurements.

Figure 4-3 Voltage Reference Points for IEC 320 C19 Plug



IMPORTANT These measurements must be performed for every power cord that plugs into the HP 9000 rp7420 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 200–240 V AC regardless of the geographic region.
- Step 2.** Measure the voltage between L1 and ground. In North America, verify this voltage is between 100–120 V AC. In Europe and certain parts of Asia-Pacific, verify this voltage is between 200–240 V AC.
- Step 3.** Measure the voltage between L2 and ground. In North America, verify this voltage is between 100–120 V 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

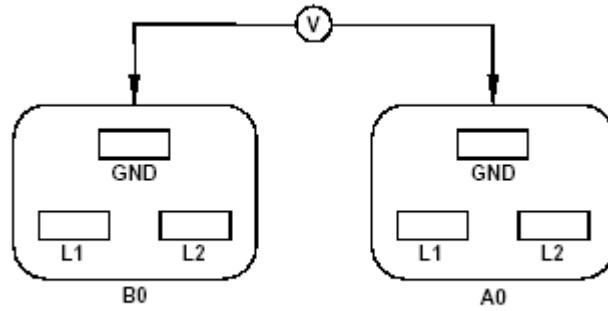
| | Japan | North America | Europe ^a |
|--------|-------|----------------|---------------------|
| L1-L2 | 210 V | 208 V or 240 V | 230 V |
| L1-GND | 105 V | 120 V | 230 V |
| L2-GND | 105 V | 120 V | 0 V |

- a. In some European countries there might 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. See Figure 4-4 for ground reference points when performing this measurement.

Figure 4-4 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 0–5 V AC. If the measurement is 5 V or greater, escalate the situation. Do not attempt to plug the power cords into the HP 9000 rp7420 Server.

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 can also be found at <http://www.hp.com/racksolutions>.

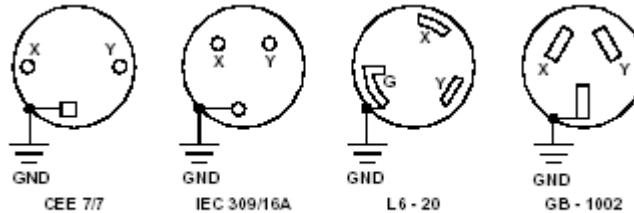
Step 1. Verify that site power is **OFF**.

Step 2. Open the site circuit breakers.

Step 3. Verify that the receptacle ground connector is connected to ground. See Figure 4-5 for connector details.

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

Figure 4-5 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 240 V 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 might 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 9000 rp7420 Server can have up to two MP Core I/O board sets installed. Which allows two partitions to operate, or 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/PCI-X 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 use 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 still active if the front panel power switch is off and AC is present.

- 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. |
|-------------|--|

Setting Up the Customer Engineer Tool (PC)

The Customer Engineer (CE) Tool is usually a laptop. It allows communication with the MP in the HP 9000 rp7420 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 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 +48 V DC.

Before powering up the HP 9000 rp7420 Server 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:

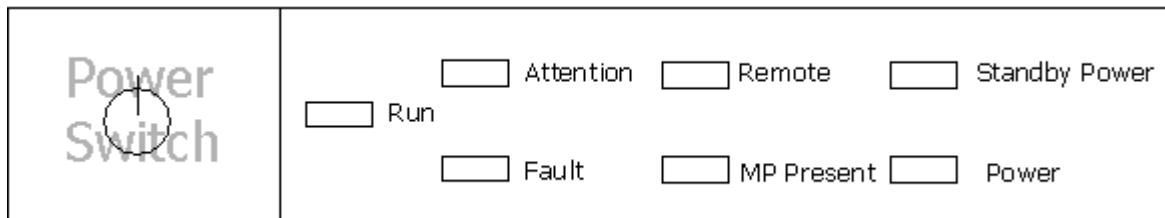
1. Connect the server to AC power.

Cabling and Power Up

MP Core I/O Connections

On the front of the HP 9000 rp7420 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 4-6 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 flash 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 4-7 MP Main Menu

```
Welcome to the
rp7420 Management Processor
(c) Copyright 1995-2003 Hewlett-Packard Co., All Rights Reserved.
Version A.0.017

MP MAIN MENU:
CO: Consoles
UFF: 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 4-8 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 4-9 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.

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

Figure 4-10 Example sa Command

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

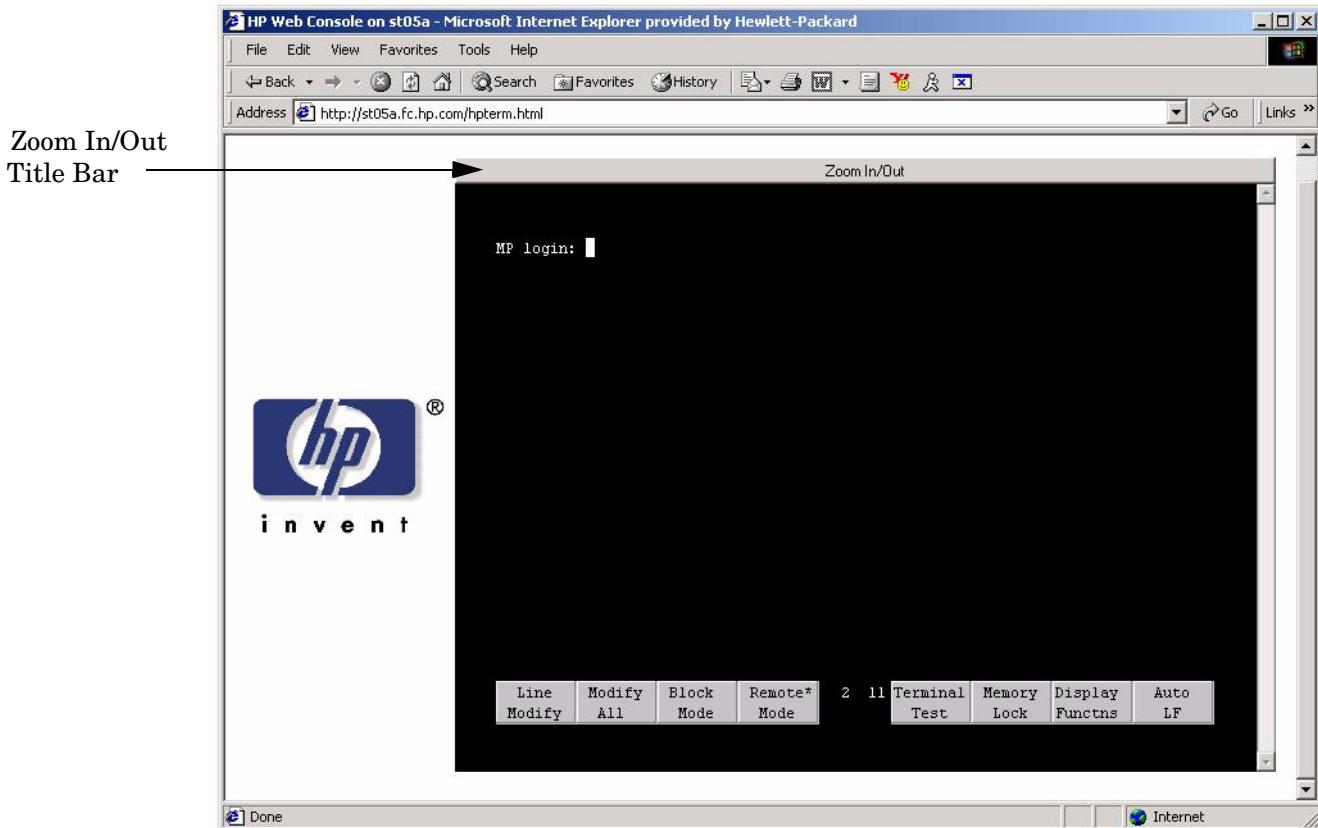
T - Telnet access      : Enabled.
M - Modem access       : Enabled.
W - Web Console         : Enabled (SSL NOT active).
N - Network Diagnostics : Disabled.
I - IPMI Lan access     : Disabled.

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 4-11 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 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 4-12 The du Command Screen

```
MP:CM> DU

The following MP bus devices were found:
+---+---+---+---+---+
| | | | Sys | | PCI | | BPS | |
| Cab | MP | Bkpln | Cells | Domain |
| # | | | 0 1 | 0 1 | 0 1 |
+---+---+---+---+---+
| 0 | * | * | * * | * * | * * |
+---+---+---+---+---+---+---+
```

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 4-12 shows that cells are installed in slots 0 and 1. In the cabinet, cells should be physically located in slots 0 and 1.

Booting the HP 9000 rp7420 Server

After powering on the 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.
 - 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 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 can be booted in any order.
4. Return to the MP Main Menu by entering **ma** from the Command Menu
5. Go to the Console Menu by entering **co** at the MP Main Menu.

Exiting the MP should automatically return to the Boot Console Handler main menu.

Verifying the System Configuration using Boot Console Handler

From the BCH main menu, enter **in** to go the Information Menu. Use the corresponding command from the menu to verify the type and quantity of processors, memory, and I/O cards:

- **pr** (Processors)
- **me** (Memory)
- **io** (Check the PCI device information to determine if the values match the devices installed in the server)

Once the parameters have been verified, use the **ma** command to return to the BCH Main Menu.

Booting HP-UX using Boot Console Handler

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, use the **pa** (path) command (from the Configuration Menu) to set boot path.

1. Main Menu: Enter command or Menu> **co**
2. Configuration Menu> **pa pri xx/xx/xx**
3. Configuration Menu> **ma**

Once the Primary Path has been set, use the **bo** (boot) command (from the Main Menu) to boot HP-UX.

1. Main Menu: Enter command or Menu> **bo pri**
2. The following prompt is displayed:

Do you wish to stop at the ISL prompt prior to booting (y/n)?

Enter **n**.

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

Adding Processors with Instant Capacity On Demand

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

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

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

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

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) | | | | | |

Cabling and Power Up
Using the Checklist