Installation Guide

HP 9000 rp8420 Server

Fifth Edition

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Fifth Edition	Minor edits. Updated minimum BPS configuration, updated several graphic images, and corrected book structure elements. May 2007.

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1 Introduction

The HP 9000 rp8420 server is a member of the HP business-critical computing platform family mid-range, mid-volume servers positioned between the HP 9000 rp7420 and HP 9000 Superdome servers.

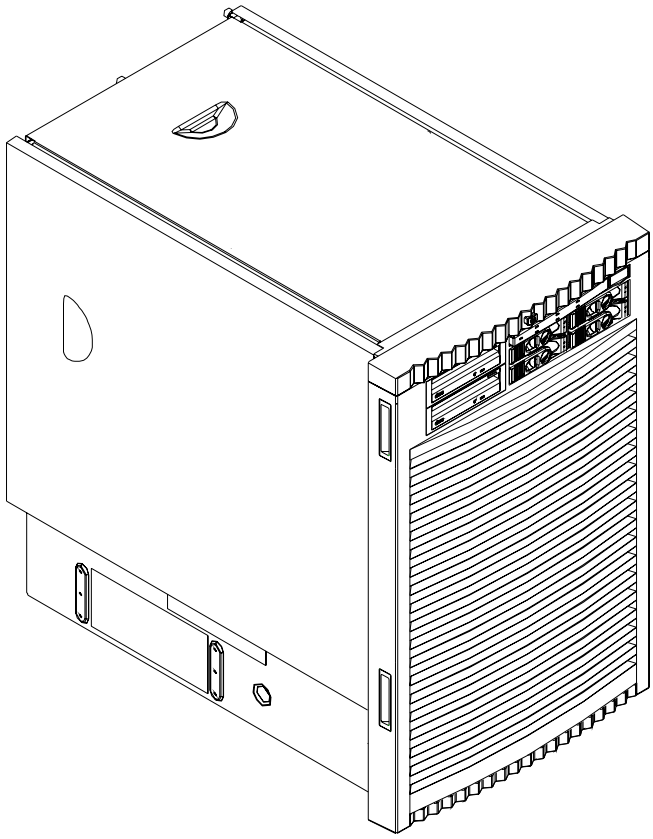
Overview

The HP 9000 rp8420 servers are 17 U[1] high, 16-socket symmetric multiprocessor (SMP) rack-mount, or stand-alone servers that accommodate up to 128GB of memory, PCI-X I/O, and internal peripherals including disks and DVD or tape drives. High-availability features include N+1 hot-swap fans and power, redundant power cords, and hot-plug PCI cards and hard disk drives. Both 900 MHz and 1 GHz processor speeds are available. Features of the server include:

- Up to 128GB of physical memory using HP supported 2GB dual in-line memory modules (DIMMs).
- Up to 32 processors with a maximum of eight processor modules per cell board with a maximum of four cell boards. There are four processor module sockets per cell board and each socket will accept a dual-core processor so each cell can hold up to eight processors.
- One cell controller (CC) per cell board.
- All CPUs and cell controllers on the cell boards are cooled with turbo cooler fans.
- Four embedded hard disk drives. Available sizes are 36GB, 73GB, and 146GB drives.
- Two internal DVD drives or one DVD drive and one 40GB DDS-4 DAT drive.
- Nine front chassis mounted N+1 fans.
- Twelve rear chassis mounted N+1 fans.
- Six N+1 PCI-X card cage fans.
- Six N+1 bulk power supplies.
- Two PCI power supplies
- Sixteen PCI-X slots divided into two partitions. Each partition can accommodate up to eight PCI cards.
- Two core I/O cards.
- Four 220 VAC power plugs. Two are required and the other two provide power source redundancy.

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

Figure 1-1 HP 9000 rp8420 server with mounted bezel (Front View)



- *Depth:* Defined by cable management constraints to fit into a standard 36-inch deep rack:

  25.5 inches from front rack column to PCI connector surface

  26.7 inches from front rack column to core I/O card connector surface

  30 inches overall package dimension, including 2.7 inches protruding in front of the front rack columns
- *Width*: 17.5 inches, constrained by electronic industries alliance (EIA) standard 19-inch racks
- *Height*: 17U (29.55 inches), constrained by package density

See Figure 1-2 on page 15 for component location.

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

Below the mass storage section and behind the removable bezel are two PCI DC-to-DC power supplies. Each PCI power supply will provide power requirements for only one PCI-X I/O partition.

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

When facing the front of the server, the cell boards are located on the right side of the product behind a removable side cover. Rack cabinet front doors are more often hinged on the left, which restricts the cell board to be extracted or inserted from the right.

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

Figure 1-2 HP 9000 rp8420 server with bezel removed (Front View)

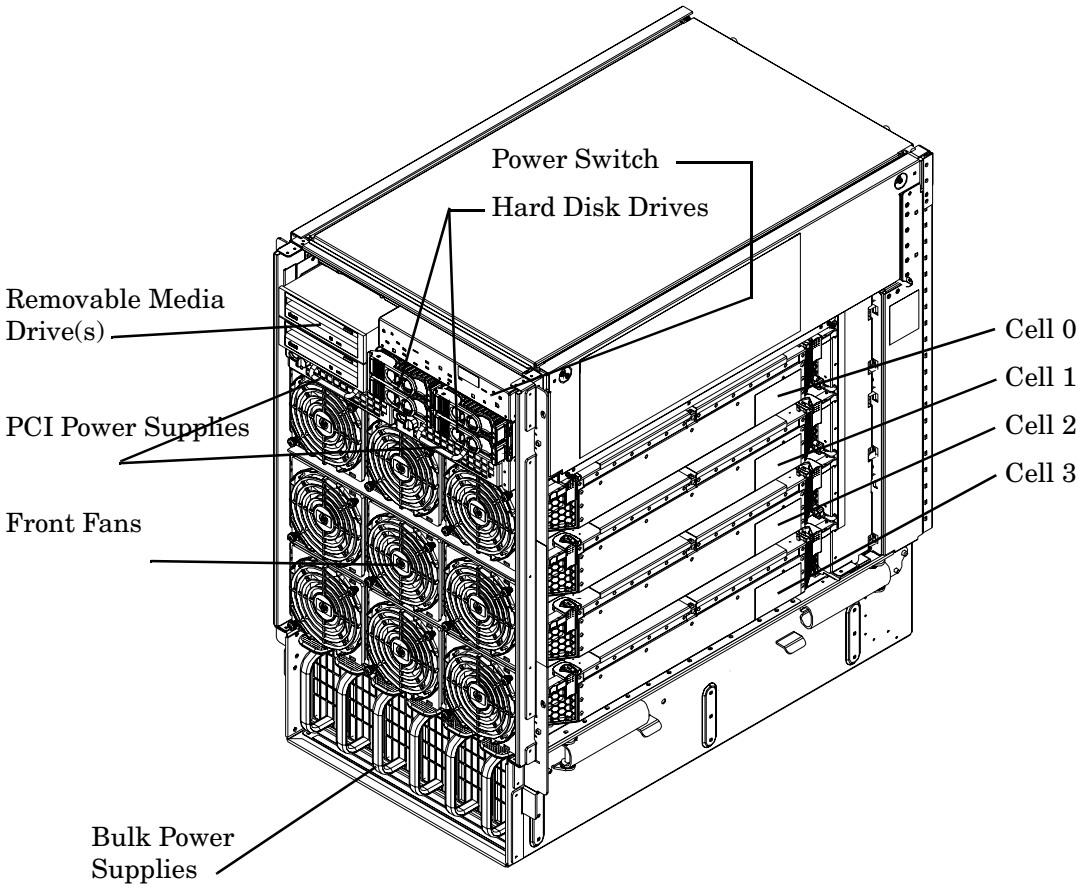
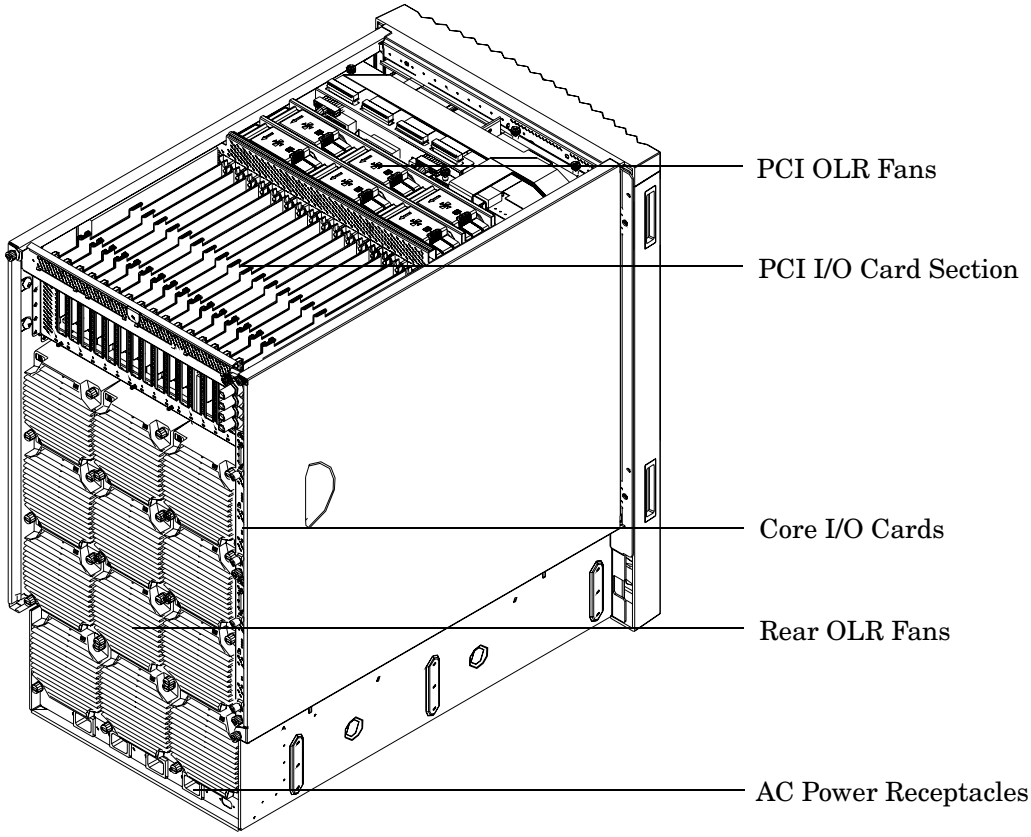


Figure 1-3 HP 9000 rp8420 server with top cover removed (Rear View)



See Figure 1-3 for component locations described below.

The PCI-X I/O card section, located in upper rear of server, is accessed by removing the top cover.

The PCI-X OLR fan modules are located opposite PCI-X card bulkheads. They are housed in blue plastic carriers.

The two redundant core I/O cards are positioned vertically, one above the other, at the rear of the chassis.

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

The 12 rear OLR fans house 120-mm exhaust fans.

Redundant power line cords attach to the AC power receptacles at the bottom rear. Two 20-amp cords are required to power the HP 9000 rp8420 server. Two additional 20-amp cords provide redundancy.

When facing the front of the server, access the system backplane by removing the left side cover (cover shown installed in figure). The system backplane hinges from the lower edge and is anchored at the top with a large blue, single jack screw assembly.

The SCSI ribbon cable assembly (not shown in figure) is connected on the opposite side of the cell board connectors of the system backplane, towards the rear of the server near the core I/O boards.

The blue deployment handles at the base of the server sides (not shown in figure) hinge outward to manually lift and place the server onto a cabinet slide rack.

Front Panel

Front Panel Indicators and Controls

The front panel, located on the front of the server, includes the power switch and status LEDs. See Figure 1-4.

Status LEDs

The following status LEDs are on the front panel:

- Standby Power status LED (green)
- MP (Management Processor) Present status LED (green)
- Status LEDs: Run (green), Fault (red), Attention (yellow), and Power (green) LEDs
- Remote port status LED (green)

Figure 1-4 Front Panel LEDs and Power Switch

Cell Board

The cell board contains the processors, main memory, and the cell controller (CC) application-specific integrated circuit (ASIC) that interfaces the processors and memory to the I/O. The CC provides a connection that allows communication with other cell boards in the system. It connects to the processor-dependent hardware (PDH) and micro controller hardware. Each cell board holds up to 16 DIMMS. There can be one to four cell boards installed in an HP 9000 rp8420 server. A cell board can be selectively powered down for cell replacement without affecting cells in other configured partitions.

System Backplane

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

I/O Subsystem

All of the I/O is integrated into the system by way of the PCI busses. The CC on each cell board communicates with one system bus adapter (SBA). The SBA converts the SBA link protocol into “ropes.” A rope is defined as a high-speed, point-to-point data bus. The SBA can support up to 16 of these high-speed bi-directional links for a total aggregate bandwidth of approximately 4GB/s. The server supports a maximum of two SBAs with the capability of supporting an additional two SBAs in an externally connected I/O cabinet known as the HP Server Expansion Unit.

There are LBA chips on the PCI-X backplane that act as a bus bridge, supporting either one or two ropes and capable of driving 33 MHz or 66 MHz for PCI cards. The LBAs can also drive at 66 MHz or 133 MHz for PCI-X cards.

The PCI-X backplane is physically one board but behaves as 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[b]	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	7	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	6	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	5	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	4	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	3	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	2	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
0	1	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	8[b]	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	7	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	6	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	5	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	4	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	3	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	2	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot
1	1	PCI (33 or 66 MHz) / PCI-X (66 or 133 MHz) 64-bit, 3.3 V connector, Hot-Plug Slot

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.
b. There is a single rope between the SBA and LBA and not a dual rope like that seen for slots 1–7.

Core I/O Card

Up to two core I/O cards may be plugged into the HP 9000 rp8420 server. Two core I/O cards allows for two I/O partitions to exist in the HP 9000 rp8420 server. A single server may support up to two partitions and with a Server Expansion Unit (SEU) attached to the server, will support up to four partitions.

The core I/O card can be replaced with standby power (5V) applied. The system power to the core I/O is handled in the hardware the same way a hot-plug PCI/PCI-X card is handled. Standby power to core I/O is handled by power manager devices to limit inrush current during insertion.

Internal Disk Devices for the HP 9000 rp8420 server

Figure 1-5 shows the location of the internal hard disk drives in a HP 9000 rp8420 server. The internal hard disk drives in slots 0 & 1 (top) connect to cell 0 through the core I/O for cell 0. The internal hard disk drives in slots 2 & 3 (bottom) connect to cell 1 through the core I/O for cell 1.

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

Figure 1-5 Internal Disks

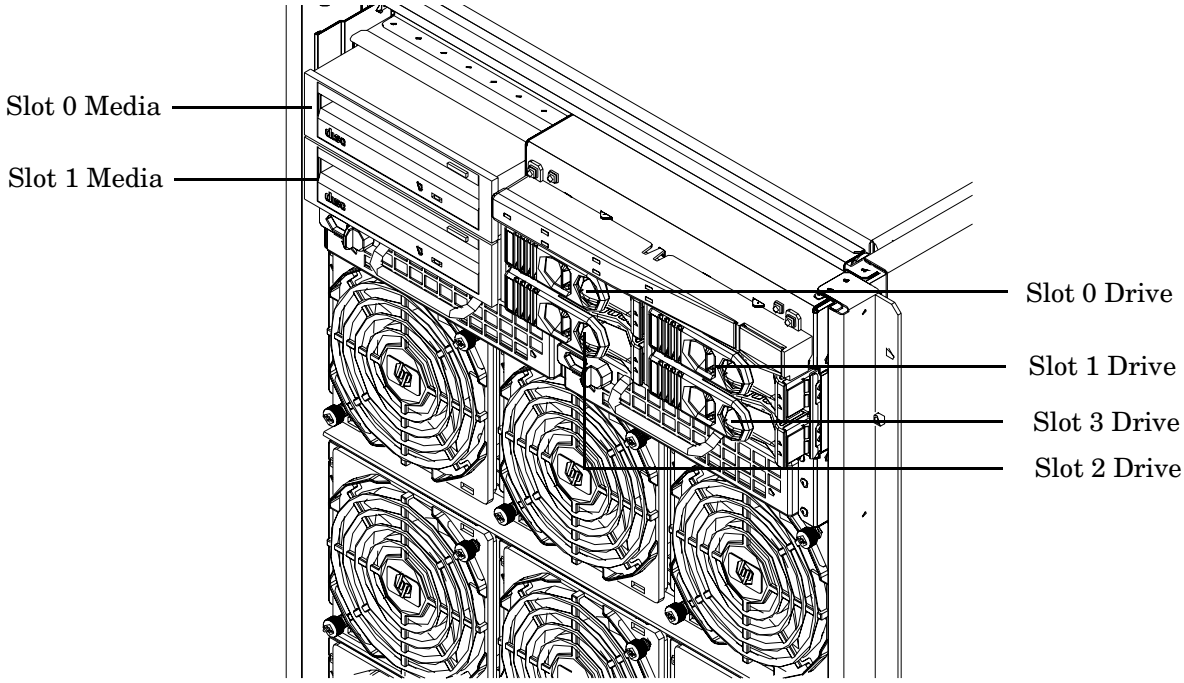


Table 1-2 Removable Media Drive Path

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

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

Table 1-3 Hard Disk Drive Path

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

2 Installation

Inspect shipping containers when the equipment arrives at the site. Check equipment after the packing has been removed. This chapter discusses how to inspect and receive the HP 9000 rp8420 server.

Inspecting the Server Cabinet

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

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

HP shipping containers are designed to protect their contents under normal shipping conditions. After the equipment arrives at the customer site, carefully inspect each carton for signs of shipping damage. A tilt indicator is installed on each carton shipped. The beads in the indicator 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, accidentally dropped, or knocked against something, 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 may have been obscured by the shipping container. If damage is found after visual inspection, document the damage with photographs and contact the transport carrier immediately.

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

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

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

Receiving the Server Cabinet

This section contains information about unpacking a server installed in a cabinet.

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

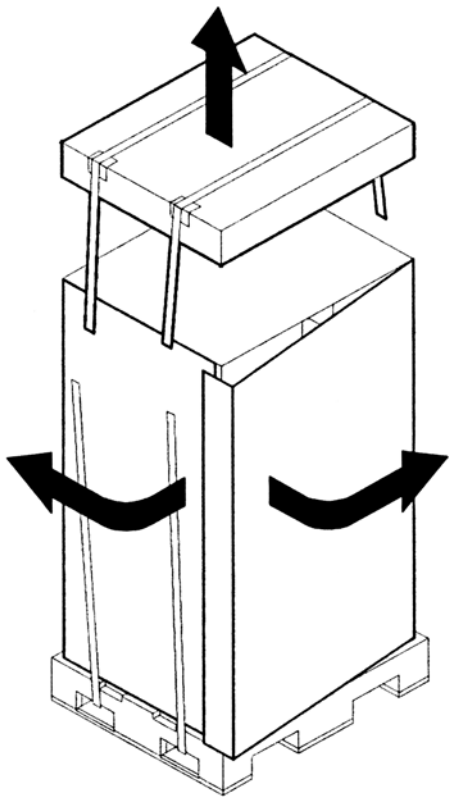
NOTE Position the pallet, allowing for enough space to roll the cabinet off the pallet before starting.

Remove the server cabinet using the following steps:

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

Step 2. Lift the cardboard top cap from the shipping box.

Figure 2-1 Removing the Polystraps and Cardboard



Step 3. Remove the cardboard wrap from the pallet.

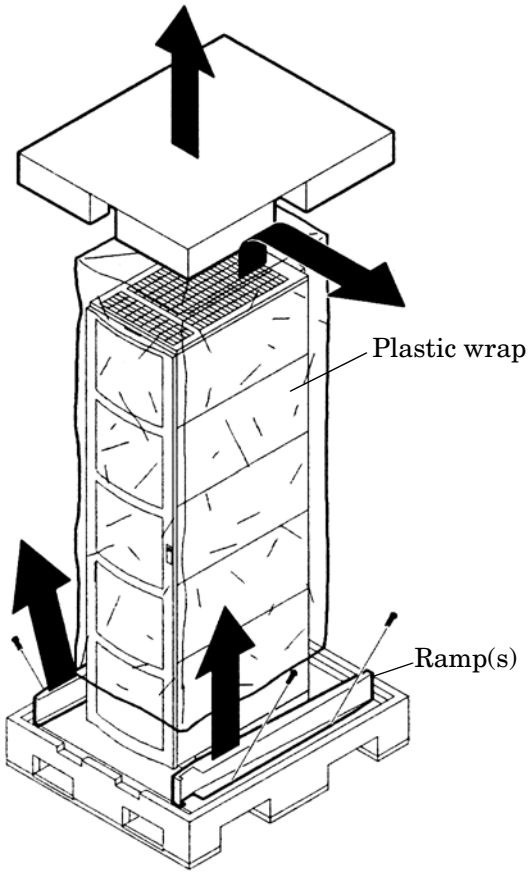
Step 4. Remove the packing materials.

CAUTION	To reduce any ESD exposure, cut off the plastic wrapping around the cabinet. DO NOT pull it off the cabinet.

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

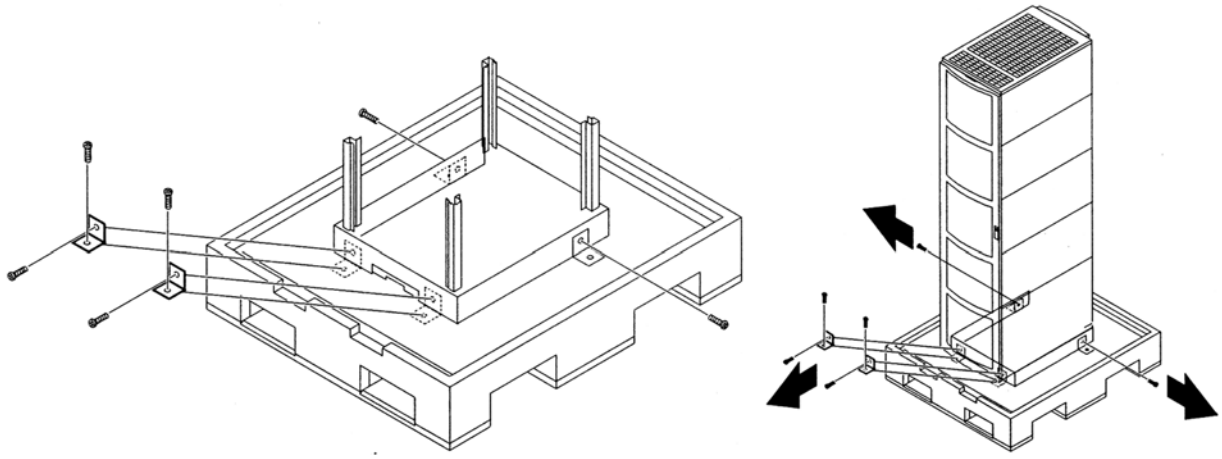
NOTE	Figure 2-2 shows one ramp attached to the pallet on either side of the cabinet with each ramp secured to the pallet using two bolts. There is another configuration where the ramps are secured together on one side of the cabinet with one bolt.

Figure 2-2 Removing the Shipping Bolts and Plastic Cover



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

Figure 2-3 Preparing to Roll Off the Pallet



WARNING **Use caution when rolling the cabinet off the ramp. A single 4-cell server in the cabinet weighs approximately 400 lb. To avoid a safety hazard, be sure that the leveling feet on the cabinet are raised before you roll the cabinet down the ramp, and any time you roll the cabinet on the casters. It is strongly recommended that two people control rolling the cabinet off the pallet.**

Step 7. Attach the ramps to the pallet.

Step 8. Carefully roll the cabinet down the ramps.

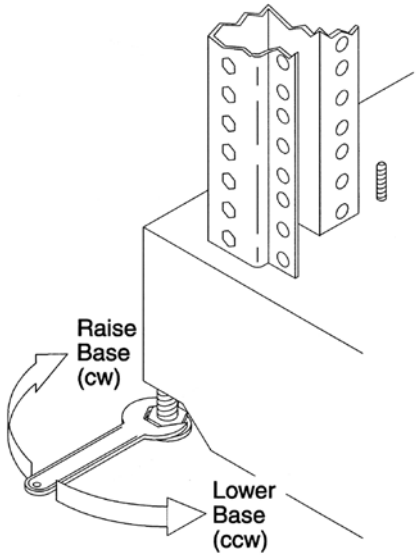
Step 9. Position cabinet in final location.

Step 10. Remove pallet , ramps and any other packing material from work area.

Securing the Cabinet

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

Figure 2-4 Securing the Cabinet



Stand Alone and To Be Racked Systems

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

Rack Mount System Installation

There are several documents written to help with rack mounting the server. This list is intended to guide the HP Installation Specialist to the documentation that has been written by the Rack Solutions team. The external Web site is http://www.hp.com/racksolutions. The internal Web site is http://racksolutions.corp.hp.com.

Rack System/E

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

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

The part number for this user's manual is 5967-6409.

Rack System/E Stabilizer Feet

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

- How to Install the Stabilizers
- Moving the Rack

The part number for this installation guide is A5805-96001.

HP J1528A Rack Integration Kit

The rack integration kit information covers installing the following products:

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

This installation guide provides a complete parts list of the hardware and tools required to perform the installation of the products mentioned. Installation of the products is illustrated in this guide. The part number for this installation guide is J1528-90001.

Manual Lifting

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

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

System damage can occur through improper removal and re-installation of devices. This task must be performed by trained personnel only. Instructions for removing and re-installing components can be found in the Removal and Replacement chapter of the *HP Service Guide: HP 9000 rp8420 server*.

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

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

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

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

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

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

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

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

Using the RonI Model 17000 SP 400 Lifting Device

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

Documentation for the RonI lifter has been written by RonI and is on the HP intranet at the Cybrary Web site. Complete details on how to assemble the lifter, troubleshoot the lifter, and maintain the lifter are provided by RonI in the documentation.

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

WARNING **Use caution when using the lifter. A 4-cell server weighs approximately 400lbs. and it must be centered on the lifter forks before raising it off the pallet to avoid injury.**

The first server must be racked in the bottom of a cabinet for safety reasons. Never extend more than one server from the same cabinet while installing or servicing either an HP 9000 rp8420 server or another server product. Failure to follow these instructions could result in the cabinet tipping over.

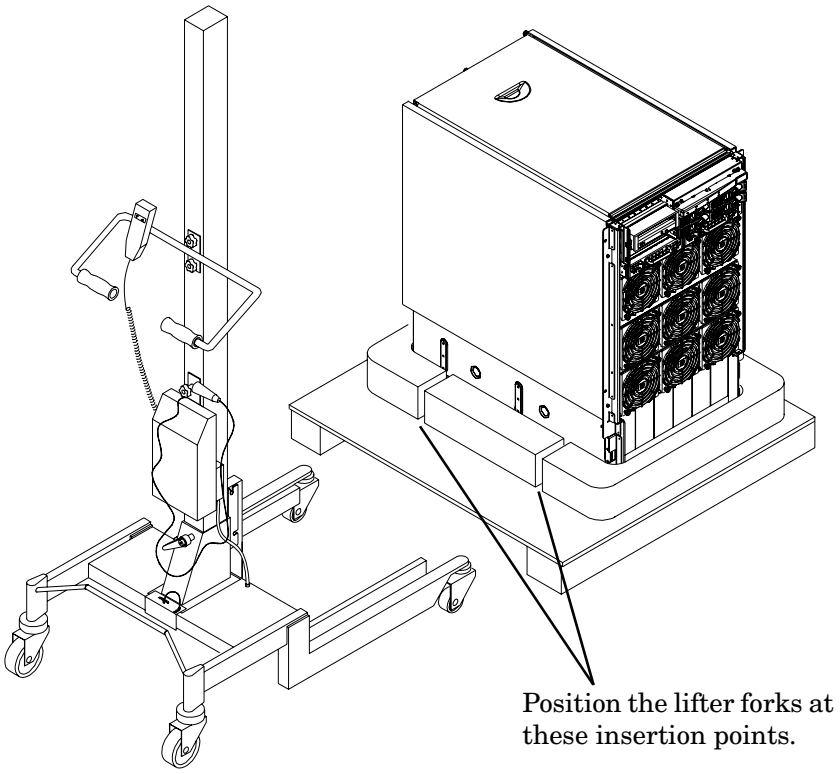
Step 1. Obtain the *HP J1528A Rack Integration Kit Installation Guide* before proceeding with the rack-mount procedure. This guide covers these important steps:

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

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

Step 3. Insert the lifter forks between the cushions.

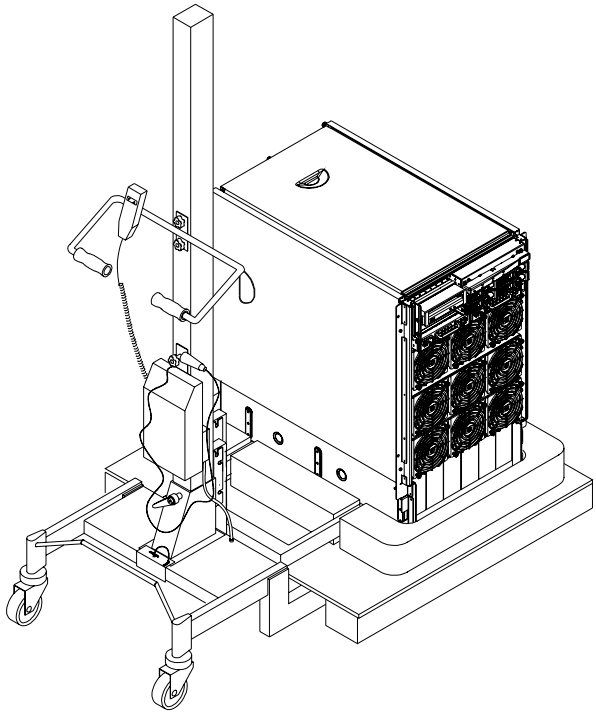
Figure 2-5 Positioning the Lifter to the Pallet



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

Step 5. Slowly raise the server off the pallet until it clears the pallet cushions.

Figure 2-6 Raising the Server off the Pallet Cushions



Step 6. Carefully roll the lifter and server away from the pallet. Do not raise the server any higher than necessary when moving it to the rack.

Step 7. Follow the *HP J1528A Rack Integration Kit Installation Guide* to complete these steps:

- Mounting the server to the slides.
- Installing the CMA (Cable Management Arm)
- Installing the interlock device assembly (if two servers are in the same cabinet)

Wheel Kit Installation

If the server will be configured stand alone, install the included wheel kit. Compare the packing list with the contents of the wheel kit before beginning the installation.

Table 2-1 Wheel Kit Packing List

Part Number	Description	Quantity
A9904-04002	Caster Cover	2
A9904-04007	Right Side Cover	1
A9904-04008	Left Side Cover	1
A9904-04009	Top Cover	1
A6093-04082	Right Front Caster Assembly	1
A6093-04083	Right Rear Caster Assembly	1
A6093-04084	Left Front Caster Assembly	1
A6093-04085	Left Rear Caster Assembly	1
0515-2478	M4 x 0.7 8mm T15 Steel Zinc Machine Screw (used to attach each caster to the chassis)	8
A6093-44013	Plywood Unloading Ramp	1
Not Applicable	Phillips Head Wood Screw (used to attach the ramp to the pallet)	2

Tools Required for Installation

The listing below outlines the tools required to install the wheel kit.

- Diagonal side cutters
- Safety glasses
- Torx driver with T-15, T-25 bits
- 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.**

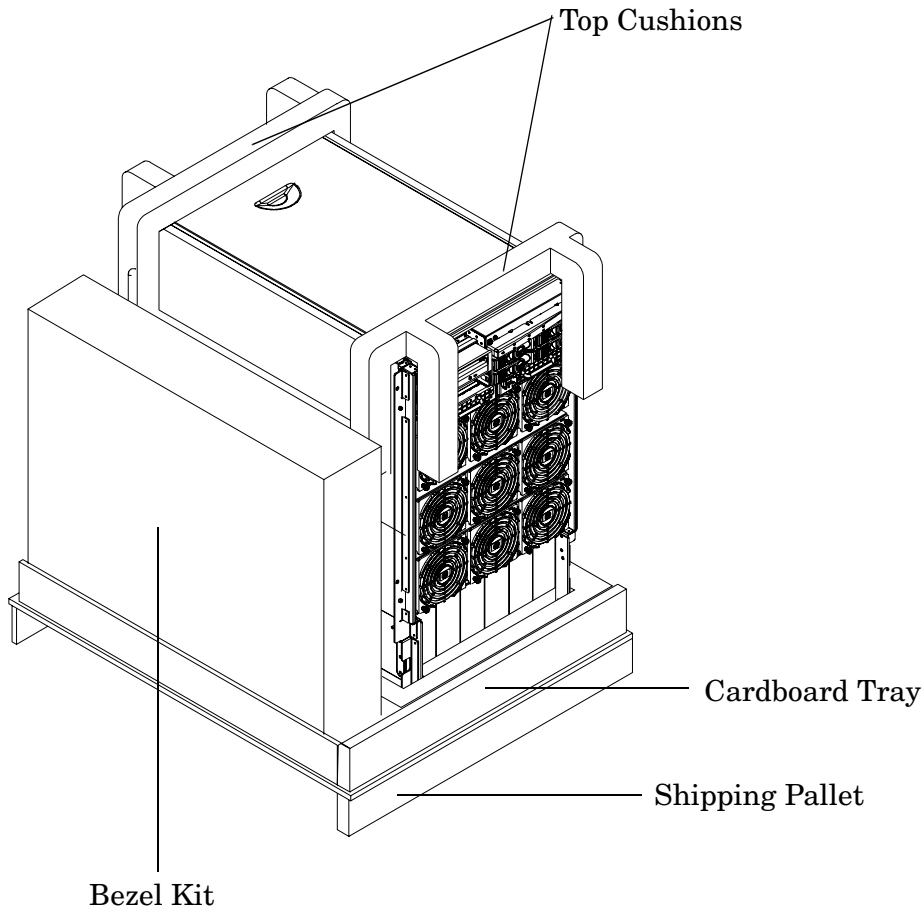
Installing the Server Wheel Kit

Step 1. Cut and remove the polystrap bands securing the server to the pallet.

Step 2. Lift the cardboard top from the cardboard tray resting on the pallet.

Step 3. Remove the bezel kit carton and top cushions from the pallet.

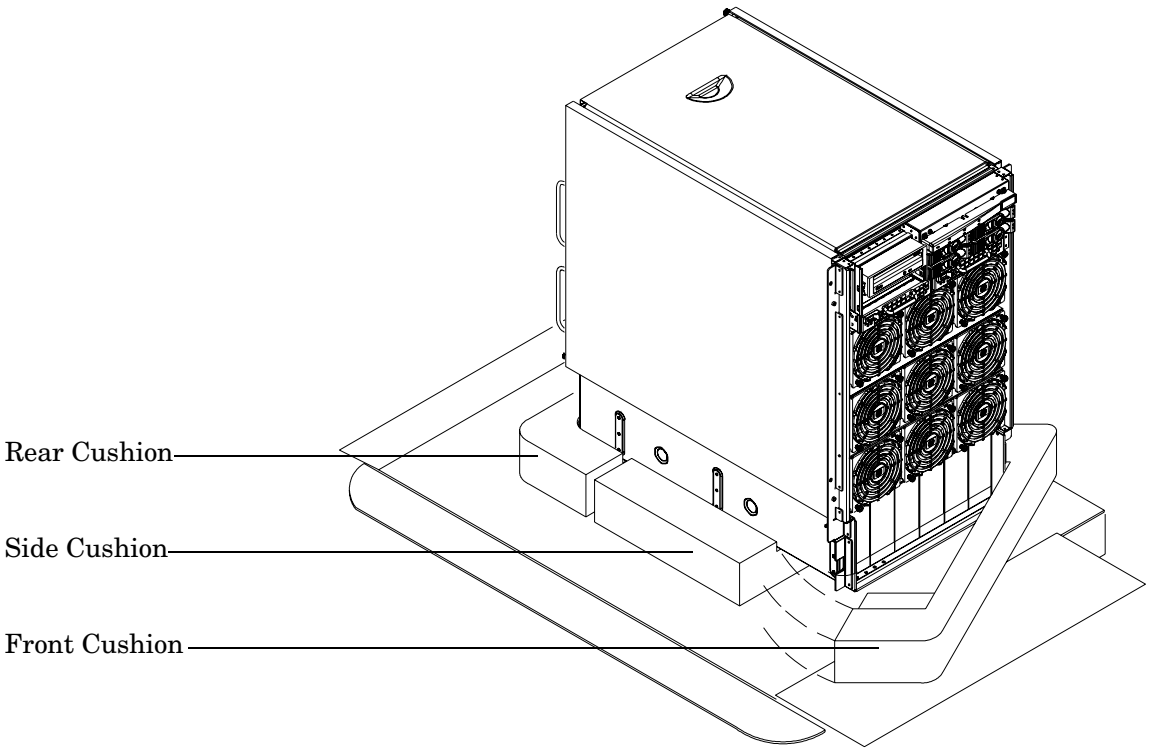
Figure 2-7Server on Shipping Pallet



Step 4. Unfold bottom cardboard tray.

Step 5. Remove the lower front cushion only. Do not remove any other cushions until further instructed.

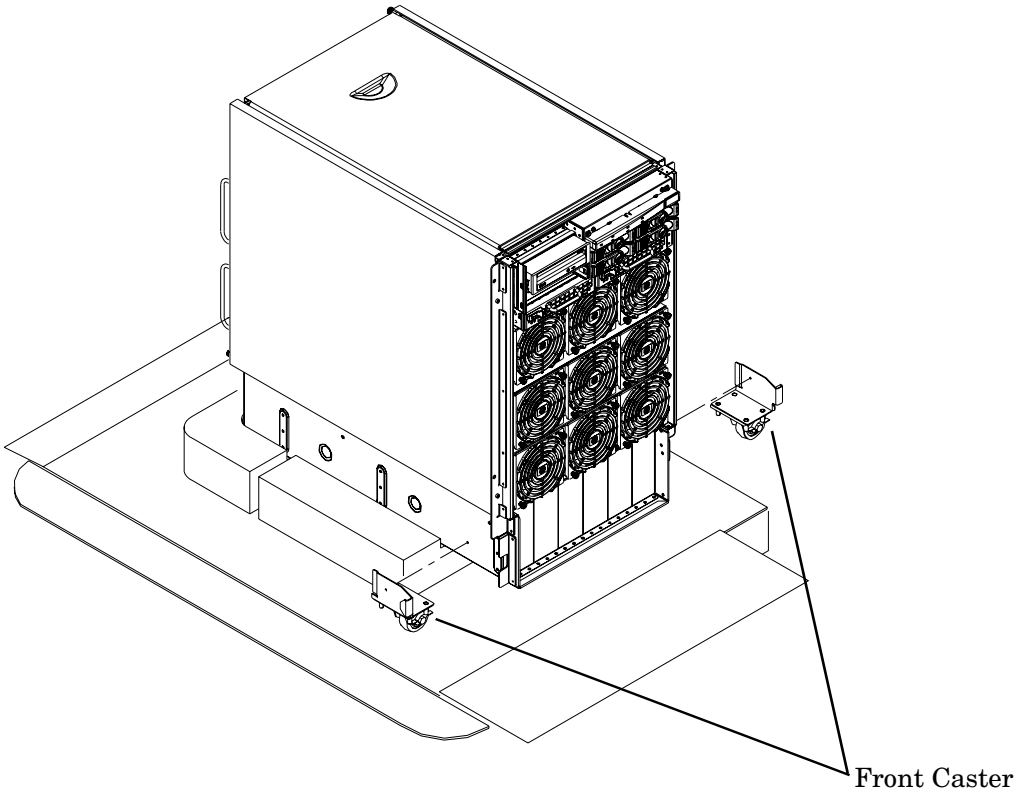
Figure 2-8Removal of Cushion from Front Edge of Server



Step 6. Referencing Table 2-1, locate the two front casters. The two front casters are shorter in length than the two rear casters. Each front caster is designed to fit only on one corner of the server. There is a right front caster and a left front caster. See Figure 2-9 on page 35 and Figure 2-12 on page 38 to identify front and rear casters.

Step 7. Using two of the eight screws from the plastic pouch, attach one wheel caster to the front of the server.

Figure 2-9Attaching a Caster Wheel to the Server



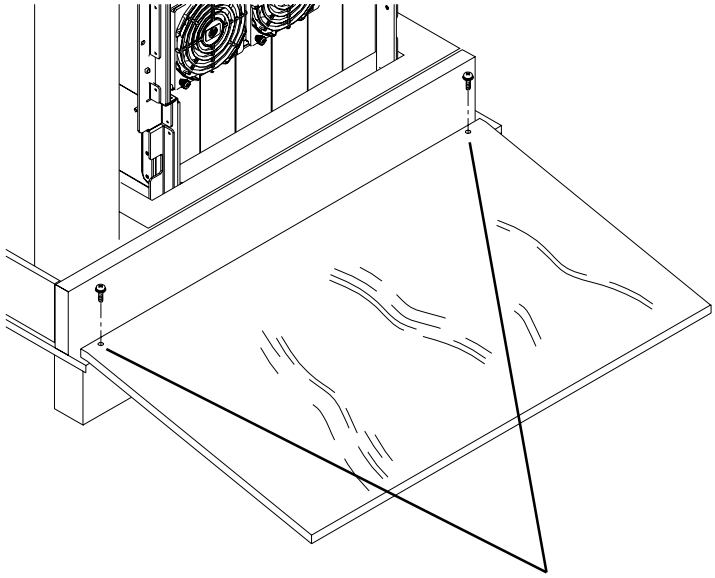
Step 8. Attach the other front caster to the server using two more screws supplied in the plastic pouch.

Step 9. Remove the rear cushion at the rear of the server. Do not remove the remaining cushions.

Step 10. Locate and mount each of the two rear casters to the server using the remaining four screws.

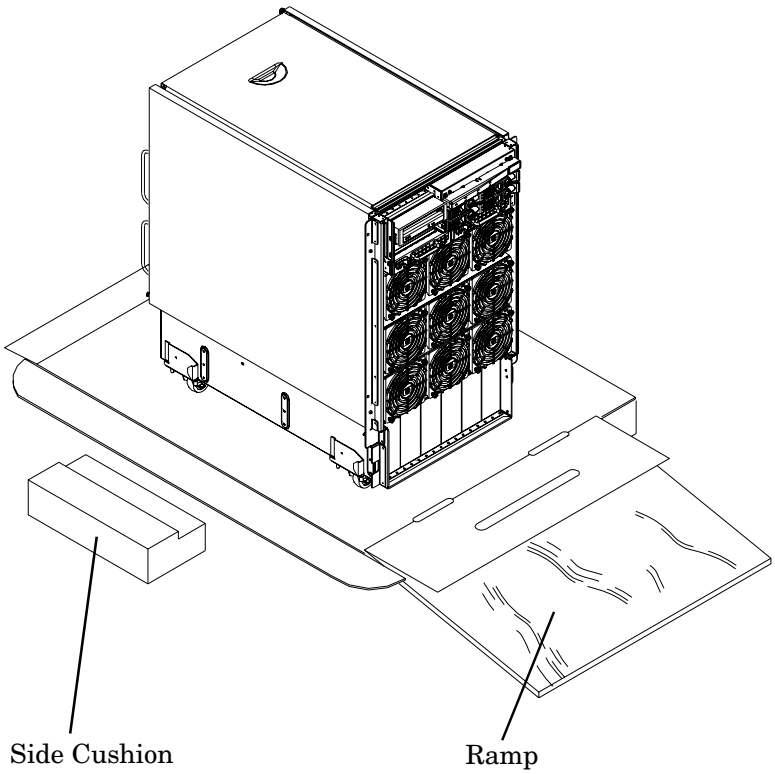
Step 11. Facing the front of the server, attach the plywood ramp to the edge of the pallet. Note there are two pre-drilled holes in the ramp. Use the two screws taped to the ramp and attach it to the pallet.

Figure 2-10Attaching the Ramp to the Pallet



Step 12. Remove the two side cushions from the server and unfold the cardboard tray so that it lays flat on the pallet.

Figure 2-11Side Cushion Removal from Server



Step 13. Carefully roll the server off the pallet and down the ramp.

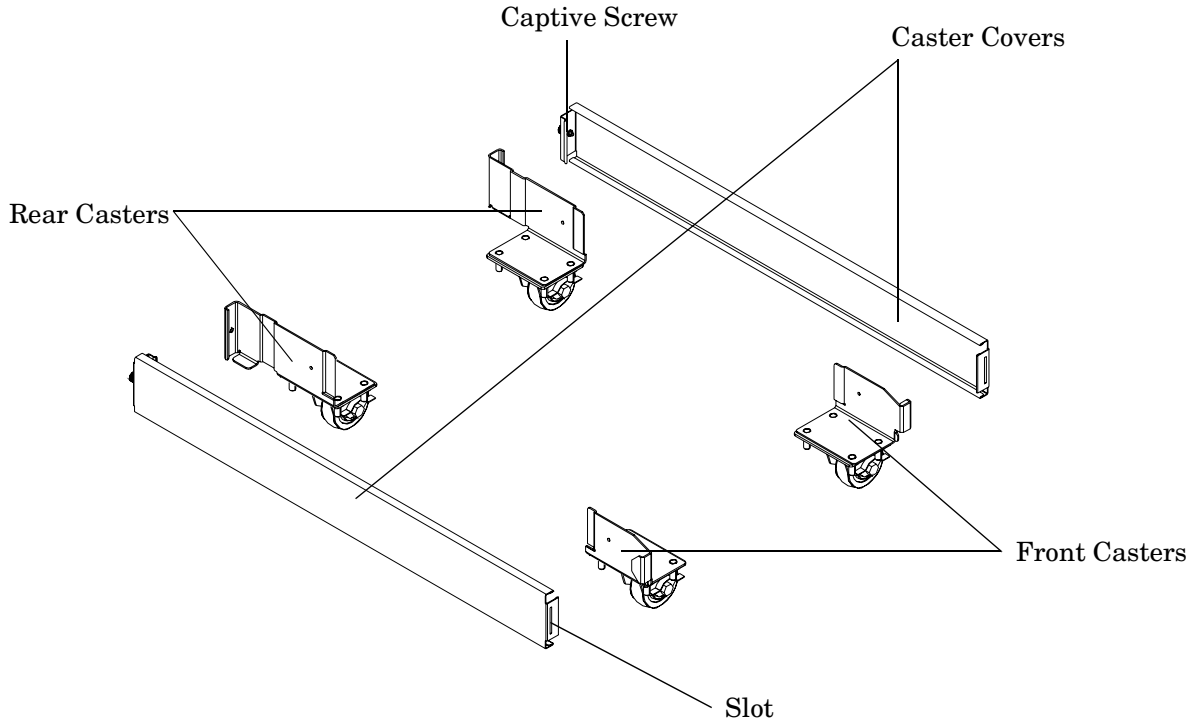
Step 14. Obtain the caster covers from the wheel kit. Note that the caster covers are designed to fit on either side of the server

---

NOTE It may be necessary to loosen or remove the mounted side covers to install the supplied caster covers. If removal is required, see Figure 2-16 on page 42 for details.

Step 15. Insert the slot on the caster cover into the front caster. Secure the caster cover to the server by tightening the captive screw on the cover at the rear of the server.

Figure 2-12Securing Each Caster Cover to the Server

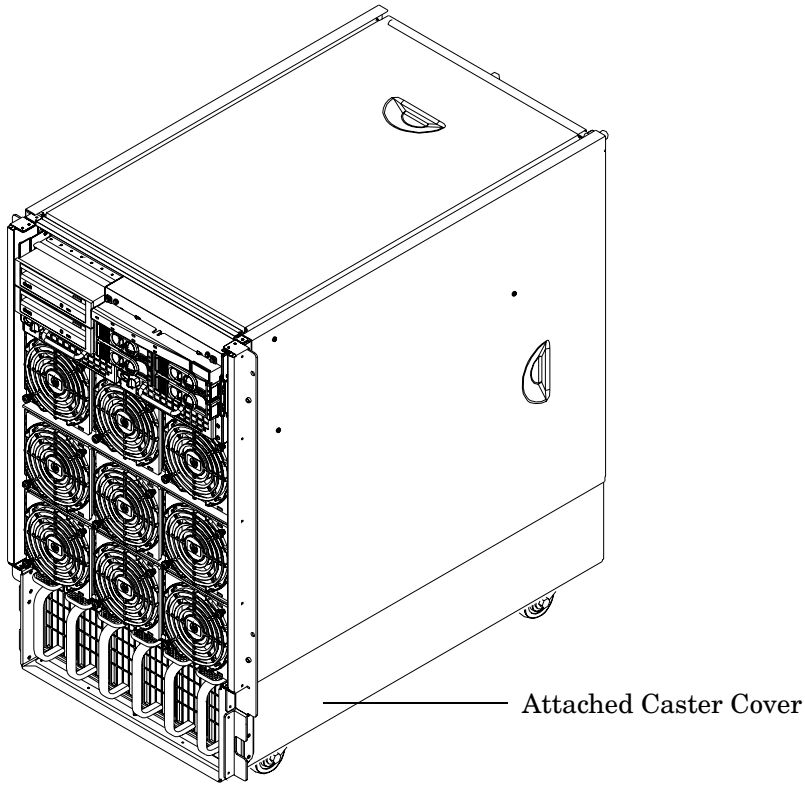


Step 16. Install the front bezel.

- Locate and mount the 4 plastic spring clips on front corners of chassis.
- Orient the bezel onto the front of the server.
- Push the bezel onto the spring clips on either side of the chassis until it snaps in place.

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

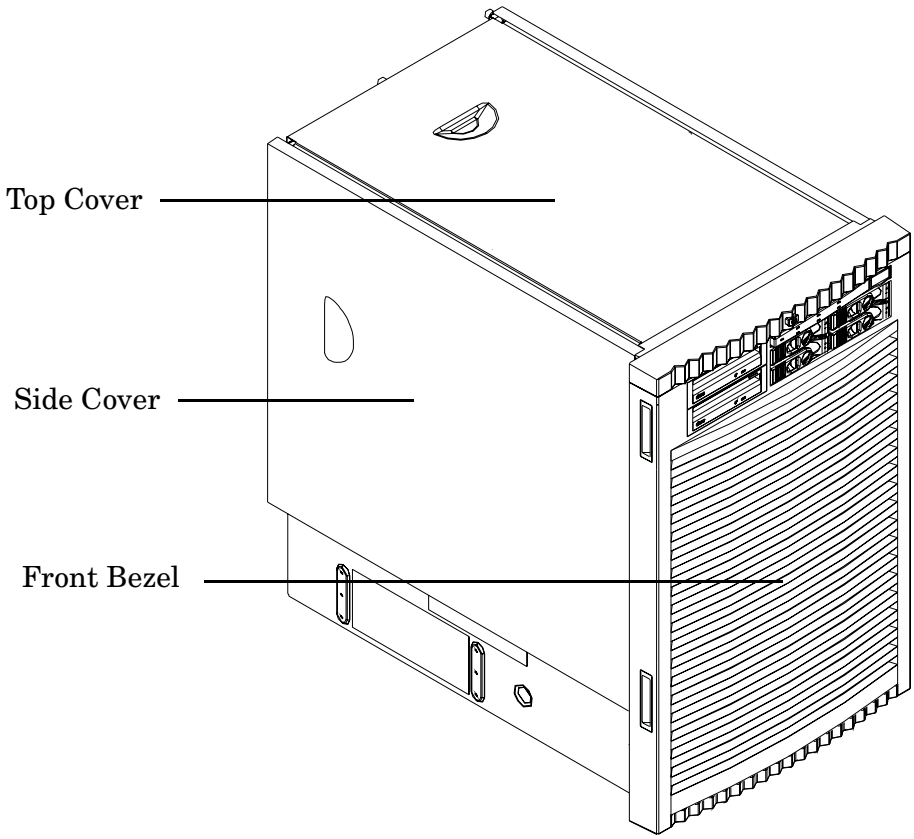
Figure 2-13Completed Wheel Kit Installation



Top and Side Cover Removal and Installation

NOTE It may be necessary to remove existing top and side covers installed on the server to complete a specific customer configuration (install memory, I/O cards, etc.) prior to installing the covers shipped with the wheel kit. If cover removal is not needed, go directly to the sections for installing the top and side cover.

Figure 2-14 Cover Locations



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

Removing the Top Cover

Step 1. Connect to ground with a wrist strap.

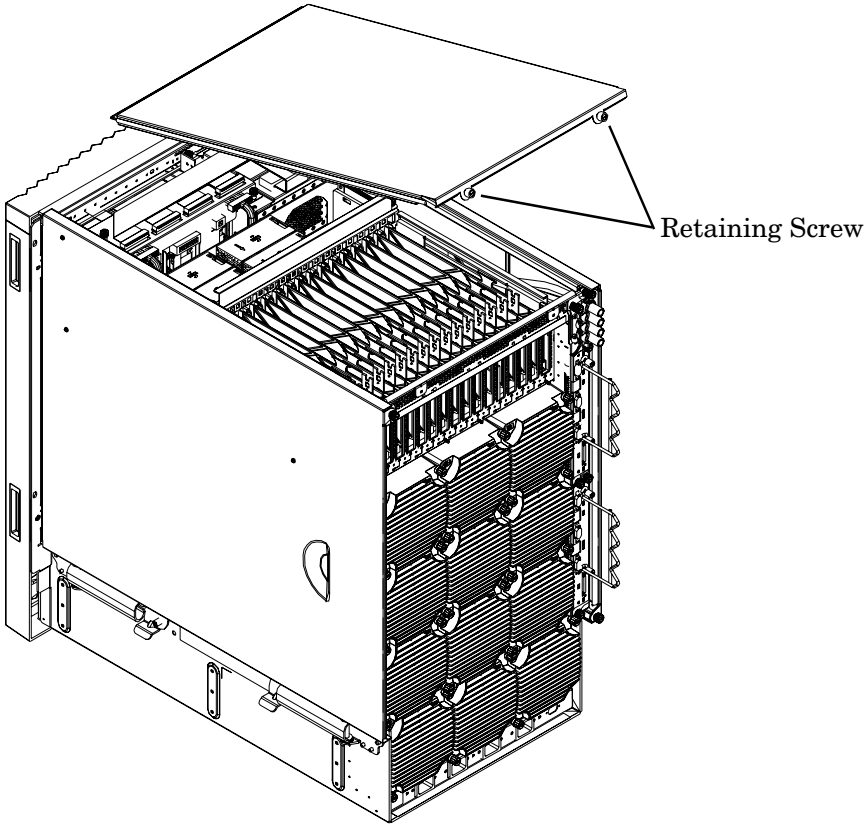
Step 2. At the rear of server, loosen the blue retaining screws securing the cover to the chassis.

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

Step 4. Lift the rear of the cover up and pull away from the chassis.

Step 5. Place the cover in a safe location.

Figure 2-15 Top Cover Detail



Installing the Top Cover

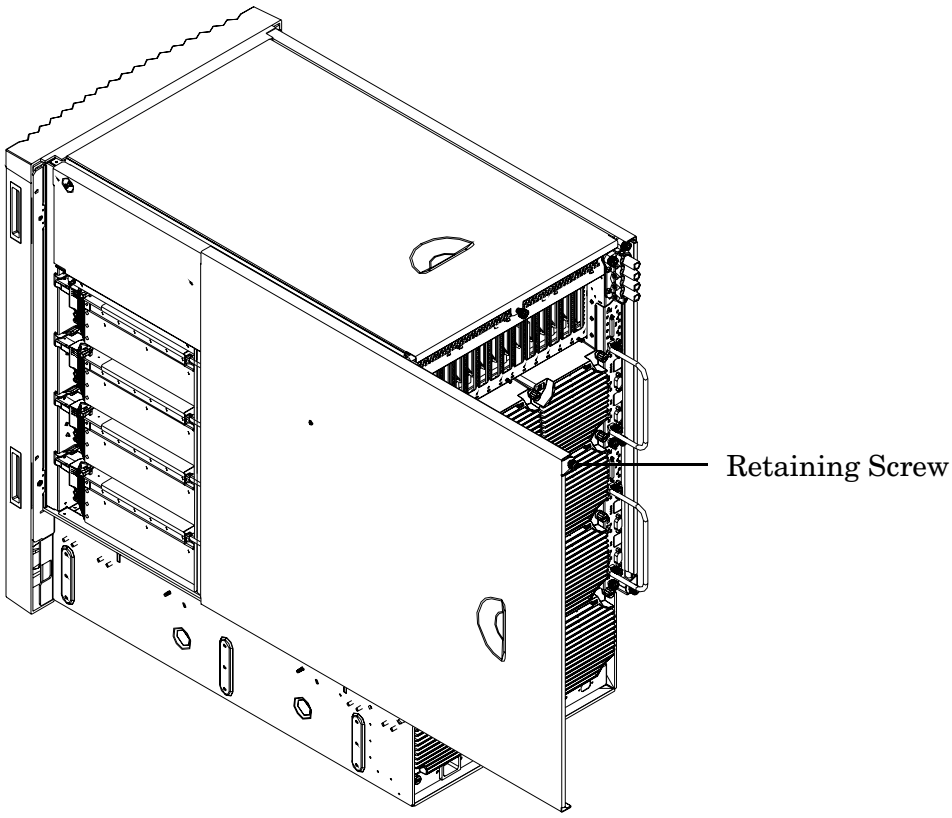
Step 1. Orient the cover on top of the server, with blue reatining screws facing the rear.

Step 2. Slide the front cover lip into the front retaining slot using a slow, firm pressure to properly seat the cover.

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

Removing the Side Cover

Figure 2-16 Side Cover Detail



Step 1. Connect to ground with a wrist strap.

Step 2. At the rear of server, loosen the blue retaining screw securing the cover to the chassis. See Figure 2-16.

Step 3. Slide the cover toward the rear of the system and remove from the server.

Step 4. Place the cover in a safe location.

Installing the Side Cover

Step 1. Orient the cover on the side of the server.

Step 2. Slide the front cover lip into the front vertical retaining slot using a slow, firm pressure to properly seat the cover.

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

Power Distribution Unit

The server may ship with a power distribution unit (PDU). There are two 60A PDUs available for the HP 9000 rp8420 server. Each PDU is mounted horizontally between the rear columns of the server cabinet. The 60A PDUs are delivered with an IEC-309 60A plug.

The 60A NEMA[1] PDU has four 20A circuit breakers and is constructed for North American use. Each of the four circuit breakers has two IEC[2]-320 C19 outlets providing a total of eight IEC-320 C19 outlets.

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

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

Documentation for installation will accompany the PDU. The documentation can also be found at the external Rack Solutions Web site at http://www.hp.com/racksolutions. This PDU might be referred to as a Relocatable Power Tap outside HP.

The PDU installation kit contains:

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

1. NEMA — National Electrical Manufacturers Association

2. IEC — International Electrotechnical Commission

Installing Accessories

The following options can be installed in the HP 9000 rp8420 server:

- additional hard disk drive storage
- additional removable media device storage
- PCI and PCI-X I/O cards

Installing Add-On Products

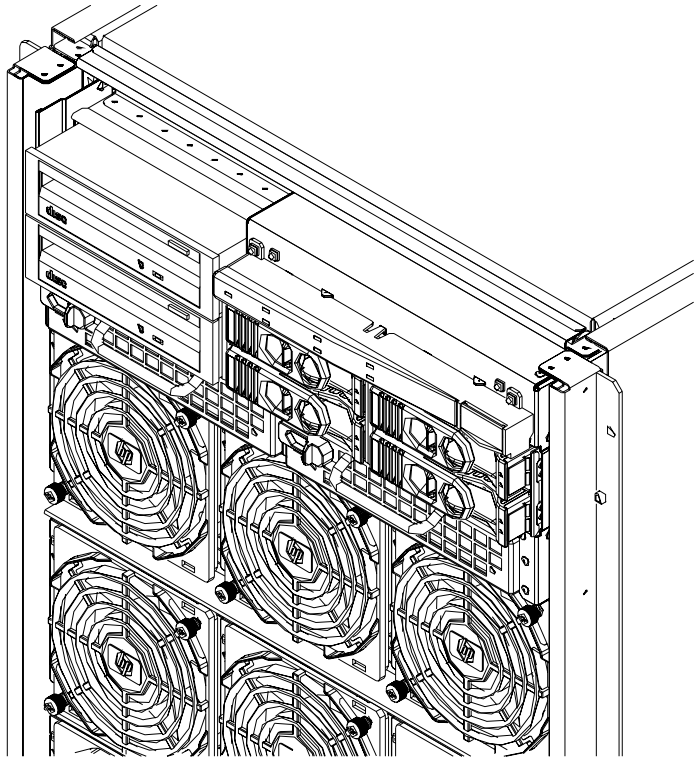
This section provides information on additional products ordered after installation and any dependencies for these add-on products.

Embedded Disks

When disks are installed, the top two hard disk drives are driven by cell 0 located in the HP 9000 rp8420 server. The bottom two hard disk drives are driven by cell 1 located in the HP 9000 rp8420 server.

A list of replacement disk drives for the HP 9000 rp8420 server is in Appendix A of the Service Guide for the HP 9000 rp8420 server. The list contains both removable media disk drives and hard disk drives.

Figure 2-17 Embedded Disks



Hard Disk Drive Installation

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

CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the HP 9000 rp8420 server.

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

Step 2. Slide the disk drive into the chassis; a slow, firm pressure is needed to properly seat the connector.

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

Step 4. Spin up the disk by entering one of the following commands:

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

#ioscan -f
```

Removable Media Drive Installation

The DVD drive or DDS-4 tape drive is located in the front of the chassis. The server power must be turned off before attempting to install it. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” in the Service Guide for the HP 9000 rp8420 server 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 HP 9000 rp8420 server.

If an upper drive is installed, it will need to be removed before installing a lower drive.

Step 1. Remove filler panel.

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

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

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

The drive easily slides into the chassis; however, a slow, firm pressure is needed for proper seating. The front locking tab will latch to secure the drive in the chassis.

PCI/PCI-X Card Cage Assembly I/O Cards

A number of PCI and PCI-X I/O cards are supported in the HP 9000 rp8420 server. Known cards supported at the release of this manual are shown in Table 2-2.

Table 2-2 HP 9000 rp8420 server I/O Cards

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A3739B	FDDI Dual Attach	16
A4800A	FWD SCSI	16

Table 2-2 HP 9000 rp8420 server I/O Cards (Continued)

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A4926A	Gigabit Ethernet (1000B-SX)	16
A4929A	Gigabit Ethernet (1000B-T)	16
A5483A	ATM 622 (MMF connector)	16
A5515A	ATM 155 (UTP5 connector)	16
A6847A	Next Generation 1000B-SX	16[a]
A6825A	Next Generation 1000B-T	16[a]
A6826A	PCI-X Dual Channel 2 GB Fibre Channel HBA	16[b]
A5149A	Ultra2 SCSI	16
A5150A	2-port Ultra2 SCSI	16
A5158A	Fibre Channel PCI Adapter	16[c]
A5159B	2-port FWD SCSI	16B
A5230A	10/100B-TX (RJ45)	16
A5506B	4-port 10/100B-TX	16
A5513A	ATM 155 (MMF connector)	16
A5783A	Token Ring (4/16/100 Mb/s)	16
A5838A	2-port Ultra2-SCSI + 2-port 100T	16
A5856A	RAID 4Si	12B
A6092A	Hyperfabric (PCI 4X)	8
A6386A	Hyperfabric II	8
A6826A	PCI-X Dual Channel 2Gb Fibre Channel HBA	16B
A6748A	8-port Terminal MUX	16
A6749A	64-port Terminal MUX	16
A6795A	2G FC Tachlite	16B
A6828A	1-port U160 SCSI	16B
A6829A	2-port U160 SCSI	16B
A7011A	PCI-X 2 port 1000BaseSX Dual Port (Intel chip)	16
A7012A	PCI-X 2 port 1000BaseT Dual Port (Intel chip)	16
A7143A	U160 RAID - SmartArray 5304	8

Table 2-2 HP 9000 rp8420 server I/O Cards (Continued)

Part Number	Card Description	Number of Cards Supported (B-Bootable)
A7173A	2 port U320 SCSI	16B
A9782A	PCI-X 1000B-T GB FC GigE-SX	16B
A9784A	PCI-X 1000B-T GigE/2 G FC combo	16B
A9890A	SmartArray 6402 2-channel RAID	12
A9891A	SmartArray 6404 4-channel RAID	12
AB286A	PCI-X 2 port 4X InfiniBand HCA (HPC)	2
AB287A	10G Ethernet	2
AB290A	U320 SCSI/GigE Combo Card	16B
AB378A	1-port 4Gb FC card PCI-X	16B
AB379A	2-port 4Gb FC card PCI-X	16B
AB545A	4-port 1000B-T Ethernet	16
AB465A	PCI-X 2-port 1000B-T/2-port 2Gb FC Combo	16B
J3525A	2-port serial (X25/FR/SDLC)	16
J3526A	4-port serial (X25/FR)	16
Z7340A	8-port PCI ACC	16

a. Supports a pre-OS network boot (IODC or EFI) for the purpose of OS installation (ignite, RIS).
b. Supports a pre-OS network boot (IODC or EFI) for the purpose of OS installation (ignite, RIS).
c. This I/O card will be supported at the first update of the HP-UX B.11.23 release.

PCI I/O Card Installation

HP 9000 rp8420 servers implement manual retention 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 manual release latch for the card slot to the open position. See Figure 2-18.

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 manual release latch for the card slot to the closed position.

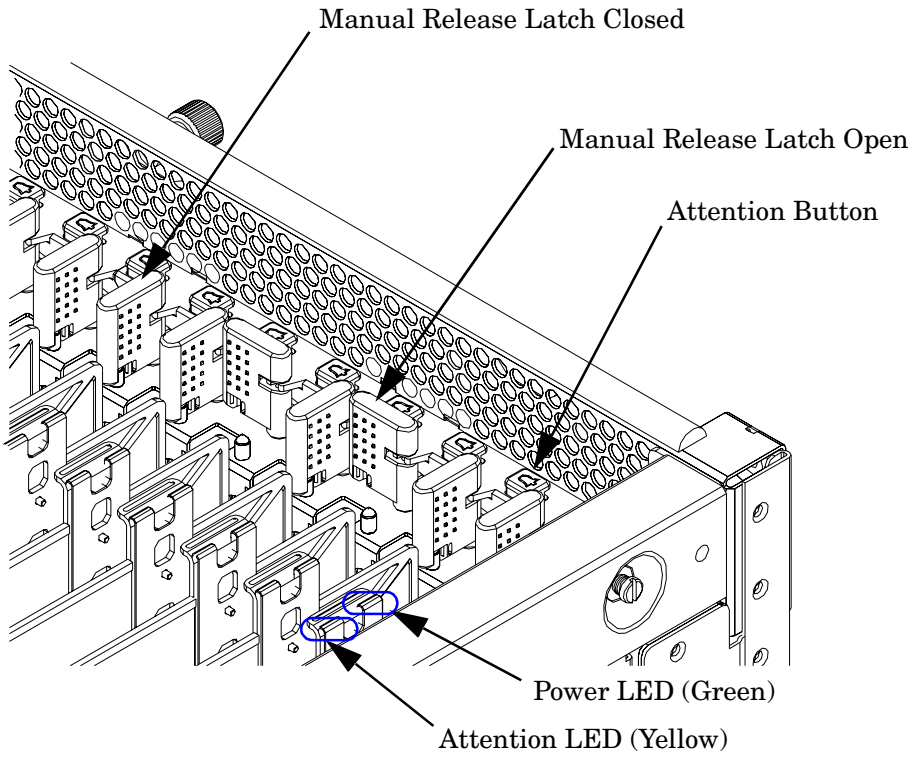
CAUTION Working out of sequence or not completing the actions within each step could cause the system to crash.

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

Step 6. Press the attention button.

The green power LED will start to blink.

Figure 2-18 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 hotplugd daemon log file (default: /var/adm/hotplugd.log).

The critical resource analysis (CRA) performed while doing an attention button initiated add action is very restrictive and the action will not complete—it will fail—to protect critical resources from being impacted. For finer control over CRA actions use `pdweb` or the `olrad` command. 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.

Cabling and Power Up

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

Voltage Check

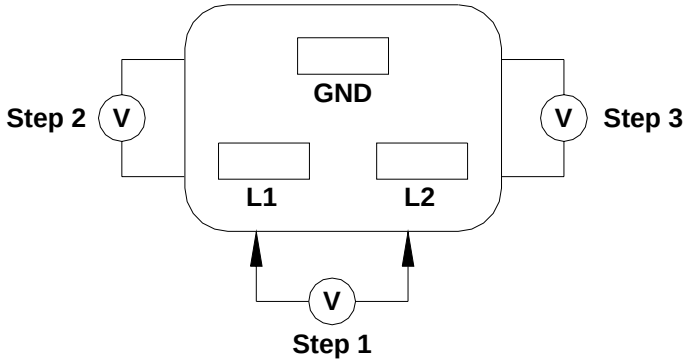
This section provides voltage check information for use on the customer site. The emphasis is on measuring the voltages at the power cord plug end specified as an IEC-320 C19 type plug. This is the end that plugs directly into the back of the server cabinet.

NOTE These procedures need to be performed for each power cord that will be plugged directly into the back of the server cabinet. If the expected results from this procedure are not observed during the voltage check, See the section titled “Voltage Check (Additional Procedure)” on page 54.

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 2-19 for voltage reference points when performing the following measurements.

Figure 2-19 Voltage Reference Points for IEC-320 C19 Plug



IMPORTANT These measurements must be performed for every power cord that plugs into the HP 9000 rp8420 server.

Step 1. Measure the voltage between L1 and L2. This is considered to be a phase-to-phase measurement in North America. In Europe and certain parts of Asia-Pacific, this measurement is referred to as a phase-to-neutral measurement. The expected voltage should be between 200–240 VAC regardless of the geographic region.

Step 2. Measure the voltage between L1 and ground. In North America, verify this voltage is between 100–120 VAC. In Europe and certain parts of Asia-Pacific, verify this voltage is between 200–240 VAC.

Step 3. Measure the voltage between L2 and ground. In North America, verify this voltage is between 100–120 VAC. In Europe and certain parts of Asia-Pacific, verify this voltage is 0 (zero) VAC.

Table 2-3 provides single-phase voltage measurement examples dependent on the geographic region where these measurements are taken.

Table 2-3 Single-Phase Voltage Examples

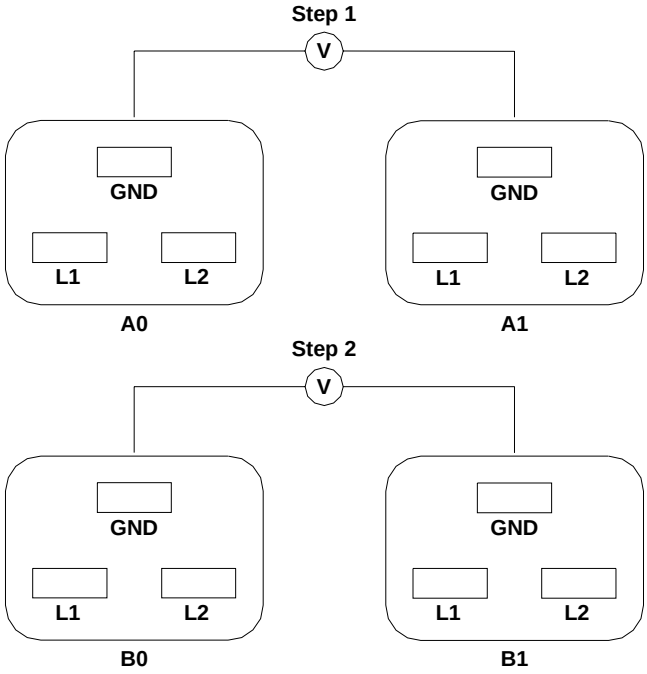
	Japan	North America	Europe[a]
L1-L2	210V	208V or 240V	230V
L1-GND	105V	120V	230V
L2-GND	105V	120V	0V

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

Safety Ground Verification (Single Power Source)

This procedure measures the voltage level between A0 and A1. The voltage level between B0 and B1 will also be verified. All measurements will be taken between ground pins. See Figure 2-20 for ground reference points when performing these measurements.

Figure 2-20 Safety Ground Reference Check—Single Power Source



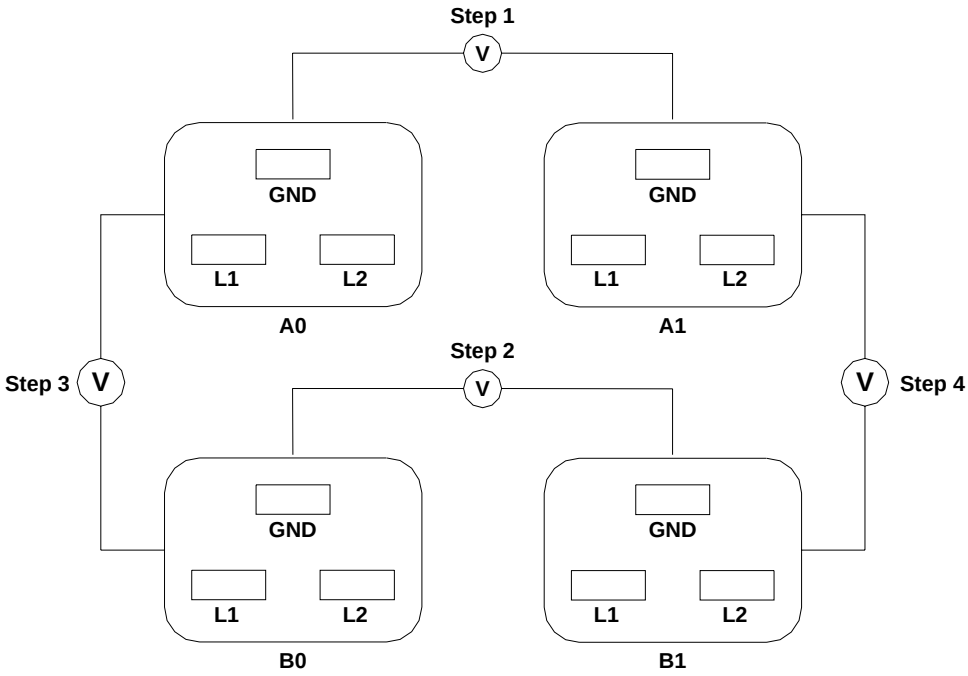
Step 1. Measure the voltage between A0 and A1. Take the AC voltage down to the lowest scale on the volt meter. One probe is inserted into the ground pin for A0. The other probe is inserted into the ground pin for A1. Verify that the measurement is between 0–5 VAC. If the measurement is 5 V or greater,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

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

Safety Ground Verification (Dual Power Source)

This procedure measures the voltage level between A0 and A1, between B0 and B1, between A0 and B0, and between A1 and B1. All measurements will be taken between ground pins. See Figure 2-21 for ground reference points when performing these measurements.

Figure 2-21 Safety Ground Reference Check—Dual Power Source



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

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

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

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

Voltage Check (Additional Procedure)

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

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

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

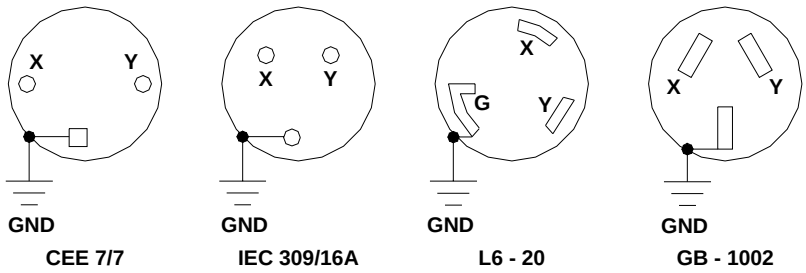
Step 1. Verify that site power is **OFF**.

Step 2. Open the site circuit breakers.

Step 3. Verify that the receptacle ground connector is connected to ground. See Figure 2-22 for connector details.

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

Figure 2-22 Wall Receptacle Pinouts



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

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.

a. For locking type receptacles, line up the key on the plug with the groove in the receptacle.

b. Push the plug into the receptacle and rotate to lock the connector in place.

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

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

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

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

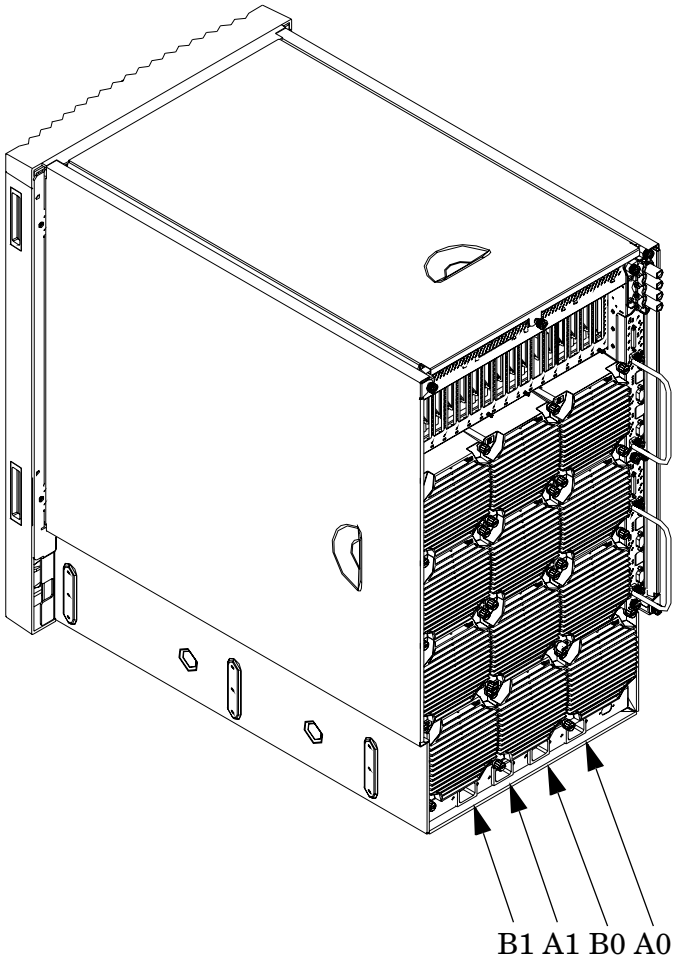
Step 11. Check that the indicator light on each power supply is lit.

Connecting AC Input Power

The server can receive AC input from two different AC power sources. If two separate power sources are available, each source can be plugged into the server, increasing system reliability if one power source fails. The main power source is defined to be A0 and A1. The redundant power source is defined to be B0 and B1. See Figure 2-23 for the AC power input label scheme.

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

Figure 2-23 AC Power Input Labeling

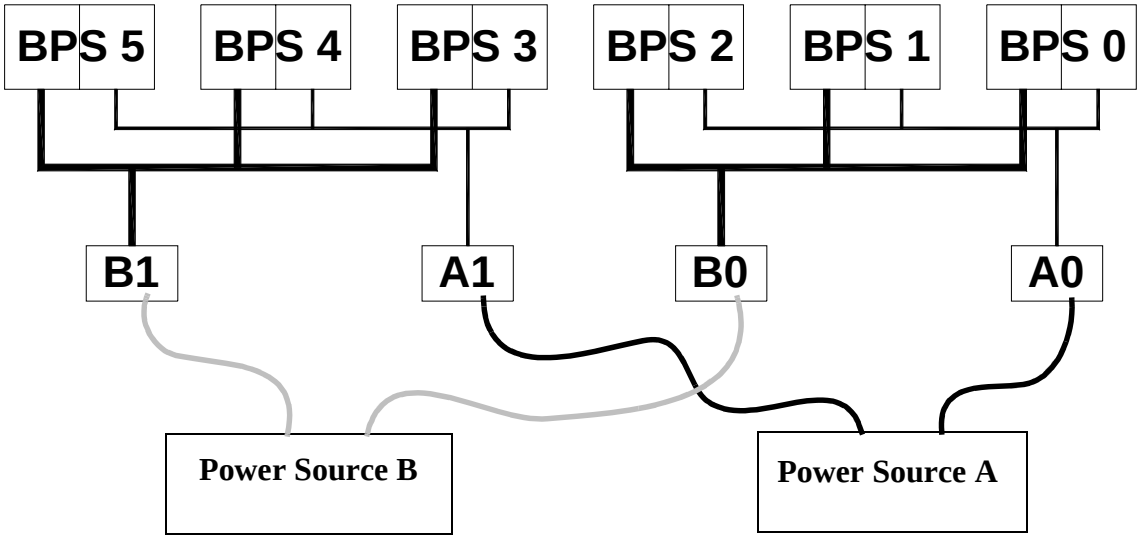


The power distribution for the bulk power supplies (BPS) follows:

- A0 input provides power to BPS 0, BPS 1, and BPS 2
- A1 input provides power to BPS 3, BPS 4, and BPS 5
- B0 input provides power to BPS 0, BPS 1, and BPS 2
- B1 input provides power to BPS 3, BPS 4, and BPS 5

For information on how input power cords supply power to each BPS, see Figure 2-24.

Figure 2-24 Distribution of Input Power for Each BPS



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 comply could result in personal injury or damage to equipment.**

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

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

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

The server can accomodate a total of six BPSs. N+1 BPS capability describes the server having adequate BPSs plus one additional module installed. If one BPS fails, adequate power will still be supplied to the cell board(s) to keep the server partition(s) operational. Replace the failed BPS promptly to restore N+1 functionality.

A minimum of two BPS are required to bring up a single cell board installed in the server. This minimum configuration is not N+1 capable. See Table 2-4 for BPS to cell board N+1 configurations.

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

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

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

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

Applying Power to the HP 9000 rp8420 server

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

INTERVAL ONE

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

INTERVAL TWO

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

INTERVAL THREE

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

Installing the Line Cord Anchor (rack mounted servers)

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

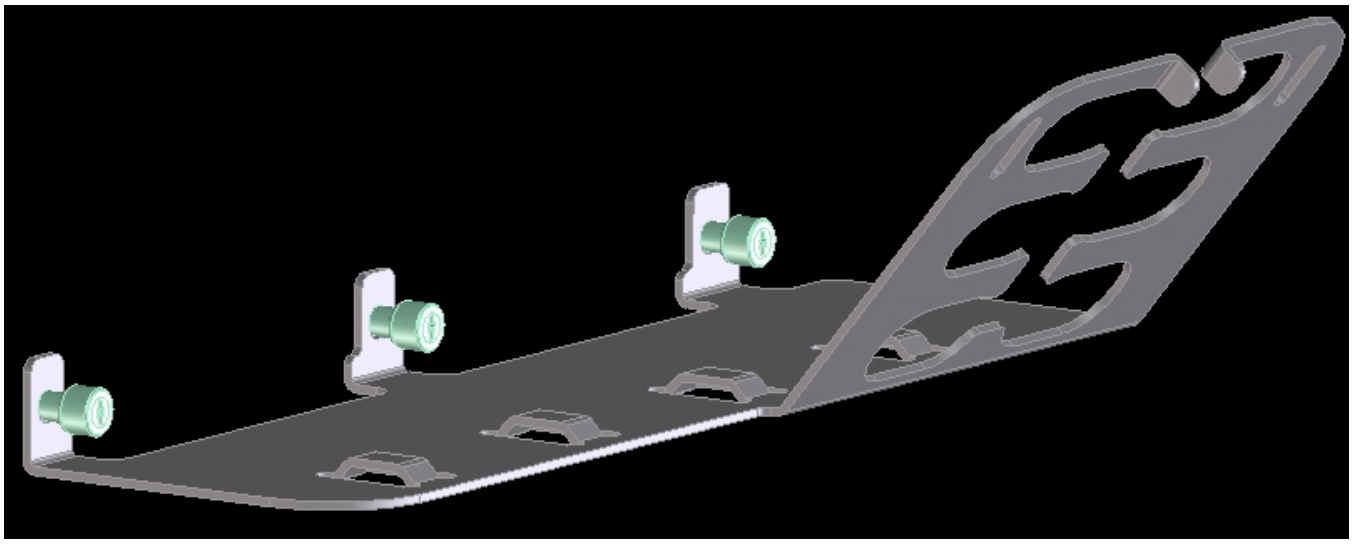
Four Cell Server Installation (rp8400, rp8420, rp8440, rx8620, rx8640)

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

To install the line cord anchor:

1. Align the line cord anchor thumbscrews with the corresponding captive nuts at the rear of the chassis. See Figure 2-25, “Four Cell Line Cord Anchor (rp8400, rp8420, rp8440, rx8620, rx8640),”

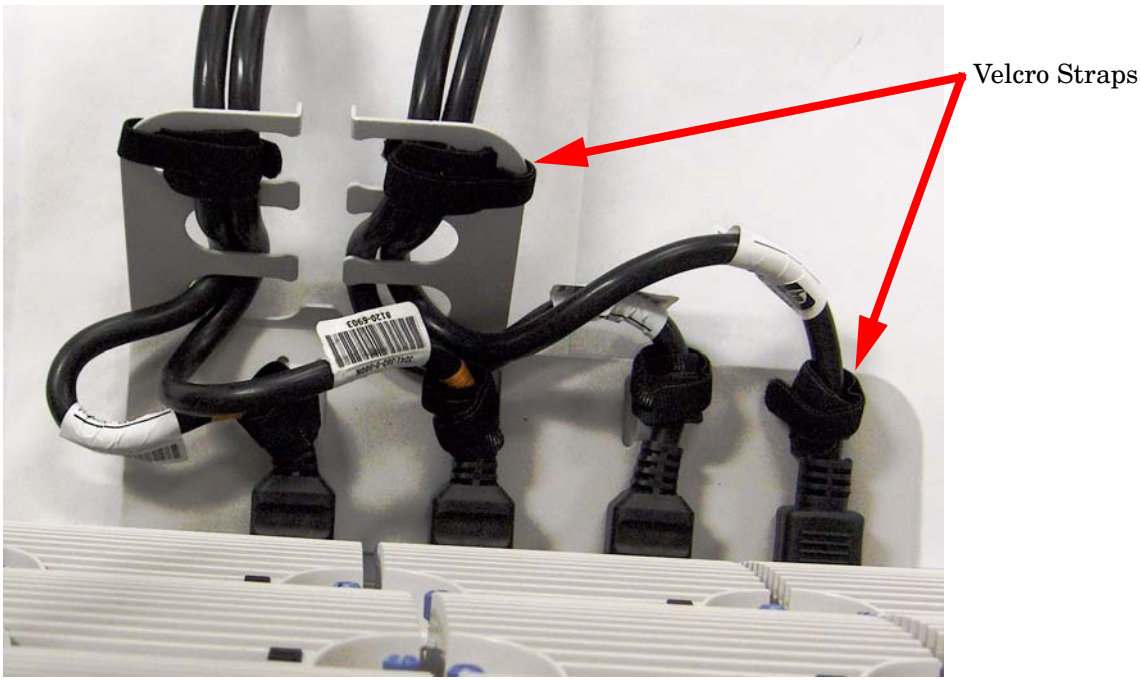
Figure 2-25 Four Cell Line Cord Anchor (rp8400, rp8420, rp8440, rx8620, rx8640)



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

4. Use the supplied Velcro straps to attach the cords to the anchor. See Figure 2-26, “Line Cord Anchor and Velcro Straps,”

Figure 2-26 Line Cord Anchor and Velcro Straps



MP Core I/O Connections

Each HP 9000 rp8420 server has at least one core I/O card installed. Each core I/O card has a management processor (MP). If two core I/O cards are installed, this allows for two partitions to be configured or enables core I/O redundancy in a single partition configuration. Each core I/O card is oriented vertically and accessed from the back of the server.

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

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

- One Ultra3 (160MB/sec) 68-pin SCSI port for connection to external SCSI devices by a very high density cable interconnect (VHDCI) connector.
- One RJ-45 style 10Base-T/100Base-T/1000Base-T system LAN connector. This LAN uses standby power and is active when AC is present and the front panel power switch is off.
- One RJ-45 style 10Base-T/100Base-T MP LAN connector. This LAN uses standby power and is active when AC is present and the front panel power switch is off. This LAN is also active when the front power switch is on.
- Three RS-232 connectors provide connections for a local console, remote console, and a UPS.

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

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

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

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

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

Setting Up the CE Tool (PC)

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

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

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

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

Setting CE Tool Parameters

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

- 8/none (parity)
- 9600 baud
- None (receive)
- None (transmit)

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

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

   Go to **More Settings** to set Xon/Xoff. 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 the VT100 HP terminal type.
8. Click **Apply**.

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

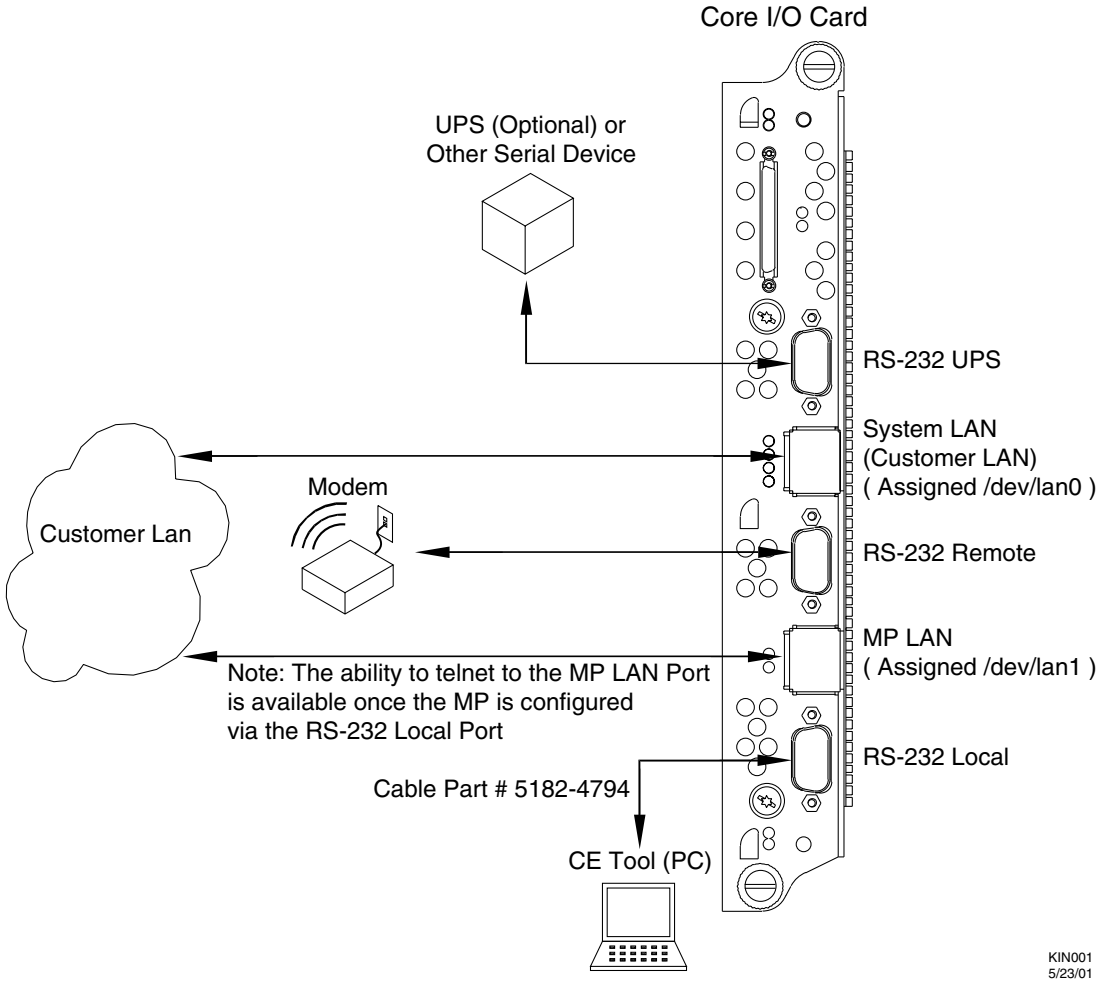
Connecting the CE Tool to the Local RS-232 Port on the MP

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 **Local RS-232** port on the core I/O card (the DB9 connector located at the bottom of the core I/O card).

Figure 2-27 LAN and RS-232 Connectors on the Core I/O Board



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

Turning On Housekeeping Power and Logging In to the MP

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

Before powering up the server cabinet for the first time:

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

   The preferred tool is the CE Tool running Reflection 1.

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

1. Apply power to the server cabinet.

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

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

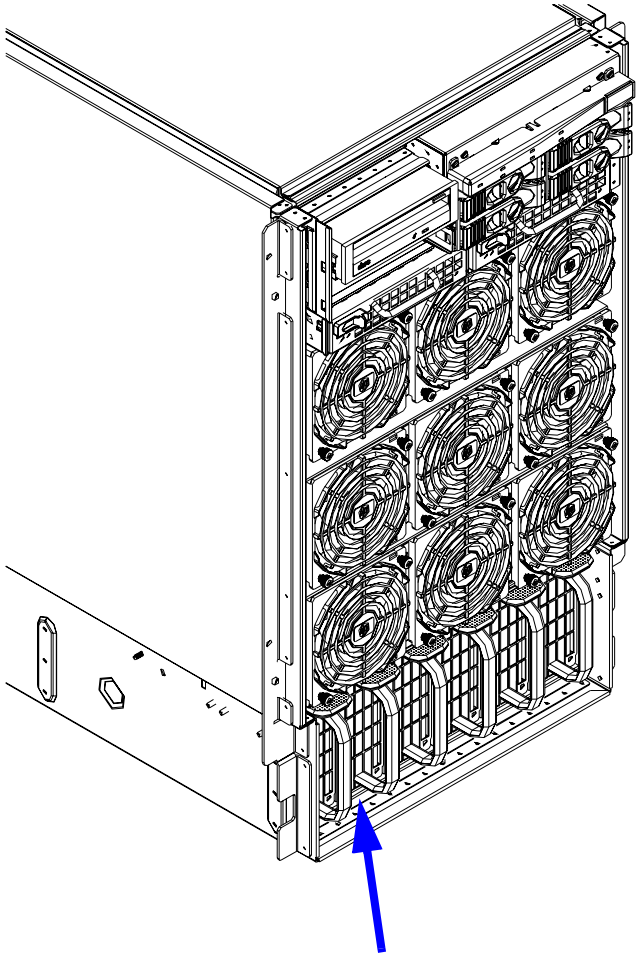
Figure 2-28 Front Panel Display

2. Check the BPS LED for each BPS. See Figure 2-29 on page 65 for the LED location.

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

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

Figure 2-29 BPS LED Location



3. Log in to the MP:

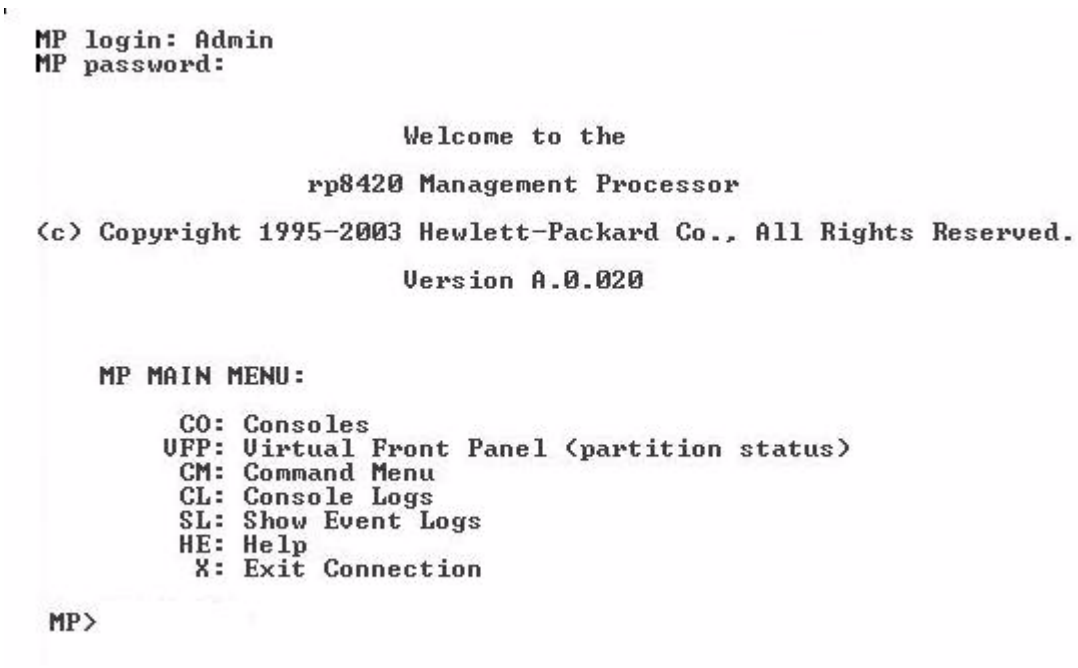
   a. Enter **`Admin`** at the login prompt. (This term is case-sensitive.)

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

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

      The MP Main Menu is displayed:

Figure 2-30 MP Main Menu



Configuring LAN Information for the MP

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

To set the MP LAN IP address:

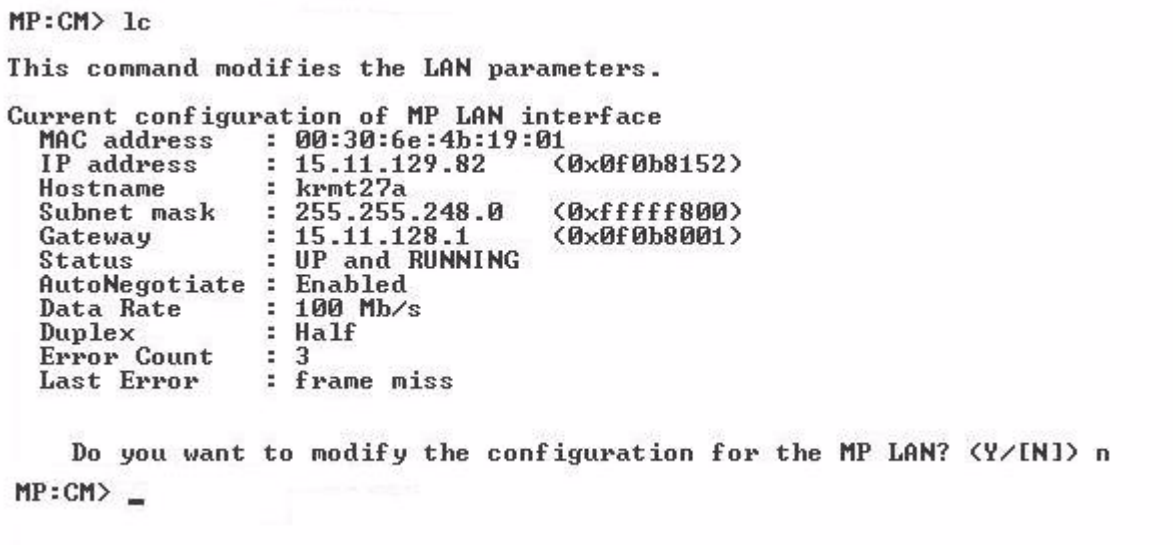
1. At the MP Main Menu prompt (*MP*>), enter **cm.** From the MP Command Menu prompt (*MP:CM*>), enter **lc** (for LAN configuration).

   The screen displays the default values and asks if you want to modify them. Write down the information or log it to a file, as 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 2-31 The lc Command Screen



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

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

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

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

   The customer shall provide this address for network interface 0.

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

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

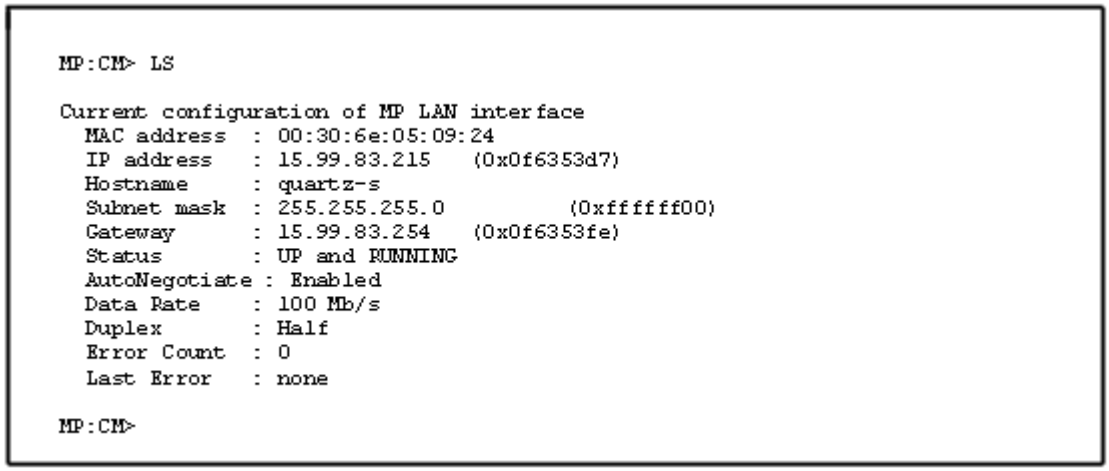
7. Enter the LAN parameters for *Subnet mask* and *Gateway address*.

   This information shall come from the customer.

8. When step 7 is completed, the system will indicate the parameters have been updated and return to the MP Command Menu prompt (*MP:CM>*).
9. To check the LAN parameters and status, enter the **ls** command at the MP Command Menu prompt (*MP:CM>*).

10. A screen similar to the following will display allowing verification of the settings:

Figure 2-32 The ls Command Screen



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

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

Accessing the Management Processor through 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
- Hostname (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. See “Configuring LAN Information for the MP” on page 66.

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

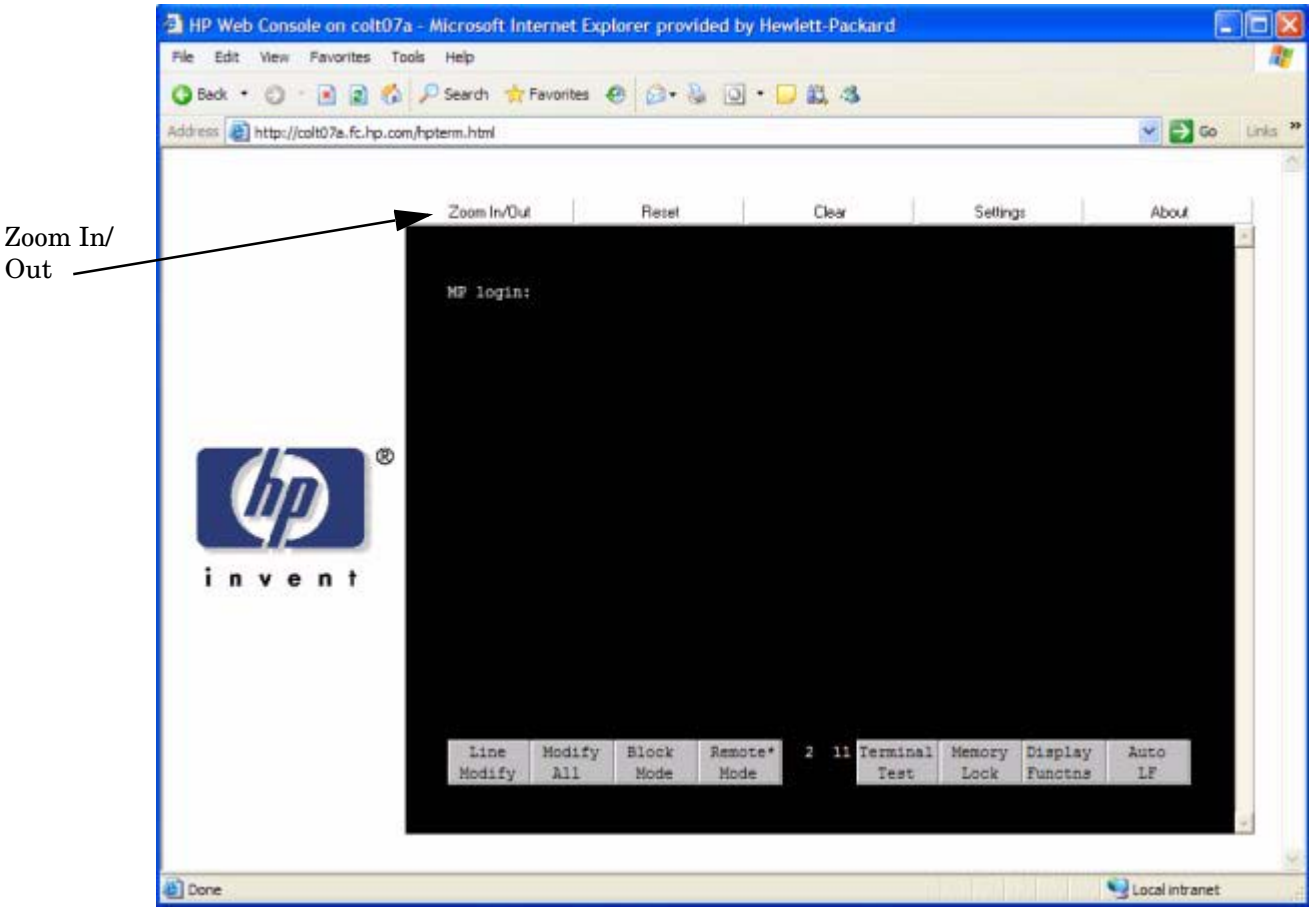
Step 4. Type **SA** at the MP:CM> prompt to display and set MP remote access.

Figure 2-33 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 2-34 Browser Window



Step 6. Click on the Zoom In/Out tab 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 over the customer console or connect the CE Tool (laptop) to the RS-232 Local port on the MP.

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

To determine if the MP detects the cell boards:

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

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

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

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

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

   Figure 2-35 The du Command Screen

```
MP:CM> du

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

   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 server cabinet, by comparing what is in the *Cells* column with the cells physically located inside the server cabinet.

   Figure 2-35 shows that cells are installed in slots 0, 1, 2, and 3 in cabinet 0. In the server cabinet, there should be cells physically located in slots 0, 1, 2, and 3.

Configuring AC Line Status

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

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

Step 1. At the MP prompt, enter **cm**. This will display the Command Menu and allow for viewing and configuring various utilities controlled by the MP.

Step 2. From the command prompt (MP:CM>), enter **pwrgrd**. The `pwrgrd` command displays the current power configuration. This command can also be used to change the power grid configuration. A screen similar to the following is displayed:

Figure 2-36 The pwrgrd Command Screen

```
MP:CM> pwrgrd

The current power configuration is: Grids A & B

Power grid configuration preference.

       1. Grid A only
       2. Grid B only
       3. Grids A & B

          Select Option: 3

Power grid configuration set to grids A & B


MP:CM>
```

Step 3. Verify that the power grid configuration is correct by examining the output from the `pwrgrd` command. The preceding power configuration indicates that both grid A and grid B have been configured.

Step 4. To change the configuration, select the proper response and enter the appropriate numeric value when `Select Option:` displays on the screen. If no change is desired, enter **q** and press the **Enter** key. After the value has been entered, the MP will respond and indicate the change has taken effect.

Booting the HP 9000 rp8420 server

Powering on the server can be accomplished by either pressing the power switch on the front panel or by using the PE command to power up the cabinet or complex at the MP command menu.

If using a LAN crossover cable with the laptop, review server activity for each partition configured while the server powers 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. If there is a Server Expansion Unit attached to the server, both the server and the SEU power switch needs to be pressed. Alternatively, at the MP:CM> prompt, the PE **X** command can be used to power on the complex or the PE **T** command can be used for each cabinet. The following events occur:
   - Power is applied to the server.
   - PDC starts to run on each cell.
   - The cell self test executes.
   - Hardware initializes for the server.
   - Console communication is established.
2. Once the cell has joined the partition or once boot is blocked (BIB) is displayed at the virtual front panel (VFP), 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 may be booted in any order.
4. Return to the MP Main Menu by entering **ma** from the MP Command Menu.
5. Enter the console by typing **co** at the MP Main Menu.

To exit the MP, the **x** command is used to return to the Boot Console Handler Main Menu.

Verifying the System Configuration Using Boot Console Handler

From the Boot Console Handler (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 2-5 Factory-Integrated Installation Checklist

PROCEDURE		IN-PROCESS		COMPLETED	
		Initials	Comments	Initials	Comments
Obtain LAN information					
Verify site preparation					
	Site grounding verified				
	Power requirements verified				
Check inventory					
Inspect shipping containers for damage					
Unpack SPU cabinet					
	Allow proper clearance				
	Cut polystrap bands				
	Remove cardboard top cap				
	Remove corrugated wrap from the pallet				
	Remove four bolts holding down the ramps and remove the ramps				
	Remove antistatic bag				
	Check for damage (exterior and interior)				
	Position ramps				
	Roll cabinet off ramp				
Unpack the peripheral cabinet (if ordered)					
Unpack other equipment					

Table 2-5 Factory-Integrated Installation Checklist (Continued) (Continued)

PROCEDURE		IN-PROCESS		COMPLETED	
Remove and dispose of packaging material					
Move cabinet(s) and equipment to computer room					
Move cabinets into final position					
	Position cabinets next to each other (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 2-5 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)					

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