User Service Guide

HP Integrity rx7620-16 Server

Third Edition

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1 Introduction

The HP Integrity rx7620-16 Server is a memeber of HP's business-critical computing platform family: a mid-range, mid-volume server, positioned as an upgrade to the current HP 9000 rp7410 product in the IA-64 product line. The HP Integrity rx7620-16 Server shares the same hardware as the HP 9000 rp7410 with changes to the cell board, CPU modules, core I/O and the PCI-X backplane. The HP Integrity rx7620-16 Server provides increased performance over its predecessor.

Overview

The HP Integrity rx7620-16 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 accomodates up to 16 IA64 processors with a maximum of four processor modules per cell board and a maximum of two cell boards.

Figure 1-1 HP Integrity rx7620-16 Server (left-front view)

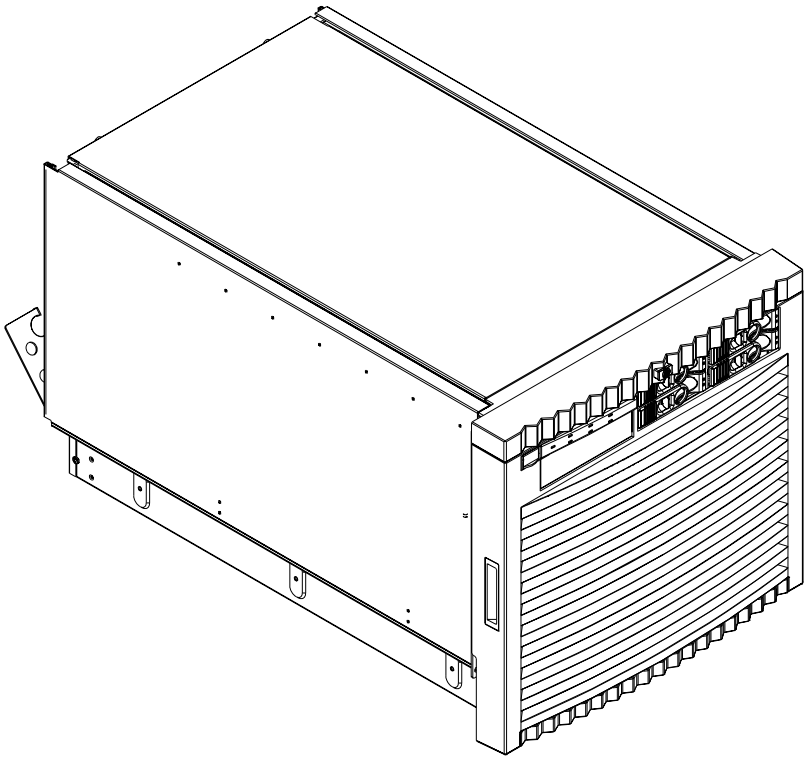
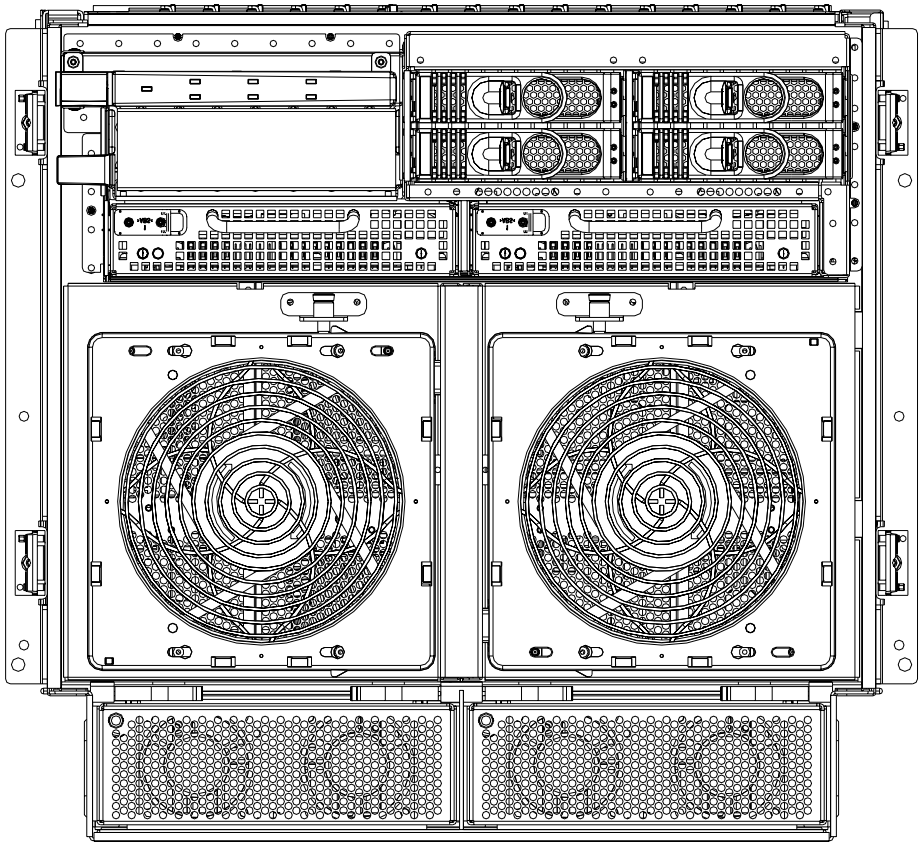


Figure 1-2 HP Integrity rx7620-16 Server (without front bezel)

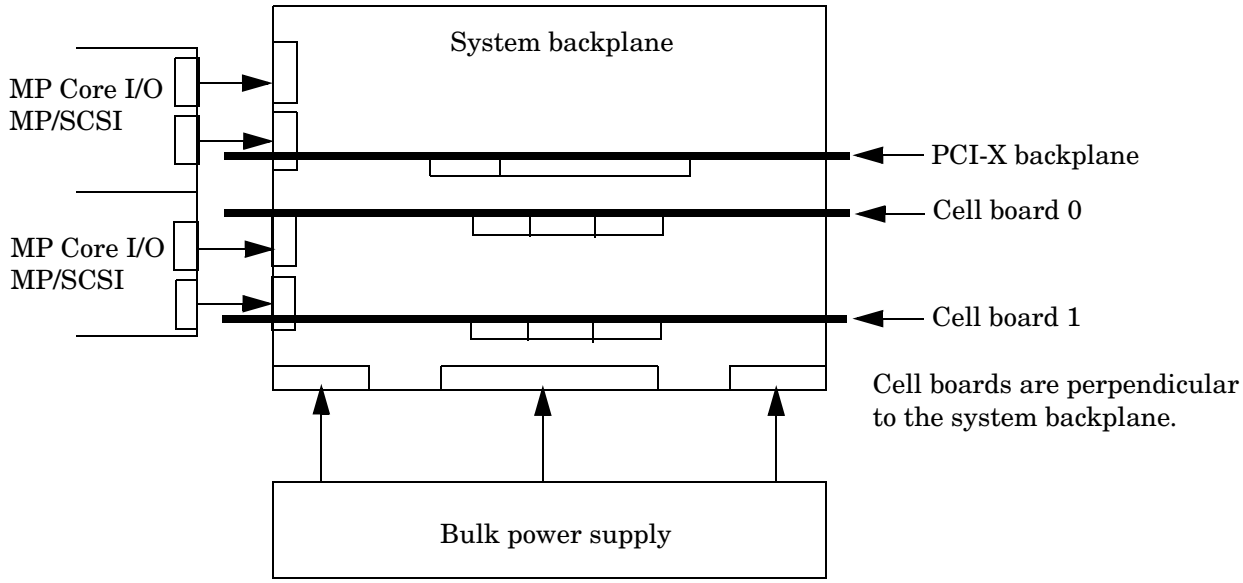


System Backplane

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

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

Figure 1-3 System Backplane Block Diagram



System Bacplane to PCI-X Backplane Connectivity

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

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

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

Clocks and Reset

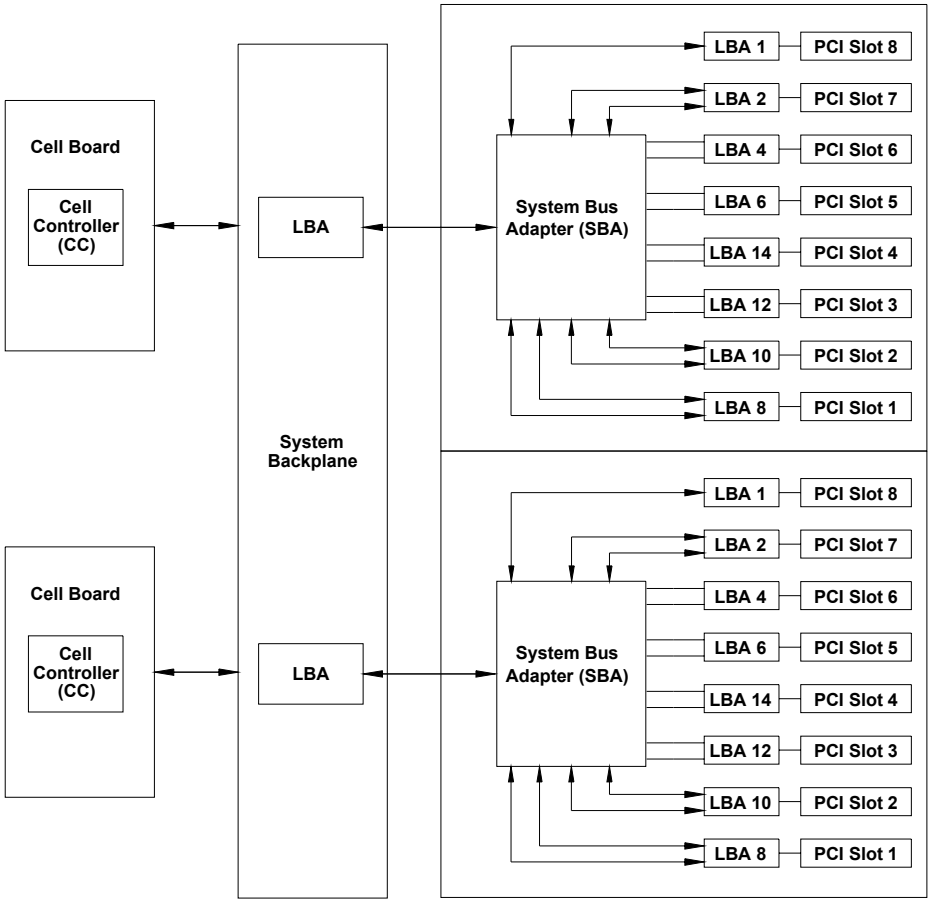
The system backplane contains reset and clock circuitry that propagates through the whole system. The central clocks drive all major chip set clocks. Therefore, these circuits represent a system wide single point of failure.

I/O Subsystem

The cell board to the PCI-X board path runs from the CC to the SBA, from the SBA to the ropes, from the ropes to the LBA, and from the LBA to the PCI slots seen in Figure 1-4. The CC on cell board 0 and cell board 1 communicates with one each SBA over the SBA link. The SBA link consists of both an inbound and an outbound link with an effective bandwidth of approximately 1 GB/sec. The SBA converts the SBA link protocol into “ropes.” A rope is defined as a high speed point to point data bus. The SBA can support up to 16

of these high-speed bi-directional rope links for a total aggregate bandwidth of approximately 4 GB/sec. Each LBA acts as a bus bridge, supporting either one or two ropes and capable of driving 33 Mhz or 66 Mhz for PCI cards. The LBAs can also drive at 66 Mhz or 133 Mhz for PCI-X cards.

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



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

The PCI-X backplane is the primary I/O interface for HP Integrity rx7620-16 Server systems. It provides sixteen 64-bit, hot-plug PCI/PCI-X slots. Fourteen of the slots have dual ropes connected to the LBA chips. The remaining two slots have a single rope connected to each LBA chip. Each of the sixteen slots are capable of 66MHz/33MHz PCI or 133MHz/66MHz PCI-X. All sixteen PCI slots are keyed for 3.3 volt connectors (accepting both Universal and 3.3 V cards). The PCI-X backplane does not provide any 5 volt slots for the I/O cards. See Table 1-1 for more details.

The PCI-X backplane is physically one board but behaves like two independent partitions. SBA 0 and its associated LBAs and eight PCI-X slots form one I/0 partition. SBA 1 and its associated LBAs and eight PCI-X slots form the other I/0 partition. One I/O partition can be powered down separately from the other I/O partition.

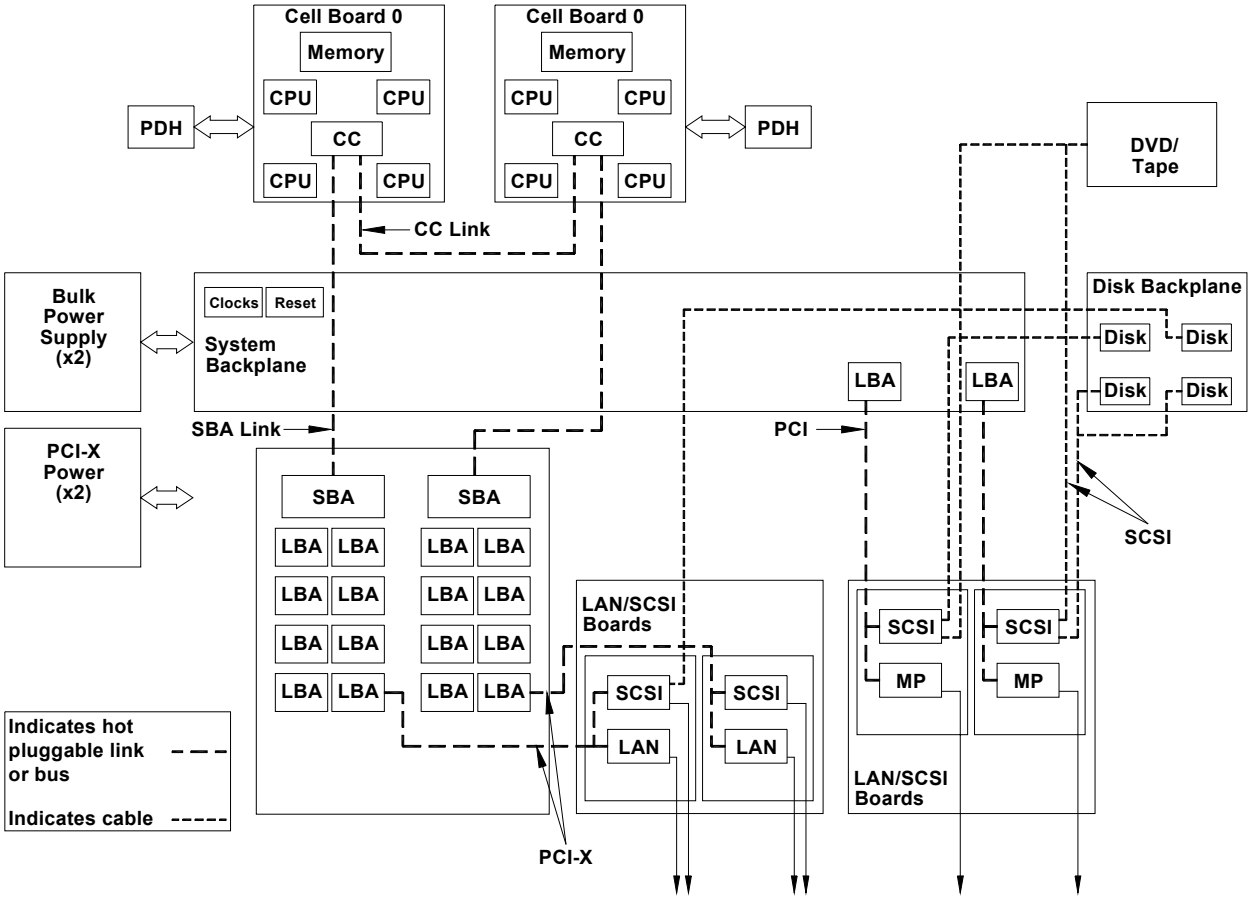
Table 1-1 PCI-X Slot Types

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

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

Detailed HP Integrity rx7620-16 Server Description

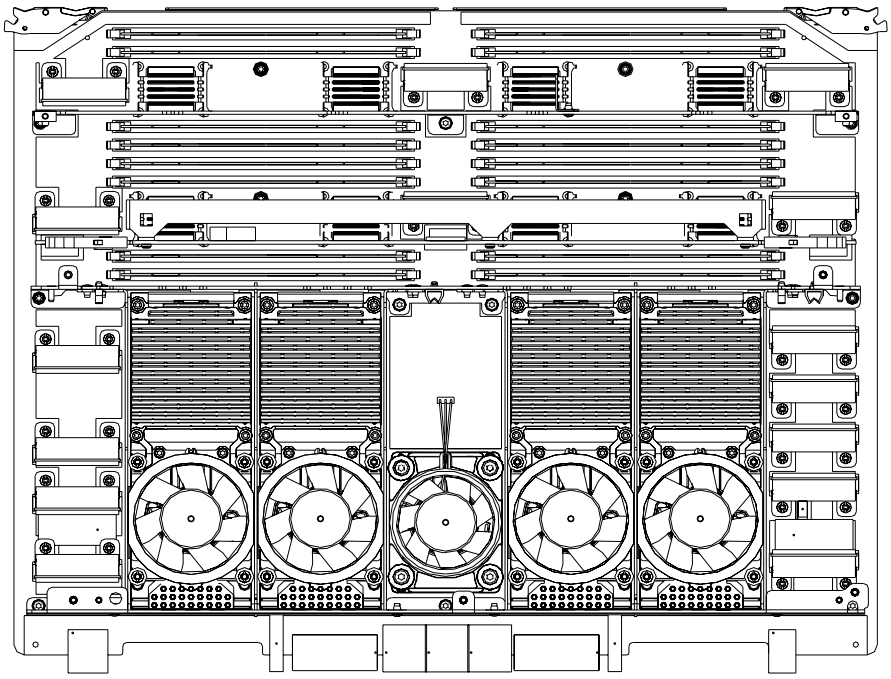
Figure 1-5 HP Integrity rx7620-16 Server 8-Socket Block Diagram



Cell Board

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

Figure 1-6 Cell Board

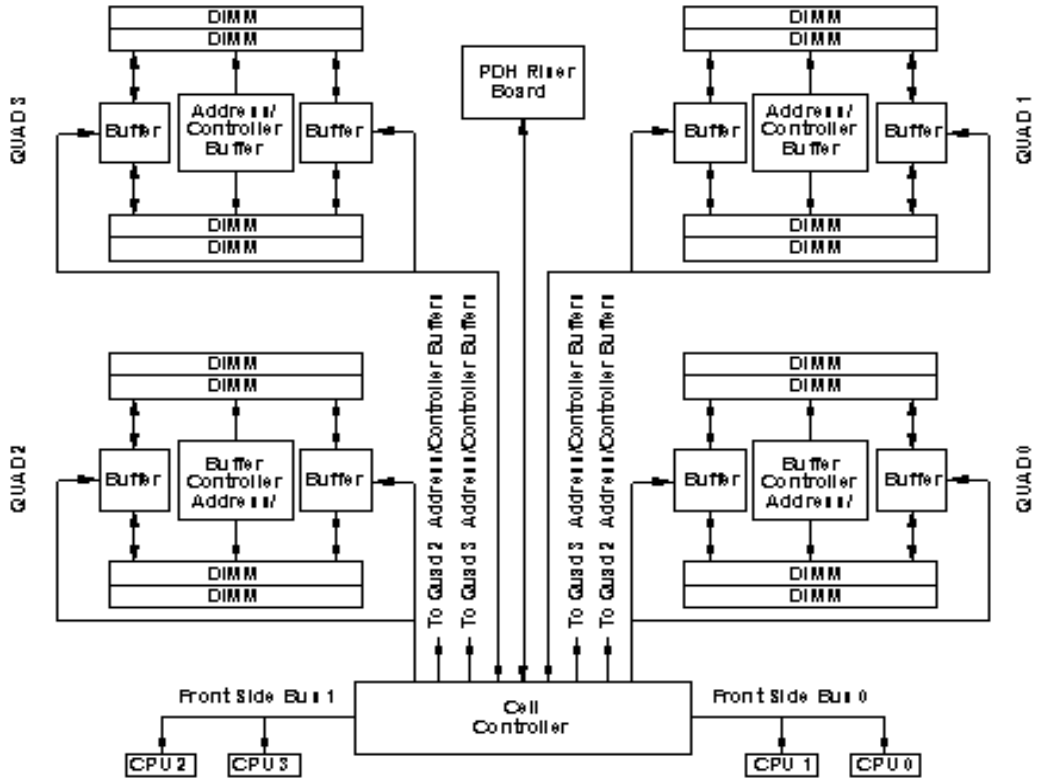


The HP Integrity rx7620-16 Server has a 48V distributed power system and receives the 48V power from the system backplane board. The cell board contains DC-to-DC converters to generate the required voltage rails. The DC-to-DC converters on the cell board do not provide N+1 redundancy.

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

Figure 1-7 shows a simplified view of the memory subsystem. It consists of two independent access paths, each path having its own address bus, control bus, data bus, and DIMMs. In practice, the CC runs the two paths 180 degrees out of phase with respect to each other to facilitate pipelining in the CC. Address and control signals are fanned out through register ports to the synchronous dynamic random access memory (SDRAM) on the DIMMs.

Figure 1-7 Memory Subsystem



PDH Riser Board

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

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

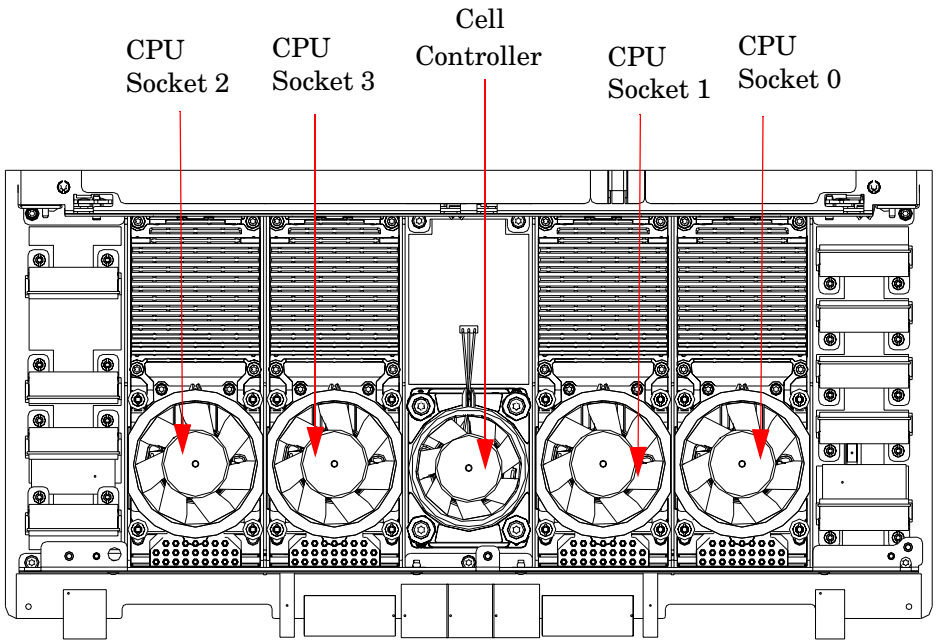
Central Processor Units

The cell board can hold up to four CPU modules and can be populated with CPUs in increments of one after meeting the minimum of two CPUs installed on the cell board. On a cell board, the processors must be the same type and speed. See Table 1-2 for the CPU load order that must be maintained when adding CPUs to the cell board. Refer to Figure 1-8 for the locations on the cell board for installing CPUs. A single CPU configuration is not available for the cell board.

Table 1-2 Cell Board CPU Load Order

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

Figure 1-8 CPU Locations on Cell Board



DIMMs

The memory DIMMs used by the HP Integrity rx7620-16 Server are customed designed by HP and are identical to those used in the Superdome server. Each DIMM contains SDRAM memory components and is qualified to run at 125MHz. The CPU chip set will not support traditional DRAMs.

The HP Integrity rx7620-16 Server supports DIMMs with densities of 64, 128, 256, and 512 Mb for the SDRAM devices. Table 1-3 shows each supported DIMM size, the resulting total system capacity, and the memory component density. Each DIMM is connected to two buffer chips on the cell board.

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

Table 1-3 HP Integrity rx7620-16 Server DIMMs

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

Main Memory Performance

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

Valid Memory Configurations

The HP Integrity rx7620-16 Server is capable of supporting as little as 0.5GB of main memory using two 256MB DIMMs installed on one of the cell boards and as much as 64 GB by filling all 16 DIMM slots on both cell boards with 2GB DIMMs.

DIMMs must be loaded in sets of two at specified locations on the cell board. Two DIMMs are called an “echelon”, so two echelons would be equivalent to four DIMMs, three echelons would be equivalent to six DIMMs and so on. The DIMMs must be the same size in an echelon. The DIMMs across all cells in a partition should have identical memory loaded. Figure 1-9 shows the DIMM slot layout on the cell board. See Table 1-4 for DIMM load order.

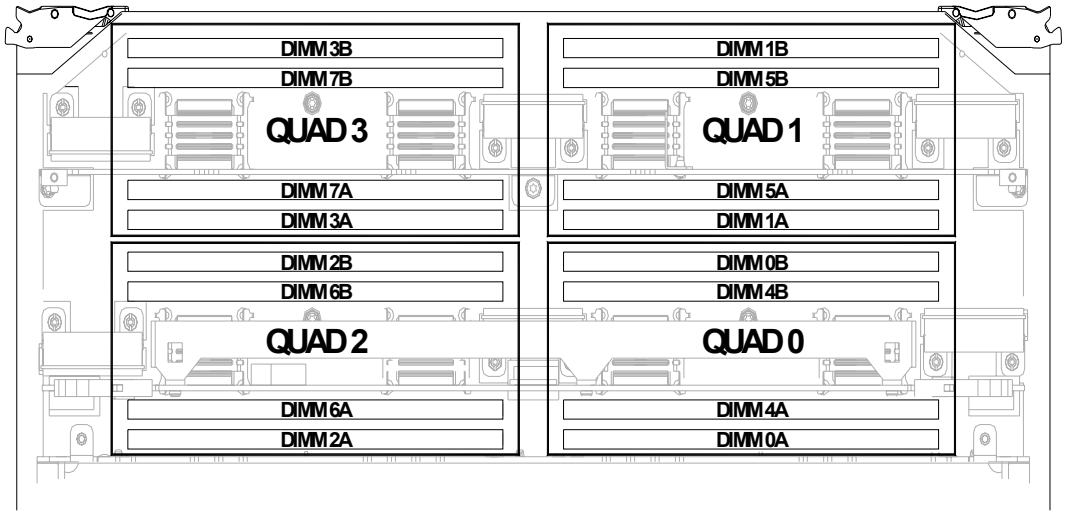
A quad seen in Figure 1-9 is a grouping of four DIMMs. Configurations with 8 or 16 DIMM slots loaded are recommended. The DIMM sizes in a quad can be different but the DIMMs in an echelon must be the same size.

Table 1-4 DIMM Load Order

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

Figure 1-9 DIMM Slot Layout

Front Edge of Cell Board



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

Cells and nPartitions

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

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

An nPartition (also called a Protection Domain) is a cell or cells running the same operating system and sharing processes and memory space among the components. Each nPartition must have one root cell and may have both. The HP Integrity rx7620-16 Server has only two possible nPartition configurations: single or dual. The additional cell that can be part of the nPartition does not require I/O links or MP/SCSI Core I/O cards.

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

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

NOTE Partition configuration information is available on the Web at http://docs.hp.com

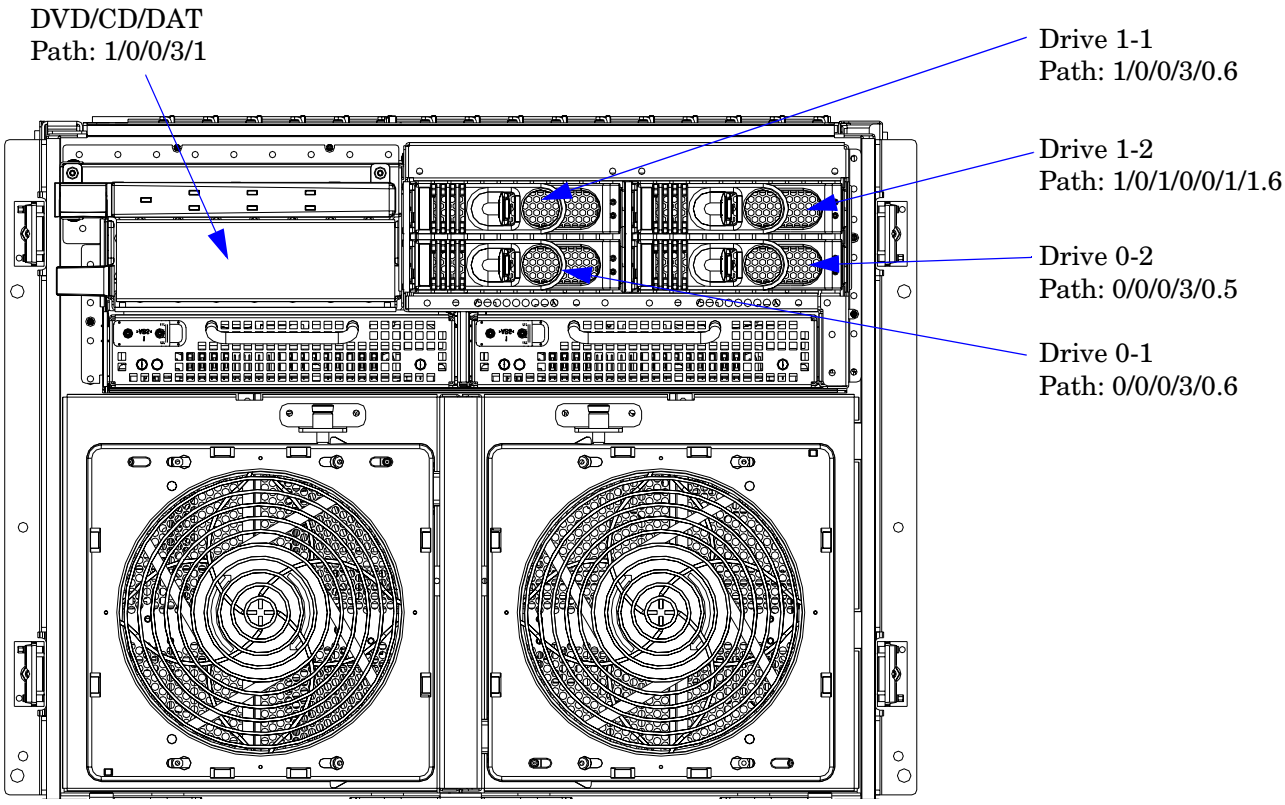
Refer to HP System Partitions Guide: Administration for nPartitions for details.

Internal Disk Devices for HP Integrity rx7620-16 Server

In an HP Integrity rx7620-16 Server, the top internal disk drives connect to cell 1 through the core I/O for cell 1. Both of the bottom disk drives connect to cell 0 through the core I/O for cell 0.

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

Figure 1-10 Internal Disks



MP/SCSI Core I/O Board

The HP Integrity rx7620-16 Server accommodates two sets of MP/SCSI Core I/O functionality. Each MP/SCSI core I/O board set consists of a MP/SCSI board and a Procurium LAN/SCSI board. At least one MP/SCSI board is required (independent of partitions). An additional MP/SCSI board can be added as well (and is required in a dual partition system). Both MP/SCSI core I/O boards are oriented vertically and plug into the system backplane. The MP/SCSI core I/O board incorporates a dual channel Ultra160 SCSI controller and is hot-pluggable.

Procurium LAN/SCSI Board

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

Mass Storage (Disk) Backplane

Internal mass storage connections to disks are routed on the mass storage backplane, having connectors and termination circuitry. All disks are hot-pluggable. The HP Integrity rx7620-16 Server accommodates one internal removable media device. Therefore, only one power connector for a removable media device is required on the mass storage backplane. The mass storage backplane incorporates a circuit that allows power to the internal removable media device to be programmatically cycled.

Server Description

Dimensions

The dimensions of the HP Integrity rx7620-16 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, Rosebowl I):

  25.5 inches from front rack column to PCI connector surface

  26.7 inches from front rack column to MP Core I/O connector surface

  30 inches overall package dimension, including 2.7 inches protruding in front of the front rack columns.
- Height: 10U – 0.54 cm = 43.91 cm (17.287 inches). This is the appropriate height for a product that consumes 10U of rack height while allowing adequate clearance between products directly above and below this product. Fitting four server units per 2 m rack and upgrade of current 10U height products in the future are the main height constraints.

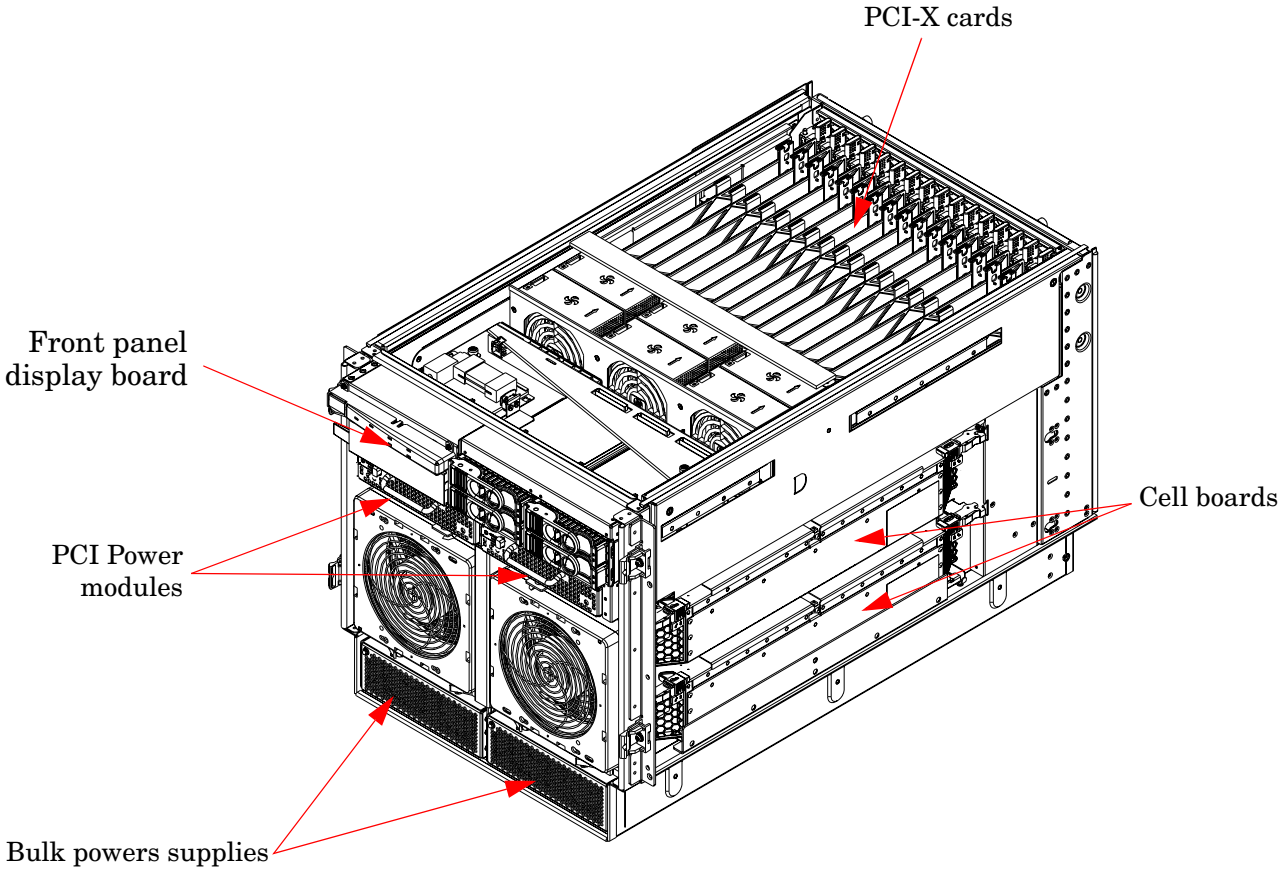
System Chassis

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

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

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

Figure 1-11 Right-Front View of HP Integrity rx7620-16 Server



The PCI-X card section, located toward the rear, is accessed by removing the top cover.

The PCI OLR fan modules are located in front of the PCI-X cards. These six 9.2-cm fans are housed in plastic carriers. They are configured in two rows of three fans.

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

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

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

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

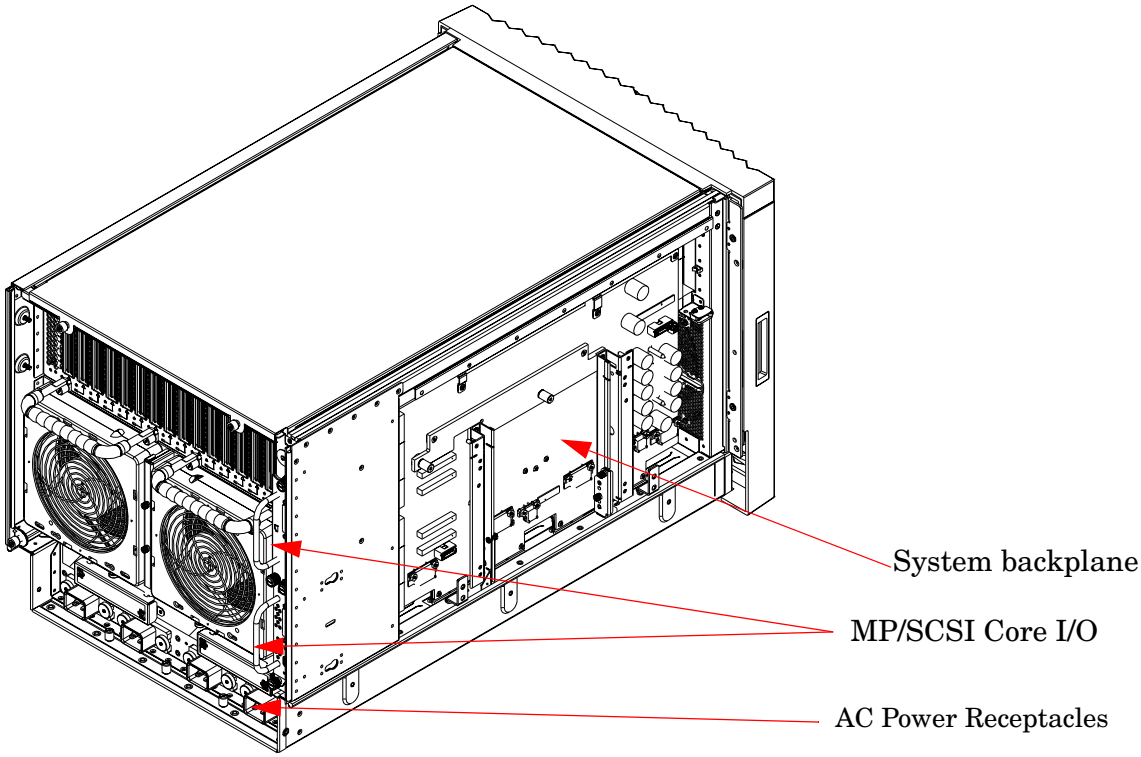
A cable harness that connects from the rear of the BPSs to the system backplane provides DC power distribution.

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

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

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

Figure 1-12 Left-Rear View of HP Integrity rx7620-16 Server



2 Troubleshooting

Common Installation Problems

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

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

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

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

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

   Check the Setup Utility. If the error is a network-related problem, determine if the server has enough memory and hard disk drive capacity.
3. Verify all cables and boards are securely plugged in to the appropriate connectors or slots.
4. Remove all extra options, such as disk drives, one at a time, checking the affect of each on the server.
5. Unplug the power cord, wait 20 seconds, plug-in the power cord and restart the server.
6. If a hardware error is suspected, follow these steps:

   a. Log users off the LAN and power down the server.

   b. Extend the server out of the rack and remove the top cover.

   c. Simplify the server to the minimum configuration.

      The minimum configuration consists of the following:

      - One cell
      - Two processors
      - One quad of memory DIMMS (size 256 MB or larger)
      - One MP/SCSI card
      - One LAN/SCSI card
      - System backplane
      - PCI-X backplane
      - One BPS
      - Two PCI power modules
      - Two power cords
7. Remove all third-party options and reinstall each one, one at a time, checking the server after each installation.
8. Replace the top cover and reconnect the power cord and other cables. Boot the server. If it does not function properly, refer to the procedures in the following section.

The Server Does Not Power On

Use these steps to check for power related problems:

1. Check each BPS LED.

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

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

2. Verify that the power supply and both power cords are plugged in to the chassis.

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

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

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

HP Integrity rx7620-16 Server LED Indicators

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

Front Panel LEDs

There are seven LEDs located on the front panel.

Figure 2-1 Front Panel with LED Indicators

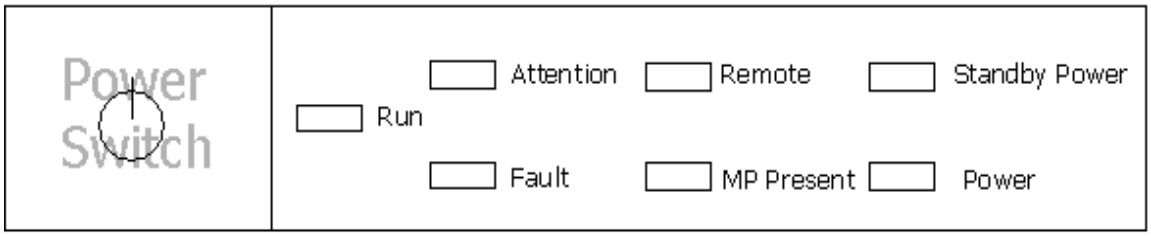


Table 2-1 Front Panel LEDs

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

Table 2-1 Front Panel LEDs (Continued)

LED	Driven By	State	Description
Fault	PDC/MP via GPM	Flash Red	One or more partitions have reported a fault
		Off	No partitions running, or MP not installed, or MP installed and not active

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

Bulk Power Supply LEDs

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

Figure 2-2 BPS LED Locations

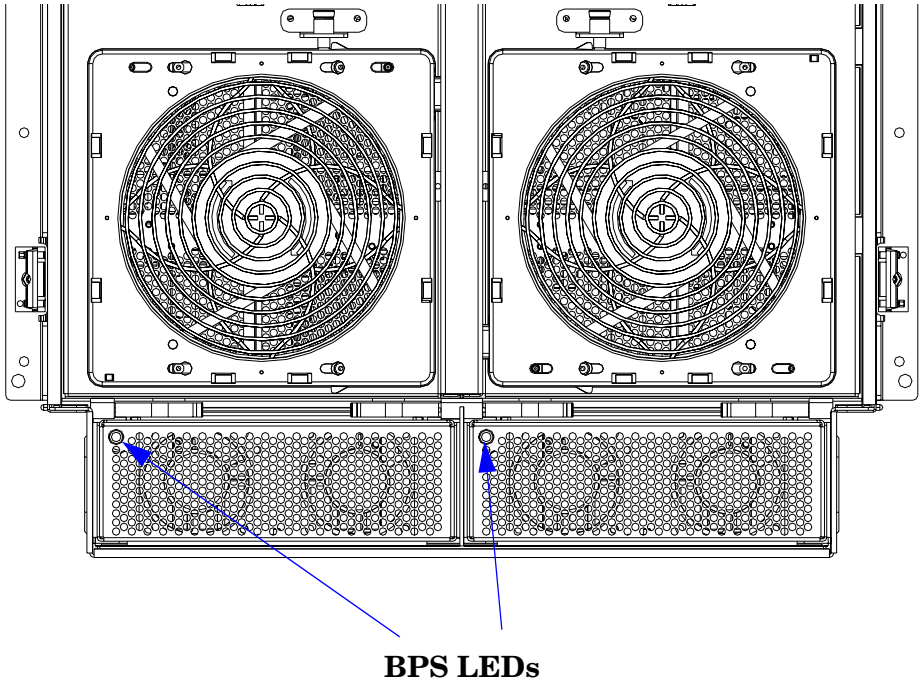


Table 2-2 BPS LEDs

LED Indication	Description
Blinking Green	BPS is in standby state with no faults or warnings
Green	BPS is in run state (48 volt output enabled) with no faults or warnings
Blinking Yellow	BPS is in standby or run state with warning(s) present but no faults

Table 2-2 BPS LEDs (Continued)

LED Indication	Description
Yellow	BPS is in standby state with recoverable fault(s) present but no non-recoverable faults
Blinking RED	BPS state might be unknown, non-recoverable fault(s) present
Red	Not Used
Off	BPS fault or failure, no power cords installed or no power to the chassis

PCI-X Power Supply LEDs

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

Figure 2-3 PCI-X Power Supply LED Locations

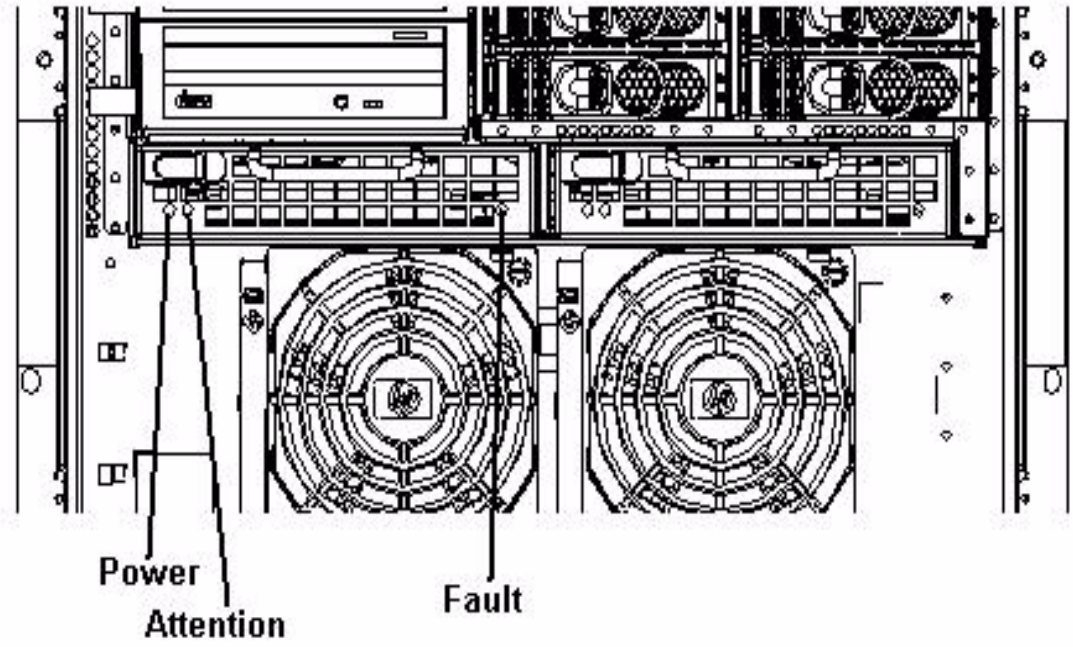


Table 2-3 PCI-X Power Supply LEDs

LED	Driven By	State	Description
Power	Each supply	On Green	All output voltages generated by the power supply are within limits.
		Off	Power to entire system has been removed.
Attention	MP through PCI LPM[a]	Yellow	See Table 2-8 for LED status in combination with the green power LED for PCI-X slot status.
Fault	Each supply	Flash Yellow	The temperature within the power supply is above the lower threshold.
		On Yellow	The temperature of the power supply is approaching the thermal limit
		Flash Red	Power supply has shut down due to an over temperature condition, a failure to regulate the power within expected limits, or a current-limit condition.
		Off	Normal operation.

a. LPM stands for local power monitor

System and PCI I/O Fan LEDs

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

Figure 2-4 Front, Rear and PCI I/O Fan LEDs

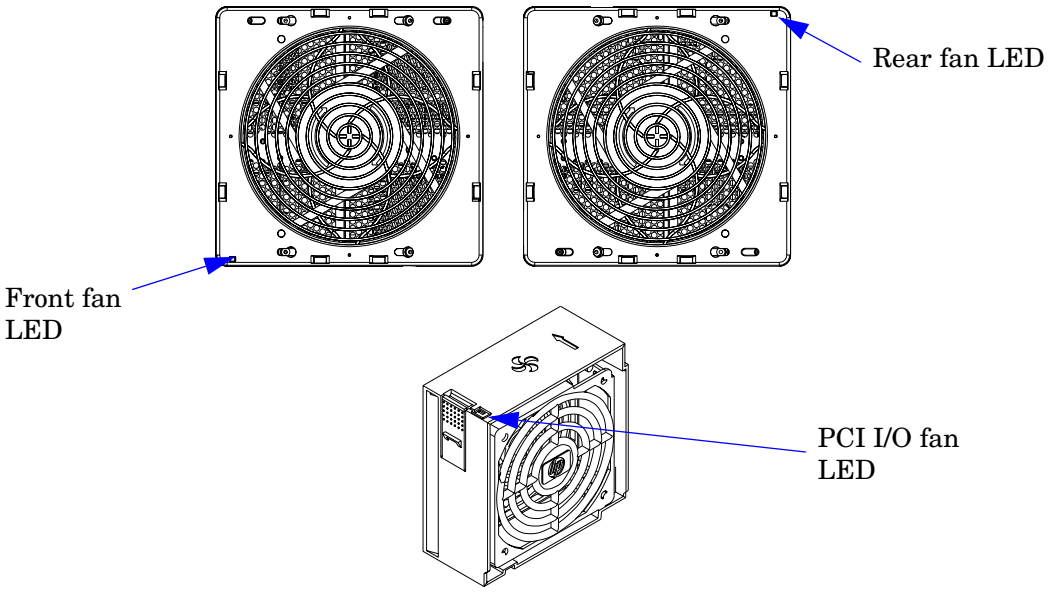


Table 2-4 System and PCI I/O Fan LEDs

LED	Driven By	State	Description
Fan Status	Fan	On Green	Normal
		Flashing Yellow	Predictive failure
		Flashing Red	Failed
		Off	No power

OL* LEDs

Cell Board LEDs

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

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

Figure 2-5 Cell Board LED Locations

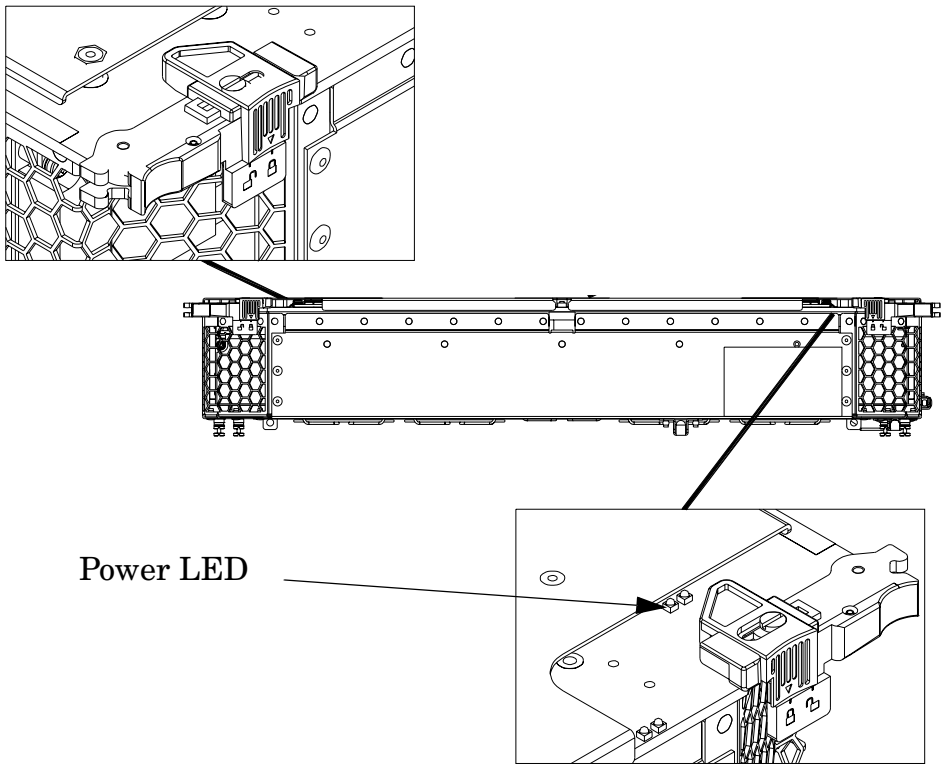


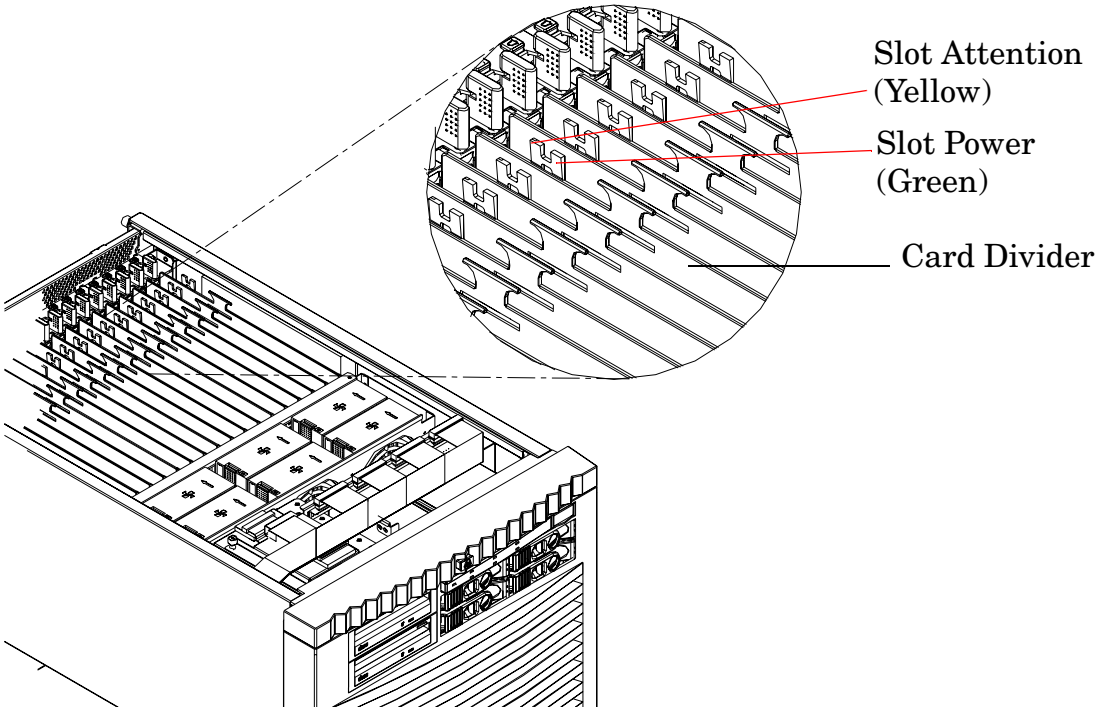
Table 2-5 Cell Board OL* LED Indicators

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

PCI-X OL* Card Divider LEDs

The PCI-X OL* card LEDs are located on each of the 16 PCI-X slot dividers in the PCI-X card cage assembly area. The green power LED indicates whether power is supplied to the card slot. The yellow attention LED states are defined in Table 2-8.

Figure 2-6 PCI-X OL* LED Locations



Core I/O LEDs

The core I/O LEDs in Table 2-6 on page 30 are located on the bulkhead of the installed core I/O PCA.

Figure 2-7 Core I/O Card Bulkhead LEDs

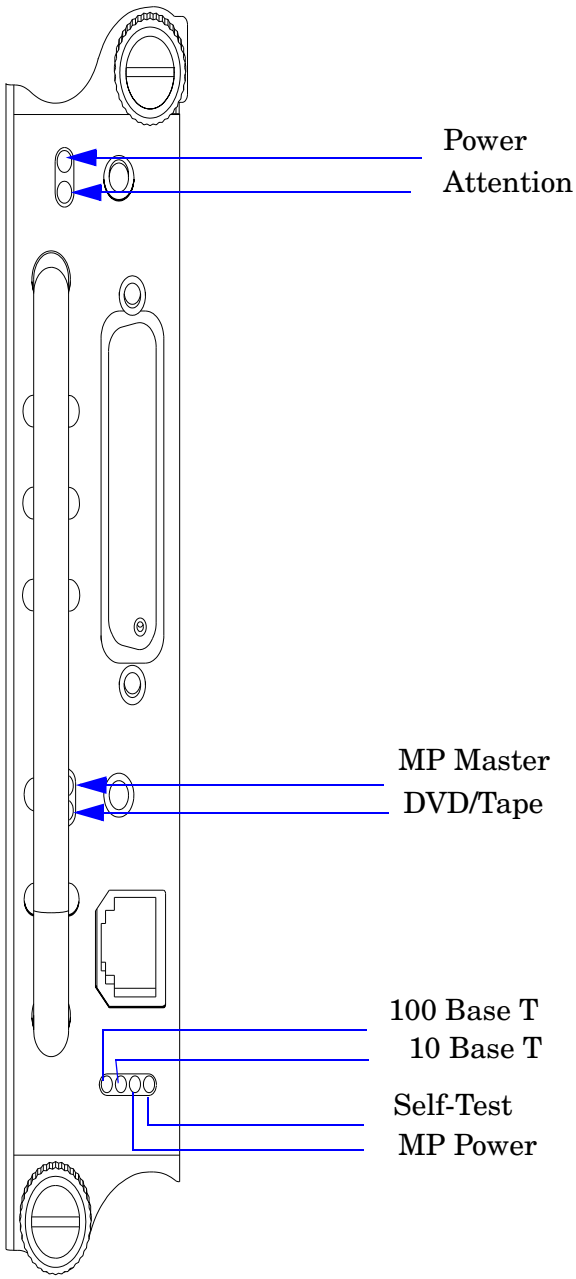


Table 2-6 Core I/O LEDs

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

Core I/O Buttons

There are two recessed buttons on the back of the core I/O card, as explained in Table 2-7.

Figure 2-8 Core I/O Button Locations

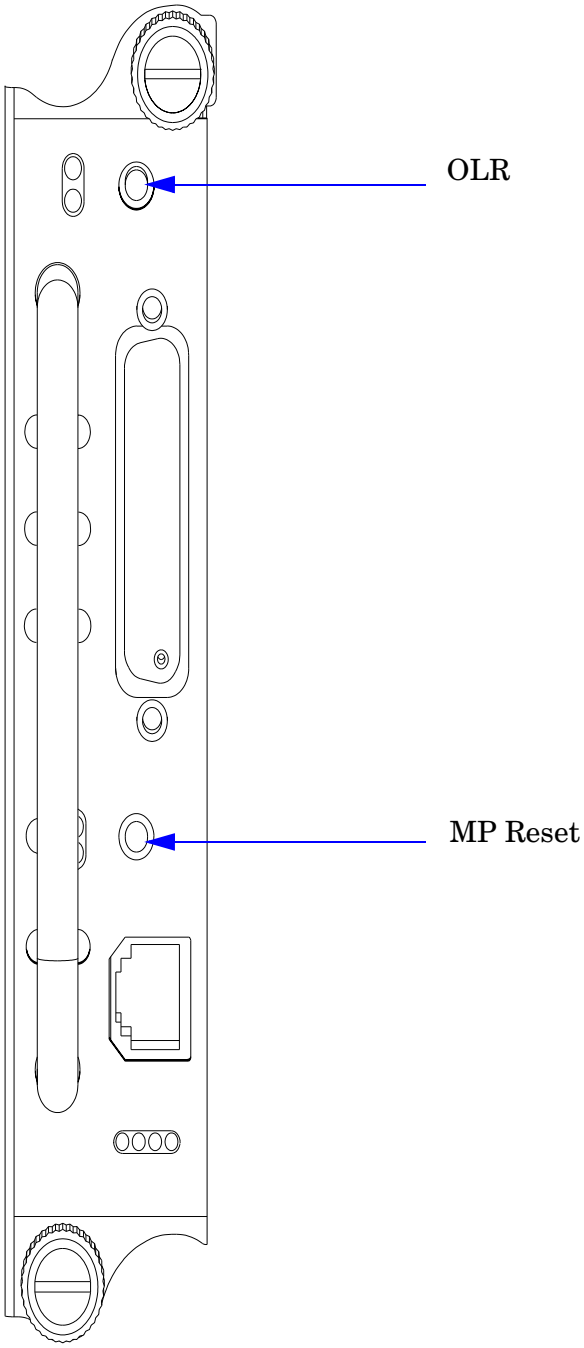


Table 2-7 Core I/O Buttons

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

PCI-X Hot-Plug LED OL* LEDs

Table 2-8 OL* LED States

State	Power (Green)	Attention (Yellow)
Normal operation, slot power on	On	Off
Slot selected, slot power on	On	Flashing
Slot needs attention, slot power on	On	On
Slot available, slot power off	Off	Off

Table 2-8 OL* LED States (Continued)

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

Disk Drive LEDs

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

Figure 2-9 Disk Drive LED Location

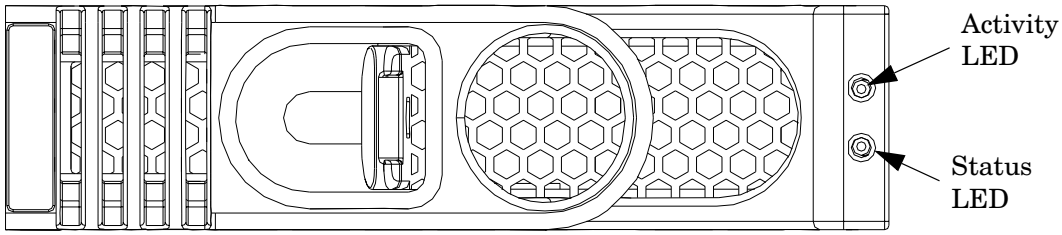


Table 2-9 Disk Drive LEDs

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

Server Management Subsystem Hardware Overview

Server management for the hp 9000 rp7420 is provided by an MP on the core I/O board. The server management hardware is powered by standby power that is available whenever the server is plugged into primary AC power. This allows service access even if the DC power to the server is switched off.

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

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

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

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

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

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

The server configuration cannot be changed without the MP.

In the event of a master MP failure, the slave MP automatically becomes the master MP.

Server Management Commands

Table 2-10 lists the server management commands.

Table 2-10 Management Commands

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

Table 2-11 lists the server status commands

Table 2-11 Status Commands

Command	Description
CP	Display partition cell assignments
HE	Display the list of available commands
LS	Display LAN connected console status
MS	Display modem status
PS	Display detailed power and hardware configuration status

Table 2-12 lists the server system and access configuration commands

Table 2-12 System and Access Configuration Commands

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

Table 2-12 System and Access Configuration Commands (Continued)

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

3 Removing and Replacing Components

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

Shutting Down nPartitions and Powering Off Hardware Components

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

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

Shutting Down an nPartition

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

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

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

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

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

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

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

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

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

  In this case, proceed with the next step.

- If the nPartition is at its Boot Console Handler (BCH) interface, then HP-UX has already been shut down.

- If the nPartition currently is booting, then you should wait for it to reach the BCH interface and, if necessary, interrupt auto-boot when you see the "Attempting to boot" and "To discontinue, press any key within 10 seconds" messages.

- If the nPartition is at the BCH menu interface, then HP-UX is shut down. Otherwise, proceed with the next step to shut down HP-UX.

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

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

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

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

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

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

Powering Off Hardware Components

This procedure is for powering off and powering on components that are to be removed and replaced.

Step 1. Log in to the server's Management Processor (MP).

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

HP-UX on the nPartition must be shut down before you power off any of the hardware assigned to the nPartition.

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

Refer to the procedure in "Shutting Down an nPartition" for details on determining the nPartition boot state and shutting down HP-UX.

Step 3. Access the MP Command menu.

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

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

The `PS` command enables you to check the status of the cabinet, system backplane, MP Core I/O, PCI power domains, or bricks, in the I/O card cage, and cells.

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

Using the **`PE`** command you can power on or off the cabinet (including all cells and I/O in the cabinet), individual cells, or PCI power domains (bricks).

Using the Command menu's `PE` command to manage cabinet power is equivalent to using the front panel power switch.

Step 6. If you need to disable *all power* in the entire cabinet, you also must disconnect all power cords to disable all housekeeping power.

NOTE Ensure that all power cords are labeled to indicate into which receptacle each cord plugs. Because of power redundancy capabilities, each power cord must plug into its proper receptacle.

Also, ensure that the cabinet power has been turned off before disconnecting any power cords.

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

Step 8. If needed, reconnect all power cords to the receptacles where they belong.

Step 9. Use the MP Command menu's **PE** command to power on the hardware component that you powered off.

Step 10. Use the MP Command menu's **PS** command to confirm the status of the newly replaced component.

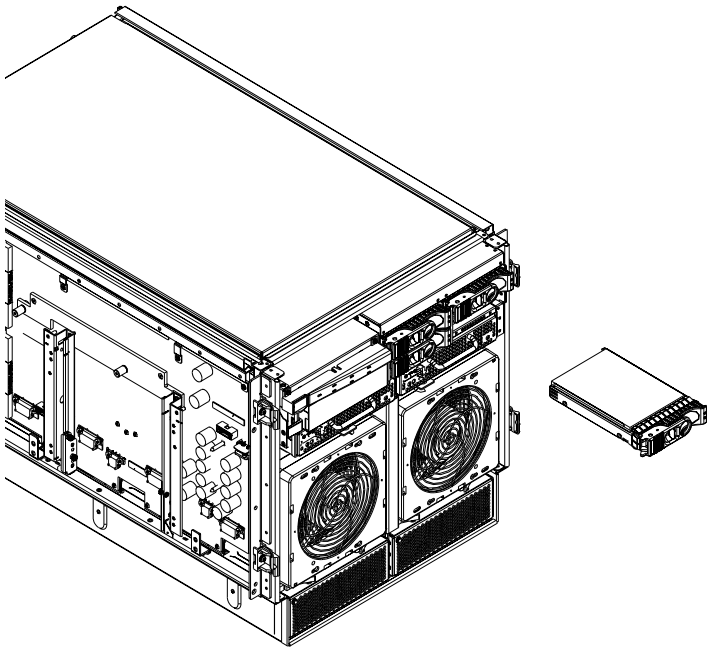
NOTE You might need to allow time for some components to complete power-on self-tests (POST) before a complete status is available.

Removing and Replacing a Disk Drive

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

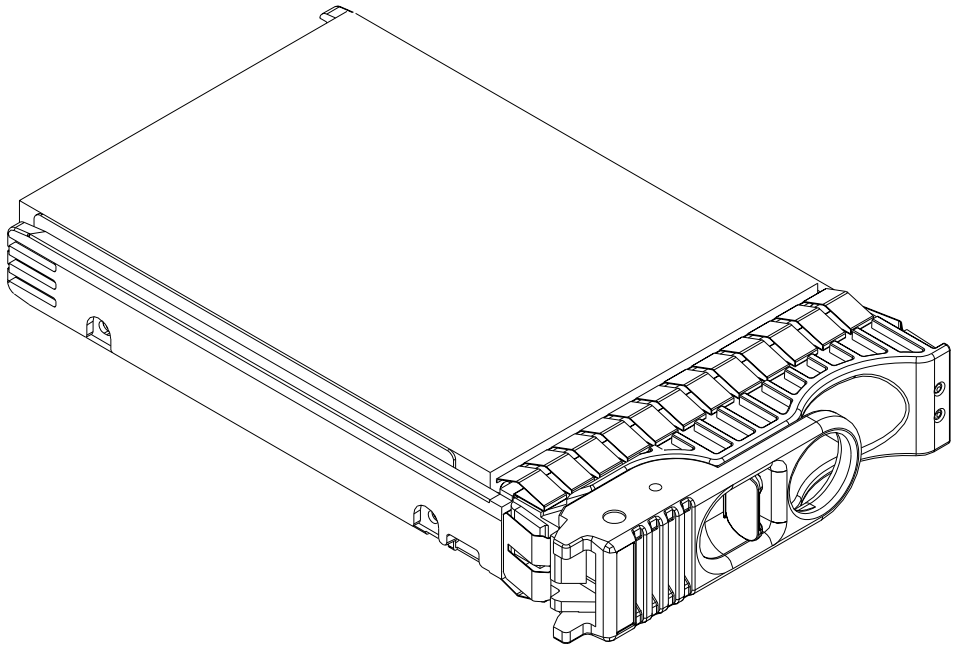
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 3-1 Disk Drive Location



Removing a Disk Drive

Figure 3-2 Disk Drive Detail



Step 1. Disengage the front locking latch on the disk drive by pushing the release tab to the right and the latch lever to the left.

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

Replacing a Disk Drive

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

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

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

Step 2. Enter the following command:

```
#ioscan -f
```

The response message after running this command is:

```
NO_HW
```

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

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

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

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

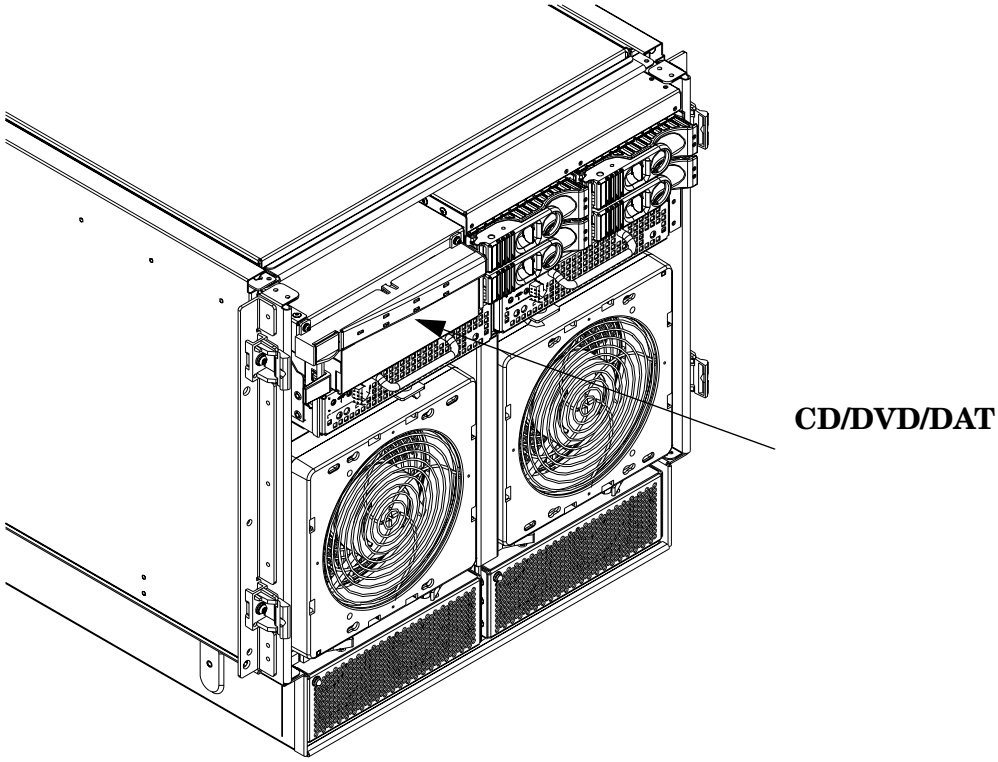
```
#diskinfo -v /dev/rdsk/cxtxdx

#ioscan -f

#pvcreate

#vgcfgrestore
```

Removing and Replacing a CD/DVD/DAT Drive

The CD/DVD/DAT is located in the front of the chassis. The system power to this component must be removed before attempting to remove or replace it. Refer to “Shutting Down nPartitions and Powering Off Hardware Components” for more information.

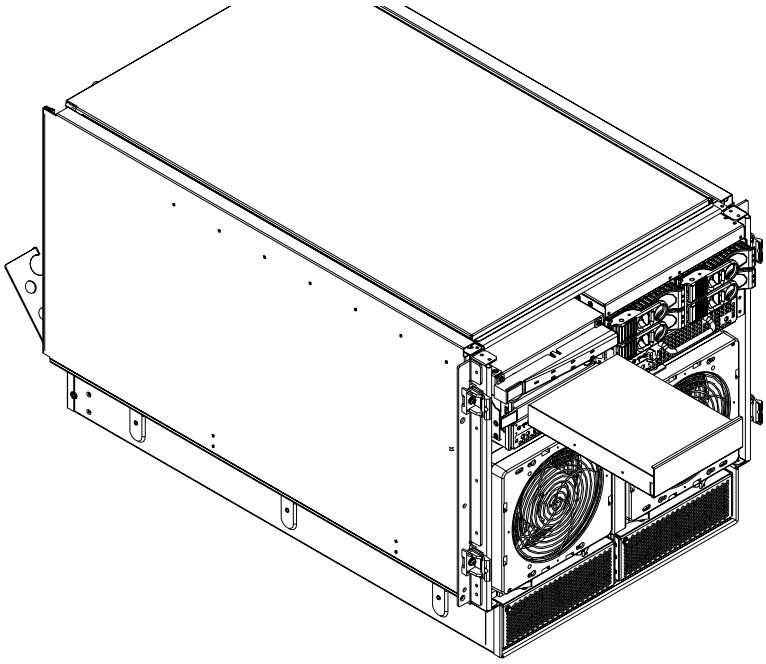
CAUTION Observe all ESD safety precautions before attempting this procedure. Failure to follow ESD safety precautions could result in damage to the server.

Figure 3-3 CD/DVD/DAT Location



Removing a CD/DVD/DAT Drive

Figure 3-4 CD/DVD/DAT Detail



Step 1. To remove the CD/DVD/DAT, depress the front locking latch to loosen the drive from the chassis.

Step 2. Disengage the cables from the rear of the CD/DVD/DAT.

Step 3. Slide the drive from the chassis.

Replacing a CD/DVD/DAT Drive

Step 1. Connect the cables to the rear of the CD/DVD/DAT.

Step 2. Slide the drive in the chassis.

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

Step 3. The drive easily slides into the chassis. Use a slow firm pressure to properly seat the drive.

Removing and Replacing a Front Smart Fan Assembly

The Front Smart Fan Assembly is located in the front of the chassis. The fan assembly is a hot swappable component.

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

Figure 3-5 Front Smart Fan Assembly Locations

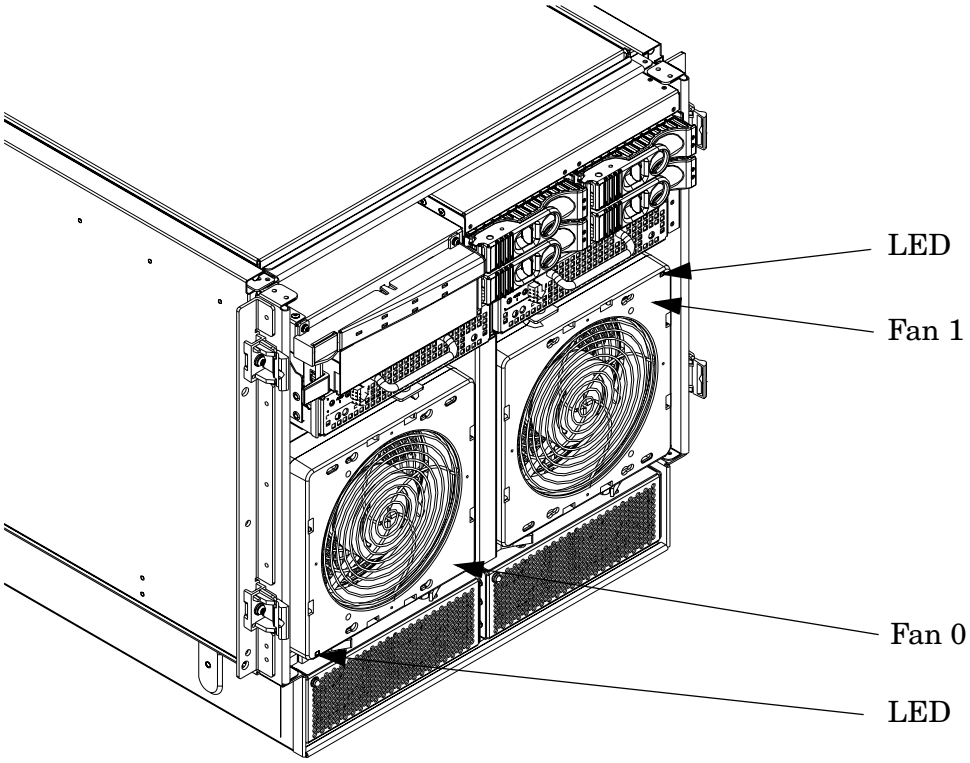


Table 3-1 Front Smart Fan Assembly LED Indications

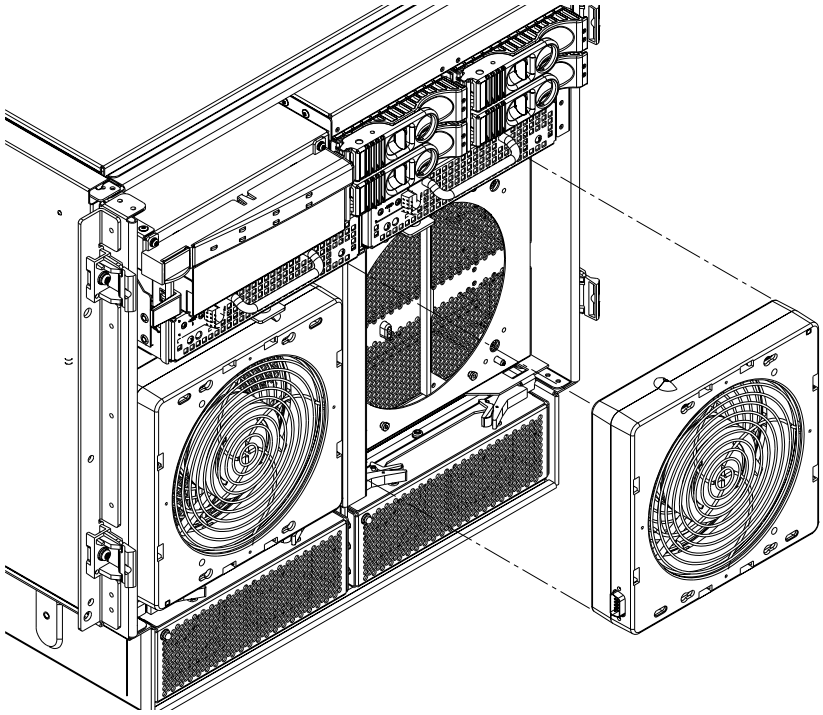
LED State	Meaning
On Green	Fan is at speed and in sync or not at speed less than six seconds
Flashing Yellow	Fan is not keeping up with speed/sync pulse for greater than six seconds

Table 3-1 Front Smart Fan Assembly LED Indications (Continued)

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

Removing a Front Smart Fan Assembly

Figure 3-6 Front Fan Detail



Step 1. Remove the front bezel.

Step 2. Push the Fan Release Pin away from the fan.

Step 3. Slide the fan away from the connector.

Step 4. Pull the fan away from the chassis.

Replacing a Front Smart Fan Assembly

Step 1. Position the fan assembly on the chassis fan guide pins.

Step 2. Slide the fan into the connector.

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

Step 4. Replace the front bezel.

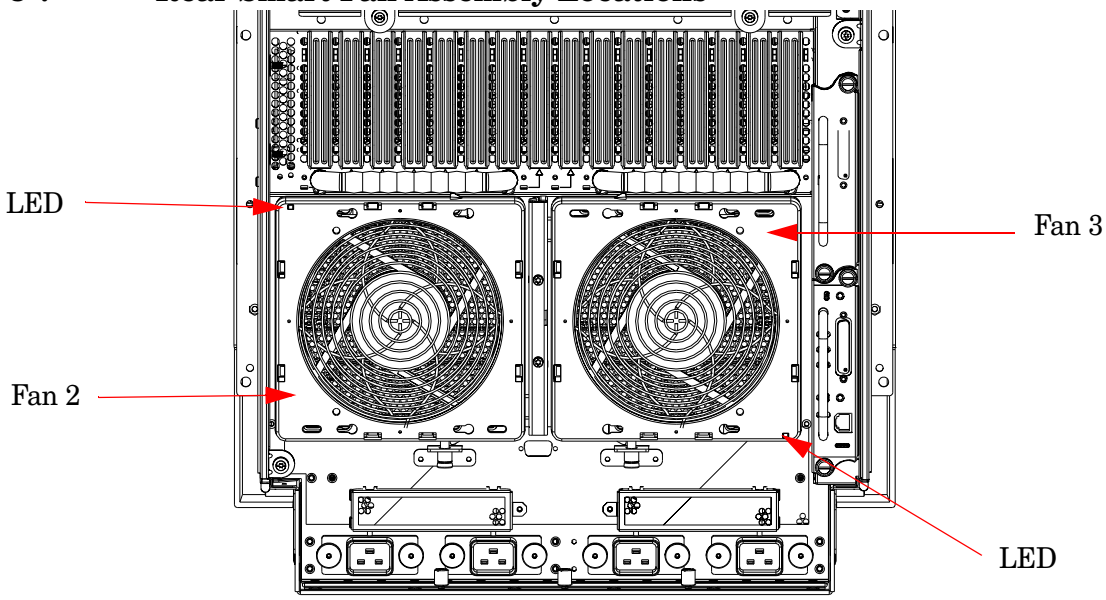
NOTE The fan LED should show fan is operational (green).

Removing and Replacing a Rear Smart Fan Assembly

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

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

Figure 3-7 Rear Smart Fan Assembly Locations



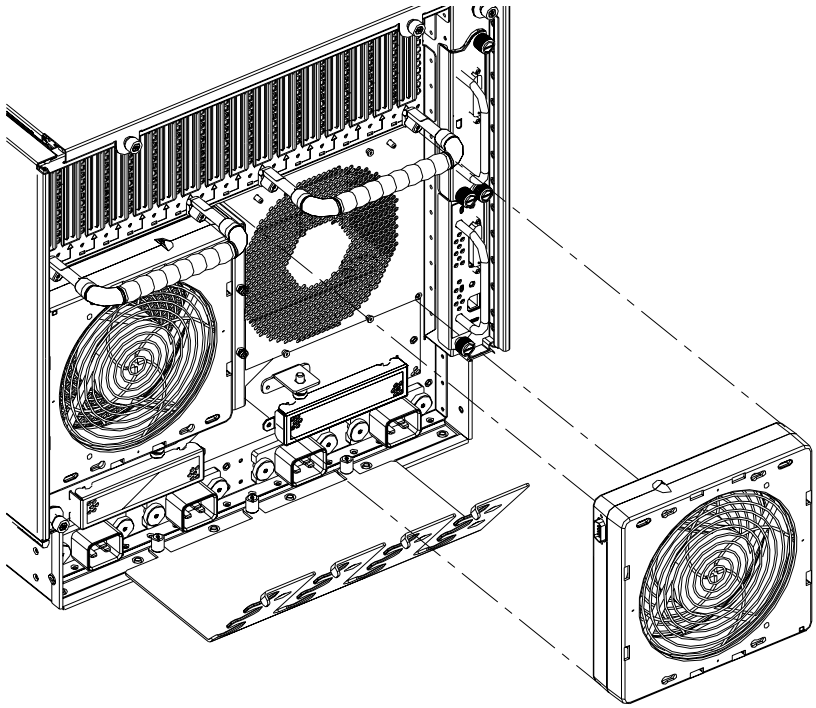
Rear View

Table 3-2 Rear Smart Fan Assembly LED Indications

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

Removing a Rear Smart Fan Assembly

Figure 3-8 Rear Fan Detail



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

Step 2. Slide the fan away from the connector.

Step 3. Pull the fan away from the chassis.

Replacing a Rear Smart Fan Assembly

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

Step 2. Slide the fan into the connector.

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

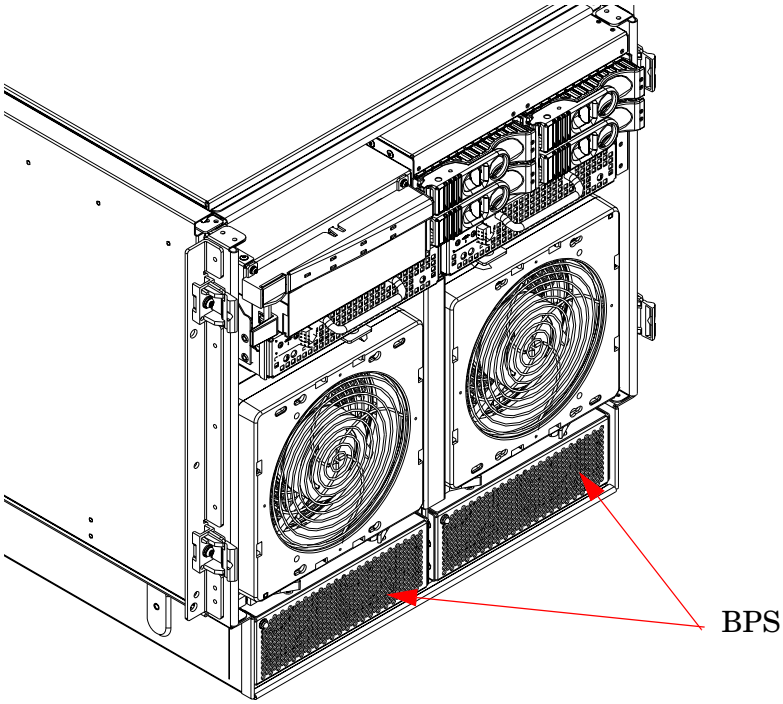
NOTE A green fan LED indicates the fan is operational.

Removing and Replacing a Bulk Power Supply

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

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

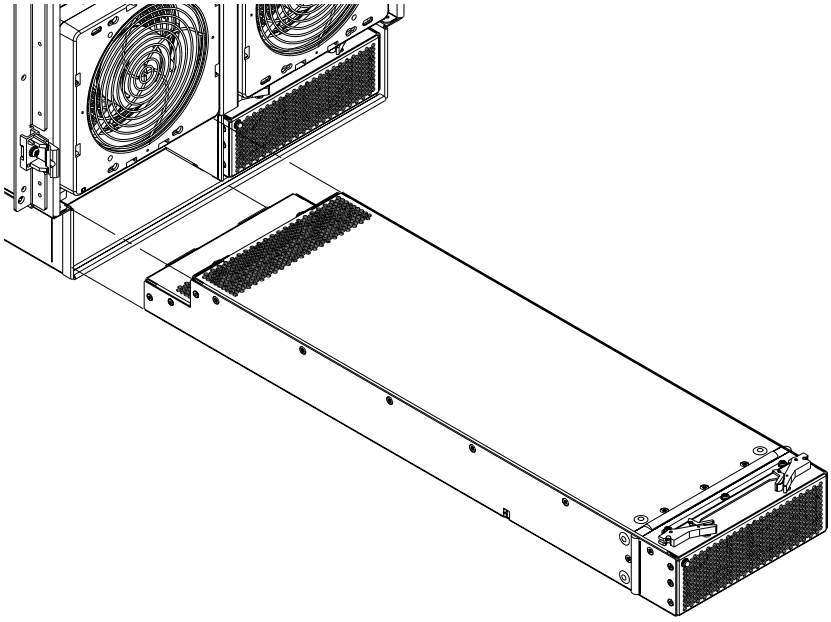
Figure 3-9 BPS Location



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

Removing a BPS

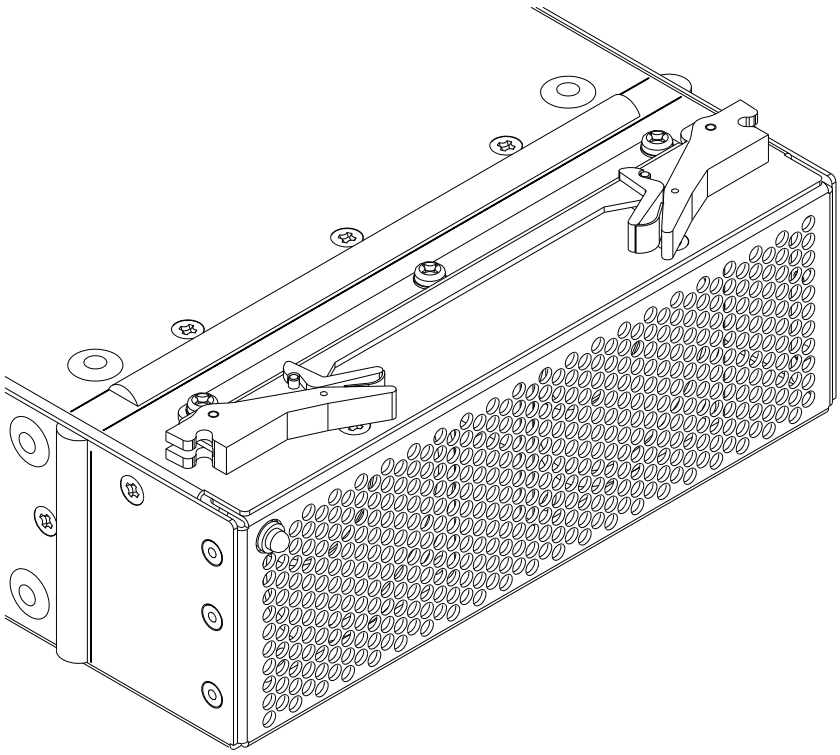
Figure 3-10 BPS Detail



Step 1. Remove the front bezel.

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

Figure 3-11 Extraction Levers



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

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

Replacing a BPS

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

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

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

Step 4. Replace the front bezel.

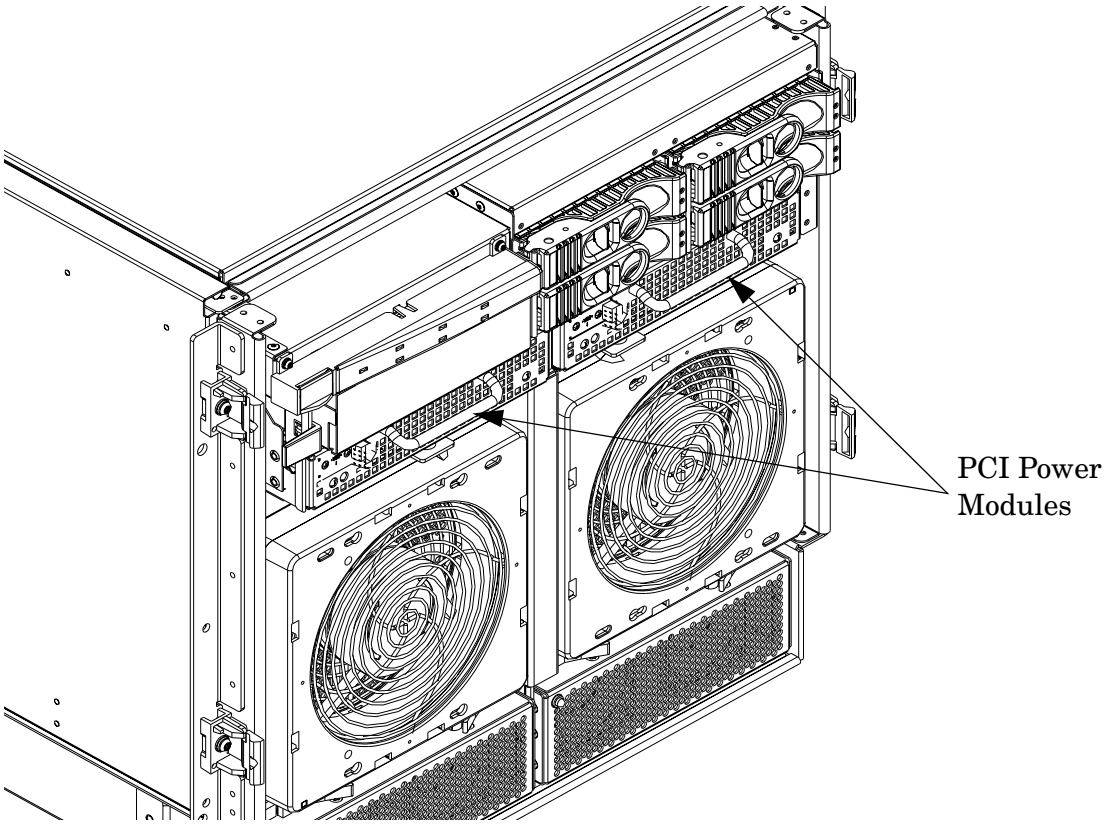
NOTE The BPS LED should show BPS operational and no fault. The BPS LED should be GREEN.

Removing and Replacing a PCI Power Module

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

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

Figure 3-12 PCI Power Module Location



Preliminary Procedures

Step 1. Identify the failed power supply. Table 3-3 identifies the meaning of the PCI Power Supply LED state.

Step 2. Connect to ground with a wrist strap.

Step 3. Visually inspect the replacement part for proper number and revision.

Step 4. Shut down the partition and power off the PCI domain.

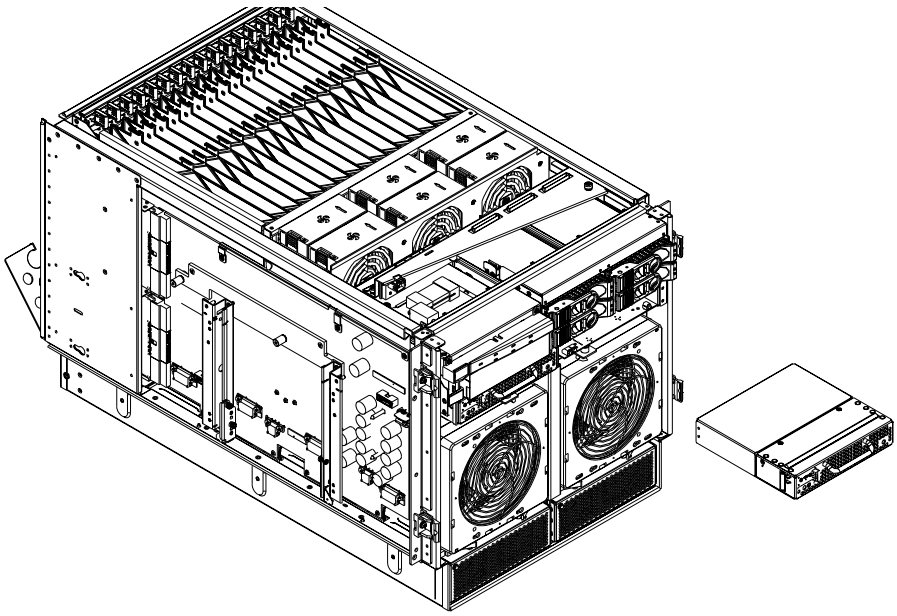
Step 5. Remove the front bezel. Refer to “Removing and Replacing Covers.”

Table 3-3 PCI Power Module LED Indications

LED	LED State	Meaning
Power LED (Green)	Off	Power module failure
	On	Normal operation
Fault LED (Multi-color)	Off	Normal operation
	Blinking amber	Module internal failure
	Amber	Module internal failure
	Binking red	Module internal failure

Removing a PCI Power Module

Figure 3-13 PCI Power Module Detail



Step 1. Grasp the handle on the front of the power module.

Step 2. Slide the module from the chassis.

Replacing a PCI Power Module

Step 1. Carefully position the power module in the chassis.

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

Step 3. Power on the system. Use **PE** and **PS** commands to confirm success.

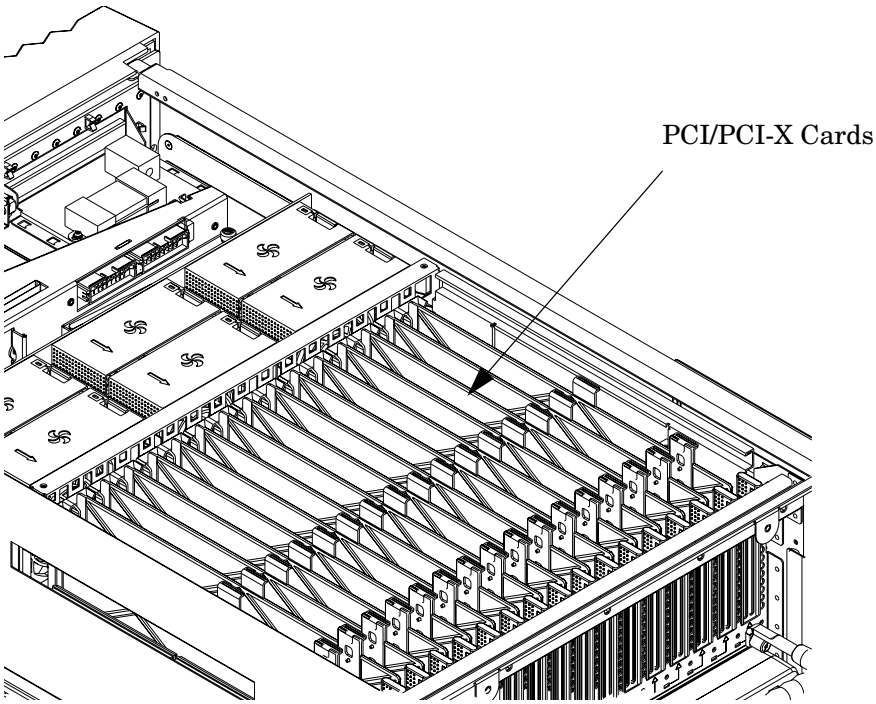
Step 4. Note status of Power Supply LEDs. Green LED should be on, and the fault LED should be off.

Removing and Replacing a PCI/PCI-X Card

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

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

Figure 3-14 PCI/PCI-X Card Location



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

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

IMPORTANT Some PCI/PCI-X I/O cards cannot be added or replaced online (while HP-UX remains running). For these cards, you must shut down HP-UX on the nPartition before performing the card replacement or addition. See “Shutting Down nPartitions and Powering Off Hardware Components” on page 40.

Step 1. Run SAM (`/usr/sbin/sam`) and from the main SAM Areas screen select the **Peripheral Devices** area, then select the **Cards** area.

Step 2. From the I/O Cards screen, select the card you will replace and then select the **Actions—>Replace** menu item.

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

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

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

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

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

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

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

Step 6. Remove the top cover.

Step 7. Flip the card slot's PCI (manual retention latch) MRL to the open position.

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

Step 9. Remove the card from the PCI slot.

Replacing the PCI/PCI-X Card

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

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

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

Step 12. Replace the top cover.

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

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

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

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

Step 16. Exit SAM

Option ROM

To allow faster booting, system firmware does not auto-scan PCI devices with an Option ROM. In order to boot from a PCI connected device with an Option ROM, it must be added to the table of boot devices as follows:

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

Step 2. Boot the server to the EFI shell.

Step 3. Execute the EFI search command.

To add a single card:

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

To add all cards:

```
search all
```

Step 4. Execute the following EFI command:

```
map -r
```

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

```
exit
```

Step 6. From the EFI Boot Manager Menu, select “Boot Option Maintenance Menu” and then from the Main Menu, select “Add a Boot Option”. Now add the device as a new boot device.

Updating Option ROMs

The Option ROM on a PCI I/O card can be “flashed” or updated. The procedure to flash an I/O card follows.

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

Step 2. Boot the server to the EFI shell.

Step 3. Execute the EFI search command.

To add a single card:

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

To add all cards:

```
search all
```

Step 4. Execute the following EFI command:

```
map -r
```

NOTE Each I/O card type and firmware image update may require a different flash utility and procedure. Follow the instructions in the .txt file included with the latest *HP IPF Offline Diagnostic & Utilities* CDROM.

Step 5. Load the *HP IPF Offline Diagnostic & Utilities* CDROM.

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

A Parts and Accessories

Table A-1 HP Integrity rx7620-16 Server Customer Replaceable Unit (CRU) List

FRU Description	Replacement Part Number	Exchange Part Number
36 GB 15K RPM SCSI Disk	A9896-64001	A9896-69001
73 GB 15K RPM SCSI Disk	A9897-64001	A9897-69001
146 GB 10K RPM SCSI Disk	A9898-64001	A9898-69001
AC Power Supply (qty 2 per system)	0950-4173	A6752-69113
Assembly, Smart Fan (Front/Rear) (4)	A6752-67029	None
Assembly, Front Bezel, No NamePlate	A7025-04001	None
Filler, Internal Disk	A6198-60003	None
Jumper, PDU-PDU 2.5 m C19/C20	8121-0802	None
Jumper, UPS-PDU 4.5 m C19/C20	8121-0806	None
M-Cable	A6144-63001	None
Nameplate, HP Integrity rx7620-16 Server	A7027-40001	None
PCI Power Module (Brick)	0950-3819	A6093-69123
Power Cord, C19/GB 1002 4.5m Black CA Assembly	8121-0070	None
Power Cord, C19/IEC-309 4.5m Black CA Assembly	8120-6897	None
Power Cord, C19/L6-20 4.5m Black CA Assembly	8120-6903	None
Power Cord, C19/unterminated International-Europe	8120-6895	None
Removable DAT Tape Drive (DDS4)	C5686-67204	C5686-69204
Removable DVD Drive	A9879-67001	None
240 V N. American UPS 4.5m C19/L6-30P	8120-8494	None

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