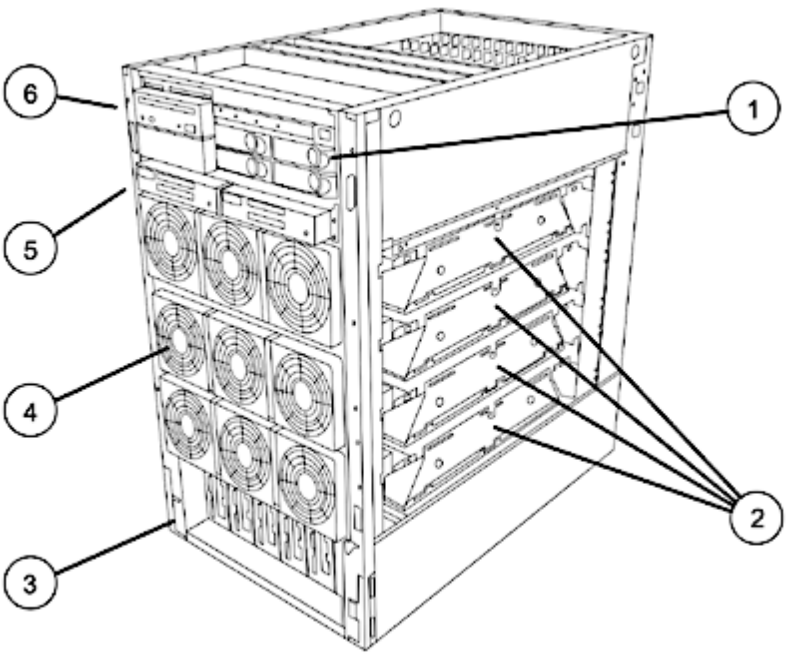
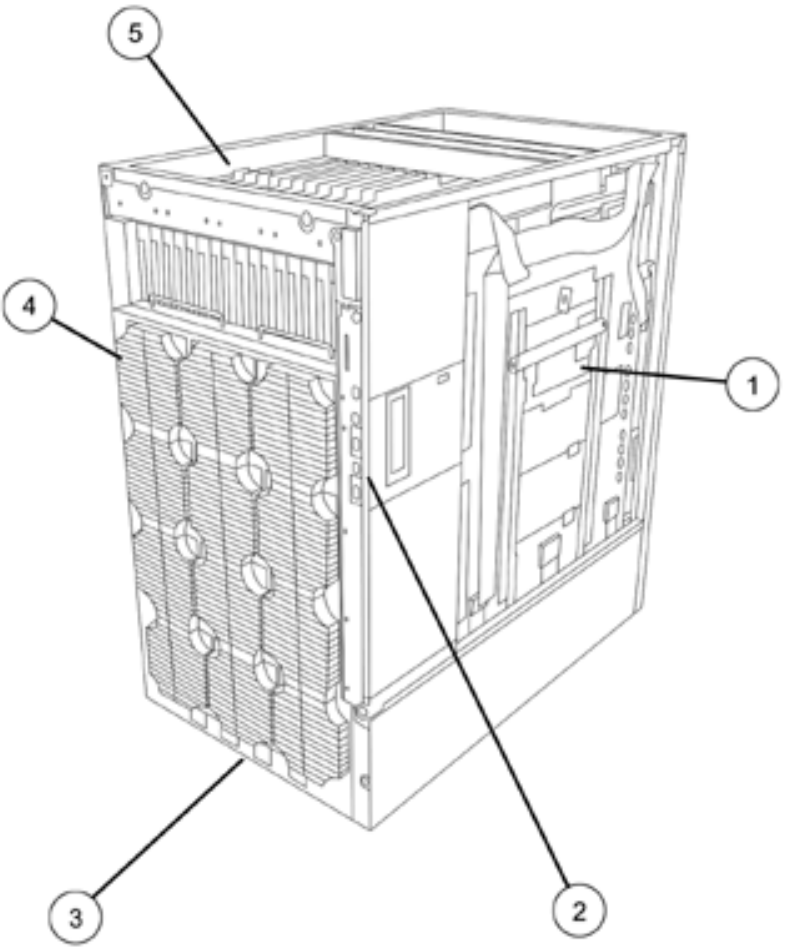
Overview



1. Hot plug disks
2. Cell boards
3. Redundant hot-swap power
4. Redundant hot-swap fans
5. PCI power supplies
6. Removable media - DVD/DAT

Overview



1. System backbone
2. Core I/O
3. 2N redundant power inputs
4. Hot-swap redundant fans
5. Hot-plug PCI slots

At A Glance

rx8620 Server Product Number (base)

A7026A

Standard System Features

Overview

- HP UX 11i v2 and HP-UX 11i v3 operating system
- Microsoft Windows Server 2003 Datacenter and Enterprise Edition
- Red Hat Enterprise Linux AS 4.0 (not supported with HP mx2 processors)
- SUSE Linux Enterprise Server 9 (not supported with HP mx2 processors)
- OpenVMS (V8.2 1 or higher; OpenVMS supports only Mad9 processors on rx8620)
- External Ultra3 LVD SCSI channel
- Four Internal Ultra SCSI channels, one channel to each internal disk
- 10/100/1000Base T LAN (with auto speed sensing)
- Management Processor technology with Integrated Web Console and LAN console
- RS 232 local and remote (modem) console and UPS ports
- 10Base T LAN port for LAN console and web console
- Rackmountable into HP 19 inch cabinets (factory or field integration)
- Rackmountable into some 3rd party cabinets
- Pedestal configuration
- Two hardware partitions (nPartitions)
- Four hardware partitions when configured with the Server Expansion Unit
- Factory integration of processors, memory, disk drives, removable media drives, and I/O cards
- HP site planning and installation
- One year warranty with same business day on site service response
- Owner's Guide and General Usage media set

HP Integrity rx8620 Server Flexible Advantage Starter (FAST) Base Systems

The Flexible Advantage STarter base systems for the HP Integrity rx8620 Server allow for faster configurations due to the semi-configured base system bundles. Configurations built from FAST base systems will have substantially lower prices than systems.

HP Integrity rx8620 Server FAST bundles

Product Number (Includes base chassis and power supplies)	Number of Intel Itanium 2 Madison 1.6 GHz (option 005) or 1.5 GHz (option 004) Processors	Number of Cell Boards	Number of Core I/O	Power Supplies
AB236A	2	1	1	3
AB237A	4	1	1	3
AB238A	8	2	2	4
AB239A	12	3	2	5
AB240A	16	4	2	6

Standard Features

Minimum System

- Two Intel Itanium 2 Madison 1.6 GHz 6 MB L3 cache or 1.5 GHz 4 MB L3 cache processors
- One processor/memory cell board
- 2-GB memory (1 quad)
- One core I/O
- One internal DVD drive for OpenVMS and Windows
- Two power cords
- 16 hot-plug 33/66/133-MHz×64-bit PCI-X slots with adaptive signaling technology

Maximum Server Capacities

- Sixteen Intel Itanium 2 Madison 1.6 GHz 6 MB cache or 1.5 GHz 4 MB cache processors
- Four processor/memory cell boards
- 256 GB memory (16 quads)
- Two core I/O
- Four power cords, providing 2N power and dual grid support
- Four internal hot-plug LVD SCSI disks
- Two removable media drives-DVD or DAT
- Sixteen PCI expansion cards

Maximum capacities when configured with the Server Expansion Unit (SEU):

- Four core I/O cards
- Eight internal hot-plug LVD SCSI disks
- Four removable media drives-DVD or DAT
- 32 PCI expansion cards

Standard System Features

- HP UX 11i v2 and HP-UX 11i v3 operating system
- Microsoft Windows Server 2003 Datacenter and Enterprise Edition
- Red Hat Enterprise Linux AS 4.0 (not supported with HP mx2 processors)
- SUSE Linux Enterprise Server 9 (not supported with HP mx2 processors)
- OpenVMS (V8.2 1 or higher; OpenVMS supports only Mad9 processors on rx8620)
- External Ultra3 LVD SCSI channel
- Four Internal Ultra SCSI channels, one channel to each internal disk
- 10/100/1000Base-T LAN (with auto speed sensing)
- Management Processor technology with Integrated Web Console and LAN console
- RS-232 local and remote (modem) console and UPS ports
- 10/100Base-T LAN port for LAN console and web console
- Rackmountable into HP 19-inch cabinets (factory or field integration)
- Rackmountable into some 3rd party cabinets
- Pedestal configuration
- Two hardware partitions (nPartitions)
- Four hardware partitions when configured with the Server Expansion Unit
- Factory integration of processors, memory, disk drives, removable media drives, and I/O cards
- HP site planning and installation
- One-year warranty with same business day on site service response
- Owner's Guide and General Usage media set

Standard Features

High Availability	• N+1 Hot-swap cooling • Redundant and hot-swap power supplies • Cell Hot-plug • Hot-plug disks • 2N power inputs • On-line memory page deallocation • ECC protected SyncDRAM memory • Full parity protection of data and address buses • On-chip processor cache with ECC protection • Memory "chip spare", "chip kill" like • Dynamic Processor resilience and deallocation (processor deallocation on failure) • On-line addition and replacement of PCI I/O cards • UPS power management • Four independent UltraSCSI buses to internal disks for mirroring across disks and controllers Journal file system • Auto reboot • On line diagnostics and system health monitor • Microsoft Cluster Services with Microsoft Windows Server 2003 Enterprise and Datacenter Edition • HP Storageworks SecurePath • HP OpenVMS Cluster Software
Security	• Separate console LAN port for system management • Password protection on console port • Disablement of remote console ports
Internet Server Functions	• Internet server (inetd) • Domain name server • Routing (OSPF, BIND, RIP, EGP, HELLO, gateD) • Network Time Protocol
Client Configuration Services	• Automatic configuration for printers, PCs, workstations, and X terminals (DHCP, Bootp, tftp, rbootp)
Optional Web Services	• Netscape Communication Server • Netscape Navigator
Email	• Mail, MailX, ELM • Sendmail, MIME, SMTP, ESMTP
Remote Access Services	• Telnet, ftp, anonymous ftp server

Standard Features

The HP Integrity rx8620 and rx7620 servers may require a firmware update to support Intel® Itanium® 2 Processor Add-On products shipping after June 15th, 2005.

Affected Intel Itanium 2 processors products for the Integrity rx8620/rx7620 are:

- AB439A - Intel Itanium 2 1.5-GHz with 4M cache
- AB441A - Instant Capacity Intel Itanium 2 1.5-GHz with 4M cache
- AB548A - Intel Itanium 2 1.6-GHz with 6M cache
- AB550A - Instant Capacity Intel Itanium 2 1.6-GHz with 6M cache

ACTION:
Check the server firmware prior to installing any of these processor products. The firmware versions can be checked using the MP "sysrev" command. The rx8620 and rx7620 require "rx8620, rx7620, and SEU Firmware Version 3.20" or later. The individual firmware revisions that make up version 3.30 and the firmware upgrade instructions are in the Release Notice that is included in the firmware download bundle. If you are not able to check the firmware or if the firmware is not at version 3.20 or later, contact HP support.

NOTE: For OpenVMS the minimum firmware version is version 4.0.

NOTE:
Once the firmware is at the supported revision level, proceed with attaching the Processor/Cell Add-On Products to the server using the Service Guide. The Service Guide is available at http://docs.hp.com.

Configuration

CPU Configuration

The HP Integrity rx8620 Server is a symmetrical multiprocessing (SMP) server supporting up to 16 high performance Intel Itanium 2 1.6 GHz 6 MB L3 cache or 1.5 GHz 4 MB L3 cache. Both servers also support the new and improved sx1000 chip set. The rx8620 can be configured as a single SMP server or divided into up to four smaller, hardware partitioned (nPars), logical servers.

Cell Boards

A minimum of one and a maximum of four cells can be ordered in HP Integrity rx8620 Servers. Each cell can be purchased with up to four active Intel Itanium 2 processors, or in combination with Instant Capacity processors. Two processor speeds are supported for the Intel Itanium 2 processor; 1.6 GHz and 1.5 GHz.

The ability to mix processor speeds within a chassis is supported (but processors within a cell or partition must be of the same speed). The rx8620 supports mixing the Intel Itanium 2 in the same chassis but not in the same partition or on the same cell board. Intel Itanium 2 processors and previous HP PA RISC processors may not be mixed in the same chassis.

The HP Integrity rx8620 and HP Integrity rx7620 (8 processor) servers share the same cell board.

Cell Details

- 4 Processor module slots (supporting up to 8 processors)
- 16 Memory DIMM slots
- Cell Controller Chip - sx1000
- DC DC Power converters

Cell Board Configuration Rules

- Cell boards are ordered individually
- Minimum: 1 cell board
- Maximum: 4 cell boards
- Cell slots 0 or 1 must be loaded first
- Recommended Cell board loading order: 0,1,2,3

Intel Itanium 2 Details

- 1.6 GHz or 1.5 GHz frequencies
- Level 3 Cache: 6 MB (1.6 GHz) or 4 MB (1.5 GHz)
- Level 2 Cache: 256 KB
- Level 1 Cache: 32 KB
- Single-bit cache error correction
- 44-bit physical addressing
- 64-bit virtual addressing
- 4-GB maximum page size

Processor and Module Configuration Rules

- 1.6 and 1.5 GHz processors consist of two modules (two processors) and can only be ordered or upgraded in pairs (2 processors)
- 1.1 GHz dual processor modules consist of one module (two processors) and processors can be ordered or upgraded as single chips (2 processors)
- There must be at least two processors (two 1.6 or 1.5 GHz modules) active (non Instant Capacity) on each cell board.
- On each cell board, processors or modules must be installed in the following sequence 0, 2, 1, 3

Configuration

Memory Configuration

The memory DIMMs used in the HP Integrity rx8620 Server are sold in quads and are custom designed by HP. Each DIMM contains 36×4 SDRAM memory chips qualified to run at 125 MHz, with full ECC protection. DIMM sizes of 512 MB, 1 GB, 2 GB and 4 GB are supported. HP 9000 rp8400/rp8420 memory modules can be carried forward to the rx8620 server. Each HP Integrity rx8620 Server cell board supports up to 16 DIMM slots and 16 GB/s of peak memory bandwidth. The 16 GB memory modules (4×4GB DIMMs) cannot be mixed with other memory DIMM sizes. When purchased from the factory, any given partition can ordered with 4 GB DIMMs or non stacked DIMMs (512 MB, 1 GB or 2 GB), but not both. When field integrated, cell boards can contain 4 GB DIMMs or non stacked DIMMs (512 MB, 1 GB or 2 GB), but not both.

HP Integrity rx8620 Memory DIMMs

Quad Size (Product)	rx8620 and rp8420 Product Numbers	rp8400 Product Numbers that are supported	HP Integrity rx8620 Server Maximum Capacity Using 1 DIMM Size	DIMM Size
1 GB	N/A	A6802A (No longer sold)	16 GB	128 MB
2 GB	AB307A	A6097A	32 GB	512 MB
4 GB	AB308A	A6098A	64 GB	1024 MB
8 GB	AB309A	A6100A	128 GB	2048 MB
16 GB	AB322A	none	256 GB	4096 MB

Memory Loading Rules

- Memory must be installed in quads (4 DIMMs of equal density)
- Memory is available in four densities: 2 GB (4×512MB), 4 GB (4×1024MB), 8 GB (4×2048MB), and 16GB (4 x 4096MB)
- Minimum memory is 2 GB per cell
- Maximum memory per system is 256 GB-using sixteen 16 GB Quads
- On each cell board, Memory Quads must be installed in the following order: 1st (0A, 0B, 1A, 1B), 2nd (2A, 2B, 3A, 3B), 3rd (4A, 4B, 5A, 5B), 4th (6A, 6B, 7A, 7B)

Performance Tuning Guidelines

- For best performance, a cell should be configured with a multiple of 8 DIMMs or two quads (although the server will execute properly with an odd number of quads). It takes 8 DIMMs to populate both buses. Populating only one of the two memory buses on a cell board will deliver only half the peak memory bandwidth.
- Load memory equally across the available cell boards.
- If growth is planned for the system, then plan on configuring high density 4 , 8 GB, or 16-GB modules to minimize memory slot constraints.

Memory Latencies

There are two types of memory latencies within the HP Integrity rx8620 Server:

1. Memory latency within the cell refers to the case where an application either runs on a partition that consists of a single cell or uses cell local memory.
2. Memory latency between cell refers to the case where the partition consists of two or more cell and cell interleaved memory is used. For example, for an rx8620 server with four cells in the partition, 25% of the addresses are to memory on the same cell as the requesting processor, and the other 75% of the addresses are to memory on the other three cells.

The HP Integrity rx8620 Server memory latency depends on the number of processors in the partition. Assuming that memory accesses are equally distributed across all cell boards and memory controllers within the partition, the average idle memory latency (load to use) is as shown below:

Configuration

Number of processors	Average Memory Latency
4-processor	241 ns
8-processor	324 ns
16-processor	366 ns

I/O Architecture

Components within the I/O subsystem are the I/O controllers, internal peripheral bay, and multifunction Core I/O. The HP Integrity I/O architecture utilizes industry standard PCI buses in a unique design for maximum performance, scalability and reliability.

The HP Integrity rx8620 Server contains two master I/O controller chips located on the PCI-X backplane. Each I/O controller contains sixteen high-performance 12 bit wide links, which connect to sixteen slave I/O controller chips supporting the PCI-X card slots and core I/O. Two links, one from each master controller is routed through the crossbar backplane and is dedicated to core I/O. The remaining thirty links are divided among the sixteen I/O card slots. This one card per link architecture leads to greater I/O performance and higher availability. Each controller chip is also directly linked to a host cell board. This means that at least two cell boards, located in cell slots 0 and 1, must be purchased in order to access all sixteen I/O card slots. With one cell board, access to eight slots is enabled.

The HP Integrity rx8620 Server can be purchased with either one or two core I/O boards (if an SEU is added, then 4 core I/O boards with 2 core I/O in the SEU). Both core I/O boards are identical and provide console, SCSI, serial, and Management Processor (MP) functionality. The second core is used to enable the dual hard partitioning in the HP Integrity rx8620 Server and provide access to a second set of disk drives. The second I/O controller in the host server is optional and is not required to support all 4 cell boards.

The internal peripheral bay is divided into two identical halves. Each half supports up to two low-profile disks and one removable media device. A SCSI controller chip located on each core I/O board supports each half of the internal peripheral bay. This means that both core I/O boards must be purchased to access both halves of the peripheral bay.

The first 8 slots starting from the left is designated as I/O bay 0. The 2nd set of 8 slots on the right is designated I/O bay 1. I/O bay 0 is supported by Cell slot 0 and connects to Core I/O slot 0. Likewise, I/O bay 1 is supported by Cell slot 1 and connects to Core I/O slot 1. I/O bays will function only when the corresponding Cell slot is populated. I/O slots are labeled 1-8 starting from the left of each I/O bay (as viewed from the rear).

Configuration

PCI Backplane

Fourteen of sixteen I/O card slots are supported by dual high-performance links. Each link is capable of providing 530 MB/s of bandwidth. This means that most HP Integrity rx8620 Server I/O slots are capable of sustained 1.06 GB/s. Aggregate I/O slot bandwidth is 15.9 GB/s. In addition, because each I/O slot has a dedicated bus, any slot can be "hot-plugged" or serviced without affecting other slots. The hot-plug operation is very easy, and can be done with minimal training and effort.

The HP Integrity rx8620 Server supports a number of PCI and PCI X HBA (I/O) cards for I/O expansion (see the **Supported HP-UX I/O Cards table** for HP-UX servers and the **Supported Windows 2003 I/O Cards** table for Windows 2003 servers). NOTE: The PCI-X backplane is backward compatible with the older PCI backplane and can support many PCI HBA (I/O) cards.

When HP 9000 rp8400 servers are upgraded to HP Integrity rx8620 servers using the chassis upgrade kit A9787A, the older and slower PCI backplanes in the HP 9000 rp8400 server are upgraded to the newer and faster PCI-X backplanes of the HP Integrity rx8620 Server.

When the rp84xx/rx86xx Server Expansion Unit is connected to the HP Integrity rx8620 Server, its I/O backplanes act as PCI-X I/O backplanes. See the rp84xx/rx86xx Server Expansion Unit section for more details.

Supported I/O Cards

Supported HP-UX I/O Cards

I/O Card	Product Number	First HP UX Release/ Boot Support	Connector Type(s)	Hot Plug/ Factory Integration	Max Cards/ Max Ports
Mass Storage Host Bus Adapters					
PCI 1 port 2x Fibre Channel	A5158A	11.00 / No	Duplex SC	Yes / Yes	16 / 16
PCI 2 Gb Fibre Channel	A6795A	11.00 / Yes	LC	Yes / Yes	16 / 16
PCI-X 4 Gb Fibre Channel	AB378B	11i/Yes	LC	Yes / Yes	16 / 16
PCI-X 4 Gb Fibre Channel	AB378A	11i/Yes	LC	Yes / Yes	16 / 16
PCI 1 channel U 160 SCSI	A6828A	11.00 / Yes	VHDCI	Yes / Yes	16 / 16
PCI 2 channel Ultra160 SCSI	A6829A	11.00 / Yes	VHDCI	Yes / Yes	16 / 32
PCI 1 port Ultra2 SCSI	A5149A	11.00 / No	VHDCI	Yes / Yes	16 / 16
PCI 2 port Ultra2 SCSI	A5150A	11.00 / No	VHDCI	Yes / Yes	16 / 32
Dual Channel Ultra320 SCSI Adapter	A7173A		VHDCI	Yes / Yes	16 / 32
PCI X 2 channel 2 Gb /sFibre Channel	A6826A	11.i/Yes	LC (SFF)	Yes / Yes	16 / 32
PCI-X 2 port SmartArray 6402	A9890A*	11i / Yes	VHDCI	Yes / Yes	8 / 16
PCI-X 2 port SmartArray 6404	A9891A	11i / Yes	VHDCI	Yes / Yes	8 / 32
Local Area Network Interface Cards					
PCI-X 1-port 10 Gb Ethernet Fiber Adapter	AB287A	11iv2/Yes	Duplex LC	Yes / Yes	2 / 2
PCI-X 4-port 1000Base-T Gigabit Adpt	AB545A	11iv2 / No	RJ-45	Yes / No	16 / 64
PCI-X 1-port 1000Base-SX	AD332A	11i/Yes	Duplex SC	Yes / Yes	16 / 16
PCI-X 1-port 1000Base-T	AD331A	111i/Yes	Duplex SC	Yes / Yes	16 / 16
PCI 1 port 1000Base SX	A4926A	11.00 / No	Duplex SC	Yes / Yes	16 / 16
PCI 1 port 10/100Base T	A5230A	11.00 / No	RJ-45	Yes / Yes	16 / 16
PCI 1 port 1000Base T	A4929A	11.i / No	RJ-45	Yes / Yes	16 / 16

PCI 4 port 10/100Base T	A5506B	11.00 / No	RJ-45	Yes / Yes	16 / 64
PCI 1 port 802.5 Token ring 4/16/100	A5783A	11.00 / No	RJ 45 and DB 9	Yes / Yes	16 / 16
PCI -X 2 port 4x Fabric (HPC)	AB286A	11iv2 / No	4x Infiniband Copper	Yes / No	2 / 4
PCI-X 2 port 4x Fabric (HPC)	AB286C	11iv2/No	4x Infiniband Copper	Yes/No	8/16
PCI 1 port Universal FDDI	A3739B	11.00 / No	FDDI SC	Yes / Yes	16 / 16
PCI-X 2-port 4X Fabric (HPC & DB) Adapter	AB286C	11iv2/No	4x Infiniband Copper	Yes/Yes	8/16
Multi-Function Cards (MassStorage / LAN)					
PCI 2 port 100Base-T / 2 port Ultra2SCSI	A5838A	11.00 / Yes	VHDCI/RJ 45	Yes / Yes	16 / 64
PCI X 2 Gb Fibre Channel/1000Base SX	A9782A	11i / Yes	LC (SFF) / LC GigE	Yes / Yes	14 / 28
PCI-X 2-Gb Fibre Channel, 1000Base-T	A9784A	11i / Yes	1 LC / 1 RJ-45	Yes / Yes	16 / 32
PCI-X 2-port 2Gb FC/ 2-port 1Gb Ethernet	AB465A	11v2/Yes	2 LC/2 RJ-45	Yes / Yes	16 / 64
PCI-X 2-port 1000BT/2-port U320 SCSI	AB290A	11i/Yes	2 LC GigE/2 RJ-45	Yes / Yes	16 / 64
Wide Area Network Interface Cards					
PCI 1 port ATM 155 Mb/s Multi mode Fiber (MMF)	A5513A	11.00/No	Duplex SC	Yes/Yes	16/16
2-port Programmable Serial Interface (PSI) X.25/Frame Relay/SDLC	J3525A	11.00 / No	RS 530, RS 232, V.35, RS 449 or X.21	Yes / Yes	16 / 32
Additional Interface Cards					
PCI 8 port Terminal Multiplexer	A6748A	11.00 / No	RS-232	Yes / Yes	16 / 128
PCI 64 port Terminal Multiplexer	A6749A	11.00 / No	RS-232 or RS-422	Yes / Yes	16 / 1024
PCI Hyperfabric2 Fiber Adapter	A6386A	11.00 / No	LC Duplex	Yes / Yes	4 / 4

*NOTE: I/O Card is supported, but no longer orderable.

Supported Windows I/O Cards

I/O Card	Product Number	Special Notes	Connector Type(s)	Hot Plug / Factory Integration	Max Cards / Max Ports
Mass Storage Host Bus Adapters					
PCI Windows and Linux Ultra160 SCSI	A7059A*		VHDCI	Yes / Yes	8 / 8
PCI Windows Linux 2 port Ultra160 SCSI	A7060A*		VHDCI	Yes / Yes	8 / 16
Dual Channel Ultra320 SCSI Adapter	A7173A		VHDCI	Yes / Yes	8 / 16
PCI-X Smart Array P600 Serial Attached SCSI (SAS) Controller	337972-B21	External Storage Only	SFF8470	Yes/Yes	8/32**
2 channel Smart Array 5302 / 128 MB	A9825A		VHDCI	Yes / Yes	8 / 16
4 channel Smart Array 5304 / 256 MB	A9826A		VHDCI	Yes / Yes	8 / 32
PCI-X 2 channel Smart Array 6402 128MB	A9890A	External Storage Only	VHDCI	Yes / Yes	8 / 16
PCI-X 2 channel Smart Array 6404 256MB	A9891A	External Storage Only	VHDCI	Yes / Yes	8 / 32

Configuration

PCI X 2 Gb/s Fibre Channel	AB232A*		LC	Yes / Yes	12 / 12
PCI X 2 channel 2 Gb/s Fibre Channel	AB466A		LC	Yes / Yes	8 / 16
PCI X 1 channel 2 Gb/s Fibre Channel	AB467A		LC	Yes / Yes	12 / 12
Emulex PCI-X single channel 4-Gb/s Fibre Channel HBA	AD167A		LC	Yes / Yes	12/12
Emulex PCI-X dual channel 4Gb/s Fibre Channel HBA	AD168A		LC	Yes / Yes	8/16
Local Area Network Interface Cards					
PCI 2 port Windows / Linux 1000Base-TX	A9990A		RJ-45	Yes / Yes	12 / 24
PCI 2 port Windows / Linux 1000Base-SX	A9899A		LC	Yes / Yes	12 / 24
PCI 1 port 1000BaseT	A7061A		RJ-45	Yes / Yes	12 /12
PCI 1 port 1000BaseSX	A7073A		Duplex SC	Yes / Yes	12 /12
PCI 1-port 10GbE	AD144A			Yes/Yes	4/4
Additional Interface Cards					
Graphics / USB Card (Optional)	A6869A	Max 1		No / Yes	2/ 2

* I/O card is supported, but no longer orderable
** For Windows, each 337972-B21 External port supports a maximum of two (2) MSA50s attached in series.

Supported Linux I/O Cards

I/O Card	Product Number	Special Notes	Connector Type(s)	Hot Plug / Factory integration	MaxCards / Max Ports
Mass Storage Host Bus Adapters					
PCI Windows and Linux Ultra160 SCSI	A7059A		VHDCI	No / Yes	8 / 8
PCI Windows Linux 2 port Ultra160 SCSI	A7060A		VHDCI	No / Yes	5 / 10
Dual Channel Ultra320 SCSI Adapter	A7173A		VHDCI	No / Yes	8 / 16
PCI-X Smart Array P600 Serial Attached SCSI (SAS) Controller	337972-B21	External Storage Only	SFF8470	No / Yes	8 / 8
2 channel Smart Array 5302 / 128 MB	A9825A		VHDCI	No / Yes	8 / 16
4 channel Smart Array 5304 / 256 MB	A9826A		VHDCI	No / Yes	8 / 32
PCI-X 2 channel Smart Array 6402 128MB	A9890A		VHDCI	No / Yes	8 / 16
PCI-X 2 channel 2-Gb /s Fibre Channel	A6826A		LC	No / Yes	8 / 16
PCI-X 1-port 2Gb Fibre Channel	A7538A		LC	Yes / No	8 / 8
Local Area Network Interface Cards					
PCI 1 port 1000BaseT	A7061A		RJ-45	No / Yes	8 / 8
PCI 1 port 1000BaseSX	A7073A		Duplex SC	No / Yes	8 / 8
PCI 4-port 100Base-TX	A5506B			No / Yes	2 / 8
PCI Win /Linux 2-port 1000Base-SX	A9899A	No SLES support with rx8620		No / Yes	8 / 16
PCI Win /Linux 2-port 1000Base-T	A9900A	No SLES support with rx8620		No / Yes	8 / 16
PCI Win/Linux 10GbE SR (133MHz)	AD144A			No / Yes	2 / 2
PCI Win/Linux 4-port 1000Base-T	AD145A	No SLES support with rx8620		No / Yes	4 / 16

Supported OpenVMS Cards

I/O Card	Product Number	Special Notes	Connector Type(s)	Hot Plug / Factory integration	Maximum Cards/ Ports Per Partition
Mass Storage Host Bus Adapters					
PCI X 2 channel 2 Gb/s Fibre Channel	A6826A	bootable	LC (SFF)	No / Yes	8/16
PCI 2 channel Ultra320 SCSI Adapter	A7173A	bootable	VHDCI	No / Yes	2/4
PCI 1 port 4 Gb Fibre Channel[1]	AB378A	bootable	LC	No/Yes	8/8
PCI 2 port 4 Gb Fibre Channel[1]	AB379A	bootable		No/Yes	8/16
PCI 1 port 4 Gb Fibre Channel[1]	AB378B	bootable	LC	No/Yes	8/8
PCI 2 port 4 Gb Fibre Channel[1]	AB379B	bootable		No/Yes	8/16
Local Area Network Interface Cards					
PCI X 4 port 1000Base T Gigabit Adapter	AB545A		RJ-45	No / Yes	3/12
PCI-X 1 port 1000Base T (gigabit copper)	AD331A		RJ-45	No/Yes	8/8
PCI-X 1 port 1000Base SX (gigabit fiber)	AD332A		Duplex SC	No/Yes	8/8
PCI X 2 port 1000Base SX	A7011A			No/Yes	8/16
PCI X 2 port 1000Base T	A7012A			No/Yes	8/16
Multi function Cards (Mass Storage/LAN)					
PCI X 2 Gb Fibre Channel, 1000Base SX	A9782A	FC bootable	LC (SFF) / LC GigE	No/Yes	4/8
PCI X 2 Gb Fibre Channel, 1000Base T	A9784A	FC bootable	1LC / 1 RJ 45	No/Yes	4/8
PCI X 2 port 2 Gb FC/2 port 1 Gb Ethernet	AB465A	FC bootable	2 LC/2 RJ 45	No/Yes	2/8
PCI X 2 port 1000Base T/2 port Ultra320 SCSI	AB290A	SCSI bootable	2 LC GigE/2 RJ 45	No/Yes	2/8

[1]Minimum version is OpenVMS V8.3

Integrated Multifunction I/O

The HP Integrity rx8620 Server chassis supports either one or two Core I/O cards (AB306A). Core I/O slots are located along the right rear vertical edge of the chassis. A minimum of one core I/O card must be ordered with each system. The first core I/O card will support up to 4 cell boards in the server and all I/O slots. For support of 2 hard partitions, a second core I/O is required in the host system. For support of 3 or 4 hard partitions (nPars), a third and/or fourth core I/O card can be added in the rp84xx/rx86xx Server Expansion Unit. See its section for more details.

When upgrading HP Server rp8400 servers ordered before September 2003, these older servers will require a Core I/O board upgrade. These servers were ordered with Core I/O product A6096A, which is not supported in the rp8400 to rx8620 Server upgrade. HP Server rp8400s ordered after September 2003 were delivered with Core I/O product A7109A, which is supported in the rp8400 to rx86420 Server upgrade.

Each HP Integrity core I/O card provides the following features:

- Management Processor: The Management Processor (MP) is a dedicated processor that simplifies and extends system management, as well as, enhances serviceability. The MP feature set was designed to minimize/eliminate the need for the System Administrator to be physically at the system to perform tasks such as diagnostics, system management, or even hard resets.
  Features:
  - System management over the Internet or Intranet
  - System console redirection
  - Console mirroring
  - System configuration for automatic restart
  - Viewing history log of system events
  - Viewing history log of console activity
  - Setting MP inactivity timeout thresholds
  - Remote system control
  - Remote power cycle (except for MP housekeeping power)
  - Viewing system status
  - Event notification to system console, e mail, pager, and/or HP Response Centers
  - Automatic hardware protection of critical environmental problems
  - Access to management interface and console(s) on LAN failure (modem required)
  - Auto system restart
  - Remote resetting of hardware partitions
  - Forward progress indicator (Virtual front panel)
  - Out-of-band Manageability and PDC firmware update
  - Configure manageability and console security
  - SSL
- External LAN port: 10/100/1000Base-T LAN port using an RJ-45 connector
- External SCSI port: Ultra3 LVD SCSI port for connections to mass storage or media
- Access to internal peripheral bay: The first core I/O card enables half of the HP Integrity rx8620 Server peripheral bay, which includes one removable media and two low profile disks. The second core I/O card enables the remaining internal peripherals, two disks and one removable media bays. Customers that require access to more than two internal disks and/or one removable media slot must purchase the second core I/O card and more than one cell board.

The integrated multifunction I/O provides core I/O functionally and includes the Management Processor technology.

Core I/O Loading Rules

- Minimum of 1 Core I/O card must be purchased with each HP Integrity rx8620 Server
- Load the 1st Core I/O board into slot 0.
- Core I/O slot 0 corresponds to Cell Board slot 0. Core I/O slot 1 corresponds to Cell Board slot 1.
- A cell board must be installed in slot 0 to enable use of Core I/O 0. Likewise, a cell board must be installed in slot 1 to enable use of Core I/O 1.
- Access to two internal disk drives and 1 Removable Media bay is enabled with the installation of the 1st Core I/O board.
- The optional second Core I/O board must be ordered to enable hardware partitioning (systems not using the Server Expansion Unit).
- The optional second Core I/O board must be ordered to enable access to the 3rd/4th internal disks and 2nd removable media drive. (NOTE: For support of 3 or 4 hard partitions [nPartitions], a third and/or fourth core I/O board can be included in the rp84xx/rx86xx Server Expansion Unit. See its section for more details.)

Internal Disk Drives — HP Integrity rx8620 Server supports up to four internal low profile hot plug disk drives.

Internal Disk Drive Specifications

Configuration

Product Number	rp8400 Product Numbers Supported	Disk Capacity	Rotational speed	Average seek time (read/write)	Sustained Bandwidth
A9880A	A6831A	36 GB	15,000 RPM	3.6 msec (read); 3.9 msec (write)	40 MB/s
A9881A	A6725A	73 GB	15,000 RPM (A9881A) 10,000 RPM (A6725A)	3.6 msec (read); 3.9 msec (write) (A9881A) 4.7 msec (read); 5.2 msec (write) (A6725A)	40 MB/s (A9881A) 40 MB/s (A6725A)
A9882A	A7083A	146 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	40 MB/s
AD050A	N/A	300 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	69 MB/s
AD146A		36 GB	15,000 RPM	3.6 msec (read); 3.9 msec (write)	40 MB/s
AD147A		73 GB	15,000 RPM	3.6 msec (read); 3.9 msec (write)	40 MB/s
AD148A		146 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	40 MB/s
AD149A		300 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	69 MB/s

For HP UX:

- Two UltraSCSI controllers provide each disk drive with an independent SCSI channel
- Supported by MirrorDisk/UX across disk drives, controllers, and Core I/O boards
- Must order two Core I/O cards to support more than two internal disk drives

For Windows:

- The rx8620 customer only needs to order AB360A #0D1 in order to receive a SA5302 Smart Array card cabled and configured for RAID1 Mirroring in the factory. AB360A product includes the SA5302 Smart Array Card and the Internal RAID cables. The customer does not need to order A9825A SA5302 #0D1 Smart Array card or AB338A Internal RAID cables.

  Likewise the rx8620 customer only needs to order AB361A #0D1 in order to receive a SA5304 card cabled and configured for RAID1 Mirroring in the factory. AB361A product includes the SA5304 Smart Array Card and the Internal RAID cables. The customer does not need to order A9826A SA5304 #0D1 Smart Array card or AB338A Internal RAID cables.

  The customer is limited to max one of combination of AB360A and AB361A per partition.

  The customer can order additional Smart Array products as add in cards for connection to external storage devices. When these products are ordered #0D1 they are not connected to the internal HDD's. The supported Smart Array products (for external storage) on rx8620 are:
  - A9890A-SA6402 (recommended for external storage)
  - A9891A-SA6404 (recommended for external storage)
  - A9825A SA5302
  - A9826A SA5304

  As an example the customer could order AB360A #0D1 and A9825A #0D1. The customer would receive (2) SA5302 cards, one SA5302 card would be connected to (2) internal HDD's and configured RAID 1 Mirroring, the second SA5302 card would be factory integrated and would support connectivity to external storage devices, no RAID arrays would be configured in the factory.

Configuration

Internal Removable Media

- HP Integrity rx8620 Server contains two removable media bays, which will support either a DVD-ROM or DDS-4 DAT drive. Removable media drives are not hot-plug capable.
- DVD-ROM drive provides enhanced features while preserving backward read compatibility with CD-ROM. Data transfer rates of up to 6.75 MB/s are achieved with the DVD format; 4.8 MB/s can be achieved with the CD format.
  NOTE: installing the Smart Array card connected to the internal drives does NOT affect the function of the DVD-ROM
- A DVD drive is required for all OpenVMS and Windows configurations.
- DDS-4 drive has a maximum storage capacity of 40 GB with a peak transfer rate of 21.6 GB/hour compressed.
- DAT 72 GB drive has a maximum storage capacity of 72 GB and is RoHS compliant.
- Must order two Core I/O cards to enable more than one Internal Media device.

Internal Removable Media Specifications

Product Number	rp8400 Product Numbers Supported	Device	Capacity	Data transfer rate
A9879A	A6180A	DVD-ROM drive	650 MB	6.75 MB/s
A9878A	A6182A	DDS-4 tape drive	40 GB	21.6 GB/hour
AB351A*		DVD+RW		
AB351B*		DVD+RW (RoHS)		
		DAT	72 GB	

*NOTE: Third Party software (not included with AB351A) is required to support DVD write capability with Windows.

I/O Configuration Rules

The following table summarizes previously mentioned configuration rules pertaining to usage of I/O slots and internal peripherals.

Configuration	Minimum Required Number of Cells	Minimum Number of Core I/Os
>8 I/O card slots	2	1
>2 Internal Disks	2	2
2 Internal Removable Media	2	2
2 Partitions	2	2

Additional I/O resources using the Server Expansion Unit (SEU)

Additional I/O resources can be obtained by adding the HP Server Expansion Unit (SEU). The SEU is an add on chassis containing I/O resources that complement the I/O and partitioning capabilities within the HP Integrity rx8620 Server. The SEU mirrors the I/O resources embedded within the HP Integrity rx8620 Server chassis, adding 16 I/O card slots, 4 disk bays, 2 removable media slots, and enabling 2 additional hard partitions.

The SEU must be installed in the same cabinet and directly above the host rx8620 server for factory racked installations. For field installations, the SEU can be installed in an adjacent rack at the same height as the server if there are space limitations. The preferred installation is directly above the host server in the same rack. Please refer to the Server Expansion Unit section in this guide or more specific details.

The following table summarizes the I/O configuration rules when an SEU is configured with the HP Integrity rx8620 Server.

Configuration

Required Configuration	Minimum Required Number of Cells	Minimum Required Number of Core I/Os
>16 I/O card slots	3	4(1)
>24 I/O card slots	4	4(1)
>4 Disks	3	4(1)
>6 Disks	4	4(1)
3 Removable Media	3	4(1)
4 Removable Media	4	4(1)
3 Hard Partitions	3	4(1)
4 Hard Partitions	4	4(1)

(1) Two Core I/O cards must be purchased and configured in each SEU

If a Server Expansion Unit purchased for an rp8400 which contains a light, quartz gray colored front bezel is desired to be upgraded to the dark charcoal gray front bezel associated with the rx8620 server, product number AB328A must be purchased to acquire this new front bezel.

AC/DC Power

DC Power Supplies

The HP Integrity rx8620 Server supports up to six hot swap bulk power supplies for 2N+1 protection. The hot swap design allows for the replacement of a failed power supply without interrupting server operation. Two supplies are included with the base system. A minimum of one additional supply is required for each cell board. Following this rule, all configurations will have 2N+1 power protection.

PCI Power Supplies: Each PCI power supply is dedicated to a single I/O bay. A PCI power supply failure will affect the hard partition or nPar utilizing that PCI supply and the associated I/O bay. All other nPars will continue normal operation. In an HP- UX world, for high availability, consider mirroring two nPars using MC/Serviceguard. PCI power supplies are not hot swap capable.

AC Power

The HP Integrity rx8620 Server contains four C20 power receptacle ports located at the bottom rear bulkhead. A minimum of two power cords must be used to maintain normal operation of the HP Integrity rx8620 Server. A second set of two cords can be added to improve system availability by protecting, for example, against power grid failures or accidentally tripped circuit breakers. The HP Integrity rx8620 Server hardware is capable of receiving AC input from two different AC power sources. The objective is to maintain full equipment functionality when operating from power source A and power source B, or A alone, or B alone. This capability is called "fault tolerant power compliance".

Although many HP Integrity rx8620 Server configurations can be sufficiently powered from a single 16 /20 amp branch circuit, HP strongly recommends using one 16 amp (minimum) branch circuit per power cord. Due to the variety of 16/20 plugs used throughout the world, the HP Integrity rx8620 Server menu offers a choice of plug options.

All HP Integrity rx8620 servers are shipped with four AC power cords.

AC Power Consumption

The HP Integrity rx8620 Server power consumption will vary greatly depending on the hardware configuration and the input line voltages supplied at customer sites. Because of the disparity of line voltages throughout the world it's best to represent power consumption in VA (Volt*Amperes). With power consumption being of high concern throughout the world, it's necessary to specify consumption in a couple of different ways.

Maximum Theoretical Power: or "Maximum Configuration" (Input power at the ac input expressed as Volt-Amps to take into account Power factor correction.)
The calculated sum of the maximum worst case power consumption for every subsystem in the server. This number will NEVER be exceeded by a functioning server for any combination of hardware and software under any conditions.

Marked Electrical Power: (Input power at the ac input expressed as Volt-Amps.)
The server Marked Electrical Power is the rating given on the chassis label and represents the input power required for facility ac power planning and wiring requirements. This number represents the expected maximum power consumption for the server based on the power rating of the bulk power supplies. This number can safely be used to size ac circuits and breakers for the system under all conditions.

Typical Maximum Power: or User Expected Maximum Power, "Typical Configuration" (Expressed as Volt-Amps.)
The measured maximum worst case power consumption. This number represents the larges power consumption that HP engineers were able to produce for the server with any combination of hardware under laboratory conditions using aggressive software applications designed specifically to work the system at maximum load. This number can safely be used to compute thermal loads and power consumption for the system under all conditions.

Configuration

HP Integrity rx8620 Server Fully Loaded Configuration

- Sixteen 1.6-GHz Intel Itanium 2 processors or sixteen HP mx2 dual processor modules
- 128 GB of Memory
- 16 PCI cards
- 4 cell boards
- 4 internal hard drives
- 2 DVD drives
- 2 Core I/O cards
- 6 bulk power supplies
- Typical maximum power: 3800 VA (3724 W) (19.0 A @ 200 VAC across 2 cords)
- Theoretical maximum power consumption: 5400 VA (27.0 A @ 200 VAC across 2 cords)
- Marked Electrical Power: 5400 VA (30A @ 180 VAC)

HP Integrity rx8620 Server Average Configuration

- Eight 1.6-GHz Intel Itanium 2 processors or eight HP mx2 dual-processor modules
- 16 GB of Memory
- 8 PCI cards
- 2 cell boards
- 2 internal hard drives
- 1 DVD drives
- 2 Core I/O cards
- 3 bulk power supplies.
- Typical power consumption: 1870 VA (9.35 A @ 200 VAC across 2 cords)

Configuration

Power Distribution Units

60-amp Power Distribution Unit-
AF916A (NA/JPN) and AF917A (international) - supported with 10K G2 rack
E7683A (NA/JPN) and E7684A (International) - supported with Rack System E
A 60-amp Power Distribution Unit (PDU) has been developed for HP Integrity customers that prefer to use fewer, higher amperage connections into their wall electrical infrastructure. This PDU is sold separately and can be ordered with any HP Server solution.

The PDU can be configured with the HP Integrity rx8620 Server in a dual power grid configuration. In this case there are two HP Integrity rx8620 servers (average configurations drawing ~9 amps each) and two 60 amp PDUs configured with redundant power. The blue cords represent the primary power connections needed for normal operation. In this example, cords from each server are plugged into a separate branch circuits. However, it is acceptable, for lower VA configurations, for each server to plug both grid A cords into one branch circuit and both grid B cords into 2nd branch circuit. The remaining PDU outlets can be used to power other components as long as the specs per PDU rating is not exceeded.

For redundant power inputs, the second set of red cords is added. If the second PDU is plugged into a second grid this configuration provides protection against:

- Losing power from a single power grid
- Accidental tripping of one or two circuit breakers
- Accidental disconnect of a single PDU power cord
- Accidental disconnect of up to four system power cords

30-amp Power Distribution Unit-
252663-D74 (NA/JPN) and 252663-B33 (international) - supported with 10KG2 rack
E7681A (NA/JPN) and E7682A (International) - supported with Rack System E
A 30-amp Power Distribution Unit (PDU) is also supported with HP Integrity rx8620 Server. This PDU is sold separately and can be ordered with any HP Server solution.

Unlike the 60-amp PDU, each 30-amp PDU can only support one HP Integrity rx8620 Server. The following configuration guidelines apply when using the 30-amp PDU:

- HP Integrity rx8620 Server plugs A0 and A1 should be plugged into the same PDU
- Ax and Bx cords should never be plugged into the same PDU
- Use two 30 amp PDUs to achieve input power redundancy. A0/A1 and B0/B1 into separate PDUs.
- Ordering tools will not force the purchase of a second PDU for input power redundancy. A second PDU must be manually selected if redundant input power is desired.

Partitioning

A hardware partition corresponds roughly to a single, standalone system. The HP Integrity rx8620 Server can be subdivided into four partitions, each containing one or more cells that communicates coherently over a high bandwidth, low latency crossbar fabric. Cells are grouped into physical structures called cabinets or nodes. Special programmable hardware in the cells defines the boundaries of a partition in such a way that the isolation is enforced from the actions of other partitions. Each partition runs its own independent instance of the operating system (HP UX 11i v2, Windows 2003 Data Center Edition, Windows 2003 Enterprise Edition, or OpenVMS). Applications cannot span partitions since each partition runs its own instance of the OS, essentially functioning as a stand alone server. However, different partitions may be executing the same or different revisions of an operating system, or they may be executing different operating systems altogether (such as HP UX 11i v2, Windows 2003 Data Center Edition, Windows 2003 Enterprise Edition, or OpenVMS), with OS availability.

Each partition has its own independent processors, memory and I/O resources consisting of the resources of the cells that make up the partition. Resources may be removed from one partition and added to

another without having to physically manipulate the hardware just by using commands that are part of the System Management interface. With future releases of HP UX and Windows, using the related capabilities of dynamic reconfiguration (e.g. on line addition, on line removal), new resources may be added to a partition and failed modules may be removed and replaced while the partition continues in operation.

Partitioning the resources of the complex in this way makes it easy to run multiple applications on the same physical system; you can allocate physical resources and tune the operating system running on each partition depending on the needs of the application (or the most important application) you intend to run on it. Alternatively, you can configure the HP Integrity rx8620 Server as a single partition, allowing all the resources to be focused on a single set of tasks, for example a large online transaction processing application.

You can increase or reduce the processing power of a partition by adding or deleting cells. With HP-UX 11i v2, you must shut down the operating system running on the affected partition(s) before moving cells, and before making configuration changes that will take effect. Though HP-UX 11i v2 does include commands for some configuration tasks, HP recommends you use the Partition Manager (parmgr) to configure partitions.

Hardware based partition configuration changes may require a reboot of the HP-UX partition depending upon the configuration change. The reboot of the partition only affects the partition that is being reconfigured. The other partitions defined in the chassis are not affected and will continue to execute without interruption. In a future HP-UX release, dynamic hard partitions will be supported. Dynamic partitions imply that partition configuration changes do not require a reboot of the partition.

The HP Integrity rx8620 Server can be divided into four independent hardware partitions when configured with the HP Server Expansion Unit. In a partitioned configuration, I/O bay resources such as I/O slots, core I/O, disk and removable media bays, are always dedicated to the corresponding cell board slot. In other words, I/O bay 0 resources are always configured to the cell board in Cell slot 0. Therefore, in a partitioned system, the amount of resources within a partition is always proportional to the number of cells within that partition. There is no flexibility to otherwise divide these components. For example, in a system configured with two cells in separate nPars, it is not possible to include twelve I/O slots in partition 0 and four I/O slots in partition 1. Please refer to the "HP Server Expansion Unit" section in this document for more specific details.

The table below summarizes the resource availability based on hardware partitions.

Number of Hard Partitions	Minimum Number of Cells	Minimum Available I/O slots	Core I/O (Rquired)	Minimum Available Disk/Media Bays
1 Partition	Any one cell	8	1	2/1
2 Partitions	Any two cells	16	2	4/2
3 Partitions	Any three cells	24	4	6/3
4 Partitions	Four cells	32	4	8/4

In 2005, HP Integrity rx8620 servers are expected to support virtual partitioning (vPars) to the single processor or processor level with a new release of HP-UX similar to support on HP 9000 servers with HP-UX 11i v1. With vPars, a user will be able to support up to eight separate virtual partitions each with an instance of HP-UX within each hard partition. VPars will provide many of the features of nPars but without the electrical isolation and support for hardware failures that nPars provides.

System Management Software Features

Central Point of Administration for HP UX, Windows, Linux, and OpenVMS

HP Systems Insight Manager is an easy to use multi-system management solution with web enabled and command line interfaces. HP Systems Insight Manager delivers multi system access to all key system administration tools for fault monitoring, configuration, and workload management. HP Systems Insight Manager will replace HP Servicecontrol Manager. It is available for download from the web now and

will be included in the box soon. HP Systems Insight Manager integrates with many other HP-UX-specific system management tools, including the following:

HP-UX

Software Deployment

- Ignite UX-Ignite-UX addresses the need for HP-UX system administrators to perform fast deployment for one or many servers. It provides the means for creating and reusing standard system configurations, enables replication of systems, permits post installation customizations, and is capable of both interactive and unattended operating modes.
- Software Distributor (SD-UX) is the HP-UX administration tool set used to deliver and maintain HP-UX operating systems and layered software applications. Delivered as part of HP-UX, SD-UX can help you manage your HP-UX operating system, patches, and application software.
- Update UX is a tool for customizing the behavior and automating the process for HP-UX Operating Environment updates.
- Software Package Builder is an intuitive, GUI based tool for packaging software into SD-UX packages so that they can be installed and managed in the same way as HP's system software.

Configuration

- System Administration Manager (SAM) is used to manage accounts for users and groups, perform auditing and security, and handle disk and file system management and peripheral device management. HP Systems Insight Manager enables these tasks to be distributed to multiple systems and delegated using role based security.
- HP-UX Kernel Configuration allows users to tune both dynamic and static kernel parameters quickly and easily from a Web-based GUI to optimize system performance. This tool also sets kernel parameter alarms that notify you when system usage levels exceed thresholds.
- Partition Manager creates and manages nPartitions-hard partitions for high end servers. Once the partitions are created, the systems running on those partitions can be managed consistently with all the other tools integrated into HP Systems Insight Manager. See "partitioning" for more information.
- HP-UX webmin-based Admin is a Web based system management framework that allows a wide variety of open source webmin system management modules to be plugged in. HP supports this tool for the configuration of the HP- UX Apache-based Web Server and the HP-UX Tomcat-based Servlet Engine.
- HP-UX Bastille is a security hardening/lockdown tool that enhances the security of an HP-UX UNIX® host. It accommodates the various degrees of hardening required of servers used for webs, applications, and databases.
- Security Patch Check performs analysis of file sets and patches installed on an HP-UX system and generates a report of recommended security patches. Use of the Security Patch Check software tool can help efficiently improve system security.
- Event Monitoring Service (EMS) keeps the administrator of multiple systems aware of system operation throughout the cluster, and notifies the administrator of potential hardware or software problems before they occur. HP Systems Insight Manager can launch the EMS interface and configure EMS monitors for any node or node group that belongs to the cluster, resulting in increased reliability and reduced downtime.

Workload Management for HP-UX

- Process Resource Manager (PRM) controls the resources that processes use during peak system load. PRM can manage the allocation of processor, memory resources, and disk bandwidth. It allows administrators to run multiple mission-critical applications on a single system, improve response time for critical users and applications, allocate resources on shared servers based on departmental budget contributions, provide applications with total resource isolation, and

dynamically change configuration at any time-even under load. (fee-based)

- HP-UX Workload Manager (WLM) A key differentiator in the HP-UX family of management tools, Workload Manager provides automatic processor resource allocation and application performance management based on prioritized service level objectives (SLOs). In addition, WLM allows administrators to set real memory and disk bandwidth entitlements (guaranteed minimums) to fixed levels in the configuration. The use of workload groups and SLOs improves response time for critical users, allows system consolidation, and helps manage user expectations for performance. (Fee-based)

OpenView for HP-UX

- OpenView Operations Agent-collects and correlates OS and application events (fee-based)
- OpenView Performance Agent-determines OS and application performance trends (fee-based)
- OpenView GlancePlus-shows real time OS and application availability and performance data to diagnose problems (fee-based)
- OpenView Data Protector (Omniback II)-backs up and recovers data (fee-based)

Windows

System Management for Windows

HP Integrity Essentials Foundation Pack for Windows includes:

- HP Systems Insight Manager (see above).
- Smart Setup CD includes an Extensible Firmware Interface (EFI) based setup utility (EBSU) designed for easy server configuration and array controller configuration. The DVD also includes all the latest tested and compatible HP drivers, HP firmware, HP utilities, and HP management agents that assist both in the server deployment process by preparing the server for installation of the Windows operating system and in the ongoing management of the server. If you are interested in even easier deployment, HP suggests that you order your HP Integrity server preloaded with Windows Server 2003.
- Partition Manager and Partition Commands create and manage nPartitions-hard partitions for high-end servers. Once the partitions are created, the systems running on those partitions can be managed consistently with all the other server management tools available for Windows servers.
- System Management Homepage for Integrity servers with Windows provides consolidated information about the system health and configuration through a simple, Web-based user interface. All system faults and major subsystem status are reported within the System Management Homepage, which is accessible either directly through a browser or through a management application such as HP Systems Insight Manager or an enterprise management application (available on select systems).

OpenView for Windows

- OpenView Operations Agent-collects and correlates OS and application events (fee-based)
- OpenView Performance Agent-determines OS and application performance trends (fee-based)
- OpenView Data Protector (Omniback II)-backs up and recovers data (fee-based)

Linux

System Management for Linux

- HP Systems Insight Manager (see above)
- HP Enablement Kit for Linux facilitates setup and installation of the operating system. The kit ships with Integrity servers and includes SystemImager, an open source operating system deployment tool. SystemImager is a golden image based tool and can be used for initial deployment as well

as updates.

OpenView for LINUX

- OpenView Operations Agent-collects and correlates OS and application events (fee-based)
- OpenView Performance Agent-determines OS and application performance trends (fee-based)

OpenVMS

Software Deployment

- Factory Installed Software

Configuration

- Partition Manager creates and manages nPartitions-hard partitions for high end servers. Once the partitions are created, the systems running on those partitions can be managed consistently with all the other tools integrated into HP Systems Insight Manager. See "Partitioning" for more information.

- OpenVMS Management Station to manage user accounts, printers, and disks
- Availability Manager for real-time performance monitoring

Workload Management

- Global Workload Manager (gWLM) - Global Workload Manager provides automatic CPU resource allocation and application performance management based on prioritized service level objectives (SLOs).
- Class Scheduler for resource management

System Management for OpenVMS

- HP Systems Insight Manager (see above) in conjunction with (Web) Management Agents
- Central Management Server - CMS - Management agent for gWLM

OpenView for OpenVMS

- OpenView Operations Agent-collects and correlates OS and application events (fee based)
- OpenView Performance Agent -- determines OS and application performance trends (fee based)

Instant Capacity (iCAP, formerly known as Instant Capacity on Demand [iCOD])-HP UX and OpenVMS only (Windows and Linux currently not supported)

NOTE: OpenVMS V8.3 or higher is required for iCAP support.

Configuration

Racking

The HP Integrity rx8620 Server was designed to provide industry leading performance density and availability when ordered in a racked configuration. At 17 EIA units (29.75 inches), two HP Integrity rx8620 servers can be mounted into a single HP two meter cabinet with 7 EIA units of extra space for mounting external peripherals. One rx8620 can be mounted in a rack along with a Server Expansion Unit.

The HP Integrity rx8620 Server industrial design and packaging was designed to allow easy and quick access to all of the system's components. The most frequently handled devices, removable media and disks, are directly accessible at the system's front. By removing the front bezel, hot swap fans, hot swap power supplies, and PCI power supplies can be completely serviced. At the rear, core I/O and more hot swap fans are directly accessible. For access to all other components, the rack mounted HP Integrity rx8620 Server comes with rack sliders.

These rack sliders enables the HP Integrity rx8620 Server to be slid forward out of the HP Rack Systems/E cabinet for servicing of internal components such as fans, cell boards, and I/O cards, while the system is still running. The sliders also allows for servicing or replacement of any FRU (field replaceable unit) without removing the chassis from the cabinet. The HP Integrity rx8620 Server industrial design and slider strategy enables access and removal of any FRU within 15 minutes or less. This design feature minimizes the downtime associated with system upgrades in the rare event of a component failure. Also included with ever rack mounted HP Integrity rx8620 Server is a cable management arm (CMA). The CMA neatly secures data cables and prevents cables from becoming entangled while servicing of the system.

The following racking rules apply for HP Integrity rx8620 servers configured with an HP Server Expansion Unit.

- The HP Server Expansion Unit must be mounted in the same cabinet as the host HP Integrity rx8620 Server
- The HP Integrity rx8620 Server must be mounted directly below the HP Server Expansion Unit

Ballasts for HP System E racks (not required for new Universal 10K G2 rack)

Due to the weight of the HP Integrity rx8620 Server, ballast kits have been developed to add stability to HP Rack Systems/E cabinets while the system is being serviced. Every HP Integrity rx8620 Server shipped to customers, excluding Pedestal models, will be shipped with a ballast kit. These ballasts were designed to easily attach to the rear anti tip foot that comes standard with every HP Rack System E cabinet. Use of the HP Integrity rx8620 Server ballast kit is mandatory and should be installed immediately.

Heavy Duty Stabilizing Kit for 10K G2 racks (not for HP System E racks)

A heavy duty stabilizing kit is required for the rack of the rx8640 server to add stability for the HP Universal 10K G2 rack. With this stabilizing kit, the ballast is no longer needed with the new HP Universal rack. Use of the Heavy Duty Stabilizing kit is mandatory and should be installed immediately.

Configuration

HP 10000 and 9000 Racks

The HP 9000 and HP Integrity servers are supported for field installs into these racks. Factory integration is not yet supported for HP 10000 and HP 9000 racks. Differing depth requirements of the HP 9000/HP Integrity racking kits preclude racking HP 9000/HP Integrity servers and HP ProLiant servers in the same racks.

Refer to the 10000 G2 Series Rack Best Practices Guide for information on rack deployment, stabilization and transportation. Go to HP.com/go/rackandpower for more information.

When field racking for the mid-range servers in any rack (10K G2, System E or 3rd party), the customer will have to order the appropriate service product (HP PN: HA124A1 Opt. 570 - HP Startup Field Racked Mid Server Service).

For further details, refer to the racking solutions section in the configuration guide.

Third-Party Racking

HP Servers are designed to maximize performance density when installed into HP Rack Systems. HP system Rack Systems maintain the high level of safety and reliability of HP Server solutions that customers have come to expect. Although HP strongly recommends racking servers in HP Rack Systems, it is recognizes that some customer circumstances may prohibit this. For those customers, HP has developed a set of guidelines that when followed, enables server installations into third party cabinets. It is extremely important that the guidelines be followed due to the wide variety of cabinets in the market place.

HP 9000 rp8400 Upgrades to HP Integrity rx8620 Servers

The HP 9000 rp8400 Servers were designed to be easily upgradeable to Intel Itanium 2 and HP mx2 processors. With the release of the HP Intel Itanium 2 Madison and the HP mx2 processors, HP 9000 rp8400 Server customers can now upgrade their systems as desired.

So here are the components that a customer will need to order to do a board level upgrade to these new servers from an rp8400 server:

- A chassis upgrade kit: This product will contain new PCI-X (133 MHz) I/O backplanes (two logical backplanes, one physical backplane), a new front bezel, new firmware and various labels to apply to the server. Most old PCI I/O cards will run in the new PCI-X I/O backplane.
  - HP 9000 rp8400 to HP Integrity rx8620 upgrades-use product A9786A
- New sx1000-based cell boards: These cell boards contain four processor modules and are the same for the Itanium 2 and HP mx2 processors. You can install two Intel Itanium 2 Madison modules (four cores in four processor modules), or four HP mx2 modules (eight cores in four processor modules). You cannot intermix PA 8800/PA 8900, Intel Itanium 2 or mx2 modules on the same cell board. You cannot intermix PA 8800/PA 8900, Intel Itanium 2 or HP mx2 modules in the same server (with the exception that Intel Itanium 2 Madison and HP mx2 modules can be intermixed in the same server on differing cell boards). Memory previously installed on the replaced cell board will be just reinstalled on the new cell board.
  - HP Integrity mid-range server cell board-use product A6913A
  - When upgrading to HP mx2 modules and if ordering 1 processor module per cell board, you must order cell board processor terminator (AB225A)
  - When upgrading to HP mx2 modules, you must buy one cell board baffle (A9792A) per cell board being upgraded
- New processor modules: HP sells two processors per module. These will replace two processors of the older modules.
- Intel Itanium 2 dual processor module, 1.6 GHz, 6 MB cache-use product AB548A
- Intel Itanium 2 dual processor module, 1.5 GHz, 4 MB cache-use product AB439A
- HP mx2 dual processor module, 1.1-GHz, 4-MB L3 cache, 32-MB L4 cache-use product A9767A
- New core I/O cards: In order to support the new PCI-X I/O backplanes, new Core I/O cards have to be used. For most servers, this means new ones have to be bought. However, rp8400 servers shipped after early September, may already have the new core I/O cards (see note below) rp8420/rx8620 core I/O card (AB306A) replaces old rp8400 core I/O card (A6096A)
  NOTE: New rp8400 core I/O card (A7109A) does not have to be replaced
- Add in I/O cards: A total of 32 I/O adapters were available for the rp8400 platform. The vast majority of these, 24, are compatible and can be used when upgrading from an rp8400 to a rx8620 platform. The following I/O cards are NOT compatible when upgrading from a rp8400 to a rx8620 platform……

Mass Storage	LAN	WAN	Other
A5856A	A5483A	Z7340A	A6092A
A4800A		J3526A	A5486A
A5159A			

Unless listed above, all other add in I/O cards can be leveraged forward, protecting the customers' initial investment.

- Return credits: If the customer returns his old cell boards, processor modules or core I/O boards, they can get a return credit:
  - Processors (NOTE: These are single processor credits, not dual processor module credits. This means that two PA-8700 return credits should be ordered for each new dual processor module purchased.):
    - rp8400 650-MHz module-no return credit allowed
    - rp8400 750-MHz single processor return credit-use product A6444AN option 001
    - rp8400 875-MHz single processor return credit-use product A6435AN option 001
  - Cell Boards:
    - rp8400 cell board return credit-use product A6094AN option 001
  - Core I/O cards:
    - rp8400 old core I/O card (A6096A) return credit-use A6096AN option 001
    - rp8400 new core I/O card (A7109A) is not replaced and does not have a return credit
- SEU upgrade: The rp8400 Server Extension Unit (A6434A) needs to be updated with a new front bezel and labels.
  - To upgrade the rp8400 SEU when moving to an rp8420/rx8620, use product AB328A. NOTE: The rp8400 SEU core I/O card (A7109A) does not have to be replaced.
- Software:
  - For the HP Integrity servers, the operating system needs to be upgraded to HP-UX 11i version 2

HP 9000 rp8420 Upgrades to HP Integrity rx8620 Servers

The HP 9000 rp8420 Servers were designed to be easily upgradeable to Intel Itanium 2, HP mx2 and future PA RISC processors. With the release of the Intel Itanium 2 and the HP mx2 processors, HP 9000 rp8420 Server customers can now upgrade their systems as desired. So here are the components that a customer will need to order to do a board level upgrade to these new servers from an rp8420:

- A chassis upgrade kit: This product will contain a new server name insert for the front bezel, new firmware and various labels to apply to the server.
  - HP 9000 rp8420 to HP Integrity rx8620 upgrades-use product A9787A
- No new cell boards and memory: Cell boards are the same between PA 8800/PA-8900 servers and Intel Madison 2 and HP mx2-based servers.
  - When upgrading to mx2 modules and if ordering 1 processor module per cell board, you must order cell board processor terminator (AB225A)
  - When upgrading to HP mx2 modules, you must buy one cell board baffle (A9792A) per cell board being upgraded
- New processor modules: HP sells two processors per module. These will replace two processors of the older modules.
  - Intel Itanium 2 dual processor module, 1.6 GHz, 6 MB cache-use product AB548A
  - Intel Itanium 2 dual processor module, 1.5 GHz, 4 MB cache-use product AB439A
  - HP mx2 dual-processor module, 1.1-GHz, 4-MB L3 cache, 32-MB L4 cache-use product A9767A
- Add in I/O cards: A total of 33 I/O adapters were available for the rp8420 platform. The vast majority of these, 28, are compatible and can be used when upgrading from an rp8420 to a rx8620 platform. The following I/O cards are NOT compatible when upgrading from a rp8420 to a rx8620 platform……

Mass Storage	LAN
A7143A	A7011A
A5160A	A7012A
	AB286A

Unless listed above, all other add in I/O cards can be leveraged forward, protecting the customers' initial investment.

- Return credits: If the customer returns his old processor modules, they can get a return credit. (NOTE: These are single processor credits, not dual processor module credits. This means that two PA-8800/PA-8900 return credits should be ordered for each new dual processor module purchased.):
  - rp8420 900-MHz single processor return credit-use product A6436AN option 001
  - rp8420 1-GHz single processor return credit-use product A6437AN option 001
- Software:
  - For the HP Integrity servers, the operating system needs to be upgraded to HP-UX 11i version 2.

HP Integrity rx86XX Upgrades to other Intel Itanium2 or HP mx2 Processor Modules

The HP Integrity rx8620 Servers were designed to be easily upgradeable to higher frequency Intel Itanium 2 or HP mx2 processor modules. So here are the components that a customer will need to order to do a board level upgrade to these new servers from an rp7420 or rp8420:

- No new cell boards and memory: Cell boards are the same between Intel Itanium 2 processors and the HP mx2-based processors.
  - When upgrading to mx2 modules and if ordering 1 processor module per cell board, you must order cell board processor terminator (AB225A)
- New processor modules: HP sells two processors per module. These will replace two processors of the older modules.
  - Intel Itanium 2 dual processor module, 1.6 GHz, 6 MB cache-use product AB548A
  - Intel Itanium 2 dual processor module, 1.5 GHz, 4 MB cache-use product AB439A
  - HP mx2 dual-processor module, 1.1-GHz, 4-MB L3 cache, 32-MB L4 cache-use product A9767A
- Return credits: If the customer returns his old processor modules, they can get a return credit. (NOTE: These are single processor credits, not dual processor module credits. This means that two processor return credits should be ordered for each dual processor module purchased.):
  - rx8620 1.3-GHz single processor return credit-use product A9765AN option 001
  - rx8620 1.5-GHz single processor return credit-use product A6438AN option 001
- Software:
  - For the HP Integrity servers running HP UX, the operating system stays at HP UX 11i version 2
  - For the HP Integrity servers running Windows, the operating system stays the same
  - For the HP Integrity servers running Linux, the operating system stays the same
  - For the HP Integrity servers running OpenVMS, the operating system stays the same (minimum version is OpenVMS V8.2-1; upgrades to mx2 processors not supported)

Server model number	rx8620	
Server product numbers	Base	A7026A
	Number of Processors	2
	Hardware Warranty	1 year same day on site

Fast Bundles (All include base chassis and power supplies)	Product Number	Number Processors	# Cell Boards	# I/O Cards	# Power Supplies
	AB236A	2	1	1	3
	AB237A	4	1	1	3
	AB238A	8	2	2	4
	AB239A	12	3	2	5
	AB240A	16	4	2	6

Supported Processors	1.6-GHz Intel Itanium 2 processor	Cache	6 MB
		Floating Point Coprocessor	Yes
	1.5-GHz Itanium 2 processor	Cache	4 MB
		Floating Point Coprocessor	Yes

Memory	Memory slots	64 (16 per cell board)
	Minimum memory (Quad: 4 DIMMs)	2 GB
	Maximum memory capacity	256 GB (64 GB per cell board)

Internal Disks	Maximum disk mechanisms	4
	Maximum disk capacity	1.2 TB
	Internal Removable Media	2 slots
	DVD-ROM	
	DDS 4 DAT	40 GB

Technical Specifications

Core I/O	Ultra3 SCSI-LVD	Yes
	10/100/1000Base-T (RJ-45 connector)	Yes
	RS-232 serial ports (one console and one UPS)	2
	10/100Base-T port (Web and LAN console conn.)	Yes
I/O Buses and Slots	Total Hot-plug PCI-X Slots (133 MHz×64 bits)	16
	14 Dual channel slots (1060 MB/s each)	
	2 Single channel (530 MB/s each)	
Maximum I/O Cards (See supported I/O table for specific products)	Mass Storage	8
	LAN	2
	WAN	16
	Multi-Function (Mass Storage / LAN)	14
	Additional Interface Cards	4
Electrical Characteristics	AC Input power	200-240V 50/60 Hz
	Hot swap Power supplies	6 total, 2 included with base
	Redundant AC power inputs	2 required, 4 cords for 2N
	Typical maximum power dissipation for maximum processor, memory, disk, I/O configurations	3800 VA (3724 W) 19A @200VAC
	Marked Electrical for server	5,400 VA (30A @180VAC)
	Marked Electrical per line cord	2700 VA (15A @180VAC)
	Power factor at full load	0.98 (approximately)
	kW rating for UPS loading*	6.0

*NOTE: Represents theoretical maximum power/heat dissipation under worst case conditions, may increase with future upgrades

Technical Specifications

Site Preparation	Site planning and installation included	Yes
	Depth (in/mm)	30 in (762 mm)
	Width (in/mm)	19 in (482 mm)
	Height (in/mm/EIA) Racked	29.75 in (755 mm)/17 units
	Height (in/mm) Pedestal	32.8 in (833 mm)
	Weight (lbs/kg)	171.4 kg (378 lbs)
Environmental Characteristics	Acoustics (sound power) at 25°C	7.2 Bels LwA
	Acoustics (sound power) at 30°C	7.5 Bels LwA
	Acoustics (operator/bystander) at 24°C	61.0 dB LpA
	Operating Temperature (up to 5000 ft)*	41° to 95° F (5° to 35° C)
	Non-operating Temperature	-40° to 158° F (-40° to 70° C)
	Maximum rate of temperature change	68° F (20° C)/hour
	Operating relative humidity	15% to 80%, non-condensing, max. web bulb = 78.8° F (26° C)
	Non-operating relative humidity	5% to 90%, non-condensing
	Operating altitude above sea level	To 10,000 feet (3.0 km)
	Non-operating altitude above sea level	To 15,000 feet (4.5 km)
Regulatory Compliance	Regulatory Model Number	RSVLA-0102
	Electromagnetic Interference	Complies with FCC Rules and Regulations, Part 15, as a Class A digital device. Manufacturer's Declaration to EN55022 Level A, VCCI Registered, Class 1, Korea RLL
	Safety	UL Listed, cUL Certified, compliant with EN 60950

*NOTE: Maximum operating temperature range up to 1524 meters (5000 feet.) For higher altitudes, derate the maximum temperature by 1°C/350 meters (1000 feet) above 1524 meters (5000 feet).