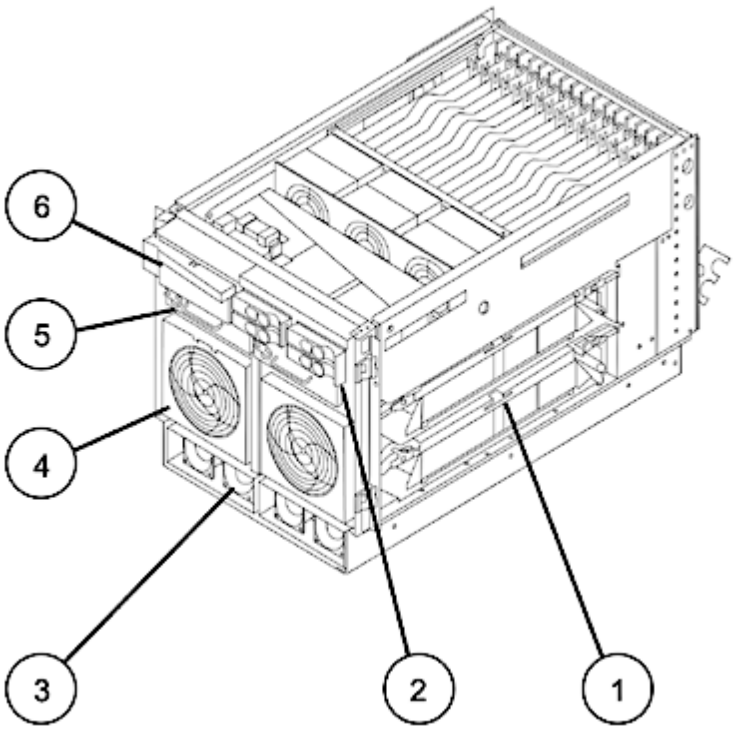
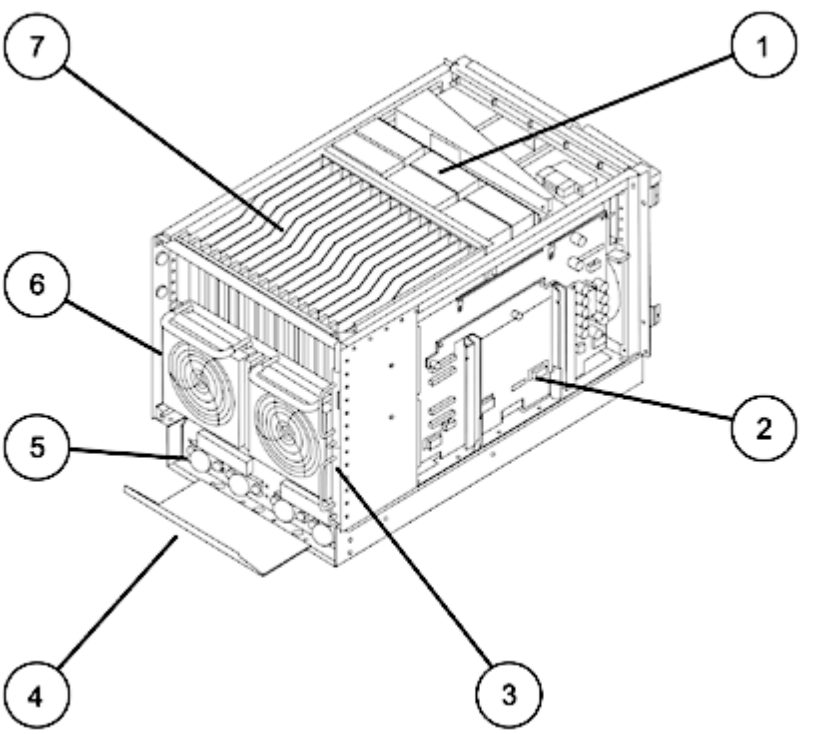


1. Cell Boards (2)
2. Hot-plug disks (4)
3. 2N redundant hot-swap system power (2)
4. N+1 redundant hot-swap fans (2)
5. 2 Independent PCI power supplies
6. Removable DVD or DAT



Overview

1. N+1 PCI cooling fans
2. System backplane (right side)
3. Core I/O
4. Power cord retention bracket
5. Dual-grid 2N redundant power inputs
6. Hot-swap redundant fans
7. 15 Hot-plug PCI-X slots

At A Glance

HP Integrity rx7640 Server Product Number (base system)
AB312A

Standard System Features

- HP UX 11i v2 operating system
- Microsoft Windows Server 2003 Enterprise and Datacenter Editions
- Linux (future)
- OpenVMS (future)
- Two External Ultra320 LVD SCSI channel
- Four internal SCSI controllers
- Two GbE LAN ports (with auto speed sensing)
- Management Processor technology with Integrated LAN console
- 100Base T LAN port for LAN console
- Rackmountable into HP 19 inch cabinets (factory or field integration)
- Rackmountable into some third party cabinets
- One or Two hardware partitions (nPartitions)
- Factory integration of CPUs, memory, disk drives, removable media drives, and I/O cards
- HP site planning and installation
- One year warranty with next business day on site service response
- Owner's Guide and General Usage media set

HP Integrity rx7640 Server Flexible Advantage Starter (FAST) Configurable Bundles

HP Integrity rx7640 Server Flexible Advantage Starter (FAST) Configurable Bundles

The Flexible Advantage STarter base systems for the HP Integrity rx7640 Server allow for faster configurations due to the semi configured system bundles. Configurations built from FAST base systems will have substantially lower prices than systems built from the parts.

HP Integrity rx7640 Server FAST Configurable Bundles

Product Number[1]	Number of Intel Itanium 2 Madison 1.6 GHz processors	Number of Cell Boards	Number of Core I/O Cards
AD064A	2	1	1
AB447A	4	1	1
AD242A	6	2	1
AB448A	8	2	1

[1]Includes base chassis and power supplies.

Standard Features

Minimum System

- Two Intel Itanium 2 1.6 GHz 6 MB cache processors
- One processor/memory cell board
- 2 GB memory (1 pair of 1 GB DIMMs)
- One core I/O (included; not configurable)
- Two power cords
- Seven hot plug 33 /66 /133 /266 MHz 64 bit PCI X slots-with adaptive signaling technology

Maximum Server Capacities

- Eight Intel Itanium 2 1.6 GHz 6 MB cache processor
- Two processor/memory cell boards
- 64 GB memory (16 pairs of 2 GB DIMMs)
- Two core I/O
- Four power cords, providing 2N power and dual grid support
- Four internal hot plug LVD SCSI disks
- One removable media drive, DVD or DAT (or optional 2 slim line DVD module)
- 15 hot plug 33 /66 /133 /266 MHz 64 bit PCI X slots with adaptive signaling technology (14 with second core IO)

Standard System Features

- HP UX 11i v2 operating system
- Microsoft Windows Server 2003 Enterprise and Datacenter Editions
- Linux (future)
- OpenVMS (future)
- Two External Ultra320 LVD SCSI channel
- Four internal SCSI controllers
- Two GbE LAN ports (with auto speed sensing)
- Management Processor technology with Integrated LAN console
- 100Base T LAN port for LAN console
- Rackmountable into HP 19 inch cabinets (factory or field integration)
- Rackmountable into some third party cabinets
- One or Two hardware partitions (nPartitions)
- Factory integration of CPUs, memory, disk drives, removable media drives, and I/O cards
- HP site planning and installation
- One year warranty with next 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 (redundant line cords/dual power grid support)
- On line memory page deallocation
- ECC protected SyncDRAM memory
- Full parity protection of data and address buses
- On chip CPU cache with ECC protection
- Memory "chip spare", "chip kill" like
- Dynamic Processor resilience and deallocation (CPU deallocation on failure)
- On line addition and replacement of PCI I/O cards
- UPS power management
- Three independent Ultra160 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 for Microsoft Windows Server 2003 Enterprise and Datacenter Edition
- HP StorageWorks Software for HP Integrity Servers running Windows Server 2003, Enterprise and Datacenter Editions. Includes Cluster Extension XP and EVA, Continuous Access, Business Copy and SQL Server Fast Recovery

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

Configuration

The HP Integrity rx7640 Server is a symmetrical multiprocessing (SMP) server supporting up to eight high performance 64 bit Intel Itanium 2 1.6 GHz 6 MB cache processors.

It also supports the new and improved sx2000 chip set. The rx7640 can be configured as a single SMP server or divided into two smaller, hardware partitioned (nPars), logical servers.

Cell Boards

A minimum of one and a maximum of two cells can be ordered in an HP Integrity rx7640 Server. Each cell can be purchased with up to four active Intel Itanium 2 processors or in combination with Instant Capacity processors.

The HP Integrity rx7640 and HP Integrity rx8640 servers share the same cell board.

Cell Details

- 4 processor module slots (supporting up to eight processors in future)
- HP sx2000 cell controller
- 16 DDR 2 Memory DIMM slots
- DC DC Power converters
- Manageability and Processor Dependent Hardware Circuitry

Cell Board Configuration Rules

- Cell boards are ordered individually
- Minimum: 1 cell board
- Maximum: 2 cell boards
- Cell slot 1 must be loaded first

Intel Itanium 2 (Single CPU) **Details**

- 1.6 GHz
- Level 3 Cache: 6 MB
- 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

CPU Configuration Rules

- 1.6 GHz processors consist of two chips (two processors) and can only be ordered or upgraded in pairs (two processors)
- There must be at least two processors 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

Memory Configuration

The memory DIMMs used in the HP Integrity rx7640 Server are sold in pairs and are custom designed by HP. Each DIMM contains DDR II chips with full ECC protection. DIMM sizes of 1 GB or 2 GB are supported. Each HP Integrity rx7640 Server cell board supports up to 16 DIMMs with 16 GB/s of peak memory bandwidth. The HP Integrity rx7640 and HP Integrity rx8640 servers share the same 2-GB and 4-GB memory products.

HP Integrity rx7640 Server Memory DIMMs

Configuration

Pair Size (Product)	rx7640 Product Numbers	HP Integrity rx7640 Server Maximum Capacity Using 1 DIMM Size	DIMM Size
2 GB	AB453A	32 GB	1024 MB
4 GB	AB454A	64 GB	2048 MB

Memory Loading Rules

- Memory must be installed in pairs (2 DIMMs of equal size)
- Memory is available in two densities: 2 GB (2×1024MB) and 4 GB (2×2048MB)
- Minimum memory is 2 GB per cell
- Larger DIMMs must be loaded first across a cell, followed by progressively smaller DIMM sizes.
- Maximum memory per system is 64 GB-using sixteen 2 GB DIMM pairs per system.
- On each cell board, Memory Pairs must be installed in the following order:
  (0A, 0B), (1A, 1B), (2A, 2B), (3A, 3B), (4A, 4B), (5A, 5B), (6A, 6B),(7A, 7B)
- DIMM mixing other than recommended configurations is supported as long as the memory loading rules are followed

rx7640 Recommended Memory Configurations

Desired Memory per Cell (GBs)	Number of DIMMs		Cell Loading DIMM Slots							
	1 GB	2 GB	OA, OB	1A, 1B	2A, 2B	3A, 3B	4A, 4B	5A, 5B	6A, 6B	7A, 7B
2	2		1 GB							
4	4		1 GB	1 GB						
8	6		1 GB	1 GB	1 GB	1 GB				
16	16		1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
24	8	8	2 GB	2 GB	2 GB	2 GB	1 GB	1 GB	1 GB	1 GB
32		16	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB

Performance Tuning Guidelines

- For best performance, a cell should be configured with a multiple of 8 DIMMs or four pairs (although the server will execute properly with an odd number of pairs). It takes 8 DIMMs to populate both memory 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 GB pairs (2 GB DIMMs) to minimize memory slot constraints.

Memory Latencies

There are two types of memory latencies within the HP Integrity rx7640 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** cells refers to the case where the partition consists of two cells and cell interleaved memory is used. In this case 50% of the addresses are to memory on the same cell as the requesting processor, and the other 50% of the addresses are to memory of the other cell.

The HP Integrity rx7640 Server average memory latency depends on the number of CPUs 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 show below:

Number of CPUs Per Partition	Average Memory Latency
4-CPU (single cell)	~185 ns
8-CPU (two cell)	~249 ns

I/O Architecture

Components within the I/O subsystem are the I/O controllers, internal peripheral bay, and multifunction Core I/O. The figure below shows the basic block diagram of the I/O subsystem. The HP Integrity rx7640 Server I/O architecture utilizes industry standard PCI X buses in a unique design for maximum performance, scalability and reliability.

The HP Integrity rx7640 Server contains two master I/O controller chips located on the PCI X backplane. Each I/O controller contains 16 high performance, 12 bit wide links; these links connect to 18 slave I/O controller chips supporting the PCI card slots and core I/O. In the HP Integrity rx7640 Server, two links, one from each master controller, are routed through the system backplane and are dedicated to core I/O. The remaining 30 links are divided among the sixteen (133 MHz; 64 bit and 266 MHz; 64 bit) PCI X card slots, with each slot on a PCI bus by itself. This one card per bus architecture leads to greater I/O performance, better error containment, and higher availability.

Each controller chip is also directly linked to a host cell board. This means that both cell boards must be purchased in order to access all 15 available I/O card slots. (With only one cell board, access to seven slots is enabled.)

The HP Integrity rx7640 Server can be purchased with either one or two core I/O board sets. Each Core I/O product contains two boards, a MP/SCSI and a LAN/SCSI card. The core I/O boards provide console, Ultra320 SCSI, Gigabit LAN, and management processor functionality. If you opt for the second core I/O board set, it can be used to enable dual hard partitioning (nPars) in the HP Integrity rx7640 Server and to provide access to a second set of disk drives. Two cell boards and access to all I/O slots are available to the server with one I/O board set.

The LAN/SCSI card provided with each Core I/O product occupies one of the sixteen PCI slots. Since there must always be at least one Core I/O board set, the HP Integrity rx7640 Server has fifteen available PCI X slots for expansion cards. If the second Core I/O product (board set) is purchased, there are fourteen remaining slots available for cards.

The internal peripheral bay supports up to four low profile disks and one removable media device. The internal disks are electrically divided into two pairs. SCSI controller chips located on each core I/O board set supports each pair of internal disks. This means that you must have both board sets in order to access both halves of the peripheral bay. This also means that I/O paths are not shared, and disks are electrically isolated, providing for optimal isolation between partitions.

PCI Backplane

Eight of sixteen I/O card slots are supported by dual high performance fat links. Each link is capable of ~2 GB/s of bandwidth. Six of the sixteen I/O card slots are supported by dual high-performance links. Each link is capable of providing 1060 of bandwidth. This means that half of HP Integrity rx7640 Server I/O slots are capable of sustained 2.12 GB/s. Aggregate I/O slot bandwidth is ~23 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.

Supported I/O Cards for HP-UX and Windows

Supported HP-UX I/O Cards					
I/O Card	Product Number	First HP-UX Release / Boot Support	Connector Type(s)	Hot Plug / Factory Integration	Maximum Cards/Ports
Mass Storage Host Bus Adapters					
PCI 1 port 2x Fibre Channel	A5158A	11.00/No	Duplex SC	Yes/No	15 / 15
PCI 2 GB Fibre Channel	A6795A	11.00/Yes	LC	Yes / Yes	15 / 15

Configuration

PCI 1 port 4 Gb Fibre Channel	AB378A	11i/Yes		Yes / Yes	15 / 15
PCI 2 port 4 Gb Fibre Channel	AB379A	11i/Yes		Yes/No	15 / 15
PCI 1 channel Ultra160 SCSI	A6828A	11.00/Yes	VHDCI	Yes/No	15 / 15
PCI 2 channel Ultra160 SCSI	A6829A	11.00/Yes	VHDCI	Yes/No	15 / 30
Dual Channel Ultra320 SCSI Adapter	A7173A	11i/Yes	VHDCI	Yes / Yes	15 / 30
PCI X 2 channel 2 Gb/s Fibre Channel	A6826A	11i/Yes	LC (SFF)	Yes / Yes	15 / 30
PCI-X 2-channel Smart Array 6402	A9890A	11i/Yes	VHDCI	Yes / Yes	8 / 16
PCI-X 4 channel Smart Array 6404/256-MB	A9891A	11i/Yes	VHDCI	Yes / Yes	8 / 32
Local Area Network Interface Cards					
PCI-X 1-port 10 Gb Ethernet Fiber Adapter	AB287A	11iv2 / No	Duplex LC	Yes / Yes	2 / 2
PCI-X 4 port 1000Base-T Gigabit Adapter	AB545A	11iv2 / No	RJ-45	Yes / No	15 / 60
PCI 1 port1000Base-SX	A6847A	11.00 / Yes	Duplex SC	Yes / Yes	15 / 15
PCI 1port1000Base-T	A6825A	11.00 / Yes	Duplex SC	Yes / Yes	15 / 15
PCI 1 port 1000Base-SX	A4926A	11.00 / No	Duplex SC	Yes / Yes	15 / 15
PCI 1 port10/100Base-T	A5230A	11.00 / No	RJ-45	Yes / Yes	15 / 15
PCI 1 port1000Base-T	A4929A	11.i / No	RJ-45	Yes / Yes	15 / 15
PCI 4 port 10/100Base-T	A5506B	11.00 / No	RJ-45	Yes / Yes	15 / 60
PCI Dual port 1000BaseSX	A7011A	11iv2/Yes		Yes / Yes	15/30
PCI Dual port 1000Base T	A7012A	11iv2/Yes		Yes / Yes	15/30
PCI-X 2-port 4X Fabric HCA (HPC)	AB286A	11iv2 / No	4x Infiniband Copper	Yes / No	2 / 4
PCI X 2 port 4X Fabric (HA and DB) Adapter	AB345A	11iv2/No	4x Infiniband Copper	Yes/No	15/30
Multi-Function Cards (Mass Storage / LAN)					
PCI 2 port 100Base T / 2 port Ultra2 SCSI	A5838A	11.00 / No	VHDCI/RJ-45	Yes / No	15 / 60
PCI X 2 Gb Fibre Channel/1000Base SX	A9782A	11i / Yes	LC (SFF) / LC GigE	Yes / Yes	15 / 30
PCI-X 2-Gb Fibre Channel, 1000Base-T	A9784A	11i / Yes	1LC / 1 RJ-45	Yes / Yes	15 / 30
PCI-X 2-port 2Gb FC/ 2-port 1Gb Ethernet	AB465A	11iv2 / Yes	2 LC/2 RJ-45	Yes / Yes	15 / 60
PCI-X 2-port 1000BT/2-port U320 SCSI	AB290A	11i / Yes	2 LC GigE/2 RJ-45	Yes / Yes	15 / 60
Wide Area Network Interface Cards					
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	15 / 30
Additional Interface Cards					
PCI 8-port Terminal Multiplexer	A6748A	11.00 / No	RS-232	Yes / Yes	15 / 120
PCI 64-port Terminal Multiplexer	A6749A	11.00 / No	RS-232 or RS-422	Yes / Yes	15 / 960
Hyperfabric2 Fiber Adapter	A6386A	11.00 / No	LC Duplex	Yes / Yes	4 / 4
PCI Obsidian 2 USB Adapter	A6869B	11iv2/Yes		Yes / Yes	15/15

Configuration

Supported Windows I/O cards					
I/O Card	Product Number	Special Notes	Connector Types(s)	Hot Plug / Factory Integration	Maximum Cards/Ports
Mass Storage Host Bus Adapters					
PCI Windows and Linux Ultra160 SCSI	A7059A[1]		VHDCI	Yes / Yes	6 / 6
PCI Windows and Linux 2 channel Ultra160 SCSI	A7060A[1]		VHDCI	Yes / Yes	6 / 12
PCI 2 Channel Ultra 320 SCSI Adapter	A7173A		VHDCI	Yes / Yes	6 / 12
PCI-X Smart Array P600 Serial Attached SCSI (SAS) Controller	337972-B21	External Storage Only	SFF8470	Yes/Yes	8/8 [2]
PCI-X SmartArray 6402/128 MB	A9890A[1]		VHDCI	Yes / Yes	8 / 16
PCI-X SmartArray 6404/256 MB	A9891A		VHDCI	Yes / Yes	8 / 32
PCI X Smart Array 6402 128MB - factory integrated for a RAID 1 array	AB362A	Must order 2 identical HDDs in the hard partition	VHDCI	Yes / Yes	8/16
PCI-X Smart Array 6404 256-MB	AB363A	Must order 2 identical HDD's in the hard partition	VHDCI	Yes / Yes	8 / 32
Emulex 4Gb PCI X Fibre Channel HBA	AD167A		LC	Yes / Yes	8/8
Emulex 4Gb PCI X Fibre Channel, Dual Channel HBA	AD168A		LC	Yes / Yes	6/12
PCI X 2 GB /s FCA2404 Fibre Channel	AB232A[1]		LC	Yes / Yes	8 / 8
PCI-X 2 channel 2-GB / s Fibre Channel	AB466A		LC	Yes / Yes	6 / 12
PCI-C 1 channel 2-GB /s Fibre Channel	AB467A		LC	Yes / Yes	8 / 8
Local Area Network Interface Cards					
PCI 2-port Windows / Linux 1000Base-TX	A9900A		RJ-45	Yes / Yes	8 / 16
PCI 2-port Windows / Linux 1000Base-SX	A9899A		LC	Yes / Yes	8 / 16
PCI 1 port 1000Base-T	A7061A		RJ-45	Yes / Yes	8 / 8
PCI 1 port 1000Base-SX	A7073A		Duplex SC	Yes / Yes	8 / 8
Additional Interface Cards					
Graphics/USB Card – Optional; Max 1 per partition	A6869A	Max 1 / Partition		No / Yes	2 / 2

[1] I/O card supported, but not orderable with system

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

Integrated Multifunction Core I/O

The HP Integrity rx7640 Server chassis supports up to two core I/O board sets. Each board set contains two cards (MP/SCSI and LAN/SCSI), which are installed in different locations. MP/SCSI cards are installed along the right rear vertical edge of the chassis. The LAN/SCSI cards are installed in the PCI

card bay. The first core I/O board set will support up to two cell boards in the server and all I/O slots. For support of two hard partitions or for support of the third and fourth integrated disk drive, a second core I/O board set is required in the host system.

Both Core I/O board sets are identical. The "primary" and "secondary" Core I/O LAN/SCSI board is supported by a 530 MB/s link. In addition, in the "primary" core I/O, a SCSI controller from both the LAN/SCSI board and MP/SCSI board each support a single internal disk drive. In the "secondary" core I/O, only the MP/SCSI board is used to support both disk drives off of a single SCSI controller and bus.

Each HP Integrity rx7640 Server core I/O board set provides the following features:

- Management Processor: The management processor (MP), located on each MP/SCSI card, is a dedicated processor that simplifies and extends system management, and also enhances serviceability. The MP minimizes or eliminates the need for the system administrator to be physically at the system to perform tasks such as diagnostics, system management, or even hard resets. Here are some of the features enabled by the HP Integrity rx7640 Server management processor:
  - System management over the Internet or Intranet (telnet or web)
  - 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)
  - 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.
- Two External SCSI ports: Ultra320 LVD SCSI port for connections to mass storage or media.
- Two External 1GbE LAN ports.
- Access to internal peripheral bay: The HP Integrity rx7640 Server internal peripheral bay is located at the top front of the system chassis. The peripheral bay holds up to four low profile hot plug disks and one half height removable media device (One half height bay supports two devices in the case of optional slim line DVD's). Each HP Integrity rx7640 Server core I/O board set contains dual channel Ultra320 SCSI controller chips that support the SCSI devices in the internal peripheral bay. Each core I/O board set supports two internal disks. It is important to note that separate controllers and SCSI busses manage the two disks supported by the primary and secondary core I/O set (This is a change from the previous architecture in sx1000 based servers). If use of more than two internal disks is needed, the HP Integrity rx7640 Server will require both core I/O sets.

Core I/O Loading Rules

- Minimum of one Core I/O board set (primary) must be purchased with each HP Integrity rx7640 Server
- Load the Primary (1) MP/SCSI board into slot 1 and the LAN SCSI board into I/O cabinet 1 (slot 8).

- MP/SCSI slot 0 and I/O cabinet 0 corresponds to Cell Board slot 0. MP/SCSI slot 1 and I/O cabinet 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 one half height removable media bay is enabled with the installation of the first Core I/O board set (Primary).
- The optional second Core I/O board set (secondary) must be ordered to enable hardware partitioning
- The optional second Core I/O board set (secondary) must be ordered to enable access to the third/fourth internal disks.
- The optional second core I/O board set (secondary) must be ordered to enable using the optional slim line DVD's.

Internal Disk Drives HP Integrity rx7640 Server supports up to four internal low profile hot plug disk drives.

Internal Disk Drive Specifications

Product Number	Disk Capacity	Rotational speed	Average seek time (read/write)	Sustained Bandwidth
AD146A	36 GB	15,000 RPM	3.6 msec (read); 3.9 msec (write)	75 MB/s
AD147A	73 GB	15,000 RPM	3.6 msec (read); 3.9 msec (write)	75 MB/s
AD148A	146 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	69 MB/s
AD149A	300 GB	10,000 RPM	4.7 msec (read); 5.2 msec (write)	69 MB/s

For HP UX:

- Supported by MirrorDisk/UX across disk drives, controllers, and core I/O boards
- Must order the second Core I/O board set to support more than two internal disk drives

For Windows:

- An rx7640 customer need only order AB362A 0D1 in order to receive an SA6402 Smart Array card cabled and configured for RAID 1 mirroring in the factory. The AB362A product includes both the SA6402 Smart Array Card (A9890A) and the internal RAID cables (AB338A).
- An rx7640 customer need only order AB363A 0D1 in order to receive an SA6404 Smart Array card cabled and configured for RAID 1 mirroring in the factory. The AB363A product includes both the SA6404 Smart Array Card (A9891A) and the internal RAID cables (AB338A).
- The customer is limited to maximum of one AB362A or AB363A per partition.
- The customer may order additional Smart Array controllers as add in cards for connection to external storage devices. When these products are ordered with option 0D1 they will be installed, but will not be connected to the internal HDDs. The supported Smart Array products (for external storage) on rx7640 are:
  - A9890A - SA6402
  - A9891A - SA6404
  - 337972-B21 - SA P600

Configuration

Internal Removable Media

- HP Integrity rx7640 Server contains one half height removable media bay, which will support either a DVD+RW or DAT 72 drive or two slim line DVD+RW drives. Removable media drives are not hot plug capable.
- DVD+RW 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.
- DAT drive has a maximum storage capacity of 72 GB with a peak transfer rate of 21.6 GB/hour compressed.

Internal Removable Media Specifications

Product Number	Device	Capacity	Data transfer rate
AB351B[1]	DVD+RW		
AB400A	DAT	72 GB	
AD013A[2]	Two slimline DVD+RW		

[1]Third party software (not included with AB351B) is required to support DVD write capability with Windows.
[2]The slimline DVD's require the second core I/O set.

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

	Minimum Requirement	
Configuration	Minimum Number of Cells	Minimum Number of Core I/Os
>7 I/O card slots or access to both I/O card bays	2	1
>2 internal disks or access to both pairs of disks	2	2
1 Internal half height Removable Media	1	1
2 Hard Partitions	2	2
2 Internal slim line DVD's	2	2

AC/DC Power

DC Power Supplies

The HP Integrity rx7640 Server comes with two power supplies that provided dual grid (2N) protection. The hot swap design allows for the replacement of a failed power supply without interrupting server operation. All four power cords must be utilized to fully enable power supply hot swap.

PCI Power Supplies: Each PCI power supply is dedicated to a single I/O bay. A PCI power supply failure will affect the nPar utilizing that PCI supply and the associated I/O bay. All other nPars will continue normal operation. PCI power supplies are not hot swap capable.

AC Power

The HP Integrity rx7640 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 rx7640 Server. A second set of two cords can be added to improve system availability by protecting, for example, against power grid failures, accidentally tripped circuit breakers, or a failed power supply. The HP Integrity rx7640 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 rx7640 Server configurations can be sufficiently powered from a single 16 /20 amp branch circuit, the optimum configuration is to use one 16 amp (minimum) branch circuit per power cord. Due to the variety of 16/20 plugs used throughout the world, the HP Integrity rx7640 Server Ordering Guide offers a choice of plug options.

AC Power Consumption

The HP Integrity rx7640 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. First, the "Marked Electrical" number will represent the maximum wattage of a given configuration. This is the number that electricians typically use to size an electrical connection. It is also the number that is provided on the label of the server . Second, the "typical" number will represent the expected power consumption of a given configuration. The specified "typical" number is the approximate power consumption that a customer will most likely experience, and could be used for power budgeting purposes.

Configuration

HP Integrity rx7640 Server Fully Loaded Configuration

- Eight 1.6 GHz Intel Itanium 2 processors
- 64 GB of memory
- 14 PCI cards
- 2 cell boards
- 4 internal hard drives
- 1 DVD drive
- 2 core I/O board sets
- 2 bulk power supplies.
- Typical power consumption: 2171 VA (10.9 A @ 200 VAC across two cords)
- Marked Electrical for the server: 2640 VA (12A @ 220 VAC across two cords)
- Marked Electrical per line cord: 1320VA (6A @ 220 VAC across each cord)

HP Integrity rx7640 Server Average Configuration

- Four 1.6 GHz Intel Itanium 2 processors
- 10 GB of memory
- 5 PCI cards
- 2 cell boards
- 2 internal hard drives
- 1 DVD drive
- 1 core I/O board set
- 2 bulk power supplies.
- Typical power consumption: 1100 VA (5.5 A @ 200 VAC across two cords)

Power Distribution Units

60-amp Power Distribution Unit-E7683A (US) and E7684A (International)

Customers who prefer the fewest higher amperage connections from their ac line current source to the HP Integrity rx7640 Server can use the 60 amp power distribution unit (PDU). This PDU is designed to fit horizontally in a standard 19 inch cabinet, and occupies 3 EIA units of racking space. This PDU is sold separately and can be ordered with any HP server solution. PDU product numbers are E7683A (North America) and E7684A (International).

Each 60 amp PDU contains eight C19 outlets spread evenly among four 20 amp branch circuits (two C19s per branch). Each of the four branch circuits is protected by a circuit breaker that is either 20 amp (United States) or 16 amps (international). All 60 amp PDUs are delivered with an IEC 309 63A plug.

The maximum amperage is 60 amps through the entire PDU and 20 amps per breaker. Both limits must be met. If 20 amps are being drawn per breaker, only three sets may be used.

Each 60 amp PDU can support up to four HP Integrity rx7640 servers if the PDU is not mounted in the same rack. Up to three HP Integrity rx7640 servers can be supported if the PDU is mounted within the same rack (each 60 amp PDU consumes three units of rack space).

In this case there are two HP Integrity rx7640 servers (average configurations drawing ~5 amps each) and two 60 amp PDUs configured with redundant power. The solid line 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 each server to plug both grid A (A0 and A1) cords into one branch circuit and both grid B cords (B0 and B1) into a 2nd branch circuit. The remaining PDU outlets can be used to power other servers/components as long as the 16 /20 amps per circuit breaker and 60 amps per PDU rating is not exceeded.

For redundant power inputs, the second set of cords (dotted line) 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 (two from each system) system power cords

30 amp Power Distribution Unit-Factory Integrated A5499AZ opt. 001 (US) and 002 (International), or Field integrated E7681A (North America) and E7682A (International).

A 30 amp Power Distribution Unit (PDU) is also supported with HP Integrity rx7640 Server. Rack configurations consisting of peripherals and only one HP Integrity rx7640 Server will likely be best supported with the 30 amp PDU. This PDU is also designed to fit horizontally in a standard 19 inch cabinet, but occupies 3 EIA units of racking space. This PDU is sold separately and can be ordered with any HP server solution. PDU product numbers are A5499AZ opt. 001 (North America) and A5499AZ opt. 002 (International)

Each 30 amp PDU contains two C19 and eight C13 outlets spread evenly between two 20 amp branch circuits. Unlike the 60 amp PDU, each 30 amp PDU can only support one HP Integrity rx7640 Server. The following configuration guidelines apply when using the 30 amp PDU:

- A0 and A1 or B0 and B1 cords should never be plugged into the same PDU
- Use two 30 amp PDUs to achieve input power redundancy (plugging 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.
- The C13 outlets can be used to support additional peripherals. Exercise caution not to overload the branch circuits.

Configuration

Partitioning

A hardware partition corresponds roughly to a single, standalone system. Each HP Integrity rx7640 Server can be subdivided into two partitions, each containing one cell that has minimal shared resources with the other cell (partition). 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 or Windows). 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 or Windows), with OS availability.

Each partition has its own independent CPUs, 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 a future release of HP UX, 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 application environments 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 rx7640 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 (at this release, you must shut down the operating system running on the affected partition(s) before moving cells, and before configuration changes 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.

The current release of HP Integrity rx7640 Server/HP UX 11i v2 supports hardware partitioning. Hardware based partition configuration changes may require a reboot of the partition depending upon the configuration change. The reboot of the partition only affects the partition that is being reconfigured. The other partition defined in the chassis is 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 rx7640 Server can be divided into two independent hardware partitions. In a partitioned configuration, system resources such as cell boards, I/O slots, core I/O, and disks, are evenly split between the two partitions (the removable media device is dedicated to partition 1). There is no flexibility to otherwise divide these components. For example, it is not possible to include 12 I/O slots in partition 0 and 4 I/O slots in partition 1; the split must be even.

The table below summarizes the resource split between hardware partitions.

	Cells (required)	I/O slots	Core I/O (required)	Disk/Media Bays
Partition 0	Cell 0	7	1	2/0
Partition 1	Cell 1	7	1	2/1

System Management Software Features

Central Point of Administration for HP UX and Windows

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

- Process Resource Manager (PRM) controls the resources that processes use during peak system load. PRM can manage the allocation of processors, 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 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)

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

With HP's Instant Capacity solutions, HP Integrity rx7640 Server can be fully populated with Intel Itanium 2 processors at a significantly lower cost. It is no longer necessary to pay for inactive Instant Capacity processors until the moment when you actually use them. These additional processors can then be activated instantly with a simple command, providing immediate increases in processing power to accommodate application traffic demands.

Instant Capacity is also a high availability feature. In the unlikely event that a processor fails, the HP system will automatically replace the failed processor on the cell board at no additional charge-without

rebooting! In online mode, the Instant Capacity processor brings the system back to full performance and capacity levels, reducing downtime and ensuring no degradation in performance.

Temporary Instant Capacity is the ability to turn Instant Capacity processors already installed in the system, on and off for short periods of time to provide added capacity. Temporary Instant Capacity allows customers the ability to adjust to unplanned or planned spikes in computing.

Cell Board Instant Capacity extends the Instant Capacity value proposition to include a complete cell board (processor modules and memory) to be standby in the system for a fraction of the cost. When processing capacity is needed, simply activate the cell board (memory and at least one processor) to immediately increase the compute power of the server.

HP's Instant Capacity tools use this algorithm to activate new processors:

- Verify that there is at least one active processor per cell board.
- Activate processors round robin across cell boards within a partition. This means that the number of active processors per cell board will differ by at most one across the partition.
- Enable processors on a cell board in the order 0, 1, 2, 3 (for HP mx2 processors: 4, 5, 6, 7). This spreads the processors across the two internal cell controller buses and allocates processors in the best thermal fashion.
- When a failed processor is replaced, choose one from the same cell board when possible. If that is not possible, choose the next available processor, following rules 2 and 3.

For best performance, all cell boards in the same partition should contain the same number of active processors. For high availability reasons, each cell board should contain at least two active processors.

The following applies to Instant Capacity on HP Integrity rx7640 Server:

- Instant Capacity can be ordered pre installed on HP Integrity rx7640 servers.
- Instant Capacity processors are purchased in pairs. HP mx2 dual processor modules are purchased individually, since they reflect a pair of processors. However, Instant Capacity processors can be activated one at a time.
- At least one processor pair per cell in a partition must be a purchased processor (non Instant Capacity).
- Cell board Instant Capacity requires one active cell board per partition (1 active processor is required on the active cell; the rest could be Instant Capacity.) In other words a partition can contain 1 cell board with 1 active processor with the other three (or seven for HP mx2 modules) Instant Capacity. In the same partition, you can have multiple Instant Capacity cell boards (they must be configured identical). No partition can contain all Instant Capacity cell boards, one must be active.
- The rx7640 does not require email connectivity for CPU Instant Capacity and cell board Instant Capacity. Temporary Instant Capacity is still required to have an email connection to HP.
- Processors can be allocated and deallocated instantly or after a reboot at the discretion of the user.
- When upgrading active and Instant Capacity processors, customers with odd quantities of active processors must purchase upgrade processors in the next higher even quantity (i.e. three active and one Instant Capacity are upgraded to four active).

Performance considerations with Instant Capacity:

- Going from one to two to three (four to six for HP mx2 modules) active processors on a cell board gives linear performance improvement
- Going from three to four (six to eight for HP mx2 modules) active processors gives linear performance improvement for most applications except some technical applications that push the

memory bus bandwidth.

- Number of active processors per cell boards should be balanced across partitions. However, minor differences are okay. (**Example**: Four active processors on one cell board and three active processors on the second cell board.)

Racking

The HP Integrity rx7640 Server was designed to provide industry leading performance density and availability when ordered in a racked configuration. At 10 EIA units (17.5 inches), four HP Integrity rx7640 servers can be mounted into a single HP two meter cabinet (HP 10K G2 Universal rack).

The HP Integrity rx7640 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 rx7640 Server comes with rack sliders.

These rack sliders enables the HP Integrity rx7640 Server to be slid forward out of the HP 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 rx7640 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 rx7640 Server is a cable management arm (CMA) The CMA neatly secures data cables and prevents cables from becoming entangled while servicing of the system.

Ballasts (Only required for HP Rack System E cabinets, Not required for the Universal rack 10K G2)

Due to the weight of the HP Integrity rx7640 Server, ballast kits have been developed to add stability to HP cabinets while the system is being serviced. Every HP Integrity rx7640 Server shipped to customers 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 rx7640 Server ballast kit is mandatory and should be installed immediately. A common ballast kit is used for both the HP Integrity rx7640 Server and HP 9000 rp7410 Server. Only one kit is needed for each cabinet containing one or more of these servers.

Heavy Duty Stabilizing Kit (Only required for the HP 10K G2 Universal rack, Not HP System E rack)

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

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UPS

Management of local UPSs for the rx7640 and rx8640 is now through a LAN port on the core I/O card. Management of UPSs by the predecessor, rx7620 and rx8620 servers was through a serial port on the core I/O. The serial port is not available on the rx7640 and rx8640 servers. Therefore, when upgrading or adding rx7640 and rx8640 servers to your environment and using local UPSs (as opposed to datacenter wide UPSs), make sure there is a LAN management card available on the local UPS.

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.
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.

Upgrades

The rx7640 server is capable of in-box upgrades from rx76xx/rp74xx servers.

Included in Upgrade Kit (AD057A):

System Backplane

The Kona System backplane is a new design with the following feature modifications:

- New high speed differential links
- Redesign of the crossbar ASIC
- Additional switch fabric on the backplane
- Redesign of the backplane power subsystem
- Redesign of the system clock infrastructure
- New high speed, impedance controlled, board-to-board connectors will be used

Mass Storage Backplane PCA

- The mass storage subsystem upgrades from SCSI SE interconnect to U320.

PCIX IO Backplane

- PCI-X 2.0 (266MHz) based I/O attach

Other Miscellaneous Nameplates and Labels
Read Me Docs, Upgrade Guide, CDROM
Misc Cables

Must Order Separately:
CPU Modules
(Unless already have Madison CPU modules)

Cell Boards

- New Cell board design to support new chipset and future Itanium CPUs

Memory DIMMs

- The memory system uses Double Data Rate DRAMs (DDR II).

Core IO

- U320 support

Reuse:
Chassis
System Fans
AC Power Distr PCA
DC Power Distr PCA
OL* PCA (IO cards)
Bulk Power Supplies
Hard Disk Drives
Removable Media Drives
Supported IO Cards (please refer to supported I/O card list)

Technical Specifications

Server Model Number	rx7640		
Server Product Number	Base System	AB312A	
	Number of 1.6 GHz Intel Itanium 2 Processors	2-8	
Hardware Warranty	1 year next day on site		
Supported Processors	1.6 GHz Intel Itanium 2 Processor	L3 Cache	6 MB
		Floating Point Coprocessor	Yes
Memory	Memory slots	32 (16 per cell board)	
	Minimum memory (pair: 2 DIMMs)	2 GB	
	Maximum memory capacity	64 GB (32 GB per cell board)	
Internal Disks	Maximum disk mechanisms	4	
	Maximum disk capacity	1.2 TB	
	Internal Removable Media	1 slot	
	DVD+RW		
	DDS 72 DAT	72 GB	
Core I/O	Ultra320 SCSI	2	
	1 GbE (RJ 45 connector)	2	
	10/100Base T port (LAN console connection)	1	
	RS 232 Management Console port	1	
I/O buses and slots	Total hot plug PCI X Slots (266 MHz; 64 bits)	15	
	8 Dual channel slots (2128 MB/s each)		
	6 Dual channel slots (1060 MB/s each)		
	2 Single channel (530 MB/s each)		

Technical Specifications

Maximum I/O Cards (See supported I/O table for specific products)	**Mass Storage**	15
	LAN	2-15
	WAN	15
	Multi-Function (Mass Storage / LAN)	15
	Additional Interface Cards	4-15
Electrical Characteristics	**AC Input power**	200-240V 50/60 Hz
	Hot swap Power supplies	2 total, included with base
	Redundant AC power inputs	2 required, 4 cords for 2N
	Typical Power dissipation (VA) **for maximum processor, memory, disk, I/O configurations**	2171 VA 10.9A @200VAC
	Marked Electrical for server	2640 VA (12A @220VAC)
	Marked Electrical per line cord	1320 VA (6A @220VAC)
	Power factor at full load	0.98 (approximately)
Site Preparation	**kW rating for UPS loading***	3.0
	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**	17.5 in (445 mm)/10 units
	Weight (lb/kg)	224 lbs (99.8 kg)

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

Technical Specifications

Environmental Characteristics	Regulatory Model	RSVLA-0102
	Acoustics (sound power) at 25° C	7.4 Bels LwA
	Acoustics (sound power) at 30° C	7.4 Bels LwA
	Acoustics (operator/bystander) at 24° C	58.4 dB LpA
	Operating Temperature (up to 5000 ft)*	5° to 32°C (41° to 89°F)
	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 80%, 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)

*NOTE: Maximum operating temperature range up to 5000 ft. For higher altitudes derate the max temperature by 1°C/1000 ft above 5000 ft.

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	CSAus Certified, compliant with EN 60950