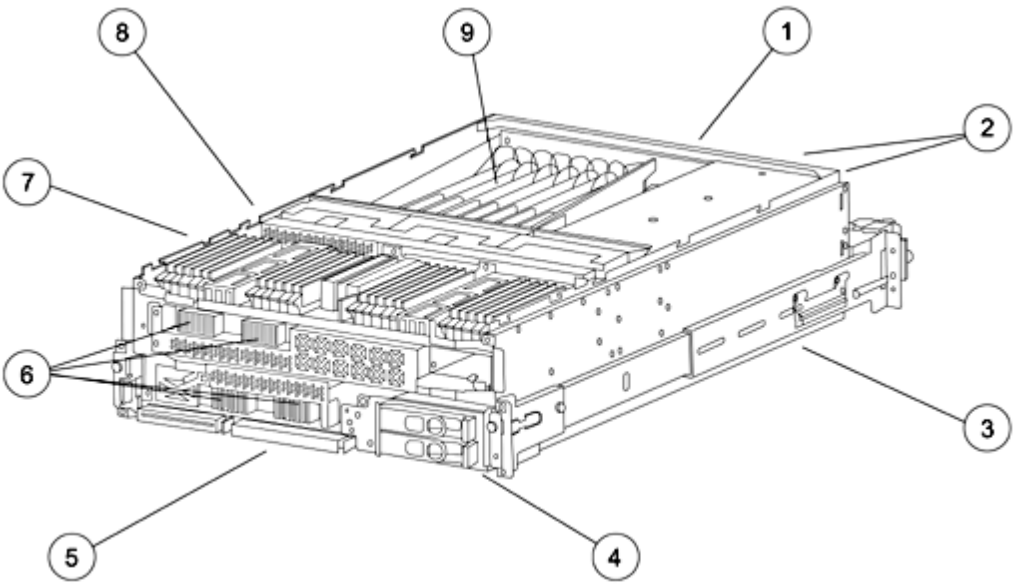
Overview



1. Two Reserved PCI-X slots for LAN and SCSI
2. Dual Hot Plug Power Supplies
3. Rack Slides with Tool-free Installation
4. Two SCSI Hot Plug Hard Disk Drives
5. Optional Low-profile DVD Drive
6. 1 to 4 Intel® Itanium 2® processors *or 1 to 4 HP mx2 Dual-processor Modules**
7. Memory Board with 16 or 32 DIMM Slots
8. Row of Six Hot Plug N+1 Redundant Fans
9. Six Available PCI-X Slots

*NOTE: Single Itanium 2 processors and HP mx2 two-processor modules cannot be mixed in the same system.

At A Glance

rx4640 Server Product Numbers

- Base System
  AB370B
- HP Integrity rx4640 Fast Configuration with One 1.5 GHz/4 MB Intel® Itanium 2® Processor
  AB530A
- HP Integrity rx4640 Fast Configuration with Two 1.5 GHz/4 MB Intel Itanium 2 Processor
  AB531A
- HP Integrity rx4640 Fast Configuration with One 1.6 GHz/6 MB Intel Itanium 2 Processor
  AB532A
- HP Integrity rx4640 Fast Configuration with Four 1.6 GHz/9 MB Intel Itanium 2 Processor
  AB533A
- Base System
  AB370A
- Fast Configuration with One 1.3 GHz/3-MB Intel Itanium 2 Processor
  AB371A
- Fast Configuration with Two 1.5 GHz/6-MB Intel Itanium 2 Processors
  AB372A
- Fast Configuration with HP mx2 two processor Modules
  AB373A

Standard System Features

Overview

- Operating System support: HP UX 11i version 2, Linux, OpenVMS Industry Standard 64 V8.2 and Microsoft Windows Server 2003, Enterprise Edition
- System offerings AB370A, AB371A, AB372A and AB373A: Dual channel Ultra160 LVD SCSI controller
  NOTE: Windows, HP UX and OpenVMS systems may be upgraded to Smart Array controller at time of order.
- External Ultra160 LVD SCSI port (HP UX and Linux)
- For system offerings AB370B, AB530A, AB531A, AB532A and AB533A: Dual channel Ultra320 SCSI controller. External Ultra320 SCSI port.
  NOTE: Windows, HP UX and OpenVMS systems may be upgraded to Smart Array controller at time of order.
- Dual port 10/100/1000Base TX LAN (with auto speed sensing; RJ 45 connector)
- Management Processor for remote management and HA monitoring
- Telnet and web console via 10/100Base TX management LAN (RJ 45 connector)
- Three RS 232 serial ports linked to the management processor
- Factory integration of processors, memory, disk drives, removable media, and I/O cards
- Rackmountable into 19 inch cabinets - HP Rack System/E and HP Universal 1000 G2 series as well as many 3rd party racks
- Optional stand alone pedestal mount
- Three year warranty with next business day on site

The following matrix summarizes the available base systems and FAST Bundles for the rx4640.

	Base Systems		FAST Systems (Bundles)						
Product Numbers	AB370B	AB370A	AB530A	AB531A	AB532A	AB533A	AB371A	AB372A	AB373A
Common Equipment	1	1	1	1	1	1	1	1	1
2 Port Gig E LAN Adapter	1	1	1	1	1	1	1	1	1
Power Supply	1	1	1	1	1	1	1	2	2
2 Channel Ultra 320 SCSI	1	1	1	1	1	1			
1 Channel Ultra 160 SCSI		1					1	1	1
Processor									
HP mx Two Processor Modules* (each mod has 2 1.1 Ghz chips) NOTE: 8 mx2 two Processor module is not support with Linux systems.	Must Order	Must Order							2 Modules 4 cores
1.3 Ghz/ 3MB Intel Itanium 2							1		
1.5 Ghz/ 4MB Intel Itanium 2			1	2				2	
1.6 Ghz/ 6MB Intel Itanium 2					1				
1.6 Ghz/ 9MB Intel Itanium 2						4			
Memory Carrier Boards									
16-DIMM memory carrier board	Must Order	Must Order	1	1	1		1		
32-DIMM memory carrier board						1		1	1
Memory									
512MB (# / memory Size)	Must Order	Must Order	4 / 2GB		4 / 2GB	4 / 2GB	4 / 2GB	16 / 8GB	
1GB (# / memory Size)				4 / 4GB					16 / 16GB
Hard Drives									
36-GB / 15K rpm	Must Order	Must Order					2	2	
73-GB / 15K rpm			1	2	1	1			2

DVD Drives									
	Must Order	Must Order	1	1	1	1	1	1	1

Standard Features

Minimum System

- One 64 bit Intel Itanium 2 processor/one core; either 1.3 GHz/3 MB cache, 1.5 GHz/6 MB cache, 1.5 GHz/4MB cache or 1.6 GHz/6 MB, or four (4) 1.6 GHz/9 MB processors, or one HP mx2 two processor module (contains two 1.1 GHz Itanium 2 processors/one core each)
- 1-GB PC2100 ECC Registered DDR266A/B SDRAM (4×256MB DIMMs)
- One 16 DIMM slot memory carrier board
- One internal DVD drive for OpenVMS and Windows
- One hot swap power supply

NOTE: mx2 two processor module is not support with Linux systems.

Maximum Server Capacities

- Four 64 bit Intel Itanium 2 processors/one core; either 1.3 GHz/3 MB cache or 1.5 GHz/6 MB cache, 1.5 GHz/4 MB cache or 1.6 GHz/6 MB cache, 1.6 GHz/9 MB cache processors, or four HP mx2 two processor module (contains two 1.1 GHz Itanium 2 processors/one core each)
- 128 GB PC2100 ECC Registered DDR266A/B SDRAM (32×4GB DIMMs).
  NOTE: Windows Server 2003 Enterprise Edition supports a maximum of 64 GB of memory.
- One 32 DIMM slot memory carrier board
- Two hot swap power supplies, providing N+1 protection for power supplies and power input
- 6 PCI-X IO adapter cards
- One internal DVD-ROM Slimline Drive, DVD-ROM/CD+RW Slimline Drive (can write only to CDs), or DVD+RW Slimline Drive
- Two internal hot-plug LVD SCSI disks

Standard System Features

- Operating System support: HP UX 11i version 2, Linux, OpenVMS Industry Standard 64 V8.2 and Microsoft Windows Server 2003, Enterprise Edition
- System offerings AB370A, AB371A, AB372A and AB373A: Dual channel Ultra160 LVD SCSI controller
  NOTE: Windows, HP UX and OpenVMS systems may be upgraded to Smart Array controller at time of order.
- External Ultra160 LVD SCSI port (HP UX and Linux)
- For system offerings AB370B, AB530A, AB531A, AB532A and AB533A: Dual channel Ultra320 SCSI controller. External Ultra320 SCSI port.
  NOTE: Windows, HP UX and OpenVMS systems may be upgraded to Smart Array controller at time of order.
- Dual port 10/100/1000Base TX LAN (with auto speed sensing; RJ 45 connector)
- Management Processor for remote management and HA monitoring
- Telnet and web console via 10/100Base-TX management LAN (RJ-45 connector)
- Three RS-232 serial ports linked to the management processor
- Factory integration of processors, memory, disk drives, removable media, and I/O cards
- Rackmountable into 19 inch cabinets - HP Rack System/E and HP Universal 1000 G2 series as well as many 3rd party racks
- Optional stand-alone pedestal mount
- Three-year warranty with next business day on-site

Standard Features

High Availability

- N+1 Hotswap cooling
- One Hotswap power supply-optional second power supply for N+1 protection
- Hot Plug PCI-X I/O slots
- On-line memory page deallocation
- ECC protected DDR memory
- Memory chip spare to overcome single DRAM chip failures
- Dynamic Processor resilience and deallocation
- UPS power management
- Hot Plug internal disks
- Optional two-channel Ultra160 SCSI backplane for mirroring across internal disks and controllers
- Journal file system with HP-UX
- Auto reboot
- HP Serviceguard for HP-UX
- HP Serviceguard Extension for RAC for HP-UX
- HP Serviceguard Extension for SAP for HP-UX
- Serviceguard Manager for HP-UX and Linux Clusters
- HP Event Monitoring Service
- HA Monitors for HP-UX
- HA Toolkits for HP-UX and Linux
- HP Mirrordisk/UX
- Extended Campus Cluster, HP Metrocluster, and HP Continentalclusters for HP-UX
- OpenVMS clusters
- System Insight Manager for proactive fault management
- Microsoft Cluster Service for Windows Server 2003, Enterprise Edition
- HP StorageWorks Software for HP Integrity Servers running Windows Server 2003, Enterprise Edition. Includes Cluster Extension XP and EVA, Continuous Access, Business Copy and SQL Server Fast Recovery.
- HP StorageWorks Cluster Extension XP for Linux

Security

- Separate LAN for system management
- Password protection on console port
- Disablement of remote console ports
- SSL encryption on web console

Manageability

Deploy

- HP Ignite-UX for installation and deployment of the operating system
- HP Software Distributor-UX for software and patch management
- HP Enablement Kit for Linux
- HP Integrity Essentials Foundation Pack for Windows including Smart Setup CD for easy server setup and configuration

Monitor

- Built-in Management Processor for comprehensive remote server management of HP-UX, Linux, Windows and OpenVMS
- HP Servicecontrol suite for HP-UX servers including tools for system administration, asset management, and fault management
- HP-UX kernel configuration for easy, dynamic kernel parameter changes
- HP System Insight Manager (SIM)

Optimize

Standard Features

- Process Resource Manager for HP-UX resource management
- HP-UX Workload Manager for HP-UX workload management based upon service-level objectives
- HP OpenView Glanceplus Pack
- HP Intelligent Networking Pack for Windows
- HP Performance Management Pack for Windows
- Windows System Resource Manager (included with each copy of Windows Server 2003 Enterprise Edition)

Configuration

Processor Configuration

The HP Integrity rx4640 is a symmetrical multiprocessing (SMP) server supporting up to four high performance 64 bit Intel Itanium 2 processors/one core or four HP mx2 two processor modules.

Processor Details

1.3 GHz, 1.5 GHz frequencies and 1.6 GHz, or HP mx2 two processor modules (each module contains two 1.1 GHz Itanium 2 processors/one core each):

Intel Itanium 2 Processors/one core:

- 1.3 GHz with 3 MB Level 3 Cache
- 1.5 GHz with 4 MB Level 3 Cache
- 1.5 GHz with 6 MB Level 3 Cache
- 1.6 GHz with 6 MB Level 3 Cache
- 1.6 GHz with 9 MB Level 3 Cache

All processors support:

- Level 2 Cache: 256 KB
- Level 1 Cache: 32 KB
- Single bit cache error correction
- 50-bit physical addressing
- 64-bit virtual addressing
- 4-GB maximum page size

HP mx2 two-processor module: NOTE: not supported with Linux-based systems.

- Level 4 Cache on processor module: 32 MB
- Level 3 Cache: 4-MB
- Level 2 Cache: 256 KB
- Level 1 Cache: 32 KB
- Single-bit cache error correction
- 50-bit physical addressing
- 64-bit virtual addressing
- 4-GB maximum page size

Processor Configuration Rules

- Processors can be installed one at a time
- Processors must be installed in the following sequence: 0, 1, 2, 3
- Processors cannot be mixed in the same system

The HP Integrity rx4640 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 rx4640 are:

- A9731A Intel Itanium 2 1.5-GHz 4MB
- A9732A Intel Itanium 2 1.6-GHz 6MB

ACTION:
Check server firmware prior to installing any of these processor products. The rx4640 requires system firmware 3.17 or later. The firmware version can be checked as follows:

FIRMWARE INFORMATION
Firmware Revision: 3.17 [4511]
BMC Revision: 3.49
Management Processor Revision: E.03.15
Updatable EFI Drivers:
Floating-Point Software Assistance Handler: 00000118
Broadcom Gigabit Ethernet Driver: 00070003

If firmware requires updating, the firmware upgrade instructions are included in the Release Notice that is included in the download bundle.

To download the firmware, go to http://www.hp.com/bizsupport.

NOTE:
After the firmware has been downloaded to the server, proceed with attaching the Processor Add-On Products to the server using the Server Installation Guide. The installation guide is provided:

- On the CD-ROM that shipped with Server
- On the http://docs.hp.com Web site

Memory Configuration

The HP Integrity rx4640 supports double data rate (DDR) synchronous dynamic random access memory (SDRAM) DIMMs with ECC and chip spare protection. The HP Integrity rx4640 can be ordered with one of the following two memory carrier boards:

- A9738A–Supports from 4 to 16 DIMMs (1- to 64-GB); 12.8 GB/s memory bandwidth
- A9739A–Supports from 4 to 32 DIMMs (1- to 128-GB); 12.8 GB/s memory bandwidth

Both memory carrier boards provide the same bandwidth to the processors. The primary difference between the two boards is in total memory capacity.

Memory Loading Rules

- Memory must be installed in groups of four DIMMs, also known as quads
- Each quad must consist of equal density DIMMs
- Memory can be ordered in quads of 1 GB (4×256MB), 2 GB (4×512MB), 4 GB (4×1GB), 8 GB (4×2GB), or 16 GB (4×4GB)
- Minimum memory is 1 GB (4×256MB)
- Maximum memory is 128 GB, using eight 16 GB memory quads in memory carrier board A9739A
- Memory must be loaded in the order depicted on the memory carrier board
- Arrange DIMMs so that the quads with the largest capacity are in the lowest numbered slots.

Configuration

Memory Options

Description	Product Number
1-GB DDR memory quad (4 x 256MB DIMMs)	A6967A
2-GB DDR memory quad (4 x 512MB DIMMs)	A6968A
4-GB DDR memory quad (4 x 1GB DIMMs)	A6969A
8-GB DDR memory quad (4 x 2GB DIMMs)	A6970A
16-GB DDR memory quad (4×4GB DIMMs)	AB475A

Server Form Factor and Rack Configuration

The HP Integrity rx4640 is a 4U rack optimized server. It is supported in HP Rack System/E series cabinets and HP 10000 G2 series cabinets. For factory integration order A6977AZ. Sliding mounts and a cable management arm will be installed with the server in a factory integrated rack.

The HP Integrity rx4640 can be installed in the field with the Field Rack Kit (A6977A). This field kit contains the slide mounts, cable management arm, and all other hardware needed to mount an rx4640 into a 19 inch cabinet.

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

For stand-alone, non-racked deployments, the HP Integrity rx4640 can be placed into a freestanding tubular frame that wraps around the server (A6979A). This product is not available with factory installation. However, the tubular frame is easily installed in the field.

I/O Architecture

The HP Integrity rx4640 I/O architecture utilizes industry standard PCI-X buses in a unique design for maximum performance, scalability and reliability.

The HP Integrity rx4640 architecture uses eight high-speed I/O channels. Each channel provides 0.5 GB/s of sustained I/O throughput. The diagram above shows how these channels are used to provide bandwidth to the six available PCI-X slots, two reserved PCI-X slots, and to multifunction core I/O. The reserved slots, #1 and #2 (counting from the bottom), will always be filled with core I/O. Slot #2 will come factory-loaded with a dual-channel SCSI card. Slot #1 will come factory loaded with a dual-port 10/100/1000Base TX LAN adapter.

Each channel of the SCSI card may be used for either internal or external connection but not both internal and external connections. The factory default configuration is one channel connected to the internal hard disk drive backplane. The second channel is free for use with an external disk shelf (JBOD). The internal disk drives can be set up in a duplex configuration such that each disk has a dedicated SCSI channel. This is called a duplex configuration and is done to enhance server availability. It is often combined with disk mirroring software. The second internal SCSI cable is already in place to support a duplex configuration. Order A9740B for additional components needed on the SCSI backplane of the internal disks for duplex mode. Factory installation is recommended for the A9740B duplex kit.

The two slots at the outside edge of the backplane (slots #7 and #8) each have their own dedicated 64 bit 133 MHz PCI X bus and their own independent 1.0 GB/s I/O channel. These slots should be used for high performance PCI and PCI X cards, such as clustering interconnects or multi port storage adapters. The independent buses and I/O channels provide improved performance and error containment. Independence protects each I/O card from bus hangs or extended latencies due to the failure or high bandwidth demands of other I/O cards. Independence also ensures that each I/O card can achieve maximum throughput. Both of these slots support hot plug operations in HP UX. Hot plug is not supported with the Linux or OpenVMS operating systems.

The remaining four slots (#3 through #6) share two 64 bit 66 MHz PCI X buses, with two slots allocated to each bus. Each pair of slots shares a 0.5 GB/s I/O channel. If a 33 MHz card shares a bus with a 66 MHz card, the faster card will downgrade to 33 MHz. All four of these slots support hot plug operations in HP UX. Hot plug is not supported with the Linux or OpenVMS operating systems.

Configuration

All I/O slots are keyed for I/O cards with 3.3V signaling. Cards that use 5V signaling are not supported in the HP Integrity rx4640.

	Number of Slots	Bandwidth Per Slot	Bus Width	Bus Speed	Hot-Plug[1]	Slot Keying
Dedicated	2	1.0 GB/s	64 bits	133 MHz, 66 MHz or 33 MHz	Yes	3.3 Volts
Shared	4	0.5 GB/s per pair of slots (two pairs)	64 bits	66 MHz or 33 MHz	Yes	3.3 Volts
Dual channel SCSI Core I/O	1	0.5 GB/s shared with LAN Core I/O	64 bits	66 MHz	No	3.3 Volts
1000Base-TX LAN Core I/O	1	0.5 GB/s shared with SCSI Core I/O	64 bits	66 MHz	No	3.3 Volts

[1]NOTE: Hot Plug I/O operations are only supported with the HP UX operating system. Hot Plug I/O operations are not supported with Linux or OpenVMS.

Supported I/O Cards

I/O Card	Product Number	Boot Support	Connector Type(s)	Operating Systems	Max Cards / System
Mass Storage Host Bus Adapters					
PCI 2 Gb/s Fibre Channel	A6795A	Yes	LC	H	6 /6
PCI 1 channel U160 SCSI	A6828A[2]	Yes	VHDCI	H	6 /6
PCI 2 channel U160 SCSI	A6829A[2]	Yes	VHDCI	H	6 /12
PCI Windows and Linux Ultra160 SCSI	A7059A[2]	Yes	VHDCI	L, W	6 /6 (2/2 for Windows)
PCI Windows Linux 2 port Ultra160 SCSI	A7060A[2]	Yes	VHDCI	L, W	6 /12 (2/2 for Windows)
PCI 2 channel Ultra320 SCSI	A7173A	Yes	VHDCI	H, L, W, OpenVMS[5]	6/12 (2/4 for Windows)
PCI-X Smart Array P600 Serial Attached SCSI (SAS) Controller (for external storage only)	337972-B21	Yes	SFF8470	Windows, Linux	3/3[6] 3/12 for Linux
PCI-X 2 channel Smart Array 6402 U320[1]	A9890A	Yes	VHDCI	H, L, W, OpenVMS[3]	3 /6
512 MB cache memory upgrade for SA640x and SA P600 controller	372538-B21	NA	NA	Windows, Linux	3/12
PCI-X 2-channel Smart Array 6404 Ultra3201	A9891A	Yes	VHDCI	OpenVMS[3]	3/6
PCI X 2 Gb/s Fibre Channel	A7298A[2]	Yes	LC	W	4/4
PCI X 2 Gb/s Fibre Channel	AB232A[2]	Yes	LC	W	4/4
PCI X 2 channel 2 Gb /sFibre Channel	A6826A	Yes	LC	H, L, OpenVMS	6 /12
PCI X 1 channel 2 Gb/s Fibre Channel Windows	AB467A	Yes	LC	W	4/4
PCI X 2 channel 2 Gb/s Fibre Channel Windows	AB466A	Yes	LC	W	4/8
Local Area Network (LAN) Adapters					

Configuration

PCI 1 port 1000Base T (gigabit copper)	A6825A	No	RJ-45	H, OpenVMS	6 /6
PCI 1 port 1000Base SX (gigabit fiber)	A6847A	No	Duplex SC	H, OpenVMS	6 /6
PCI 1 port 10/100Base-TX	A5230A[2]	No	RJ-45	H, OpenVMS	6/6 (5/5 for OVMS)
PCI-X 2-port 1000Base-T	A7012A	No	RJ-45	H, OpenVMS	6 /12
PCI-X 2-port 1000Base-SX	A7011A	No	Duplex SC	H, OpenVMS	6 /12
PCI 4 port 100Base-TX	A5506B[2]	No	RJ-45	H, L, OpenVMS	6/24 (5/20 for OVMS)
PCI 1 port 802.5 Token Ring 4/16/100	A5783A	No	RJ-45 and DB 9	H	6 /6
PCI 1 port Universal FDDI LAN	A3739B	No	FDDI SC	H	6 /6
PCI 2 port Windows/Linux 1000Base-SX	A9899A	No	LC	L, W	6 /12 (4/8 for Windows)
PCI 2 port Windows/Linux 1000Base-TX	A9900A	No	RJ-45	L, W	6 /12 (4/8 for Windows)
PCI 1 port 1000Base-T	A7061A	Yes Linux No Windows	RJ-45	L, W	6 /6 (4/4 for Windows)
PCI 1 port 1000Base-SX	A7073A	Yes Linux No Windows	Duplex SC	L, W	6 /6 (4/4 for Windows)
PCI -X 2 port 4x Fabric (HPC) Adapter[2]	AB286A[2]	No	4x Infiniband Copper	H	6 /12
PCI-X 2 port 4x Fabric (HPC) Adapter[1]	AB286C	No	4x Infiniband Copper	HP UX	6/12
PCI-X 1-port 2-GbE Fiber Channel Adpater	A7538A	Yes	LC	Linux (RHEL 4, SLES 9)	6 / 6
PCI-X 4-port 1000Base-T 1GbE Adapter	AB545A	Yes	RJ-45	H OpenVMS	6 / 24 (3/12 for OpenVMS)
PCI-X 2-port 4x Fabric Adapter	AB345A[2]	No	4x Infiniband Copper	H	6 / 12
PCI X 2 port 4x Fabric (HA and DB) Adapter9	AB345C	No	4x Infiniband Copper	HP UX	6/12
PCI-X 4-port 1000Base-T 1GbE Adapter	AD145A	Yes	RJ-45	Linux (RHEL 4)	2/8
Multi-Function Cards (Mass Storage/LAN)					
PCI 2 port 100Base T/ 2 port Ultra2 SCSI[1]	A5838A[2]	Yes	VHDCI/RJ-45	H	6 / 24
PCI-X 2Gb Fibre Channel / 1000BaseSX	A9782A	Yes	LC	H, OpenVMS	6 /12
PCI-X 2Gb Fibre Channel / 1000BaseTX	A9784A	Yes	1 LC, 1 RJ-45	H, OpenVMS	6 /12
PCI-X 2-port 2-Gb Fibre Channel/2-port 1-Gb Ethernet Adapter	AB465A	Yes	2 RJ-45	HP UX, OpenVMS	6/12 (1/2 for OpenVMS)

Configuration

PCI-X 2-port 1000BT/2-port U320 Multifunction adapter	AB290A	Yes	SCSI - LVD/SE LAN - RJ-45	HP UX, OpenVMS	6/24 (2/8 for OpenVMS
Wide Area Network (WAN) **Adapters**					
PCI 1 port ATM 155 Mbps (MMF)	A5513A	No	Duplex SC	H	6/6
2 port Programmable Serial Interface (PSI) X.25 / Frame Relay / SDLC	J3525A	No	RS-530, RS-232, V.35, RS-449 or X.21	H	6 /12
Additional Interface Cards					
PCI 8 port Serial MUX Adapter	AD278A	No		HP UX (11i v2 only)	6/48
PCI 64 port Serial MUX Adapter	AD279A	No		HP UX	6/384
16-port RS-232 RJ45 Port Module	AD280A[7]	No		HP UX	4 per AD279A
16-port RS-232 DB25 Port Module	AD281A[8]	No		HP UX	4 per AD279A
PCI 64-port Terminal Multiplexer	A6749A	No	RS-232 or RS-422	H	6 /384
PCI 8-port Terminal Multiplexer	A6748A	No	RS-232	H	6 /64
PCI HyperFabric 2 Fibre[1]	A6386A	No	LC Duplex	H	6 /6
PCI 2D/3D Graphics[4]	AB551A	No	VGA	OpenVMS, HP-UX	4/4 2/2 for HP-UX

[1] A minimum 512 MB of system memory per card is required for performance considerations.
[2] I/O card is supported but no longer orderable.
[3] Support available in Q4 Calendar Year 2005 for OpenVMS.
[4] When adding a single graphics card, must be in slot 8. When adding two graphics cards, must be in slots 3 and 4.. For OpenVMS, two cards can not be in shared slots; both 3 and 4 or 5 and 6.
[5] If the core I/O is Ultra160, maximum of two A7173A cards are supported. If the core I/O is not Ultra160, a maximum of four A7173A cards are supported.
[6] For Windows, each 337972-B21 external port supports a maximum of two (2) MSA50s attached in series.
[7] AD280A #001 Port Module Power Supply, required on Port Module (3) and Port Module (4) connected to an AD279A 64P Mux adapter.
[8] AD281A #001 Port Module Power Supply, required on Port Module (3) and Port Module (4) connected to an AD279A 64P Mux adapter.
[9]A minimum 1 GB of system memory per card is required for performance considerations.

Support Internal Storage Devices

Device	Product Number
Internal Hard Drives	
36GB 15K RPM Hot Plug Ultra320 SCSI Low Profile Drive	AB420A
73GB 15K RPM Hot Plug Ultra320 SCSI Low Profile Drive	AB421A
146GB 10K RPM Hot Plug Ultra320 SCSI Low Profile Drive	AB422A
300-GB 10K RPM Hot Plug Ultra320 SCSI Low Profile Drive	AB423A
Removable Media NOTE: Required for Windows, Linux and OpenVMS. Optional for HP UX. Maximum 1 supported.	
DVD Read Only drive	A7163B
DVD+RW Optical Drive NOTE: Third party software (not included with AB349A) is required to support DVD write with Windows on AB349A. OpenVMS to support DVD write in a future release.	AB349B

Configuration

Integrated Multi-function Core I/O

The integrated multifunction I/O provides core I/O functionally and includes the management processor, which provides remote management and high availability monitoring capabilities.

- Dual-port 10/100/1000Base-T LAN with RJ-45 connector-Supports LAN boot for operating system installation. NOTE: Red Hat AS 2.1 and SuSE SLES 8 Linux systems are required to change core I/O from dual port GigE LAN to single port GigE LAN.
- AB370A, AB371A, AB372A and AB373A system offerings include two internal Ultra160 SCSI channels-One channel is routed to the external SCSI port and one channel is routed to the two internal hot plug disk bays. NOTE: Windows customers may upgrade core I/O from Ultra160 SCSI controller to Smart Array 6402 Ultra320 RAID controller.
- AB370B, AB530A, AB531A, AB532A and AB533A system offerings include two internal Ultra320 SCSI channels-One channel is routed to the external SCSI port and one channel is routed to the two internal hot plug disk bays. NOTE: May upgrade core I/O from Ultra320 SCSI controller to Smart Array 6402 Ultra320 RAID controller, except with OpenVMS. OpenVMS will support Smart Array 6402 Ultra320 RAID controller in the future.
- An optional conversion kit is available to split the internal disks between two separate SCSI channels (HP product number A9740B). This option provides additional high availability through fault isolation on the internal disks.

Integrated Management Processor Functionality

- Dedicated 10/100Base-T LAN port for LAN console and embedded web console access
- DB-25 serial port-Multiplexed (using W-cable) into three RS-232 ports: local ASCII console, remote/modem console, and general purpose
- Password protected console ports
- Console mirroring between all local, modem, LAN, and web consoles
- Remote power up and power down control
- Configurable remote access control
- Event notification to system console-Provides connectivity, information, and support for HP-UX tools (such as STM and EMS) to notify by email, pager and/or HP response centers.
- Interface to system monitoring and diagnostic hardware via an internal IC bus
- Secure Sockets Layer security on web console
- Support for Integrated Lights Out (iLO) Advanced Pack activation key and license (AB500A). Firmware license installs on the integrated Management Processor Card. Integrated Lights Out (iLO) Advanced Pack provides additional remote management capabilities, including LDAP directory services, SSH security, and Group Actions with HP Systems Insight Manager (SIM)
- The Management Processor Card provides basic graphic capabilities via integrated Radeon 7000 2D graphics chip and 16 MB memory. VGA port is provided on rear of the system. Supported resolutions and refresh rates include:

Operating System	Minimum Resolution	Refresh Rate	Maximum Resolution	Refresh Rate
HP-UX	1024x768	75 Hz	1920x1200	75 Hz
Linux	1024x768	75 Hz	1920x1200	75 Hz
Windows	640x480	75 Hz	1600x1200	75 Hz
OpenVMS	640x480	60 Hz	1920x1200	75 Hz

Configuration

System Console Configurations

The HP Integrity rx4640's integrated Management Processor Card provides five methods for console connections.

- SSL-secured Web console accessible through the 10/100Base-T management LAN
- Standard telnet connections accessible through the 10/100Base-T management LAN
- Local VT100 or hpterm terminal, or VT100 or hpterm emulator via local RS-232 serial connection
- Remote VT100 or hpterm terminal, or VT100 or hpterm emulator via external modem
- VGA graphics console using the integrated VGA port. Keyboard and mouse connections are provided by USB. OpenVMS doesn't support VGA console.

Internal Disk and Media Drives

- The HP Integrity rx4640 supports up to two internal low profile hot plug disk drives.
- A dual channel U320 SCSI channel provides independent channels for the internal disks-two disks on one channel and one disk on a second channel. Split SCSI channels provide enhanced high availability-one channel can fail without impacting the disks on the other channel.
- Supported by Mirrordisk/UX across disk drives and independent channels
- For Windows, the SmartArray 6402 may be factory configured to support RAID 1 on the internal disks
- SCSI cables required to connect the internal disk drives to the A9890A Smart Array 6402 RAID Controller are shipped with the system; no need to order separately.
- 36 GB 15K, 73GB 15K, 146 GB 10K and 300-GB 10K hot plug Ultra320 SCSI disks are supported
- Factory configured RAID 1 array on internal disks is supported on the IPF servers. Refer to the following URL for details on servers, Smart Array cards, and operating systems supported.

http://www.docs.hp.com/en/RAID_SM-20050125/CombinedRaidsupportMatrix.html

- The following configurations are allowed when the SA6402 (or standard SCSI HBA) is used in the Core I/O slot:
  - Channel A connected to internal storage, Channel B connected to external storage
  - Both Channel A and B connected to external storage (boot from external storage)
- The following configurations are not allowed when the SA6402 (or standard SCSI HBA) is used in the Core I/O slot:
  - Both Channel A and Channel B connected to internal storage AND Channel B connected to external storage
  - Channel A connected to BOTH internal and external storage; Channel B not connected
- Optical media drives include a DVD ROM (A7163A) and DVD+RW (AB349A). A DVD drive is required for all OpenVMS, Linux and Windows configurations. Third party software (not included with the AB349A) is required to support DVD write with Windows on AB349A. OpenVMS will support DVD write capability in a future release of the operating system.

Configuration

HP Integrity rx4640 Power Subsystem The HP Integrity rx4640 provides a high level of integrated power protection:

- N+1 redundant hotswap power supplies
- N+1 redundant AC power input protection with electrical phase isolation
- Power monitoring and control

The HP Integrity rx4640 supports a second hot swap power supply for N+1 protection. One supply is shipped as a standard part of every system and is required for correct operation. The hot swap design allows for the online replacement of a power supply when N+1=2 supplies are configured in the server.

The HP Integrity rx4640 provides an independent power input receptacle for each power supply. The independent design provides protection against losing the connection from a power cord or breaker. The HP Integrity rx4640 power cords should always be plugged into separate breakers when possible.

The following table displays the AC power needs of the HP Integrity rx4640 at various configurations. The server has two power supplies; two internal hard disk drives and a DVD drive in each configuration. These power figures are based on actual measurements under typical server workloads, and are appropriate for power budgeting at customer installations

HP Integrity rx4640 AC Power Requirements at Various Configurations					
Processors	DIMMs	I/O Cards	Watts, AC	Volt Amps	Amps @ 200V
1	4	2	464	484	2.4
1	16	4	540	562	2.8
1	32	6	633	657	3.3
2	4	2	595	618	3.1
2	16	4	668	693	3.5
2	32	6	755	781	3.9
4	4	2	836	864	4.3
4	16	4	907	936	4.7
4	32	6	999	1028	5.1

Number of Processors	1-4		
Supported Processors	1.3-GHz Intel Itanium 2 processor/One core	A7159A	
		Cache On-chip Level 1	32 KB
		Cache On-chip Level 2	256 KB
		Cache On-chip Level 3	3 MB
		Floating Point Coprocessor included	Yes
	1.5-GHz Intel Itanium 2 Processor/One core	A7158A	
		Cache On-chip Level 1	32 KB
		Cache On-chip Level 2	256 KB
		Cache On-chip Level 3	6 MB
		Floating Point Coprocessor included	Yes
	HP mx2 two-processor Module (Contains two 1.1 GHz Itanium 2 processors/one core each)	A9730A	
		Cache-On chip Level 1	32 KB
		Cache-On chip Level 2	256 KB
		Cache-On chip Level 3	4 MB
		Floating point Coprocessor included	Yes
	NOTE: 8 mx2 two-Processor module is not support with Linux systems.		
	1.5-GHz Intel Itanium 2 Processor/One core	A9731A	
		Cache-On chip Level 1	32 KB
		Cache-On chip Level 2	256 KB
		Cache-On chip Level 3	4 MB
		Floating point Coprocessor included	Yes
	1.6-GHz Intel Itanium 2 Processor/One core	A9732A	
		Cache-On chip Level 1	32 KB
		Cache-On chip Level 2	256 KB
		Cache-On chip Level 3	6 MB
		Floating point Coprocessor included	Yes

	1.6 GHz Intel Itanium 2 Processor/One core	A9733A	
		Cache-On chip Level 1	32 KB
		Cache-On chip Level 2	256 KB
		Cache-On chip Level 3	9 MB
		Floating point Coprocessor included	Yes
System Memory	Minimum memory	1 GB	
	Maximum memory capacity	128 GB	
Internal Disks	Maximum disk mechanisms	2	
	Maximum disk capacity	292 GB	
Standard Integrated I/O	Ultra320 or Ultra160 SCSI-LVD (Please see specific system offerings for details)	2 channels	
	10/100/1000Base-T (RJ-45 connector)	2 ports	
	RS-232 serial ports	3	
	10/100Base-T management port (RJ-45 connector)	Yes	
	USB and VGA	Yes	
I/O Buses and Slots	Available PCI-X slots	6	
	Two 133 MHz, 64 bit slots on dedicated PCI X buses		
	Four 66 MHz, 64 bit slots distributed on 2 PCI X buses; 2 slots per bus		
Maximum I/O Cards (See supported I/O able for product specifics)	Mass Storage	3-6	
	LAN	6	
	WAN	6	
	Multi-Function (Mass Storage / LAN)	6	
	Additional Interface Cards	6	

Technical Specifications

Electrical Characteristics	AC Input power	200-240V 50-60 Hz
	Hot swap Power supplies	1 included, 2nd for N+1
	Redundant AC power inputs	1 included, 2nd for N+1
	Typical current requirements at 230V	5.58 A (shared across inputs)
	Typical maximum power dissipation	1065 Watts
	Conservative maximum power dissipation	1368 Watts
	Power factor at full load	0.95 or higher
	Typical Heat dissipation (BTUs/hour)	3600
	Maximum Heat dissipation (BTUs/hour)	5500
Site Preparation	Site planning and installation included	No
	Depth (in/mm)	25.2 in/639 mm
	Width (in/mm)	17.32 in/440 mm
	Rack Height (EIA/in/mm)	6.9 in/4 U4/175 mm
	Weight (lbs/kg) Maximum	100 lb (45 kg)
Environmental Characteristics	Acoustics (operator/bystander) at 77° F (25° C)	<7.2 Bels LwA
	Operating Temperature (up to 5000 ft/1524 m)*	41° to 95° F (5° to 35° C)
	Non-operating Temperature	-40° to 158° F (-40° to 70° C)
	Maximum rate of temperature change	20° per hour
	Operating relative humidity	15% to 80% RH non-condensing
	Non-operating relative humidity	5% to 90% non-condensing
	Operating altitude above sea level	10000 ft (3000 m) maximum
	Non-operating altitude above sea level	15000 ft (4500 m) maximum

*NOTE: Max operating temperature range up to 5000 ft. For higher altitudes de-rate the max temperature by 2° C/1000 ft above 5000 ft.

Regulatory Compliance	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 A, Korea RLL
	Safety	UL Listed, CSA Certified, UL GS Mark compliant with EN 60950 and EN 41003