

# HP Integrity rx2660 Site Preparation Guide

## Regulatory Model Number: RSVLA-0503

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# About This Document

This document provides information and instructions for preparing the site location when installing the HP Integrity rx2660 server.

The document printing date and part number indicate the document's current edition. The printing date changes when a new edition is printed. Minor changes may be made at reprint without changing the printing date. The document part number changes when extensive changes are made.

Document updates may be issued between editions to correct errors or document product changes. To ensure that you receive the updated or new editions, you should subscribe to the appropriate product support service. See your HP sales representative for details.

The latest version of this document can be found on line at <http://www.docs.hp.com..>

## Intended Audience

This document is intended to provide technical product and support information for authorized service providers, system administrators, and HP support personnel.

## New and Changed Information in This Edition

This guide has been updated with new processor information.

## Publishing History

The publishing history below identifies the edition dates of this manual. Updates are made to this publication on an unscheduled, *as needed*, basis. The updates will consist of a complete replacement manual and pertinent online or CD documentation.

**Table 1 Publishing History Details**

Manufacturing Part Number	Supported Operating Systems	Publication Date
AB419-9004A	HP-UX, Windows®, Linux®, OpenVMS®	December 2006
AB419-9004B	HP-UX, Windows, Linux, OpenVMS	May 2007
AB419-9004C	HP-UX, Windows, Linux, OpenVMS	November 2007

## Document Organization

This guide is organized as follows:

Chapter 1      *Server Specifications* Use this chapter to learn about the specifications of the HP Integrity rx2660 server.

# Typographic Conventions

This document uses the following conventions.



**WARNING!** A warning lists requirements that you must meet to avoid personal injury.



**CAUTION:** A caution provides information required to avoid losing data or avoid losing system functionality.



**NOTE:** A note highlights useful information such as restrictions, recommendations, or important details about HP product features.

*Book Title* The title of a book. On the web and on the Instant Information CD, it may be a hot link to the book itself.

**KeyCap** The name of a keyboard key or graphical interface item (such as buttons, tabs, and menu items). Note that **Return** and **Enter** both refer to the same key.

*Emphasis* Text that is emphasized.

**Bold** Text that is strongly emphasized.

**Bold** The defined use of an important word or phrase.

ComputerOut Text displayed by the computer.

**UserInput** Commands and other text that you type.

Command A command name or qualified command phrase.

Option An available option.

Screen Output Example of computer screen output.

[ ] The contents are optional in formats and command descriptions. If the contents are a list separated by |, you must select one of the items.

{ } The contents are required in formats and command descriptions. If the contents are a list separated by |, you must select one of the items.

... The preceding element may be repeated an arbitrary number of times.

| Separates items in a list of choices.

## Warranty Information

The latest versions of the *BCS Global Limited Warranty and Technical Support* documentation is posted on the HP website in the *Enterprise Servers, Workstations, and System Hardware* collection under each server to which it applies, at: <http://www.docs.hp.com>

## Related Information

You can find other information on server hardware management, Microsoft® Windows®, and diagnostic support tools in the following publications.

**Web Site for HP Technical Documentation:** <http://docs.hp.com>

**Server Hardware Information:** <http://docs.hp.com/hpux/hw/>

**Windows Operating System Information** You can find information about administration of the Microsoft Windows operating system at the following web sites, among others:

- [http://docs.hp.com/windows\\_nt/](http://docs.hp.com/windows_nt/)
- <http://www.microsoft.com/technet/>

**Diagnostics and Event Monitoring: Hardware Support Tools** Complete information about HP's hardware support tools, including online and offline diagnostics and event monitoring tools, is



at the <http://docs.hp.com/hpux/diag/> website. This site has manuals, tutorials, FAQs, and other reference material.

**Web Site for HP Technical Support:** <http://us-support2.external.hp.com/>

**Books about HP-UX Published by Prentice Hall** The <http://www.hp.com/hpbooks/> website lists the HP books that Prentice Hall currently publishes, such as HP-UX books including:

- *HP-UX 11i System Administration Handbook*  
[http://www.hp.com/hpbooks/prentice/ptr\\_0130600814.html](http://www.hp.com/hpbooks/prentice/ptr_0130600814.html)
- *HP-UX Virtual Partitions*  
[http://www.hp.com/hpbooks/prentice/ptr\\_0130352128.html](http://www.hp.com/hpbooks/prentice/ptr_0130352128.html)

HP Books are available worldwide through bookstores, online booksellers, and office and computer stores.

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Include title, manufacturing part number, and any comment, error found, or suggestion for improvement you have concerning this document. Also, please include what we did right so we can incorporate it into other documents.



# 1 Server Specifications

This chapter provides the specifications for the HP Integrity rx2660 server.

This chapter addresses the following topics:

- “System Configuration” (page 11).
- “Dimensions and Weight” (page 12)
- “Grounding” (page 12).
- “Electrical Specifications” (page 12).
- “Physical and Environmental Specifications” (page 13)

For general site preparation information, see the *HP Generalized Site Preparation Guide* on the HP website at <http://docs.hp.com>

## System Configuration

Table 1-1 lists the hardware specifications for the HP Integrity rx2660 server.

**Table 1-1 Hardware Specifications**

Component	HP Integrity rx2660
Processors	One or two Itanium single- or dual-core processors: <ul style="list-style-type: none"><li>• 1.6 GHz/6 MB cache single-core processor</li><li>• 1.4 GHz/12 MB cache dual-core processor</li><li>• 1.6 GHz/18 MB cache dual-core processor</li><li>• 1.6 GHz/12 MB cache single-core processor</li><li>• 1.42 GHz/12 MB cache dual-core processor</li><li>• 1.67 GHz/18 MB cache dual-core processor</li></ul>
Memory	Supports up to eight Double Data Rate 2 (DDR2) DIMMs mounted on the system board. Supported DIMM sizes are as follows: <ul style="list-style-type: none"><li>• 512 MB</li><li>• 1 GB</li><li>• 2 GB</li><li>• 4 GB</li></ul> Minimum memory configuration is 1 GB (2 x 512 MB DIMMs). Maximum memory configuration is 32 GB (8 x 4 GB DIMMs).
Disk drives	One to eight hot-pluggable SAS hard drives.
PCI slots	For the PCI-X I/O backplane assembly: <ul style="list-style-type: none"><li>• One PCI-X slot @ 133 MHz</li><li>• Two PCI-X slots @ 266 MHz</li></ul> For the PCIe/PCI-X I/O backplane assembly: <ul style="list-style-type: none"><li>• One PCI-X slot @ 133 MHz</li><li>• Two PCIe slots @ PCIe x8</li></ul>
SAS core I/O	Eight port SAS core I/O card, or eight port SAS core I/O card with RAID expansion card.
LAN core I/O	Two GigE LAN ports.
Management core I/O	Two serial ports, two USB 2.0 ports, one 10 Base-T/100 Base-T LAN port, and one optional VGA port.
Optical device	One DVD-R or DVD+RW.
Power supply	The Data Center server has one 900 watt (@120 VAC) or 1000 watt (@240 VAC) power supply, 1+1 redundancy with second power supply. The Office Friendly configuration includes two power supplies.

## Dimensions and Weight

Table 1-2 lists the dimensions and weight of the HP Integrity rx2660 Data Center server and the rx2660 Office Friendly server for a rack- or pedestal-mounted configuration.

**Table 1-2 Rack- or Pedestal-Mounted Server Dimensions**

Dimensions and Weight	Value
Data Center Server Dimensions	
• Depth	• 67.3 cm (26.5 in)
• Width	• 48.3 cm (19 in)
• Height	• 8.6 cm (3.4 in)
Data Center Server Weight	Minimum configuration – 21 kg (46 lb) Maximum configuration – 28 kg (61 lb)
Rack unit	2U
Office Friendly Server Dimensions	
• Depth	• 69.0 cm (27.18 in)
• Width	• 27.6 cm (10.88 in) w/feet 12.7 cm (5 in) w/o feet
• Height	• 50.8 cm (20 in)
Office Friendly Server Weight	Minimum configuration – 30 kg (66 lb) Maximum configuration – 37 kg (81 lb)

## Grounding

The site building shall provide a safety ground/protective earth for each ac service entrance to all cabinets.

Install a PE (protective earthing) conductor that is identical in size, insulation material, and thickness to the branch-circuit supply conductors. The PE conductor must be green with yellow stripes. The earthing conductor is to be connected from the unit to the building installation earth or, if supplied by a separately derived system, at the supply transformer or motor-generator set grounding point.

## Electrical Specifications

This section provides electrical specifications for the server.

### System Power Specifications

Available power (output) is the maximum dc power that the power supply can supply to the system.

Maximum input power is what the power supply requires from the ac line to deliver that maximum dc output (given worst case efficiency and maximum loading).

Maximum input current is the worst case/highest current given the lowest input voltage and the maximum input power.

**Table 1-3 System Power Specifications**

Parameter	Total Rating		
Input voltage	100 VAC	100-127 VAC	200-240 VAC
Marked input current	10 A	10 A	7 A
Input current (maximum)	10 A	10 A	6.7 A
Input frequency	47 to 63 Hz	47 to 63 Hz	47 to 63 Hz
Maximum ac input power	1000 W	1000 W	1205 W
Power supply maximum output power	800 W	850 W	1000 W
Max current at +12 V	65 A	69 A	82 A
Max current at -12 V	0.3 A	0.3 A	0.3 A
Max current at +3.3 V standby	8 A	8 A	8 A
Max current at +5 V standby	2 A	2 A	2 A

If an overload triggers the power supply overload protection, the system is immediately powered off. To reset the power supply unit, follow these steps:

1. Disconnect the power cord.
2. Determine what caused the overload by contacting an HP support representative.
3. Reconnect the power cord.
4. Reboot the system.



**NOTE:** If an overload occurs twice, there is an undetected short circuit somewhere.

When you use the front panel power button to turn off the server, power consumption falls below the low power consumption, but doesn't reach zero. To reach zero power consumption in "off" mode, either unplug the server or use a power block with a switch.

## Power Consumption and Cooling

The power consumptions listed in Table 1-4 are valid for a standard configuration as shipped (one 1.4 GHz dual-core processor, 1 GB of memory, one 1000 W power supply, one internal hard disk drive, and one internal DVD-RW drive).

All information in this section is based on primary power consumptions with one power supply installed.

**Table 1-4 Additional Component Power Consumption**

Additional Component	Power Consumption	
Processor	130 W	443.6 Btu/h
SAS disk drive (with I/O access)	23 W	78.4 Btu/h
SAS disk (idle)	16 W	54.5 Btu/h
PCIe/PCI-X card	10 to 25 W	34.12 Btu/h to 85.30 Btu/h

## Physical and Environmental Specifications

This section provides the temperature and humidity requirements, noise emission, and air flow specifications for the server.

Operating temperature and humidity ranges may vary depending on the installed mass storage devices. High humidity levels can cause improper disk operation. Low humidity levels can aggravate static electricity problems and cause excessive wear of the disk surface.

Temperature, humidity, and sound power levels are provided in Table 1-5 while minimum, maximum, and typical configurations are in Table 1-6 (page 15) and Table 1-7 (page 16).



**NOTE:** De-rate maximum dry bulb temperature 1 degree/300 meters (1000 feet) above 900 meters 3000 feet).

**Table 1-5 Environmental Specifications (system processing unit with hard disk)**

Parameter		Value	
Operating temperature		+5° C to +35° C (+41° F to +95° F)	
Storage temperature		- 40° C to +60° C (-40° F to +140° F)	
Over-temperature shutdown		+38° C (+100° F)	
Operating humidity		20% to 80% relative (non-condensing)	
Storage humidity		90% relative (non-condensing) at + 65° C	
Acoustic Noise Emission (ISO 9296)		Data Center Server	Office Friendly Server
Sound Power Level	Typical configuration (disk idle) <sup>1</sup>	LwAd = 6.8 B	LwAd = 5.9 B
	Maximum configuration (disk idle) <sup>2</sup>	LwAd = 6.8 B	LwAd = 5.9 B
	Maximum configuration (disk active) <sup>3</sup>	LwAd = 7.0 B	LwAd = 5.9 B
Sound Pressure Level		LpAm = 51.6 dB	LpAm = 41.4 dB
Altitude			
Operating altitude		0 to 3000 m (10,000 ft.) maximum	
Storage altitude		0 to 4572 m (15,000 ft.) maximum	

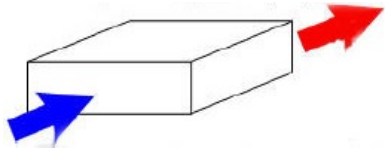
1 Typical configuration at room temperature (25°C).

2 Single processor, one to two SCSI hard disk drives and less than 8 GB of memory.

3 Dual processor, three SCSI hard disk drives and more than 8 GB of memory.

Table 1-6 (page 15) shows the physical and environmental specifications for the Data Center server.

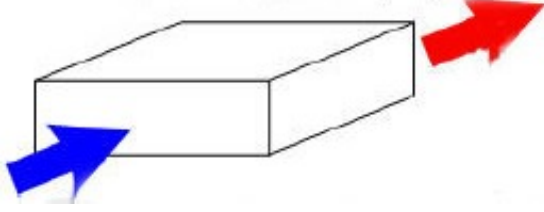
**Table 1-6 Physical and Environmental Specifications for the Data Center Server**

	Condition						Weight			Server Dimensions	
	Typical Heat Release		Nominal Airflow		Maximum Airflow @ 35 degrees C <sup>1</sup>		Server	Rack	Pedestal	Rack	Pedestal
	100-127 VAC	200-240 VAC									
	Watts	Watts	CFM	m <sup>3</sup> /hr	CFM	m <sup>3</sup> /hr					
Minimum Config.	363 W	363 W	61	104	112	190	21 kg - 28 kg (46 lb - 61 lb)	25 kg - 32 kg (55 lb - 70 lb)	30 kg - 37 kg (66 lb - 81 lb)	D 67.3 cm W 48.3 cm H 8.6 cm (D 26.5 in W 19 in H 3.4 in)	D 69 cm W 27.6 cm (with feet) W 12.7 cm (w/o feet) H 50.8 (D 27.2 in W 10.8 in (with feet) W 5.0 in (w/o feet) H 20.0 in)
Maximum Config.	782 W	782 W	79	134	112	190					
Typical Config.	483 W	483 W	61	104	112	190					
ASHRAE Class 1	Airflow cooling scheme (front to rear)					Min config	Two 4 GB DDR2 DIMMs, no PCIe/PCI-X public cards or, RAID card on private I/O slot.				
						Max Config	Eight 4 GB DDR2 DIMMs, three PCIe/PCI-X cards on public I/O slots, and RAID card in private slot.				
											Typical Config

<sup>1</sup> Derate maximum dry bulb temperature 1 degree / 300 meters above 900 meters.

Table 1-7 (page 16) shows the physical and environmental specifications for the Office Friendly server.

**Table 1-7 Physical and Environmental Specifications of the Office Friendly Server**

	Condition						Weight		Server Dimensions						
	Typical Heat Release		Nominal Airflow		Maximum Airflow @ 35 degrees C <sup>1</sup>		Server	Pedestal	Pedestal						
	100-127 VAC	200-240 VAC													
	Watts	Watts	CFM	m3/hr	CFM	m3/hr									
Minimum Config.	363 W	363 W	45	76	162	275	21 kg - 28 kg (46 lb - 61 lb)	30 kg - 37 kg (66 lb - 81 lb)	D 69 cm W 27.6 cm (with feet) W 12.7 cm (w/o feet) H 50.8 (D 27.2 in W 10.8 in (with feet) W 5.0 in (w/o feet) H 20.0 in)						
Maximum Config.	782 W	782 W	45	76	162	275									
Typical Config.	483 W	483 W	45	76	162	275									
ASHRAE Class 1	Airflow cooling scheme (front to rear)						Min Config	Two 4 GB DDR2 DIMMs, no PCIe/PCI-X public cards or, RAID card on private I/O slot.							
							Max Config	Eight 4 GB DDR2 DIMMs, three PCIe/PCI-X cards on public I/O slots, and RAID card in private slot.							
												Typical Config	Four 4 GB DDR2 DIMMs, one PCIe/PCI-X card on public I/O slots, and RAID card in private slot.		

<sup>1</sup> Derate maximum dry bulb temperature 1 degree / 300 meters above 900 meters.



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# Glossary

## A-B

- Apparent power** A value of power for ac circuits that is calculated as the product of RMS current times RMS voltage, without taking the power factor into account.
- ASHRAE Standard 52-76** Industry standard for air filtration efficiency set forth by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.
- ASL** Above sea level.
- board** A printed circuit assembly (PCA). Also called a card or adapter.
- Btu/h** The abbreviation for British thermal units. The amount of heat required to raise one pound of water one degree Fahrenheit per hour, a common measure of heat transfer rate.

## C

- CFM** The abbreviation for cubic feet per minute, commonly used to measure the rate of air flow in an air conditioning system.
- Chilled water system** A type of air conditioning system that has no refrigerant in the unit itself. The refrigerant is contained in a chiller, which is located remotely. The chiller cools water, which is piped to the air conditioner to cool the space.
- CompactPCI** The newest specification for PCI-based industrial computers is called CompactPCI. It is electrically a superset of desktop PCI with a different physical form factor. See <http://www.picmg.org> for details.

## D-K

- Dehumidification** The process of removing moisture from the air within a critical space.
- Derate** To lower the rated capability of an electrical or mechanical apparatus.
- Downflow** Refers to a type of air conditioning system that discharges air downward, directly beneath a raised floor, commonly found in computer rooms and modern office spaces.
- EIA unit** The Electronic Industries Association (EIA) defines this unit of measurement to be 1.75 inches in height. So then, 1U equals 1.75 inches (1U equals 44.45 mm).
- Humidification** The process of adding moisture to the air within a critical space.
- Inrush current** The peak current flowing into a power supply the instant ac power is applied. This peak is usually much higher than the typical input current due to the charging of the input filter capacitors. When switching power supplies are first turned on, they present high initial currents as a result of filter capacitor impedance. These large filter capacitors act like a short circuit, producing an immediate inrush surge current with a fast rise time. The peak inrush current can be several orders of magnitude greater than the supply's typical current.
- KVA** Abbreviation for kilovolt-amperes. (1,000 x volt-amperes).

## L-N

- Latent cooling capacity** An air conditioning system's capability to remove heat from the air.
- Leakage current** A term relating to current flowing between the ac supply wires and earth ground. The term does not necessarily denote a fault condition. In power supplies, leakage current usually refers to the 60 Hertz current, which flows through the EMI filter capacitors that are connected between the ac lines and ground.
- Maximum input current** The operating current of the product equal to the maximum load divided by the minimum input voltage.
- NEBS** All electronic equipment has the potential to interfere with other electronic equipment. Interference can be caused by electromagnetic radiation, the grounding system, the electrical power connection, excessive heat, or blocking the natural airflow, and connecting wires or

cables. The FCC (Federal Communications Commission) regulates a portion of this problem through Part 15 of their rules and regulations. Even more stringent than the FCC Part 15 requirements, Network Equipment Building Standards (NEBS) covers a large range of requirements including criteria for personnel safety, protection of property, and operational continuity. The documents cover both physical requirements including: Space Planning, Temperature, Humidity, Fire, Earthquake, Vibration, Transportation, Acoustical, Air Quality and Illumination; and electrical criteria including: Electrostatic Discharge (ESD), Electromagnetic Interference (EMI), Lightning and ac Power Fault, Steady State Power Induction, Corrosion, dc Potential Difference, Electrical Safety and Bonding and Grounding.

O-R

**PCA** Abbreviation for Printed Circuit Assembly also referred to as a Printed Circuit Board (PCB).

**PCI** Currently, the most popular local I/O bus, the Peripheral Component Interconnect (PCI) bus was developed by Intel and introduced in 1993.

**PICMG** A consortium of companies involved in utilizing PCI for embedded applications. The PCI Industrial Computer Manufacturers Group (PICMG) controls the PICMG specification.

**Power factor** The ratio of true power to apparent power in an ac circuit. In power conversion technology, power factor is used in conjunction with describing the ac input current to the power supply.

**RMS** Root-mean-square (rms) refers to the most common mathematical method of defining the effective voltage or current of an ac wave. To determine rms value, three mathematical operations are carried out on the function representing the ac waveform: (1) The square of the waveform function (usually a sine wave) is determined. (2) The function resulting from step (1) is averaged over time. (3) The square root of the function resulting from step (2) is found.

S-T

**Theoretical maximum power consumption** Represents the maximum wattage of a given configuration, assuming worst-case conditions (thermal tolerances, workloads, and so forth) on all system components. It is extremely unlikely that any customer will experience this level of power consumption.

**Tonnage** The unit of measure used in air conditioning to describe the heating or cooling capacity of a system. One ton of heat represents the amount of heat needed to melt one ton (2,000 lb.) of ice in one hour. 12,000 Btu/hr. equals one ton of heat.

**True power** In an ac circuit, true power is the actual power consumed. It is distinguished from apparent power by eliminating the reactive power component that may be present.

**Typical input current** The operating current of the product measured using a typical load and target voltage.

**Typical power consumption** Represents the expected power consumption of a given configuration. The typical value is the approximate power consumption that a customer will most likely experience and can use for power budgeting purposes.

U-Z

**Vapor seal** A vapor seal is an essential part of preventing moisture infiltration into or migration out of a critical space, such as a data processing center or other room that contains sensitive electronic instrumentation. Essentially, a vapor seal is a barrier that prevents air, moisture, and contaminants from migrating through tiny cracks or pores in the walls, floor, and ceiling into the critical space. Vapor barriers may be created using plastic film, vapor-retardant paint, vinyl wall coverings and vinyl floor systems, in combination with careful sealing of all openings (doors and windows) into the room.

**Watt** A unit of electricity consumption representing the product of amperage and voltage. When the power requirement of a product is listed in watts, you can convert to amps by dividing the wattage by the voltage. (e.g., 1200 watts divided by 120 volts is 10 amps.)

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