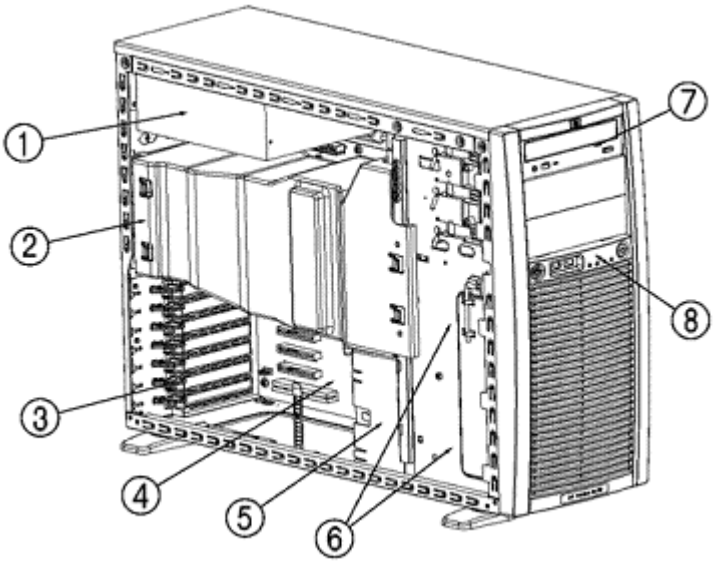
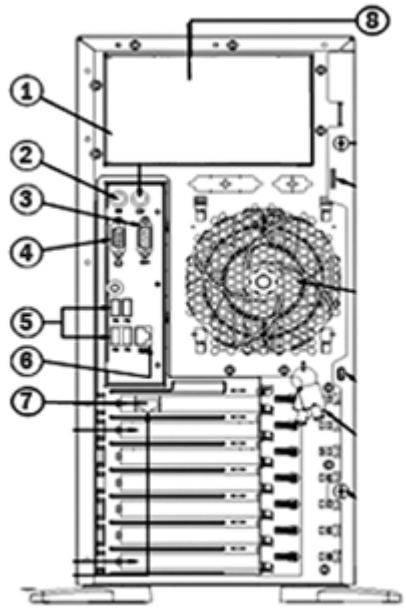
Overview





Front View:

1. Power Supply
2. Processor Air Duct
3. Six Expansion Slots
4. Main System Board
5. Front System Fan
6. Hard Drive Bays (up to 8)
7. DVD-ROM Drive
8. Lockable Bezel

Rear View:

1. Mouse Port
2. Keyboard Port
3. Serial Port
4. Monitor Port
5. USB Port
6. Network Port
7. Dedicated LO100 LAN Management Port
8. Power Supply

What's New

- Support for SAS/SATA Hot Plug and Non-Hot Plug Hard Drives

Overview

At A Glance

- Processor:
  - Quad-Core Intel® Xeon® processor E5400 sequence
  - Dual-Core Intel® Xeon® processor E5200 sequence
  - Intel® 5100 chipset
  - 1066 MHz or 1333MHz Front Side Bus
- Memory:
  - PC2-5300 Registered Buffered DIMMs (DDR2-667) Memory
  - 1 or 2 GB standard
  - 16 GB maximum
- Storage Controller:
  - HP Embedded SATA RAID Controller (RAID 0,1,10)
  - SAS Model: HP SAS SC40Ge PCI Express to 4-Port SATA/SAS HBA Controller
    NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.
  - Performance Model: HP Smart Array E200/128 BBWC SATA/SAS Controller
- Internal Drive Support:
  - Internal SAS storage capacity of up to 8.0TB (8 x 1TB SAS drives)
  - Internal SATA storage capacity of up to 8.0TB (8 x 1TB SATA drives)
  - Supports up to Eight (8) SAS/SATA hard drives via HBA or RAID Controller
- Network Controller:
  - Embedded HP NC105i PCI Express Gigabit Server Adapter
- Expansion Slots:
  - Six expansion slots: Two (2) PCI-Express x8, Three (3) PCI-Express x4(x8 connector) and One (1) PCI (32-bit/33MHz). One slot designated for optional HP ProLiant 100 G5 Lights-Out 100c Remote Management Card
- USB Ports:
  - Eight (8) USB 2.0 ports:- 4 rear, 2 front, 2 Internal(1 standard and 1HP 5-pin)
- Power Supply:
  - One 650W Single Non-Redundant Power Supply
  - 750W Redundant Power Supply(Optional)
- Form Factor:
  - 5U Tower Models. Rack models optional HP Tower to Rack Conversion Tray, Universal Kit
- Management:
  - Optional HP ProLiant 100 G5 Lights-Out 100c Remote Management Card
- Deployment/Serviceability:
  - Easy chassis entry and component access
  - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
- Warranty:
  - This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. SATA hard drives have a one year warranty.
    NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. (3-1-1 warranty offered in AP only, excluding Japan only). Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Standard Features

NOTE: For a brief, printer friendly data sheet that describes this product and informs you of the essential capabilities and specifications, please visit: http://ccesalewspr02.cce.hp.com/docfiles/concentra/604671239/4AA1-7091ENW.pdf

Processor One of the following depending on configuration	Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W) Quad-Core Intel® Xeon® processor E5405 (2.0 GHz,1333 FSB, 80W) Quad-Core Intel® Xeon® processor E5410 (2.33 GHz,1333 FSB, 80W) Quad-Core Intel® Xeon® processor E5420 (2.50 GHz,1333 FSB, 80W) Quad-Core Intel® Xeon® processor E5430 (2.66 GHz,1333 FSB, 80W) Quad-Core Intel® Xeon® processor E5440 (2.83 GHz, 1333 FSB, 80W)
Cache Memory	Integrated 1 x 6 MB level 2 cache (E5200 sequence) Integrated 2 x 6 MB level 2 cache (E5400 sequence)
Upgradeability	Upgradeable to two processors (Dual or Quad-Core) NOTE: Please contact your regional sales support NOTE: Future upgradeable to Xeon® Series 5400/5300 Quad-Core processors (Please contact your regional sales support to determine quad core upgradeability. Some of the earlier shipping models may not support this upgrade). 5100 Dual-Core models are not upgradeable to the 5200 Dual-Core processors.
Chipset	Intel® 5100 Chipset

Memory

Type	PC2-5300 Registered Buffered DIMMs (DDR2-667)
Standard for NHP SATA Models	1 GB
Standard for HP SAS/SATA Model and Performance Model	2 GB
Maximum	16 GB

Network Controller	Embedded HP NC105i PCI Express Gigabit Server Adapter 10/100/1000 WOL (Wake on LAN)

Standard Features

Expansion Slots #	Technology	Bus Width	Connector Width	Bus Number*	Form Factor	Notes
1	32-bit/33MHz PCI	N/A	N/A	0x0A	Full length, full height slot	Non Hot-plug
2	PCI-Express (Gen 1)	x4	X8	0x03	Full length, full height slot	Non Hot-plug
3	PCI-Express (Gen 1)	X4	X8	0x05	Full length, full height slot	Non Hot-plug
4	PCI-Express (Gen 1)	X4	X8	0x01	Full length, full height slot	Non Hot-plug
5	PC-Express (Gen 1)	X8	X8	0x02	Full length, full height slot	Non Hot-plug
6	PCI-Express (Gen 1)	X8	X8	0x09	Full length, full height slot	Non Hot-plug

Storage Controller	SATA/SAS Model	HP Embedded SATA RAID Controller HP SAS SC40Ge PCI Express to 4-Port SATA/SAS HBA Controller NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.
	Performance Model	HP Smart Array E200/128 BBWC SATA/SAS Controller
Storage	Diskette Drive	None ship standard 1.44 MB USB Diskette Drive Option available
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
	Hard Drives	None ship standard SAS and SATA hard drive options are available One 160GB Non-Hot Plug HDD for Non-Hot Plug BTO models
Maximum Internal Storage	SATA	8.0TB (8 x 1TB) SATA (With optional SAS controller)
	SAS	8.0TB (8 x 1TB) SAS (With optional SAS controllers)
	NOTE: The Embedded SATA RAID controller support for a single logical drive is limited to 2TB.	

Standard Features

Interfaces	Parallel	0
	Serial	1
	Pointing Device (Mouse, PS2)	1
	Graphics	1
	Keyboard (PS2)	1
	USB 2.0 Ports Dedicated USB	8 (4 Rear, 2 Front, and 2 Internal) 1 (available for USB tape connectivity) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.
	Network RJ-45 (Ethernet)	1 (10/100/1000 Gbits/s)
	Remote Management	1 (10/100 via optional HP ProLiant 100 G5 Lights-Out 100c Remote Management Card

Graphics	32MB shared supporting 1600x1200x16M resolution
Form Factor	Tower (5U) NOTE: Rack mounting available via HP Tower to Rack Conversion Tray, Universal Kit. Please see the options section in this QuickSpecs.
Industry Standard Compliance	ACPI V2.0 compliant PCI 2.3 compliant PXE Support WOL Support Microsoft® Logo certifications
Manageability	Optional HP ProLiant 100 G5 Lights-Out 100c Remote Management Card Embedded IPMI standard reporting
Security	Power-on password Setup password Diskette boot control
Server Power Cords	One Lowline NEMA power cord
Power Supply	One 650W Non-Redundant Power Supply, Non-hot plug 750W Redundant Power Supply (Optional)

Standard Features

System Fans	Two (2) – Non-hot plug, Non-redundant system fans	
Remote Management	Lights-Out 100c	Lights Out LO100c is a Remote Management Card (RMC) for HP ProLiant 100 series servers that do not have embedded LO100i. The LO100c has all the features of the LO100i Advanced license and allows customers, or their service providers, to remotely manage HP ProLiant servers over a LAN or the Internet from anywhere, anytime regardless whether the server is located in the same building, across town, or around the globe. With LO100c, users can acquire complete remote control with Virtual KVM (graphical hardware-based, remote console). Users can also access the server's serial console, control system power, update system firmware and software, as well as monitor system environmental conditions. The LO100c remote management card can be accessed from a web browser or command line interface. This virtual "at-the-server" functionality means administrators stay in control of remote HP ProLiant 100 series servers. The HP Lights-Out100c consists of a management processor and firmware that provides cost-effective, entry-level lights-out functionality, basic system board management functions, and diagnostics. NOTE: For more information, please refer to the QuickSpecs for the LO100c found at:: http://h18004.www1.hp.com/products/servers/management/remotemgmt/lightsout100/index.html
OS Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris 10 for x86/x64 based Systems NetWare NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/supportos and our driver download page http://www.hp.com/support/ML150G5 NOTE: Netware 6.5 is supported with the non-RAID mode embedded SATA controller. For driver support in RAID mode with Netware 6.5, the Smart Array E200 Controller (P/N 411508-B21) or HP SC44Ge SAS PCI-E Host Bus Adapter (P/N 416096-B21) must be purchased.	

Standard Features

Factory Express Portfolio for Servers and Storage

HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging and custom packaging to meet customer needs. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant & HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services on your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eConfigure Enterprise Configurator now provides factory default racking for our HP hardware portfolio. This approach is aligned with our strategic direction to meet the needs and expectations of our valued customers. If you require "custom" rack configuration, please contact HP's Customer Business Center or an Authorized Partner for assistance.

Service and Support

HP Care Pack Services provide total care and support expertise with committed response designed to meet your IT and business needs.

HP Care Pack services include coverage for the HP branded hardware options qualified for the server that are purchased at the same time or afterward and internal to the enclosure. It also includes the 22" and smaller external monitors and tower UPS options up to 3kVA. These items will be covered at the same service level and for the same coverage period as the server. Coverage of UPS Battery is not included and standard warranty terms & conditions apply. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

To fully capitalize on your HP ProLiant servers' capabilities requires a service partner who thoroughly understands your server technology and systems environment. HP Services, an industry leader in provision of multi vender support solutions provides a range of support services designed to meet the varying needs of business. Whether an SMB or large global corporation HP has a ProLiant server support offer to help you speedily deploy and maximize system uptime.

Recommended Service – Simplify ProLiant solution implementation, maintenance and management.

- **Support Service** – 3 Year, 9x5 Next Business Day coverage, excluding HP holidays only
- **Deployment Service** – Hardware Installation only

Enhanced Service – Optimize service level to increase IT performance and availability

- **Support Service** – 3 Year 13x5 Same Business Day, 4-Hour response coverage
- **Deployment Service** – Installation and Start-up only

Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays.

For a complete listing of service offerings and information visit:
http://www.hp.com/services/proliantservices
http://www.hp.com/go/proliant/carepack

Standard Features

SAS/SATA Hot Plug Models

Performance Model	**Processor(s)** One of the following depending on Model	(1) Quad-Core Intel® Xeon® processor E5410 (2.33 GHz, 1333 FSB, 80W) (1) Quad-Core Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80W)
HP ML150G5 E5410 HP SATA/SAS, 2GB, (1P) 450164-xx1	**Cache Memory** One of the following depending on Model	Integrated 2 x 6 MB L 2 cache (E5400 sequence) Integrated 1 x 6 MB level 2 cache (E5200 sequence)
Base Model	**Memory**	2 GB PC2-5300 Registered DIMMs (DDR2-667)
HP ML150G5 E5405 HP SATA/SAS, 2GB (1P) 450163-xx1	**Network Controller**	Embedded HP NC105i PCI Express Gigabit Server Adapter 10/100/1000 WOL
	Storage Controller	SATA/SAS model: HP SC40Ge 4 Internal Port SATA/SAS Host Bus Adapter Performance model: HP E200 8 Internal Port Smart Array SAS/SATA Controller
	Hard Drive	None ship standard
	Internal Storage One of the following depending on Model	SAS: 8.0TB (8 x 1TB) SATA: 8.0TB (8 x 1TB) (With optional SAS controllers and 2nd HDD Cage)
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
	Form Factor	Tower standard; 5U rack via optional rack mounting kit

SATA Non-Hot Plug Models

HP ML150G5 E5205 NHP 160GB SATA, 1GB, (1P) 450161-xx1	**Processor(s)** One of the following depending on Model	(1) Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W) (1) Quad-Core Intel® Xeon® processor E5405 (2.00 GHz,1333 FSB, 80W)
	Cache Memory	Integrated 1x6MB L 2 cache (E5200 sequence)
HP ML150G5 E5405 NHP 160GB SATA, 1GB, (1P) 450162-xx1	**Memory**	1 GB PC2-5300 Registered DIMMs (DDR2-667)
	Network Controller	Embedded HP NC105i PCI Express Gigabit Server Adapter 10/100/1000 WOL
	Storage Controller	HP Embedded SATA RAID Controller
	Hard Drive	One 160GB Non-Hot Plug HDD
	Internal Storage	SATA: 4.0TB (4 x 1 TB) NOTE: A Hot-plug hard drive cage can be installed into a Non-hot plug server by ordering a HBA (or Smart Attay) plus one HP 2nd LFF Hot-plug hard drive cage kit.
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
	Form Factor	Tower standard; 5U rack via optional rack mounting kit

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

Models

Country Code Key	XX=00	NA
	XX=01	Australia
	XX=03	UK
	XX=04	Germany
	XX=05	France
	XX=06	Italy
	XX=07	Spain
	XX=13	Portugal
	XX=20	Brazil
	XX=29	Japan
	XX=37	AP
	XX=42	Euro
	XX=AA	PRC
	XX=AB	Taiwan
	XX=AD	Korea

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on CTO product offerings and requirements.
NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Chassis.

Step 1: Base Configuration (Select only one model from the following selections)

Models	HP ProLiant ML150 G5 Non-hot Plug SATA CTO Chassis	450290-B21
	Factory Integrated Models ship with:	
	Embedded HP NC105i PCI Express Gigabit Server Adapter 10/100/1000 WOL	
	Tower 5U Form Factor	
	HP ProLiant ML150 G5 Hot Plug SAS/SATA CTO Chassis	450291-B21
	Factory Integrated Models ship with:	
	Embedded HP NC105i PCI Express Gigabit Server Adapter 10/100/1000 WOL	
	Tower 5U Form Factor	

Step 2: Choose Required Options (Select only one option from each category unless otherwise noted)

Processors	Quad-Core Processor Option Kits	
	Quad-Core Intel® Xeon® processor E5405 (2.00 GHz,1333 FSB, 80W), FIO NOTE: If 2 processors are desired, select one 455420-L21 and one 455420-B21	455420-L21
	Quad-Core Intel® Xeon® processor E5410 (2.33 GHz,1333 FSB, 80W), FIO NOTE: If 2 processors are desired, select one 455421-L21and one 455421-B21	455421-L21
	Quad-Core Intel® Xeon® processor E5420 (2.50 GHz,1333 FSB, 80W), FIO NOTE: If 2 processors are desired, select one 455422-L21and one 455422-B21	455422-L21
	Quad-Core Intel® Xeon® processor E5430 (2.66 GHz,1333 FSB, 80W), FIO NOTE: If 2 processors are desired, select one 455423-L21and one 455423-B21	455423-L21
	Quad-Core Intel® Xeon® processor E5440 (2.50 GHz,1333 FSB, 80W), FIO NOTE: If 2 processors are desired, select one 455424-L21and one 455424-B21	455424-L21
	Dual-Core Processor Option Kits	
	Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W) NOTE: If 2 processors are desired, select one 455419-L21and one 455419-B21	455419-L21
Memory	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Single Rank Kit	461840-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
Hard Drives	NOTE: Required only if P/N 450290-B21 is selected in Step 1 above. NOTE: the components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	SATA Non-Hot Plug 3.5" Midline (MDL) Drives	

	HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
	HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
	HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
	SATA Non-Hot Plug 3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
	SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives	
	HP 400GB 3G 10K 3.5" DP SAS ENT HDD	508232-B21
	HP 450GB 3G 15K 3.5" DP SAS ENT HDD	454234-B21
	HP 300GB 3G 15K 3.5" DP SAS ENT HDD	417950-B21
	HP 146GB 3G 15K 3.5" DP SAS ENT HDD	417855-B21
	HP 300GB SAS 15K 3.5" SP HDD	431950-B21
	HP 146GB SAS 15K 3.5" SP HD	432093-B21
	HP 72GB SAS 15K 3.5" SP HDD	432095-B21
	NOTE: If a Non-Hot Plug CTO Chassis (450290-B21) is selected in Step 1 and SAS Non-Hot- Plug drives are selected, a SAS Array Controller must also be selected.	
Storage Controllers	NOTE: If one of the following Smart Array Controller or SAS HBA is selected; the HP Internal SAS/SATA 4-Port Cable (P/N 457692-B21) is also required.	
	Smart Array E200 Controller	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	SAS HBA	
	HP SC40Ge SAS HBA, FIO NOTE: RAID 0,1. NOTE: When using the SC40Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.	449176-B21
	HP SC44Ge SAS PCI-E Host Bus Adapter NOTE: RAID 0,1. NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	416096-B21
	SCSI HBA	
	HP SC11Xe U320 PCI-E Host Bus Adapter	412911-B21
	HP Internal SAS/SATA 4-Port cable	457692-B21
Power supply	ML150G5 650W Power Supply, FIO only	465462-B21
	HP ML150G5 750W Redundant Power Supply Kit	458310-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options " sections below.

Operating Systems	Pre-install Microsoft Windows 2003 Standard (English) NOTE: For additional language part numbers, please visit: http://www.hp.com/go/microsoft and select 'HP & Windows OS'. NOTE: For additional options, please refer to the "Options" section below. NOTE: For the installation of Windows and other OS's, a floppy drive may be required to complete driver installation if you have a SAS add-on card configured in system. For configurations without floppy drive; please purchase a HP USB Floppy Key. See options section of this QuickSpecs.	409167-B21

Core Options

NOTE: Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

Unique Options	HP ML150G5 2nd LFF HP Drive Cage Kit	458312-B21
	HP ML150G5 750W Redundant Power Supply Kit, WW	458310-B21
	HP ML150G5 750W Redundant Power Supply Kit, US	458310-001
	HP ML150G5 750W Redundant Power Supply Kit, Australia	458310-011
	HP ML150G5 750W Redundant Power Supply Kit, Euro	458310-021
	HP ML150G5 750W Redundant Power Supply Kit, UK	458310-031
	HP ML150G5 750W Redundant Power Supply Kit, Japan	458310-291
	HP ML150G5 750W Redundant Power Supply Kit, PRC	458310-AA1
Processors	**Quad-Core Processor Option Kits**	
	Quad-Core Intel® Xeon® processor E5405 (2.00 GHz,1333 FSB, 80W)	455420-B21
	Quad-Core Intel® Xeon® processor E5410 (2.33 GHz,1333 FSB, 80W)	455421-B21
	Quad-Core Intel® Xeon® processor E5420 (2.50 GHz,1333 FSB, 80W)	455422-B21
	Quad-Core Intel® Xeon® processor E5430 (2.66 GHz,1333 FSB, 80W)	455423-B21
	Quad-Core Intel® Xeon® processor E5440 (2.83 GHz,1333 FSB, 80W)	455424-B21
	Dual-Core Processor Option Kits	
	Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W)	455419-B21
Memory	1 GB REG PC2-5300 2 x 512 MB Single Rank Kit	408850-B21
	2 GB REG PC2-5300 2 x 1 GB Single Rank Kit	408851-B21
	4 GB REG PC2-5300 2 x 2 GB Single Rank Kit	461840-B21
	8 GB REG PC2-5300 2 x 4 GB Dual Rank Kit	408854-B21
Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD RW Optical Drive	447328-B21
Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.	
	SATA Non-Hot Plug 3.5" Midline (MDL) Drives	
	HP 750GB 3G SATA 7.2K NHP 3.5" MDL HDD	462595-B21
	HP 500GB 3G SATA 7.2K NHP 3.5" MDL HDD	458941-B21
	HP 250GB 3G SATA 7.2K NHP 3.5" MDL HDD	458939-B21
	SATA Non-Hot Plug3.5" Entry (ETY) Drives	
	HP 160GB 3G SATA 7.2K NHP 3.5" ETY HDD	458947-B21
	SATA Hot Plug 3.5" Midline (MDL) Drives	
	HP 1TB 3G SATA 7.2K 3.5" MDL HDD	454146-B21

HP 750GB 3G SATA 7.2K 3.5" MDL HDD	458930-B21
HP 500GB 3G SATA 7.2K 3.5" MDL HDD	458928-B21
HP 250GB 3G SATA 7.2K 3.5" MDL HDD	458926-B21
SATA Hot Plug 3.5" Entry (ETY) Drives	
HP 160GB 3G SATA 7.2K 3.5" ETY HDD	458945-B21
NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)	
3.5" SATA Non-Hot Plug Drives	
HP 250GB 1.5G SATA 7.2K NHP 3.5" HDD	411276-B21
HP 160GB 1.5G SATA 7.2K NHP 3.5" HDD	411275-B21
3.5" SATA Hot Plug Drives	
HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
NOTE: The previous generation of 1.5G SATA Non-Hot Plug hard drives are supported. These drives can be purchased as an option, however, are no longer configurable.	
NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html (Worldwide)	
SAS Hot Plug 3.5" Midline (MDL) Drives	
HP 1TB 7.2K 3.5" DP SAS MDL HDD	461137-B21
HP 750GB 7.2K 3.5" DP SAS MDL HDD	461135-B21
SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives	
HP 400GB 3G NHP 10K 3.5" DP SAS ENT HDD	508232-B21
HP 450GB 3G NHP 15K 3.5" DP SAS ENT HDD	454234-B21
HP 300GB 3G NHP 15K 3.5" DP SAS ENT HDD	417950-B21
HP 146GB 3G NHP 15K 3.5" DP SAS ENT HDD	417855-B21
HP 300GB SAS 15K 3.5" SP HDD	431950-B21
HP 146GB SAS 15K 3.5" SP HD	432093-B21
HP 72GB SAS 15K 3.5" SP HDD	432095-B21
NOTE: SAS hard drives require a SAS HBA or Smart Array Controller.	
NOTE: SAS non-hot plug drives will also require the HP Internal SAS/SATA 4-Port cable (P/N 457692-B21)	
SAS Hot Plug 3.5" Enterprise (ENT) Drives	
HP 400GB 3G SAS 10K 3.5" DP HDD	459508-B21
HP 450GB 3G SAS 15K 3.5" DP HDD	454232-B21
HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21

Core Options

	HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
	HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
	HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
	HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21
	NOTE: SAS hard drives require a SAS HBA or Smart Array Controller.	
	NOTE: SAS non-hot plug drives will also require the HP Internal SAS/SATA 4-Port cable (P/N 457692-B21)	
	NOTE: SATA drives have a 1 year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)	
Communications	HP NC110T PCI Express Gigabit Server Adapter	434905-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	v90 56K PCI Modem US (with specific modem cable) RoHS	EK694AA
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs	

Additional Options

Remote Management	HP ProLiant 100 G5 Lights-Out 100c Remote Management Card	445513-B21
Storage Controllers	**Smart Array E200 Controller**	
	HP Smart Array E200/128 BBWC Controller	411508-B21
	Optional Upgrades	
	HP Internal SAS/SATA 4-Port Cable	457692-B21
	NOTE: This cable is required when adding either the HP SC44Ge HBA (P/N 416096-B21) or the HP Smart Array E200 (P/N 411508-B21) on Non-Hot Plug SATA server models.	
	SAS HBA	
	HP SC44Ge SAS PCI-E Host Bus Adapter	416096-B21
	NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required. Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	
	SCSI HBA	
	HP SC11Xe U320 PCI-E Host Bus Adapter	412911-B21
	NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/12617_div/12617_div.html (SC44Ge HBA) http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SC11Xe HBA) http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html (Smart Array E200 Controller)	
Tape Storage	NOTE: Installation of SCSI internal tape drives in a ML150 model requires SCSI controller kit (PN 412911-B21).	
	NOTE: For complete listing of tape drive offerings see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html	
	Tape Drives	
	DAT USB Tape Drives	
	HP StorageWorks DAT 40 USB Internal Tape Drive (Carbonite)	DW022A
	HP StorageWorks DAT 72 USB Internal Tape Drive (Carbonite)	DW026A
	DAT SCSI Tape Drives	
	HP StorageWorks DAT 40 SCSI Internal Tape Drive (Carbon)	C5686C
	HP StorageWorks DAT 72 SCSI Internal Tape Drive (Carbon)	Q1522B
	HP StorageWorks DAT 160 SCSI Internal Tape Drive	Q1573A
	LTO Ultrium Tape Drives	
	HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
	HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847A

Additional Options

Disk-Based Backup	RDX Removable Disk Backup	
	HP RDX160 Internal Removable Disk Backup System NOTE: 160GB of Disk Storage	AJ765A
	HP RDX320 Internal Removable Disk Backup System NOTE: 320GB of Disk Storage	AJ767A
	HP RDX500 Internal Removable Disk Backup System NOTE: 500GB of Disk Storage	AJ934A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html	
	D2D Backup	
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit NOTE: 2TB of Disk Storage	EH924A
	HP StorageWorks D2D130 Backup System with LTO-3 Ultrium 920 SAS Tape Drive NOTE: 3TB of Disk Storage	EH952A
	NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information: http://www.hp.com/go/d2d	
Uninterruptible Power Systems	HP Tower UPS	
	HP T1500 G3 UPS Models	
	HP T1500 G3 UPS, INTL	AF451A
	HP T1500 G3 UPS, NA/JPN	AF450A
	HP T1000 G3 UPS Models	
	HP T1000 G3 UPS, INTL	AF449A
	HP T1000 G3 UPS, NA/JPN	AF448A
	HP T1000 G2 UPS	
	NOTE: Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html (Worldwide)	
	HP T750 UPS	
	HP T750 UPS, Low Voltage (NA/JPN)	378439-D71
	NOTE: Please see QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12192_div/12912_div.html (Worldwide)	

Additional Options

HP Rack Series	**HP Rack 10000 G2 Series** (Carbon/Graphite Metallic)	
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Shock Pallet	AF034A
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Pallet	AF038A
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Shock Pallet	AF044A
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Pallet	AF045A
	NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.	
	NOTE: Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
HP Rack Options	**HP KVM Switch Options**	
	IP Console Switch with Virtual Media (KVM/IP), 4x1x16	AF602A
	IP Console Switch with Virtual Media (KVM/IP), 2x1x16	AF601A
	Server Console Switch with Virtual Media (KVM), 0x2x16	AF600A
	PS2 Virtual Media Interface Adapter, 1 Pack NOTE: The AF604A is only compatible with the Console Switches with Virtual Media.	AF604A
	PS/2 Interface Adapter, 1 pack	262588-B21
	PS/2 Interface Adapter, 8 pack	262587-B21
	NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	HP 1x4 Console Switch	AF611A
	HP PS2 Server Console Cable, 6 foot, 2-Pack	AF612A
	HP USB Server Console Cable, 6 foot, 2-Pack NOTE: required for supporting USB peripherals.	AF613A
	NOTE: For additional information regarding KVM switches, Serial Console servers, rack mount monitors, keyboards and all related options please see the following URL: http://www.hp.com/go/kvm.	
	Rack Kits	
	HP Tower to Rack Conversion Tray, Universal Kit	417705-B21
USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP USB 04 Standard Keyboard	DT528A#xxx
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	USB Floppy Drive, External	DC361B
	NOTE: For the installation of Windows and other OS's, a floppy drive or the HP USB Floppy Drive Key may be required to complete driver installation. A standard USB drive key may not work to complete driver installation	

Additional Options

Service and Support Offerings (HP Care Pack Services)	Support Service	
	Next Business Day On-Site Service, 9-Hour x 5-Day Coverage, 3 Years, Electronic	U8184E
	Same Business Date On-Site Service 13-Hour x 5-Day Coverage, 3 Years, Electronic	U8192E
	Deployment Services	
	Hardware Installation, Electronic (install services)	U8195E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack.	

HP ProLiant ML150 Generation 5 Server

DIMM Installation Guidelines:
NOTE: Charts do not represent all possible memory configurations. Memory must be populated in one of the following ways:

1. Slot 1 only; slots 1 and 2 only (pairs must be of the same size)
2. Slots 1, 2, 3, 4, 5 ,and 6 (pairs must be of the same size and in the example below with slots 1 and 2 the same and slots 2 and 3 the same, and slots 5 and 6 the same)
3. Dual rank DIMMs can only be supported in slots 1 and 2.

Standard Memory
All HP ML150 G5 models ship with PC2-5300 Registered DIMMs (DDR2-667)
Hot Plug SAS/SATA (performance and/or base) models include 2 x 1 GB DIMMs (2 GB total)
Non-Hot Plug SATA models include two 512 MB DIMMs (1 GB total)
Factory Integrated Models include the memory capacity of your choice.

Standard Memory Replaced with Optional Memory
Up to 16 GB of memory is available with the removal of the standard 1 GB of memory and the optional installation of PC2-5300 Registered DIMMs (DDR2-667) Memory kits.

Dual Rank Memory Options							
Memory		Slot					
		1A	2A	3B	4B	5C	6C
		DR	DR				
		DR	DR	DR	DR		
Standard	2 GB	1 GB	1 GB	Empty	Empty	Empty	Empty
Optional	10 GB	1 GB	1 GB	2 GB	2 GB	2 GB	2 GB
Maximum	16 GB	4 GB	4 GB	2 GB	2 GB	2 GB	2 GB

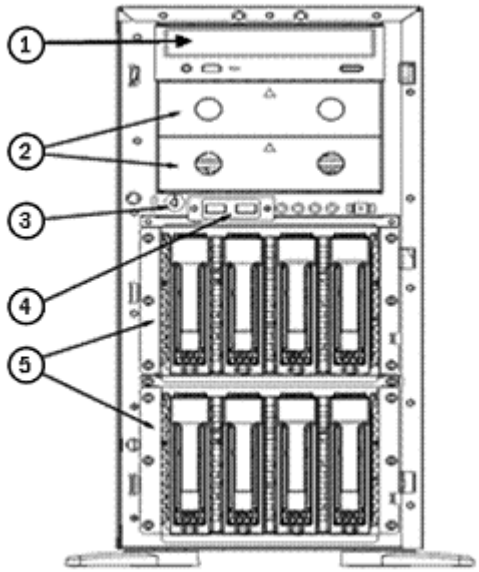
Dual Rank & Single Rank Memory Options							
Memory		Slot					
		1A (Dual/Single Rank)	2A (Dual/Single Rank)	3B (Dual/Single Rank)	4B (Dual/Single Rank)	5C (Single Rank)	6C (Single Rank)
		DR	DR				
		DR	DR	SR	SR		
		DR	DR	SR	SR	SR	SR
		DR	DR	DR	DR		
Standard	1 GB	512 MB	512 MB	Empty	Empty	Empty	Empty
Optional	9 GB	512 MB	512 MB	2 GB	2 GB	2 GB	2 GB
Maximum	16 GB	4 GB	4 GB	2 GB	2 GB	2 GB	2 GB

NOTE: Please ensure socket 1 is populated, otherwise the system will not boot. Install memory in balanced pairs (see memory options) for best performance.

Following are memory options available from HP:

1 GB PC2-5300 DDR2 2 x 512 MB Single Rank Kit	408850-B21
2 GB PC2-5300 DDR2 2 x 1 GB Single Rank Kit	408851-B21
4 GB PC2-5300 DDR2 2 x 2 GB Single Rank Kit	461840-B21
8 GB PC2-5300 DDR2 2 x 4 GB Dual Rank Kit	408854-B21

Non-Hot Plug SATA or Hot Plug SAS/SATA



1 16x SATA DVD-ROM

2 Removable Media Bay with EMI Shield

3 Thermal Sensor

4 USB Port

5 Four/Eight Hot Plug SAS/SATA or Four Non-Hot Plug SATA Drive Bays

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
SATA DVD-ROM Drive	Up to 1	1	SATA

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

SAS Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
450GB 3G SAS 15K 400GB 3G SAS 10K 300GB 3G SAS 15K 146GB 3G SAS 15K 72GB 3G SAS 15K	Up to 8	5 (Drive slots 1-8)	LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter

SAS Non-Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
400GB 3G SAS 10K 450GB 3G SAS 15K 300GB 3G SAS 15K 146GB 3G SAS 15K 72GB 3G SAS 15K	Up to 8	5 (Drive slots 1-8)	LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter

Storage

SAS Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SAS 7.2K 750GB 3G SAS 7.2K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter

SATA Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K 750GB 3G SATA 7.2K 500GB 3G SATA 7.2K 250GB 3G SATA 7.2K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.

SATA Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller

SATA Non-Hot Plug 3.5" Midline (MDL)

	Quantity Supported	Position Supported	Controller
750GB 3G SATA15K 500GB 3G SATA 15K 250GB 3G SATA 15K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller

SATA Non-Hot Plug 3.5" Entry (ETY)

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 15K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller

3.5" SATA Non-Hot Plug Drives

	Quantity Supported	Position Supported	Controller
250GB 1.5G SATA 7.2K 160GB 1.5G SATA 7.2K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.

3.5" SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller

Storage

750GB 1.5G SATA 7.2K 500GB 1.5G SATA 7.2K 250GB 1.5G SATA 7.2K	Up to 8	5 (Drive slots 1-4)	Embedded 4 port SATA Controller (for HP SATA models) LSI SATA/SAS SC40Ge PCI Express to 4-Port Controller Smart Array E200 SATA/SAS Controller Optional HP SC44Ge SATA/SAS PCI-E Host Bus Adapter NOTE: When using the SC44Ge with SATA Hard Drives, 1.5G SATA Hard Drives are required.

NOTE: To support 8 drives, the purchase of the optional HP HDD cage and possibly purchase a second SATA/SAS controller for 8 port support are required.

Maximum Storage Capacity – SAS Models

Internal	8.0TB (8 x 1TB SAS hard drives)
Total	8.0TB (8 x 1TB SAS hard drives)

Maximum Storage Capacity – SATA Models

Internal	8.0TB (8 x 1TB SATA drives)
Total	8.0TB (8 x 1TB SATA drives)

Tape and Disk-Based Backup

NOTE: Installation of SCSI tape drives in a ML150 G5 model requires SCSI controller kit (PN: 412911-B21).
NOTE: For a complete listing of compatible tape and disk-based backup offerings, please visit: http://www.hp.com/go/connect.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
Internal USB Tape Drives DAT 40 USB DAT 72 USB DAT 160 USB	2	USB 2.0 port	N/A
External USB Tape Drives DAT 40 USB DAT 72 USB DAT 160 USB	External	USB 2.0 port	N/A
Internal SCSI Tape Drives DAT 40 DAT 72 DAT 160	2	HP SC11Xe Host Bus Adapter	412911-B21
External SCSI Tape Drives DAT 40 DAT 72 DAT 160	External	HP SC11Xe Host Bus Adapter	412911-B21
Internal SAS Tape Drives LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS	2	HP SC44Ge Host Bus Adapter	416096-B21

Storage

External SAS Tape Drives LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS	External	HP SC44Ge Host Bus Adapter	416096-B21
HP StorageWorks D2D Backup Systems D2D120 D2D130	External	Embedded Network Controller	N/A
HP StorageWorks Removable Disk Backup System, Internal RDX160 RDX320 RDX500	2	USB 2.0 port	N/A

Power Specifications

Part Number	459558-001
Spare Kit	461512-001
Operational Input Voltage Range (Vrms)	90 to 135 and 180 to 264 V ac full ranging
Frequency Range (Nominal) (Hz)	47 to 66 Hz

Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	600	600	600	600	600	600
Nominal Input Current (A rms)	10	10	5	5	5	5
Max Rated Input Wattage Rating (Watts)	800	780	760	750	750	750
Max. Rated VA (Volt-Amp)	842.10	821.05	844.44	833.33	833.33	833.33
Efficiency (%)	75	77	79	80	80	80
Power Factor	0.95	0.95	0.9	0.9	0.9	0.9
Leakage Current (mA)	3.5mA	3.5mA	3.5mA	3.5mA	3.5mA	3.5mA
Maximum Inrush Current (A peak)	50	50	50	50	50	50
Maximum Inrush Current duration (mS)	3	3	3	3	3	3

System Specifications

	Power**
HP ProLiant ML150 G5 Fully Configured	(see**)
Fully Loaded System Input Wattage (W)	630W
Fully Loaded System Input Current (A rms)	6A @ 115V, 3A @ 230V
Fully Loaded System Thermal (BTU- Hr)r)	1794 BTU (526W)
Fully Loaded System VA (Volt-Amp)	630
System Leakage with all power supplies loaded (mA)	3.5mA
System Inrush Current with all power supplies loaded (A)	50A
Power cord requirements	Nema 5-15P to IEC320-C13
	IEC320-C13 to IEC320-C14
**Power shown is for a fully configured system consisting of	
(2) CPU (4) double-sided DIMMs (6) HDDs SAS/SATA (1) DVD-ROM (3) x4 PCI-E (2) x8 PCI-E (1) PCI 32 3.3V (1) Lights-Out Remote Management (1) 650 watts power supply	

Power Specifications

Power Cords (13 Cord Sets)	
Country	Power Cord Part Number
APD	100614-009, 100613-008, 139867-004, 187487-004(India)
Brazil	285052-001
Italy	109197-008
Australia/New Zealand	100661-001
Euro	100614-009
France	100614-009
Germany	100614-009
Japan	139867-004
PRC	286496-001
UK/Singapore	100613-008
US, Taiwan	121565-001

System Unit	**Dimensions** (HxWxD)	7.87 x 16.7 x 24.28 in (20 x 42.4 x 61.68 cm)	
	Weight (approximate)	Maximum: (All hard drives, power supplies and processors installed)	60.96 lb (27.65 kg)
		Minimum: (One hard drive, power supply and processor installed)	40.9 lb (18.55 kg)
	Input Requirements (per power supply)	Range Input Voltage	90 to 135 VAC 180 to 265 VAC
		Normal Line Voltage	100 to 127 VAC 200 to 240 VAC
		Rated Input Current	load 11.6A at 100 to 127 VAC 5.5A at 200 to 240 VAC
		Rated Input Frequency	47 to 66 Hz
		Rated Input Power	930 W (Max)
	BTU Rating	Maximum	2218 BTU
	Power Specifications	To review typical power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/cal/Power%20Calculator%20Catalog.xls	
	Power Supply Output Power (per power supply)	Rated Steady-State Power	526 W (at 100 VAC) for system 526 W (at 200 VAC)
		Maximum Peak Power	526 W (at 100 VAC) 526 W (at 200 VAC)
	System Inlet Temperature	Operating	50° to 93° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per 1,000 ft (1.0° C per every 305 m) above seal level to a maximum of 10,000 ft (3050 m) no direct sustained sunlight . Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-Operating	-40° to 140° F (-30° to 60° C)
	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 101.7°F (38.7°C) maximum we bulb temperature, non-condensing
		Non-operating**	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3000m). Maximum allowable altitude change rate is 1°C per 300m
		Non-Operating	30,000 ft (9144m). Maximum allowable altitude change rate is 1°C per 300m

	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWad) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 9ECMA 109).	
		Idle (Fixed Disk Drives Spinning)	
		L WAd (BELS)	5.27 B
		L-pAm	36.5 dBA
		Operating (Random Seeks to Fixed Disks)	
		L WAd (BELS)	5.30 B
		L WAd (BELS)	36.9 dBA
	Emissions Classification (EMC)	FCC Rating	Class B
		Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
		NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.	
HP Half-Height SATA DVD-ROM Optical Drive	Disk	Applicable Disk	CD-ROM, CD-XA, CD-DA (Mode 1, Mode 2, Form 1 and 2)
			Photo CD (Single and Multi-session)
			Mixed Mode (Audio and Data combined)
			CD-R, CD-RW, DVD-ROM, DVD+R, DVD+RW
		Capacity	4.7 GB (DVD-5)
			8.54 GB (DVD-9)
	Block Size	DVD Media	2,048 bytes
	Interface	SATA	1.56Gb/s
	Access Times (typical)	Random	<140 ms
		Full-Stroke	<250 ms
	Data Transfer Rate	Sustained	8100 to 21600 KB/s (6X to 16X)
	Cache Buffer	128 KB	
	Start-up Time (typical)	< 7 seconds	
	Stop Time	< 4 seconds	
	Laser Parameters	Type	Semiconductor Laser GaA1As
		Wave Length	780 ± 25 nm
	Operating Conditions	Temperature	41° to 113° F (5° to 45° C)
		Humidity	10% to 90%

	Dimensions	(HxWxD, maximum)	1.7 x 5.85 x 8.11 in (4.49 x 15.0 x 20.3 cm)
		Weight	2.64 lb (1.2 kg)
HP 4 Internal Port SAS Host Bus Adapter	(SAS/SATA HP Model) (SC40Ge SATA/SAS controller)	Dimensions (excluding bracket)	6.6 x 2.5 x 0.6 in (16.8 x 6.4 x 1.6 cm)
		Disk Drive and Enclosure Protocol Support	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)
		Architecture	64-bit
		SAS Connectors	1 internal SFF8484 x4 Wide SAS Connectors 12 Gbps per x4 Wide SAS Port (4 x 3 Gbps)
		Data Transfer Method	PCI-Express x8 - 2 GB/s maximum bandwidth
		PCI Bus Speed	PCI-Express x8
		Simultaneous Drive Transfer Ports	1 x4 Wide SAS Connectors
		Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)
		Software upgradeable Firmware	Yes
		Maximum Capacity	1.2TB (4 x 300GB)
		Memory Addressing	64-bit, supporting servers memory greater than 4 GB
		Logical Drives Supported	Up to 2 Logical Volumes Up to 10 drives total in all RAID volumes Up to 2 Drives per RAID 1 Up to 4 Drives per RAID 0
		RAID Support	RAID 1 (Mirroring) RAID 0 (Striping)
		Upgradeable Firmware	4-MB flashable ROM
		Disk Drive and Enclosure Protocol Support	3 Gbps SAS and 1.5 Gbps SATA
HP E200/128 BBWC Smart Array Controller	(Performance Model)	Dimensions (excluding bracket)	6.6 x 2.5 x 0.6 in (16.8 x 6.4 x 1.6 cm)
		Disk Drive and Enclosure Protocol Support	3 Gbps SAS (Serial Attached SCSI) 1.5 Gbps SATA (Serial Advanced Technology Attachment)
		Architecture	64-bit
		SAS Connectors	2 internal SFF8484 x4 Wide SAS Connectors 12 Gbps per x4 Wide SAS Port (4 x 3 Gbps)
		Data Transfer Method	PCI-Express x8 - 2 GB/s maximum bandwidth
		PCI Bus Speed	PCI-Express x8
		Simultaneous Drive Transfer Ports	2 x4 Wide SAS Connectors
		Port Transfer Rate	12 Gb/s per x4 Wide SAS Port (4 x 3 Gb/s)

	Software upgradeable Firmware	Yes
	Maximum Capacity	2.4TB (8 x 300GB)
	Memory Addressing	64-bit, supporting servers memory greater than 4 GB
	Logical Drives Supported	<FILL IN>
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping) RAID 5
	Upgradeable Firmware	4-MB flashable ROM
	Disk Drive and Enclosure Protocol Support	3 Gbps SAS and 1.5 Gbps SATA
Embedded NC105i PCIe Gigabit Server Adapter (Embedded)	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	Data Transfer Method	Compliant to x1 PCIe Specification
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s 10Base-T (Full-Duplex) 20 Mb/s 100Base-TX (Half-Duplex) 100 Mb/s 100Base-TX (Full-Duplex) 200 Mb/s 1000Base-TX (Half and Full-Duplex) 2000Mb/s
	Connector	RJ-45 connector
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethernet on standard Category 5 UTP
HP Embedded SATA RAID Controller	Dimensions	N/A (embedded)
	Disk Drive and Enclosure Protocol Support	1.5 Gbps SATA
	Architecture	64-bit
	SAS Connectors	4 internal x1 SATA connectors
	Software Upgradeable Firmware	Yes
	Maximum Capacity	2TB
	Memory Addressing	6GB (maximum)
	Logical Drives Supported	2 (maximum)
	RAID Support	RAID 1 (Mirroring) RAID 0 (Striping) RAID 10

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.