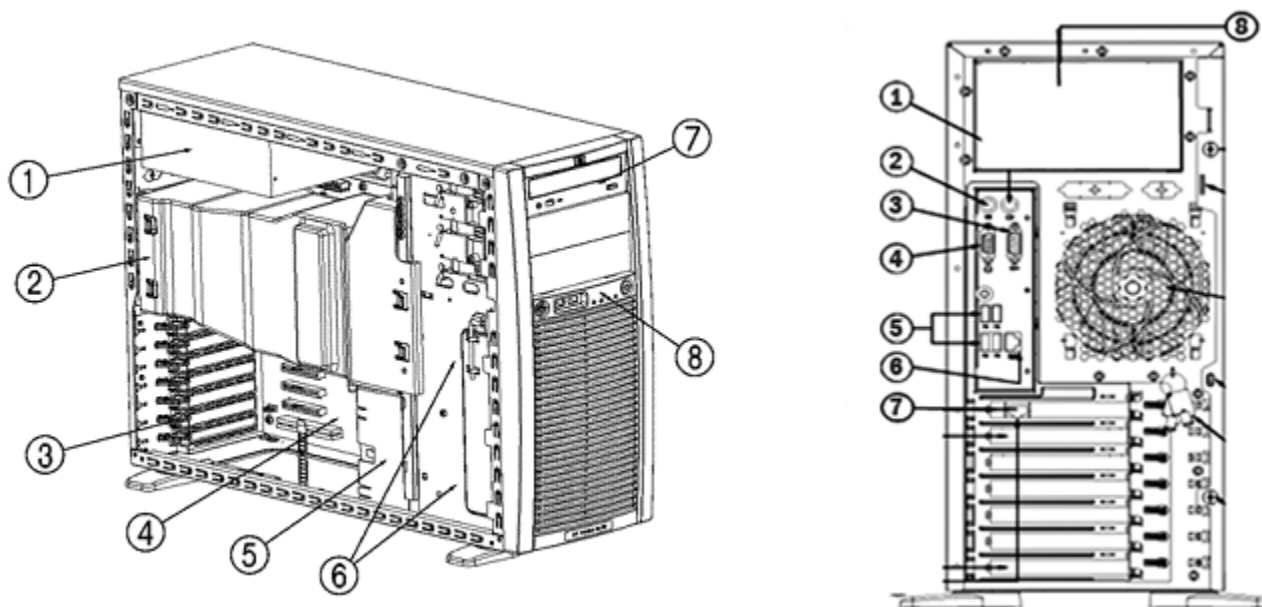*Overview*

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 Non-Hot Plug SAS Hard Drives

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)
  - HP SAS SC40Ge PCI Express to 4-Port SATA/SAS HBA Controller (SAS Model)
  - HP Smart Array E200/128 BBWC SATA/SAS Controller (Performance Model)
- **Internal Drive Support:**
  - Internal SAS storage capacity of up to 2.4TB (8 x 300GB SAS drives)
  - Internal SATA storage capacity of up to 6.0TB (8 x 750GB 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:**

Overview

- ○ 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
- **Warranty:**
  - ○ Protected by HP Services and a worldwide network of HP Authorized Channel Partners, including a one-year, limited warranty, Next Business Day 1, year on-site limited Global warranty. Certain restrictions and exclusions apply. 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. 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 1x6MB level 2 cache (E5200 sequence)
	Integrated 2x6MB level 2 cache (E5400 sequence)

Upgradeability	Upgradeable to two processors (Dual or Quad-Core)
	NOTE: Please contact your regional sales support

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)

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
	Performance Model	HP Smart Array E200/128 BBWC SATA/SAS Controller

Standard Features

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	6.0TB (8 x 750GB) SATA (With optional SAS controller)
	SAS	2.4TB (8 x 300GB) SAS (With optional SAS controllers)
	NOTE: The Embedded SATA RAID controller support for a single logical drive is limited to 2TB.	

Interfaces	Parallel	0
	Serial	1
	Pointing Device (Mouse, PS2)	1
	Graphics	1
	Keyboard (PS2)	1
	USB 2.0 Ports	8 (4 Rear, 2 Front, and 2 Internal)
	Dedicated USB	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	Integrated graphics controller with 8MB DDR2 video RAM
	Supports up to 1600x1200 x 16 million color

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

Standard Features

Server Power Cords	One Lowline NEMA power cord

Power Supply	One 650W Non-Redundant Power Supply, Non-hot plug

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

Unified Foundation Management	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq, software and latest drivers	The latest software, drivers, and firmware fully optimized and tested for your HP ProLiant server and options, available through software and drivers download pages website at: http://www.hp.com/go/support.
	NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information. **NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials.	

Standard Features

OS Support	Windows 2003 R2 Web edition
	Windows 2003 R2 Small Business edition
	Windows 2003 R2 Standard Edition (x86 and x64)
	Windows 2003 R2 Enterprise Edition (x86 and x64)
	Windows 2008 Standard Edition (x86 and x64)
	Windows 2008 Enterprise Edition (x86 and x64)
	Red Hat EL 5/4 (x86 and x64)
	SLES 10/9 (x86 and x64)
	Netware 6.5
	SCO OpenServer Legend 6.0.1
	SCO Unixware 7.1.4

NOTE: For an up-to-date listing of the latest ML150 OS support matrix, please see: http://www.hp.com/go/supportos

NOTE: For an up-to-date listing of the latest drivers available for this server, please see: http://www.hp.com/support.

NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix http://h18004.www1.hp.com/products/servers/linux/hpLinuxcert.html

---

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 MSA1000, 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 http://www.hp.com/go/factory-express.

HP Enterprise Configurator

The HP eCo-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.

Standard Features

Service and Support

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. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

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

QuickSpecs

Models

SAS/SATA Hot Plug Models

Performance Model	**Processor(s)**	(1) Quad-Core Intel® Xeon® processor E5410 (2.33 GHz, 1333 FSB, 80W)
HP ML150G5 E5410 HP SATA/SAS, 2GB, (1P)	One of the following depending on Model	(1) Quad-Core Intel® Xeon® processor E5405 (2.00 GHz, 1333 FSB, 80W)
450164-xx1	**Cache Memory**	Integrated 2x6MB L 2 cache (E5400 sequence)
Base Model	One of the following depending on Model	Integrated 1x6MB level 2 cache (E5200 sequence)
HP ML150G5 E5405 HP SATA/SAS, 2GB (1P)	**Memory**	2 GB PC2-5300 Registered DIMMs (DDR2-667)
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	2.4TB (8 x 300GB) SAS
	One of the following depending on Model	6.0TB (8 x 750GB) SATA (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)	**Processor(s)**	(1) Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W)
450161-xx1	One of the following depending on Model	(1) Quad-Core Intel® Xeon® processor E5405 (2.00 GHz,1333 FSB, 80W)
HP ML150G5 E5405 NHP 160GB SATA, 1GB, (1P)	**Cache Memory**	Integrated 1x6MB L 2 cache (E5200 sequence)
	Memory	1 GB PC2-5300 Registered DIMMs (DDR2-667)
450162-xx1	**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	2.0TB (4 x 500GB) SATA
		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

Configuration Information-Factory Integrated Models

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.
NOTE: This product offering does not support HP Factory Express Server Configuration Level 1.

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	455420-L21
	NOTE: If 2 processors are desired, select one 455420-L21 and one 455420-B21	
	Quad-Core Intel® Xeon® processor E5410 (2.33 GHz,1333 FSB, 80W), FIO	455421-L21
	NOTE: If 2 processors are desired, select one 455421-L21and one 455421-B21	
	Quad-Core Intel® Xeon® processor E5420 (2.50 GHz,1333 FSB, 80W), FIO	455422-L21
	NOTE: If 2 processors are desired, select one 455422-L21and one 455422-B21	
	Quad-Core Intel® Xeon® processor E5430 (2.66 GHz,1333 FSB, 80W), FIO	455423-L21
	NOTE: If 2 processors are desired, select one 455423-L21and one 455423-B21	
	Quad-Core Intel® Xeon® processor E5440 (2.50 GHz,1333 FSB, 80W), FIO	455424-L21
	NOTE: If 2 processors are desired, select one 455424-L21and one 455424-B21	
	Dual-Core Processor Option Kits	
	Dual-Core Intel® Xeon® processor E5205 (1.86 GHz, 1066FSB, 65W)	455419-L21
	NOTE: If 2 processors are desired, select one 455419-L21and one 455419-B21	
Memory	1 GB PC2-5300 DDR2 (2 x 512 MB) Kit, single rank	408850-B21
	2 GB PC2-5300 DDR2 (2 x 1 GB) Kit, single rank	408851-B21
	4 GB PC2-5300 DDR2 (2 x 2 GB) Kit, single rank	461840-B21
	8 GB PC2-5300 DDR2 (2 x 4GB) Kit, dual rank	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.	
	Non Hot Plug SATA Drives	
	HP 160GB 1.5G SATA 7.2K 3.5" NHP HDD	411275-B21
	HP 250GB 1.5G SATA 7.2K 3.5" NHP HDD	411276-B21
	HP 500GB 1.5G SATA 7.2K 3.5" NHP HDD, FIO	404469-B21
	Non Hot Plug SAS Drives	
	HP 72GB 3G SAS 15K 3.5" SP HDD	432095-B21
	HP 146GB 3G SAS 15K 3.5" SP HD	432093-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431950-B21

Configuration Information-Factory Integrated Models

	NOTE: If a Non-Hot Plug SAS hard drives is selected with the Non-Hot-Plug CTO Chassis; the HP Internal SAS/SATA 4-Port cable (P/N 457692-B21) and SAS HBA or Smart Array Controller is required. Please see the Storage Controller section of this QuickSpecs	
Storage Controllers	HP SC40Ge 4 Int. SAS RAID PCI-E HBA, FIO only	449176-B21
	HP SC44Ge SAS PCI-E Host Bus Adapter	416096-B21
	HP SC11Xe U320 PCI-E Host Bus Adapter	412911-B21
	HP Smart Array E200/128 BBWC Controller	411508-B21
	HP Internal SAS/SATA 4-Port cable	457692-B21
Power supply	ML150G5 650W Power Supply, FIO only	465462-B21

Step 3: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below. Some options may not be available for factory integration. Please contact an HP sales representative for additional information.

Operating Systems	Pre-install Microsoft Windows 2003 Standard (English)	409167-B21
	Pre-install Microsoft Windows 2003 Small Business Server, Premium Edition (English)	379603-B21
	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.	

Options

Unique Options	HP ML150G5 2nd LFF HP Drive Cage Kit	458312-B21

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 PC2-5300 DDR2 (2 x 512 MB) Kit, single rank	408850-B21
	2 GB PC2-5300 DDR2 (2 x 1 GB) Kit, single rank	408851-B21
	4 GB PC2-5300 DDR2 (2 x 2 GB) Kit, single rank	461840-B21
	8 GB PC2-5300 DDR2 (2 x 4GB) Kit, dual rank	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	**Hot Plug SATA Drives**	
	HP 160GB 1.5G SATA 7.2K 3.5" HDD	349238-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	349239-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	395473-B21
	HP 750GB 1.5G SATA 7.2K 3.5" HDD	432341-B21
	Non Hot Plug SATA Drives	
	HP 160GB 1.5G SATA 7.2K 3.5" HDD	411275-B21
	HP 250GB 1.5G SATA 7.2K 3.5" HDD	411276-B21
	HP 500GB 1.5G SATA 7.2K 3.5" HDD	404469-B21
	Hot Plug SAS Drives	
	HP 72GB 3G SAS 15K 3.5" SP HDD	375870-B21
	HP 72GB 3G SAS 15K 3.5" DP HDD	384852-B21
	HP 146GB 3G SAS 15K 3.5" SP HDD	375872-B21
	HP 146GB 3G SAS 15K 3.5" DP HDD	384854-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
	HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21
	Non-Hot Plug SAS Drives	
	HP 72GB 3GB SAS 15K 3.5" SP HDD	432095-B21
	HP 146GB 3G SAS 15K 3.5" SP HD	432093-B21
	HP 300GB 3G SAS 15K 3.5" SP HDD	431950-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)	

Options

Storage Controllers	HP SC44Ge SAS PCI-E Host Bus Adapter	416096-B21
	HP SC11Xe U320 PCI-E Host Bus Adapter	412911-B21
	HP Smart Array E200/128 BBWC Controller	411508-B21
	HP Internal SAS/SATA 4 in 1 to 4 in 1 Cable	438160-B21
	NOTE: This cable is required when adding either the HP SC44Ge or the HP Smart Array E200 on a hot-plug model	
	HP Internal SAS/SATA 4-Port Cable	457692-B21
	NOTE: This cable is required when adding either the HP SC44Ge or the HP Smart Array E200 on a non hot-plug SATA model	

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

Remote Management	HP ProLiant 100 G5 Lights-Out 100c Remote Management Card	445513-B21

Tape Drives	**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	
	DAT USB Tape Drives	
	HP StorageWorks DAT 40 USB Internal Tape Drive (Carbonite)	DW022A
	HP StorageWorks DAT 72 USB Internal Tape Drive (Carbonite)	DW026A
	HP StorageWorks DAT 160 USB Internal Tape Drive	Q1580A
	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-1 Ultrium 232 Internal Tape Drive (Carbonite)	DW064A
	HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive (Carbonite)	DW016A

Options

HP D2D Backup System	HP StorageWorks D2D110 Backup System **NOTE:** 1TB of Disk Storage	EH880A
	HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit **NOTE:** 1TB of Disk Storage	EH923A
	HP StorageWorks D2D120 Backup System **NOTE:** 2TB of Disk Storage	EH884A
	HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit **NOTE:** 2TB of Disk Storage	EH924A
	HP StorageWorks D2D130 Backup System **NOTE:** 3TB of Disk Storage.	EH950A
	HP StorageWorks D2D130 Backup System with Data Protector Express Software Kit **NOTE:** 3TB of Disk Storage.	EH951A
	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://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html (Worldwide)	

Uninterruptible Power Systems - Tower Supply	HP T750 UPS, Low Voltage (NA/JPN)	378439-D71
	HP T750 UPS, High Voltage (INTL)	378439-B31
	HP T500 UPS, Low Voltage, NA/JPN	361475-001
	HP T1000, UPS, USB, INTL	AF405A
	HP T1000 UPS, JPN/TWN	AF404A
	HP T1000 UPS, NA	AF403A

Installation of Server into Racks	HP Tower to Rack Conversion Tray, Universal Kit	417705-B21

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
	USB Interface Adapter, 1 pack	336047-B21
	Serial Interface adapter - 1 Pack with power supply	373035-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

Options

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.

USB Options	HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver)	DC172B
	HP USB 04 Standard Keyboard	DT528A#xxx
	USB 2.0 4-port HUB	DG954A
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-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

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.

Memory

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.

SAS/SATA -Hot Plug Memory							
Memory		**Slot**					
		1 (Dual Rank)	**2** (Dual Rank)	**3** (Single Rank)	**4** (Single Rank)	**5** (Single Rank)	**6** (Single Rank)
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

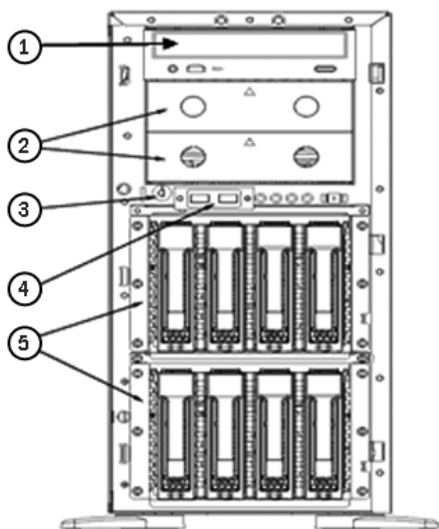| SATA - Non-Hot Plug Memory							
Memory		**Slot**					
		1 (Dual/Single Rank)	**2** (Dual/Single Rank)	**3** (Single Rank)	**4** (Single Rank)	**5** (Single Rank)	**6** (Single Rank)
Standard	1 GB	512 MB	512 MB	Empty	Empty	Empty	Empty
Optional	9 GB	512 MB	512 MB	2 GB	2 GB	2 GB	2 GB
Maximum	16 GB	4 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) Kit, single rank	408850-B21
2 GB PC2-5300 DDR2 (2 x 1 GB) Kit, single rank	408851-B21
4 GB PC2-5300 DDR2 (2 x 2 GB) Kit, single rank	461840-B21
8 GB PC2-5300 DDR2 (2 x 4GB) Kit, dual rank	408854-B21

Storage

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

SAS (Hot Plug Drives)

	Quantity Supported	Position Supported	Controller
300 GB SAS 15K 146 GB SAS 15K 72 GB SAS 10K	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 Drives) 300 GB SAS 15K 146 GB SAS 15K 72 GB 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

Hard Drives

SATA

	Quantity Supported	Position Supported	Controller
750GB 500GB 250GB 160GB	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

Storage

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	2.4TB (8 x 300GB SAS hard drives)
Total	2.4TB (8 x 300GB SAS hard drives)

Maximum Storage Capacity – SATA Models

Internal	6.0TB (8 x 750GB SATA drives)
Total	6.0TB (8 x 750GB SATA drives)

Tape Drives

NOTE: Installation of SCSI tape drives in a ML110 G5 model requires SCSI controller kit (PN: 412911-B21).

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following:
http://h18000.www1.hp.com/products/quickspecs/Division/10233.html (Worldwide)

	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 LTO-1 Ultrium 232 LTO-2 Ultrium 448	2	HP SC11Xe Host Bus Adapter	412911-B21
External SCSI Tape Drives DAT 40 DAT 72 DAT 160 LTO-1 Ultrium 232 LTO-1 Ultrium 448	External	HP SC11Xe Host Bus Adapter	412911-B21
HP StorageWorks D2D Backup Systems D2D110 D2D120 D2D130	External	Embedded Network Controller	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 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

Technical Specifications

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).	

Technical Specifications

Idle (Fixed Disk Drives Spinning)	36 dBA
L WAd (BELS)	5.15 B
L-pAm	36 dBA
Operating (Random Seeks to Fixed Disks)	36 dBA
L WAd (BELS)	5.16 B
L WAd (BELS)	36 dBA

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)

Technical Specifications

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

Technical Specifications

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.

Technical Specifications