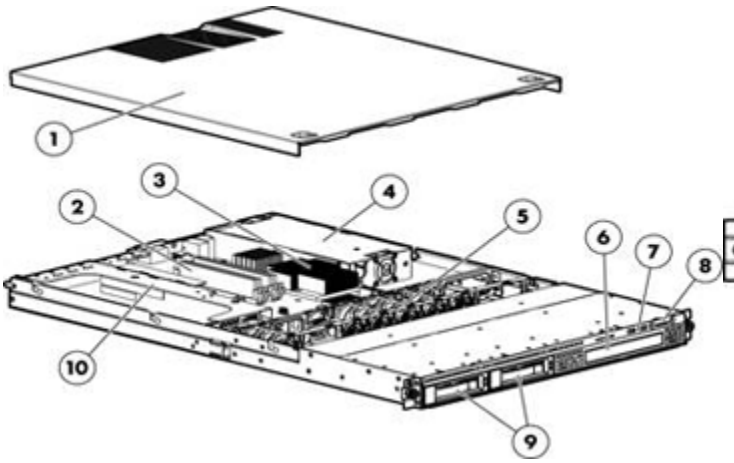
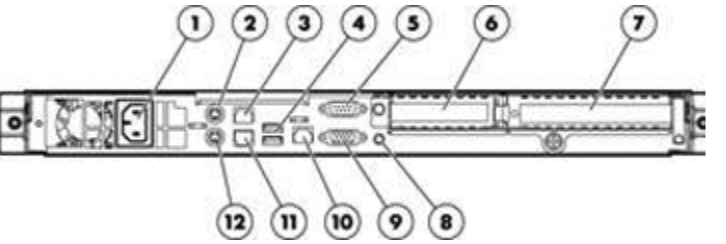
Overview





Front View:

1. Cover
2. Four PC2-6400 ECC DDR2 Memory Slots
3. Processor Socket (Intel® Xeon®, Core™2, Pentium® or Celeron®)
4. Power Supply (400 Watt)
5. Non Hot Plug Dual Rotor Fans
6. Optional 12.7mm DVD-ROM, or DVD-RW Drive for 2 HDD models and optional 9.5mm DVD-ROM, or DVD combo drive for 4-HDD model
7. Two upfront USB connectors
8. Power Button, UID Button, and Front LED Indicators
9. Support for up to four Hot Plug or Non Hot Plug SATA or SAS Hard Drives
10. Two PCI Slots (2 PCI-Express x8 connectors standard)

Rear View:

1. Power supply
2. Mouse connector
3. NIC 2 Port
4. USB connectors (2)
5. Serial connector
6. PCI Express expansion slot 5, low-profile, half-length
7. PCI Express expansion slot 4, (optional PCI-X, full-length)
8. UID button/LED
9. Video connector
10. Integrated Lights-Out 2 (iLO 2) management port (optional)
11. NIC 1 Port
12. Keyboard connector

At a Glance

The HP ProLiant DL320 G5p Server is an enterprise rack-optimized server at an entry level price. The highly manageable 1 processor, 1U server is ideal for single-application IT infrastructure, web and edge-of-network applications. The remote console and virtual KVM offered by the embedded iLO-2, coupled with the management features of SIM and deployment capabilities of SmartStart and other ProLiant Essentials software, give the DL320 G5p enterprise-class management features. Optional upgrades provide support for hot-plug SAS drives and/or up to 4 SAS or SATA drives, and gives the DL320 G5p the flexibility to meet the needs of your datacenter. Plus, you get the cost-effective solution of a single-processor platform with the performance advantages of dual-core or quad-core.

- **Processor:**
  - Quad-Core Intel® Xeon® 3200 processor sequence
  - Dual-Core Intel® Xeon® 3000 processor sequence
  - Dual-Core Intel® Core™2 E4400 processor
  - Dual-Core Intel® Pentium® E2160 processor
  - Single-Core Intel® Celeron® 420 processor
  - Intel 3210 Chipset with up to 1333MHz Front Side Bus (FSB)

Overview

- **Memory:**
  - Supports up to 8 GB of PC2-6400 (800 MHz) Unbuffered DDR2 ECC SDRAM Memory
  - 4 DIMM sockets
- **Storage Controller:**
  - 4 Port SATA Controller with RAID 0/1 support
- **Internal Drive Support:**
  - Up to four 3.5" (Large Form Factor) SATA or SAS hard drives
    - Two drive cage standard. Optional 4 HDD cage upgrade kit
    - SAS drives require optional SAS Host Bus Adapter (HBA)
    - Optional hot plug hard drive configuration
  - Internal storage capacity of up to 3.0TB (4 x 750GB SATA hard drives)
  - Optional DVD, DVD Combo or DVD-RW drive (depending on 2 or 4 HDD model)
- **Network Controller:**
  - Embedded NC326i Dual Port Gigabit Server Adapter
- **Expansion Slots:**
  - Two total slots:
    - (1) Full length PCI Express x8 slot (x8 connector)
      - Can be replaced with a full-length 64-bit /133MHz PCI-X slot
    - (1) Half-length, low-profile PCI Express x1 slot (x8 connector)
- **USB 2.0 Ports:**
  - Up to 5 Total: (2) front; (1) internal; (2) rear accessible ports
  - Internal USB port (optional) for flexible storage, security, or USB drive key deployment
- **Management:**
  - HP Insight Control Environment server management software
  - Integrated Lights-Out 2 featuring Integrated Remote Console
  - HP ProLiant Essentials Foundation Pack, including HP Systems Insight Manager, SmartStart, Rapid Deployment Pack
  - Front Panel status LEDs including system health and UID
- **Form Factor:**
  - 1U (1.70" / 4.32 cm) Rack Mount Chassis
  - 26.85" (68.20 cm) Deep
  - New fixed, mounting rails included with all models
- **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 parts repair is available for three years Next Business Day, with one year on-site support from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Expanded 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. SATA hard drives have a one-year warranty.
    NOTE: Server Warranty includes three year parts, one year labor, and one 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://h71028.www7.hp.com/ERC/downloads/4AA1-5500ENW.pdf.
NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor One of the following depending on Model	Quad-Core Intel® Xeon® processor 3220 (2.4GHz, 8MB L2 cache, 95 Watts, 1066MHz Front Side Bus (FSB)) Quad-Core Intel® Xeon® processor 3210 (2.13 GHz, 8MB L2 Cache, 95 Watts, 1066MHz FSB) Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 cache, 65 Watts, 1333MHz FSB) Dual-Core Intel® Xeon® processor 3065 (2.33 GHz, 4MB L2 Cache, 65 Watts, 1333MHz FSB) **NOTE:** Not available in Asia-Pacific and Japan Dual-Core Intel® Core™2 processor E4400 (2.0GHz, 2MB L2 cache, 800MHz FSB) Dual-Core Intel® Pentium® processor E2160 (1.80GHz, 1MB L2 cache, 800MHz FSB) **NOTE:** Not available in Japan Single-Core Intel® Celeron® processor 420 (1.60GHz, 512KB L2 cache, 800MHz FSB) **NOTE:** Not available in Latin America and Japan
Cache Memory One of the following depending on Model	8MB L2 Cache **NOTE:** For Models with Intel Xeon processor 3220 and 3210 4MB L2 Cache **NOTE:** For Models with the Intel Xeon processor 3075 and 3065 2MB L2 Cache **NOTE:** For Models with the Intel Core2 processor E4400 1MB L2 Cache **NOTE:** For Models with the Intel Pentium processor E2160 512KB L2 Cache **NOTE:** For Models with the Intel Celeron processor 420
Chipset	Intel 3210 Chipset
Memory Protection	ECC

Memory One of the following depending on Model		
	Type	PC2-6400 (800MHz) Unbuffered ECC DDR2 SDRAM Interleaving optional (Enabled when DIMMs populated in pairs)
	DIMM Sockets	4
	Standard - Xeon 3075 Model	1 GB (1 x 1 GB)
	Standard - Xeon 3210 Model	2 GB (2 x 1 GB)
	Maximum Memory	8 GB

Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter

Standard Features

Expansion Slots	Slot Number	Bus Speed	Height	Hot Plug	PCI Voltage
PCI-Express Non Hot-Plug Riser (Standard)	2	PCI Express x8 (x8 connector)	Full	no	
	1	PCI Express x1 (x8 connector)	Half	no	
PCI-X Non Hot-Plug Riser (Optional)	2	64-bit/133 MHz PCI-X	Full	no	3.3 Volt
	1	PCI Express x1 (x8 connector)	Half	no	

Storage Controllers

Integrated Intel 82801IR Serial ATA Host Controller with RAID 0/1 support.
Hot Plug SAS and SATA controllers available via PCI card option.

Storage

Optical Drive	Optional 2 HDD Models: 12.7mm DVD-ROM, or DVD-RW Drive 4 HDD Models: 9.5mm DVD-ROM, or DVD combo drive	
Hard Drives One of the following depending on Model	Hard Drives – Non Hot Plug SATA	Up to 2 or 4 non-hot plug SATA 3.5" drives
	Hard Drives – Hot Plug SATA/SAS	Up to 2 or 4 hot plug SATA or SAS 3.5" drives **NOTE:** Requires optional PCI card.

Maximum Internal Storage Type

SATA	3.0TB	4 x 750GB SATA
SAS	1.2TB	4 x 300GB SAS

Interfaces

Serial	1
USB 2.0	5 (2 front, 1 internal (optional), 2 rear) **NOTE:** Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html
Graphics	1 (rear)
Keyboard	1
Mouse	1
Network RJ-45	2
iLO 2 remote management port	1 (optional)

Graphics

Integrated ATI ES1000, 32MB video standard

- 16 bit color: maximum resolution of 1600 x 1200
- 32 bit color: maximum resolution of 1280 x 1024

NOTE: Maximum resolution available via iLO 2 remote console is 1280x1024.

Form Factor

Rack (1U), (1.70 in/4.32 cm), 26.85" deep

Standard Features

ProLiant Essentials Foundation Pack Software	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible environment to centrally manage servers, storage and other infrastructure devices across multiple operating system platforms. Through a single management view, HP SIM provides core management services that include device discovery and identification, event views, health monitoring, inventory data collection, software version control and reporting. HP SIM is built on industry standards and is extensible with value-added ProLiant Essentials, Integrity Essentials and Storage Essentials software to meet individual management needs. For more details on HP SIM visit http://www.hp.com/go/hpsim. HP SIM provides organizations with the following benefits: • Simplifies and consolidates infrastructure lifecycle management using task and query based functionality • Provides the foundation for infrastructure automation and virtualization • Enables IT management based on business processes not hardware platforms • Lowers infrastructure maintenance cost and frees resources for innovation • Maximizes resource utilization with virtualization technologies • Provides a central point of integration between infrastructure and Enterprise management tools such as HP OpenView
	SmartStart	SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart. SmartStart version supported (minimum): SmartStart 7.90.
	Insight Management Agents	Insight Management Agents should be installed on all HP servers to present system instrumentation, health and configuration information into HP Systems Insight Manager and the HP System Management Homepage. The HP System Management Homepage aggregates systems data from Insight Management Agents and other HP management tools, providing a consolidated browser-based interface for managing individual servers, Insight Management Agents and The HP System Management Homepage are included on ProLiant Support Packs, and can also be installed using the server profiles provided with the ProLiant Essentials Rapid Deployment Pack. For additional information about the Management Agents and the HP System Management Homepage please visit the management Web site at http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides automatic delivery of 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, support software, and configuration utilities	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options available in SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/servers/smartstart.

Standard Features

Survey Utility and diagnostics utilities	The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.
Optional ProLiant Essentials Value Packs	Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- **Accelerated iSCSI Pack -** enables the embedded Multifunction network controller to serve as both a NIC and an iSCSI HBA providing access to SAN storage over the same connection used for networking. Processing of the protocol stack is offloaded to the NIC reducing CPU utilization and greatly improving the speed with which the requests are processed and sent to the network.
- **HP Insight Control Environment** - is based on HP Systems Insight Manager and ProLiant Essentials software, and brings the value of Insight Control to ProLiant customers by delivering comprehensive health and performance monitoring, remote control, vulnerability scanning and patch management as well as flexible deployment and power management through an integrated installation package and streamlined licensing. For more information, visit: http://www.hp.com/go/ice
- **Rapid Deployment Pack** (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP disc includes 7-day, 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and is available for purchase with HP servers. For more information, visit: http://www.hp.com/servers/rdp.
- **Server Migration Pack** - Universal Edition - Upgrading, replacing, or virtualizing your existing server? Effortlessly transition to new virtual or physical HP ProLiant servers or BladeSystem with automated, accurate and affordable migration of OS, application and data. SMP Universal automates the manual processes required for migrating servers between physical or virtual platforms, whether migrating to VMware or Microsoft virtual machines. SMP Universal allows all of the following:
  - Physical to ProLiant
  - Physical to virtual
  - Virtual to virtual
  - Virtual to ProLiant
- **Performance Management Pack** (offered exclusively through the Insight Control suites) - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
- **Virtual Machine Management Pack** - Get the most out of server virtualization by unifying the management of physical and virtual servers in HP Systems Insight Manager. The Virtual Machine Management Pack plug-in provides central management and control of VMware and Microsoft virtual machines and provides physical host to virtual machine association.
- **Vulnerability and Patch Management Pack** (offered exclusively through the Insight Control suites) - identifies and remediates software security vulnerabilities due to missing patches as well

operating system configurations that can be exploited by viruses, worms, and other blended threats.

Optional Remote Management Packs

- **Integrated Lights-Out Advanced Pack** - upgrades the iLO 2 processor with comprehensive remote control including Virtual KVM remote graphical console, enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, power capping and enterprise security (directory services and two-factor authentication).
- **Integrated Lights-Out Select Pack** - upgrades the iLO 2 processor with enhanced console sharing and replay, virtual media (floppy, CD/DVD, USB key), virtual folders, historical power reporting, power capping and enterprise security (directory services and two-factor authentication) for servers managed using remote consoles available in iLO 2 Standard and iLO 2 Standard Blade Edition.
- **Insight Power Manager** (IPM) - upgrades the single-server remote management capabilities of iLO Select/Advanced to include centralized reporting and policy-based management of power consumption and thermal output provided by the Insight Power Manager. IPM unifies all of this functionality within a single user interface - HP Systems Insight Manager.

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

Industry Standard Compliance

ACPI 2.0
PCI 3.0 Compliant
PXE Support
WOL Support
Microsoft® Logo certifications
USB 2.0
IPMI 2.0
NOTE: iLO 2 management processor monitors fans, temperature sensors, power supply sensors and Vrms without having the System Management Driver loaded. In addition to reporting sensor status from all iLO 2 interfaces, the management processor also reports sensor status to the operating system through an IPMI 2.0 specified interface.

Standard Features

Remote Management Integrated Lights Out 2 (iLO2) Standard Management:

- Virtual Text Remote Console (pre-OS only)
- Remote Serial Console
- Virtual Power Button Control
- Virtual Unit ID control
- Integrated Remote Console
- Embedded system health
- Browser, command line and scripted access
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) and Secure Shell security (SSH)
- OS independent hardware health status
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privilege

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Intelligent Manageability

Automatic Server Recovery (ASR)
iLO 2 Advanced Pack (optional)
HP Systems Insight Manager
Integrated Management Log
Drive Parameter Tracking (with Smart Array Controllers)
Dynamic Sector Repairing (with Smart Array Controllers)
Pre-Failure Warranty (covers processors, SAS hard drives, and memory)
BIOS Serial Console
Front and Rear Unit ID (UID) button/LED

Security

Power-on password
Keyboard password
USB Port control
Removable DVD-ROM Drive Assembly (optional)
Dedicated iLO2 port (optional)
Administrator's password

Server Power Cords

North America	One 6' Highline (IEC-IEC) power cord ships standard
Japan	One 6' Highline (IEC) power cord and one 6' Lowline power cord ship standard
ROW	One 6' Highline (IEC) power cord ships standard

NOTE: HP ProLiant DL320 G5p servers hip standard worldwide with a C13 to C14 2M Highline jumper cord. Japanese models also include a 2M Lowline power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

Power Supply Auto-sensing 400-Watt PFC Power Supply, CE Mark Compliant

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UPS and PDU Power Cord Matrix Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units: http://h18004.www1.hp.com/products/servers/proliantstorage/power-protection/index.html

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System Fans 4 dual rotor fans ship standard. 4 dual rotor fans total supported internally.

Standard Features

Ultra Thin Rack Deployment Overview

For the Ultra Thin Rack Deployment Overview, including best practices for the HP ProLiant DL320 G5p, please see the following URL: http://www.hp.com/products/servers/ProLiantdl320/.

Required Cabling

For required cabling information, refer to the Web site at: http://www.hp.com/products/servers/ProLiantdl320/.

OS Support

Windows Server 2003 (web, standard, and enterprise editions; standard and enterprise editions for 64-bit extensions)
Red Hat Enterprise Linux
SUSE Linux Enterprise Server

NOTE: Support differences will exist between the SATA and SAS configurations.
NOTE: For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.
NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant DL320 G5p, please see:http://h18023.www1.hp.com/support/files/server/us/index.html.
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
NOTE: For more complete and up-to-date information on how to buy server operating systems from HP please visit the OS product site at:
http://h18004.www1.hp.com/products/servers/software/OEM.html

Rack Airflow Requirements

Rack 10000 series Cabinets
The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches)

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: http://h18004.www1.hp.com/products/servers/proliantdl320/index.html.

Rack Kit

The DL320 G5p Fixed Rail System supports installation in racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36". Installation into Telco 2 post, and 4 post, or threaded holes racks requires a 3rd party option kit. Go to www.racksolutions.com for more information.

Standard Features

HP Factory Express Capabilities

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. 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 for your specific server model please contact your sales representative or go to http://www.hp.com/go/factory-express.

Service and Support

HP Care Pack Services provide total care and support expertise with committed response times 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-inch 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 capitalizing 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 support solutions provides a range of support services designed to meet the varying needs of your business. Whether an SMB, or large global corporation, HP has ProLiant server support offers to help you speedily deploy and maximize system uptime.

Recommended Service - simplify ProLiant solution implementation, maintenance, and management.

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

Enhanced Service - optimize service level to increase IT performance and availability.

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

Refer to the information on the Installation of a ProLiant on the ProLiant Data Sheet; to be delivered on a scheduled basis 8am-5pm, M-F, excluding HP holidays.

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

Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

DL320 G5p X3075 / 1GB 445433-xx1	**Processor**	Dual-Core Intel® Xeon® processor 3075 (2.66GHz, 4MB L2 cache, 65 Watts, 1333MHz FSB)
	Cache Memory	4MB L2 Cache
	Chipset	Intel 3210 chipset
	Memory	1 GB (Standard) to 8 GB (Maximum) of ECC PC2-6400 Unbuffered DDR2 SDRAM Memory
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	Intel® 82801IR Integrated Serial ATA Host Controller
	Hard Drives	None ship standard
	Maximum Internal Storage	3.0TB with SATA drives, 1.2TB with SAS drives (SAS requires optional PCI controller)
	Optical Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.32 cm)

DL320 G5p X3210 / 2GB 445434-xx1	**Processor(s)**	Quad-Core Intel® Xeon® processor 3210 (2.13GHz, 8MB L2 cache, 95 Watts, 1066MHz FSB)
	Cache Memory	8MB L2 Cache
	Chipset	Intel 3210 chipset
	Memory	2 GB (Standard) to 8 GB (Maximum) of ECC PC2-6400 Unbuffered DDR2 SDRAM Memory
	Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
	Storage Controller	Intel® 82801IR Integrated Serial ATA Host Controller
	Hard Drives	None ship standard
	Maximum Internal Storage	3.0TB with SATA drives, 1.2TB with SAS drives (SAS requires optional PCI controller)
	Optical Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.32 cm)

Country Code Key	xx=00	North America
	xx=29	Japan
	xx=37	APD (Asia excluding Japan)
	xx=42	EURO (Europe / Middle East / Africa)
	xx=AA	PRC

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.
NOTE: FIO indicates that this option only available as a Factory Installable Option.

Step 1: Base Configuration (choose one of the following configurable models)

Models	DL320G5p CTO (Configure-To-Order) Chassis	445436-B21
	Includes:	
	Embedded NC326i Dual Port Gigabit Server Adapter	
	1 full length PCI Express x8 slot and 1 half length low profile PCI Express x8 slot	
	Integrated Lights-Out 2 (iLO 2) embedded	
	Intel® 82801IR Integrated Serial ATA Host Controller	
	Rack (1U) form factor, (1.70 in/4.32 cm)	
	Fixed, mounting rails	

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processors	Intel Celeron 420 processor FIO Kit	450125-L21
	Dual-Core Intel Pentium E2160 Processor FIO Kit	455035-L21
	Dual-Core Intel Core2 E4400 processor FIO Kit	455033-L21
	Dual-Core Intel Xeon 3065 processor FIO Kit	450143-L21
	Dual-Core Intel Xeon 3075 processor FIO Kit	450127-L21
	Quad-Core Intel Xeon 3210 processor FIO Kit	455031-L21
	Quad-Core Intel Xeon 3220 processor FIO Kit	450141-L21
Drive Cage	DL1U 2 DRV CAGE FIO KIT	450436-B21
	DL1U 4 DRV CAGE KIT	450434-B21
Memory	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

SAS HBAs	HP SC44Ge Host Bus Adapter	416096-B21
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	NOTE: Any SAS HBA requires the purchase of the HP HBA SAS-SATA 4x1LN Cable Kit (452130-B21).	
Controllers	HP Smart Array E200/128 BBWC Controller	411508-B21
	HP Smart Array P400/256MB Controller	405132-B21
	HP Smart Array P400/512MB BBWC Controller	411064-B21
	HP Smart Array E500/256MB Controller	435129-B21
	HP Smart Array P800/512MB BBWC Controller	381513-B21
	NOTE: Any Smart Array Controller requires the purchase of the HP HBA SAS-SATA 4x1LN Cable Kit (452130-B21).	452130-B21

NOTE: Some options may not be factory integratable. Contact your local sales representative for additional information.

ProLiant DL320 G5p Unique Options	DL320G5p DVD Drive 9.5mm	450432-B21
	DL320G5p CD-RW/DVD-ROM Combo Drive 9.5mm	451688-B21
	DL320G5p DVD-ROM Drive 12.7mm	449991-B21
	DL320G5p DVD-RW Drive 12.7mm	449998-B21
	DL320G5p PCI-X RISER BD	450341-B21
	DL320G5p iLO2 PORT OPT KIT	450343-B21
	DL1U 4 DRV CAGE KIT	450434-B21

HP Insight Control and ProLiant Essentials Offerings	**ProLiant Essentials Value Pack** **NOTE:** Electronic licensing options are available for Insight Control suites and select ProLiant Essentials software products. Please see the appropriate Insight Control and ProLiant Essentials QuickSpecs for additional information.	
	Accelerated iSCSI Pack	
	ProLiant Essentials Accelerated iSCSI Pack, No Media, 24x7 Support, Single License **NOTE:** For use with a single NIC port. Contains one license with a unique license activation key and documentation. **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12466_div/12466_div.html	452679-B21
	HP Insight Control Environment	
	HP Insight Control Environment, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	452148-B21
	Rapid Deployment Pack	
	ProLiant Essentials Rapid Deployment Pack No Media 1-Server License including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 server to be deployed and managed via RDP. **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.html	452151-B21
	HP Server Migration Pack - Universal Edition	
	HP Server Migration Pack - Universal Edition, No Media, 1-Year Unlimited Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows unlimited migrations (physical to ProLiant, physical to virtual, virtual to virtual, and virtual to ProLiant) for one year. Contains one license with a unique license activation key and documentation.	460756-B21
	HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to ProLiant Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to ProLiant or virtual to ProLiant migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	460750-B21
	HP Server Migration Pack - Universal Edition, No Media, Physical / Virtual to Virtual Single Migration License, including 1 year of 24x7 Technical Support and Updates **NOTE:** This license allows 1 physical to virtual or virtual to virtual migration. Customer will receive a printed license entitlement certificate and documentation via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one	460753-B21

Options

	year of 24 x 7 HP Software Technical Support and Update Service.	
	Virtual Machine Management Pack	
	ProLiant Essentials Virtual Machine Management Pack, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates **NOTE:** Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_div/12328_div.html	452153-B21
	Remote Management **NOTE:** Electronic licensing options are available for Insight Control suites and select ProLiant Essentials software products. Please see the appropriate Insight Control and ProLiant Essentials QuickSpecs for additional information.	
	Integrated Lights-Out Advanced Pack	
	Integrated Lights-Out Advanced Pack, No Media ,1 Server License **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10861_div/10861_div.html	452141-B21
	Integrated Lights-Out Select Pack	
	Integrated Lights-Out Select Pack, No Media, 1 Server License **NOTE:** For additional License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10861_div/10861_div.html	452158-B21
	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.	
Memory (DIMMs)	2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB)	450260-B21
	1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB)	450259-B21
	512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB)	450258-B21
Port Options	Internal USB Kit	451363-B21
	Serial/Parallel Port OPT KIT	401222-B21
Optical Drives	DL320G5p DVD Drive 9.5mm	450432-B21
	DL320G5p CD-RW/DVD-ROM Combo Drive 9.5mm	451688-B21
	DL320G5p DVD-ROM Drive 12.7mm	449991-B21
	DL320G5p DVD-RW Drive 12.7mm	449998-B21

Options

Hard Drives

Hot Plug SAS 3.5" Drives

HP 300GB 3G SAS 15K 3.5" SP HDD	431944-B21
HP 300GB 3G SAS 15K 3.5" DP HDD	416127-B21
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
HP 36GB 3G SAS 15K 3.5" SP HDD	375868-B21

NOTE: Serial Attached SCSI - SAS Hard Drives are only supported with optional SAS HBA or RAID cards.
NOTE: Please see the Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)

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
HP 80GB 1.5G SATA 7.2K 3.5" HDD	349237-B21

NOTE: Serial ATA hot-plug capability and drive LEDs are not supported by the DL320 G5p embedded SATA storage controller.
NOTE: SATA drives have a 1 year warranty. Please see the Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:
http://h18000.www1.hp.com/products/quickspecs/11940_div/11940_div.html (Worldwide)

Storage Controllers

SAS Controllers

Smart Array E200 Controller
NOTE: The HP Smart Array E200 Controllers require the purchase of the HP HBA SAS-SATA 4x1LN Cable Kit (PN: 452130-B21).

HP Smart Array E200/128 BBWC Controller	411508-B21
128-MB BBWC (Battery-Backed Write Cache) Enabler	351580-B21

NOTE: Supports the Smart Array E200 Controller, Smart Array 641 Controller, Smart Array 642 Controller.

Smart Array E500 Controller

HP Smart Array E500/256MB Controller	435129-B21

Smart Array P400 Controller
NOTE: The HP Smart Array P400 Controllers require the purchase of the HP HBA SAS-SATA 4x1LN Cable Kit (452130-B21).

HP Smart Array P400/256MB Controller	405132-B21
HP Smart Array P400/512MB BBWC Controller	411064-B21
Smart Array P400 Battery Attach Kit	417836-B21

NOTE: This option kit contains a 24" battery cable and adhesive material for installing a battery into the server if a Smart Array P400 is integrated outside of the factory. For all solutions, please refer to the server QuickSpecs and User's Manual for detailed installation instructions.

Options

Battery-backed write cache upgrade **NOTE:** Battery only. For Smart Array P400 Controller only.	383280-B21
512MB Battery-backed cache upgrade **NOTE:** For Smart Array P400 Controller only.	405148-B21
NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12460_div/12460_div.html (Smart Array E200 Controller) http://h18000.www1.hp.com/products/quickspecs/12700_div/12700_div.html (Smart Array E500 Controller) http://h18000.www1.hp.com/products/quickspecs/12400_div/12400_div.html (Smart Array P400 Controller)	
HP Smart Array P800/512MB BBWC Controller	381513-B21
SAS HBA	
HP SC44Ge Host Bus Adapter	416096-B21
HP 8 Internal Port SAS HBA with RAID **NOTE:** The HP SC44Ge HBA and HP 8 Internal Port SAS HBA with RAID require the purchase of the HP HBA SAS-SATA 4x1LN Cable Kit (452130-B21).	347786-B21
HP HBA SAS-SATA 4x1LN Cable Kit **NOTE:** This option is required for any internal port HBA or controller that has a standard 4 port SAS/SATA connector.	452130-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/12332_div/12332_div.html (8 Internal Port SAS HBA)	
SCSI Controllers **NOTE**: The HP ProLiant DL320 G5p PCI-X Option Kit is required for all PCI -X Controllers.	
Smart Array 6404/256 Controller **NOTE:** For External drive support only	273914-B21
Smart Array 6402/128 Controller **NOTE:** For External drive support only	273915-B21
Smart Array 642 Controller **NOTE:** For External drive support only	291967-B21
128-MB BBWC (Battery-Backed Write Cache) Enabler **NOTE:** Supports the Smart Array E200 Controller, Smart Array 641 Controller, Smart Array 642 Controller.	351580-B21
64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 **NOTE:** For External drive support only	374654-B21
SCSI HBA	
HP SC11Xe Host Bus Adapter	412911-B21
NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11587_div/11587_div.html (Smart Array 6400 Series) http://h18000.www1.hp.com/products/quickspecs/12069_div/12069_div.html (Smart Array 642) http://h18000.www1.hp.com/products/quickspecs/11943_div/11943_div.html (HP Single Channel Ultra320 SCSI HBA) http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SC11Xe HBA)	

Communications

NOTE: The DL320 G5p PCI-X Riser Board is required for all PCI-X NICs.

HP NC110T PCI Express Gigabit Server Adapter **NOTE:** Does not support Windows 2000.	434905-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI Express Quad Port Gigabit Server Adapter **NOTE:** Does not support Windows 2000.	435508-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
HP NC510F PCIe 10 Gigabit Server Adapter **NOTE:** A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510F adapter.	414126-B21
HP NC510C PCIe 10 Gigabit Server Adapter **NOTE:** A minimum of 1 gigabyte (1 GB) of server memory is required per each NC510C adapter.	414129-B21
NOTE: The NC-series network adapters listed above can be used with the integrated NC326i network adapter for ProLiant Teaming.	
HP IB 4X DDR PCI-e SINGLE PORT HCA	448398-B21

Tape Drives

NOTE: For the complete listing of Tape Drive offerings, please see: http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html

For recommended tape drive offerings for this ProLiant server see the following:

USB Tape Drives

HP StorageWorks 1U USB Rack-Mount Kit with one DAT 72 USB Tape Drive	AG594A
HP StorageWorks 1U USB Rack-Mount Kit with one DAT 160 USB Tape Drive	AG703A

SAS Tape Drives

NOTE: For the HP ProLiant DL320 G5p, HP recommends purchasing the HP SC44Ge HBA (416096-B21) for a dedicated SAS HBA for tape.

HP StorageWorks Ultrium 448 SAS Internal Tape Drive **NOTE:** HP recommends combining this tape drive with the 1U SAS Rack-Mount kit (AE459A) for a complete rack-mount solution.	DW085A
HP StorageWorks Ultrium 920 SAS Internal Tape Drive **NOTE:** HP recommends combining this tape drive with the 1U SAS Rack-Mount kit (AE459A) for a complete rack-mount solution.	EH847A

NOTE: Please refer to the "Tape Drives, Tape Autoloaders & Tape Libraries" table in the Storage section of this document for a list of SAS controllers with tape support.

Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite) **NOTE:** HP recommends combining this tape drive with the 1U SCSI Rack-Mount kit (A7445B) for a complete rack-mount solution.	DW064A
HP StorageWorks 1U Rack-mount kit with one Ultrium 448 (Carbonite)	DW028B
HP StorageWorks 1U SCSI Rack-mount kit with one Ultrium 920	EH903A

NOTE: Please see the HP StorageWorks Ultrium Tape Drive QuickSpecs for additional options such as controllers, media, and other related items:
http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html (Worldwide)
http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_div.html (Worldwide)

Options

For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives, please visit: http://www.hp.com/go/connect

SCSI DAT Drives

HP StorageWorks DAT 160 SCSI External Tape Drive — Q1574A
NOTE: HP recommends combining this tape drive with the 1U SCSI Rack-Mount kit (A7445B) for a complete rack-mount solution.

NOTE: Please see the DAT Tape Drive QuickSpecs for controllers, media, and other options:
http://h18000.www1.hp.com/products/quickspecs/11883_div/11883_div.html (Worldwide)
For an up-to-date listing of the latest O/S and software support details for HP DAT drives, please visit: http://www.hp.com/go/connect

Rack-Mount Tape Drive Enclosures

HP StorageWorks 1U SCSI Rack-Mount kit — A7445B
NOTE: The 1U Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 40, DAT 72, DAT 160, DLT VS160, Ultrium 232, Ultrium 448 and Ultrium 920 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit — A8007A
NOTE: The 1U USB Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 40 USB, DAT 72 USB and DAT 160 USB tape drives.

HP StorageWorks 1U SAS Rack-Mount Kit — AE459A
NOTE: The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the Ultrium 448 SAS and Ultrium 920 SAS tape drives.

NOTE: Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits:
http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.html (Worldwide)

HP D2D Backup System

HP StorageWorks D2D110 Backup System — EH880A
NOTE: 1TB of Disk Storage

HP StorageWorks D2D110 Backup System with Data Protector Express Software Kit — EH923A
NOTE: 1TB of Disk Storage

HP StorageWorks D2D120 Backup System — EH884A
NOTE: 2TB of Disk Storage

HP StorageWorks D2D120 Backup System with Data Protector Express Software Kit — EH924A
NOTE: 2TB of Disk Storage

NOTE: Please see the HP D2D Backup Systems QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12651_div/12651_div.html

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Options

Tape Autoloaders

HP StorageWorks DAT Autoloader	
HP StorageWorks DAT 72x10 tape autoloader	AE313B
HP StorageWorks 1/8 Tape Autoloader	
HP StorageWorks 1/8 LTO-3 Ultrium 920 G2 Tape Autoloader	AH165A
HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A
HP StorageWorks 1/8 LTO-2 Ultrium 448 G2 Tape Autoloader	AH164A
HP StorageWorks 1/8 LTO-1 Ultrium 232 G2 Tape Autoloader	AH163A
HP StorageWorks 1/8 G2 Tape Autoloader Rack Kit	AH166A

NOTE: Required to install the 1/8 G2 Autoloaders in a standard 19-inch rack; includes rails and rackmount instructions

NOTE: Please reference the Tape Autoloader QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs

Tape Libraries

HP StorageWorks MSL2024 Tape Library	
HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ033A
HP StorageWorks MSL2024 1 LTO-4 Ultrium 1840 4GB FC Library	AJ034A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 SCSI Drive Library	AG115A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 960 4GB FC Library	AG326B
HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SAS Drive Library	AH559A
HP StorageWorks MSL2024 1 LTO-3 Ultrium 920 SCSI Drive Library	AH169A
HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library	AG116A
HP StorageWorks MSL4048 Tape Library	
HP StorageWorks MSL4048 1 LTO-2 Ultrium 448 SCSI Drive Library	AG320A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SCSI Drive Library	AH171A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 SCSI Drive Library	AG322A
HP StorageWorks MSL4048 1 LTO-3 Ultrium 960 4GB FC Library	AG324B
HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ035A
HP StorageWorks MSL4048 1 LTO-4 Ultrium 1840 4GB FC Library	AJ036A
HP StorageWorks MSL8096 Tape Library	
HP StorageWorks MSL8096 2 LTO-3 Ultrium 920 SAS Drive Library	AH561A
HP StorageWorks MSL8096 2 LTO-3 Ultrium 960 4GB FC Library	AH218A
HP StorageWorks MSL8096 2 LTO-3Ultrium 960 SCSI Drive Library	AH219A
HP StorageWorks MSL8096 2 LTO-4 Ultrium 1840 SCSI Drive Library	AJ039A
HP StorageWorks MSL8096 2 LTO-4 Ultrium 1840 4GB FC Library	AJ040A
HP StorageWorks MSL6000 Tape Library	
LTO-4 Ultrium 1840 technology	
HP StorageWorks MSL6030 1 LTO-4 Ultrium 1840 SCSI Drive Library	AJ029A
HP StorageWorks MSL6030 1 LTO-4 Ultrium 1840 4GB FC Library	AJ030A
HP StorageWorks MSL6060 2 LTO-4 Ultrium 1840 SCSI Drive Library	AJ031A
HP StorageWorks MSL6060 2 LTO-4 Ultrium 1840 4GB FC Library	AJ032A
LTO-3 Ultrium 960 technology	
HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 Dr LVDS Library	AD606B
HP StorageWorks MSL6030 1 LTO-3 Ultrium 960 Dr FC Library	AD608B

Options

	HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 Dr LVDS Library	AD607B
	HP StorageWorks MSL6030 2 LTO-3 Ultrium 960 Dr FC Library	AD609B
HP StorageWorks Modular Smart Array 20	HP StorageWorks Modular Smart Array 20 **NOTE:** Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies. **NOTE:** The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 3.5" Hot Plug Hard Drives.	335921-B21
HP StorageWorks Modular Smart Array 30	HP StorageWorks Modular Smart Array 30 SB **NOTE:** Rack-mountable 14 drive enclosure with single bus, redundant power supplies	302969-B21
	HP StorageWorks Modular Smart Array 30 DB **NOTE:** Rack-mountable 14 drive enclosure with dual bus, redundant power supplies **NOTE:** The Modular Smart Array Enclosure 30 Family supports the Wide Ultra3, Ultra320 Hot Plug Hard Drives.	302970-B21
HP StorageWorks Modular Smart Array 500	HP StorageWorks Modular Smart Array 500 Generation 2 **NOTE:** Please see the Modular Smart Array 500 Generation 2 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: http://h18000.www1.hp.com/products/quickspecs/11956_div/11956_div.html (Worldwide)	335880-B21
HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000 **NOTE:** Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.html (Worldwide)	201723-B22
HP StorageWorks Modular Smart Array 1500 cs	HP StorageWorks Modular Smart Array 1500 cs **NOTE:** Please see the StorageWorks Modular SAN Array 1500 cs QuickSpecs for additional options and configuration information at: http://www.hp.com/go/MSA1500cs	AA986A

Options

StorageWorks Options	**NOTE:** The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
	HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-e HBA	A8003A
	HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
	HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A
	HP StorageWorks FC2143 4Gb PCI-X 2.0 -to-Fibre Channel HBA	AD167A
	HP StorageWorks FC2243 Dual Channel 4Gb PCI-X 2.0 HBA	AD168A
	HP StorageWorks FC1143 4Gb PCI-X 2.0 HBA	AB429A
	HP StorageWorks FC1243 Dual Channel 4Gb PCI-X 2.0 HBA	AE369A
Uninterruptible Power Systems – Rack UPS	HP, R1.5kVA UPS, 1U, NA	AF419A
	HP, R1.5kVA UPS, 1U, INTL	AF418A
	HP, R1.5kVA UPS, 1U, JPN/TW	AF421A
	HP R3000 VA UPS, 2U, DTC, INTL	AF414A
	HP R3000 VA UPS, 2U, L5-30, NA	AF422A
	HP R3000 VA UPS, 2U, L6-20, NA	AF423A
	HP R3000 VA UPS, 2U, L6-20, JPN	AF424A
	HP R3000 VA UPS, 2U, L5-30, JPN	AF425A
	HP R5500 VA UPS, INTL	AF416A
	HP R5500 VA UPS, NA/JPN	AF426A
USB Options	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
	HP 256MB USB 2.0 Floppy Drive Key	442084-B21
ProLiant DL320 Deployment Options	Rack Adapter Kit **NOTE:** This kit allows HP rack servers to fit in racks that are 24" wide.	332815-B21
HP Rack 5000 Series (Metallic Carbonite)	HP 5642 Rack-Unassembled **NOTE:** Please see the HP Rack 5642 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12074_div/12074_div.html (Worldwide) **NOTE:** For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	358254-B21

Options

HP Rack 10000 G2 Series (Graphite Metallic)	10642 G2 (42U) Rack Cabinet – Pallet	AF001A
	10642 G2 (42U) Rack Cabinet – Shock Pallet	AF002A
	10642 G2 (42U) Rack Cabinet – Crated	AF003A
	10642 G2 (42U) Rack Cabinet, with Extension – Shock Pallet	AF004A
	10636 G2 (36U) Rack Cabinet – Pallet	AF011A
	10636 G2 (36U) Rack Cabinet – Shock Pallet	AF012A
	10636 G2 (36U) Rack Cabinet – Crated	AF013A
	10636 G2 (36U) Rack Cabinet, with Extension – Shock Pallet	AF014A
	10622 G2 (22U) Rack Cabinet - Pallet	AF021A
	10622 G2 (22U) Rack Cabinet - Shock Pallet	AF022A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Pallet	AF041A
	10842 G2 (42U) 800mm Wide Rack Cabinet - Shock Pallet	AF042A
	10647 G2 (47U) Rack Cabinet - Pallet	AF031A
	NOTE: Please see the Rack 10000 G2 QuickSpecs for additional part numbers and 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 10000 Series (Graphite Metallic)	HP S10614 (14U) Rack Cabinet – Shock Pallet	292302-B22
	NOTE: xxxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels). **NOTE:** It is mandatory to use a shock pallet in order to ship racks with equipment installed.	
	NOTE: Please see the Rack 10000 QuickSpecs for additional part numbers and Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
Monitors and Keyboards	TFT7210R Rack Mounted 17" Monitor	348373-B21
	TFT7600 Rackmount Keyboard Monitor US	AG052A
	TFT7600 Rackmount Keyboard Monitor UK	AG053A
	TFT7600 Rackmount Keyboard Monitor GR	AG054A
	TFT7600 Rackmount Keyboard Monitor FR	AG055A
	TFT7600 Rackmount Keyboard Monitor IT	AG056A
	TFT7600 Rackmount Keyboard Monitor SP	AG057A
	TFT7600 Rackmount Keyboard Monitor DEN	AG058A
	TFT7600 Rackmount Keyboard Monitor NOR	AG059A
	TFT7600 Rackmount Keyboard Monitor SE/FI	AG060A
	TFT7600 Rackmount Keyboard Monitor SWI	AG061A
	TFT7600 Rackmount Keyboard Monitor PORT	AG062A
	TFT7600 Rackmount Keyboard Monitor BEL	AG063A
	TFT7600 Rackmount Keyboard Monitor JPN2	AG064A
	TFT7600 Rackmount Keyboard Monitor RUS	AG065A
	TFT7600 Rackmount Keyboard Monitor INTL	AG066A

Options

	1U Rackmount Keyboard with USB, US	AG072A
	1U Rackmount Keyboard with USB, UK	AG073A
	1U Rackmount Keyboard with USB, GR	AG074A
	1U Rackmount Keyboard with USB, FR	AG075A
	1U Rackmount Keyboard with USB, ITL	AG076A
	1U Rackmount Keyboard with USB, SP	AG077A
	1U Rackmount Keyboard with USB, DEN	AG078A
	1U Rackmount Keyboard with USB, NOR	AG079A
	1U Rackmount Keyboard with USB, SE/FI	AG080A
	1U Rackmount Keyboard with USB, SWI	AG081A
	1U Rackmount Keyboard with USB, PORT	AG082A
	1U Rackmount Keyboard with USB, BEL	AG083A
	1U Rackmount Keyboard with USB, JPN2	AG084A
	1U Rackmount Keyboard with USB, RUS	AG085A
	1U Rackmount Keyboard with USB, INTL	AG086A
	NOTE: For additional information regarding Rack Options, please see the following URL: http://www.hp.com/go/rackandpower.	
HP KVM Switch Options	2x1x16 IP Console Switch with Virtual Media	AF601A
	4x1x16 IP Console Switch with Virtual Media	AF602A
	PS/2 Virtual Media Interface Adapter, 1 pack **NOTE:** Requires PS/2 and one USB port on server.	AF604A
	Server Console Switch (KVM), 0 x 1 x 8 port	336044-B21
	Server Console Switch (KVM), 0 x 2 x 16 port	336045-B21
	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
	PS2 Server Console Cable, 6 ft, 2 pack	AF612A
	USB Server Console Cable, 6 ft, 2 pack	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.	

Options

HP Serial Console Server Options	HP 16 Port Serial Console Server (worldwide)	AF101A
	HP 48 Port Serial Console Server (worldwide)	AF102A
	Serial Adapter, RJ45-DB9 DCE Female, 1 Pack	AF103A
	Serial Adapter, RJ45-DB9 DCE Female, 8 Pack	AF110A
	NOTE: Cat5e cables are required to connect Serial Adapters to Serial Console Servers. Additional Serial Adapters and Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	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.	
Service and Support Offerings (HP Care Pack Services)	***Hardware Services On-site Service***	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	U4479E
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	U4480E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4481E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	U4482E
	Installation & Start-up Services	
	Hardware Installation, Electronic	U4490E
	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, Electronic	U4491E
	Support Plus	
	Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, Electronic	U4492E
	Support Plus 24	
	Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U4493E
	Onsite HW support 24x7, 4hr response and SuSE Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic.	U6309E
	Onsite HW support 24x7, 4hr response and Red Hat ES Linux SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic.	U8331E
	NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/	

Memory

HP ProLiant DL320 G5p

Standard Memory

NOTE: One of the following depending on model:

1 GB installed (1 x 1 GB SDRAM DIMM) on Dual-Core (Xeon 3075) model.

2 GB installed (2 x 1 GB SDRAM DIMMs) on Quad-Core (Xeon 3210) model.

Standard Memory Plus Optional Memory

Up to 8 GB memory is available with the optional installation of PC2-6400 ECC DDR2 SDRAM Memory kits.

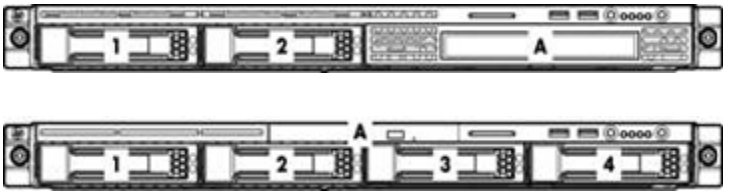
NOTE: The chart below does not represent all possible configurations. For best performance, HP recommends dual-bank interleaved mode configurations. For dual-bank interleaved mode, DIMMs must be installed in both banks with equal bank capacities.

Memory		Slot				
		1A	2B	3A	4B	Mode
Optional	512 MB	512 MB	Empty	Empty	Empty	Single-bank
Standard	1 GB	1 GB	Empty	Empty	Empty	Single-bank
Optional	1 GB	512 MB	Empty	512 MB	Empty	Dual-bank interleaved
Standard	2 GB	1 GB	Empty	1 GB	Empty	Dual-bank interleaved
Maximum	8 GB	2 GB	2 GB	2 GB	2 GB	Dual-bank interleaved

Following are memory options available from HP:

- 2 GB Unbuffered PC2-6400 ECC DIMM (1 x 2 GB) 450260-B21
- 1 GB Unbuffered PC2-6400 ECC DIMM (1 x 1 GB) 450259-B21
- 512 MB Unbuffered PC2-6400 ECC DIMM (1 x 512 MB) 450258-B21

Storage



1- 2	Two SATA or SAS drive bays
A	Optical Drive Bay: Optional DVD-ROM, or DVD-RW drive
1- 4	Four SATA or SAS drive bays
A	Optical Drive Bay: Optional DVD-ROM, or DVD-ROM/CD-RW Combo drive

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
2 Drive Models: 12.7mm IDE DVD-ROM or DVD-RW Drive	Up to 1	A	HP embedded SATA Controller
4 Drive Models: 9.5mm IDE DVD-ROM or DVD-ROM/CD-RW Combo Drive	Up to 1	A	HP embedded SATA Controller

Hot Plug SAS 3.5" Drives

	Quantity Supported	Position Supported	Controller
HP 300GB 3G SAS 15K SP HP 300GB 3G SAS 15K DP HP 146GB 3G SAS 15K SP HP 146GB 3G SAS 15K DP HP 72GB 3G SAS 15K SP HP 72GB 3G SAS 15K DP HP 36GB 3G SAS 15K SP	Up to 2 Up to 4 **NOTE:** depending on model.	1-2 1-4 **NOTE:** depending on model.	HP SC44Ge Host Bus Adapter HP 8 Internal Port SAS HBA with RAID HP Smart Array E200/128 BBWC Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P800/512MB BBWC Controller

3.5" SATA Hot Plug Drives

	Quantity Supported	Position Supported	Controller
HP 750GB 1.5G SATA 7.2K HP 500GB 1.5G SATA 7.2K HP 250GB 1.5G SATA 7.2K HP 160GB 1.5G SATA 7.2K HP 80GB 1.5G SATA 7.2K	Up to 2 Up to 4 **NOTE:** depending on model.	1-2 1-4 **NOTE:** depending on model.	HP embedded 4 Port SATA Controller with RAID 0/1 support HP SC44Ge Host Bus Adapter HP 8 Internal Port SAS HBA with RAID HP Smart Array E200/128 BBWC Controller HP Smart Array P400/256MB Controller HP Smart Array P400/512MB BBWC Controller HP Smart Array P800/512MB BBWC Controller

Storage

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
Modular Smart Array 20	Please see the Modular Smart Array 20 QuickSpecs to determine configuration requirements	External	Please see the Modular Smart Array 1000 QuickSpecs for the latest list of supported HBAs: http://www.hp.com/go/MSA20
Modular Smart Array 30 Family	Up to 14	External	Smart Array 6402/128 Controller Smart Array 642 Controller
Modular Smart Array 500 G2	1	External	Please see the Modular Smart Array 500 QuickSpecs for the latest list of supported HBAs: http://www.hp.com/go/msa500
Modular Smart Array 1000 or Modular Smart Array 1500 cs	Please see the MSA QuickSpecs to determine configuration requirements	External	Modular Smart Array 1000: http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.html (Worldwide) Modular Smart Array 1500 cs: http://www.hp.com/go/MSA1500cs

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Maximum Storage Capacity – (SAS drives)

Internal	600GB (2 x 300GB SAS)
External	4.20TB (1 x (14 x 300GB SAS))
Total	4.80TB

NOTE: In order to implement integrated SATA RAID with Smart Start 7.90 on Windows 2000/2003, the use of a floppy drive is necessary.

Maximum Storage Capacity – (SATA Drives)

Internal	1.5TB (2 x 750GB SATA)
External	9.0TB (1 x (12 x 750GB SATA))
Total	10.5TB

NOTE: In order to implement integrated SATA RAID with Smart Start 7.90 on Windows 2000/2003, the use of a floppy drive is necessary.

NOTE: The External capacity section relates to the HP StorageWorks Modular Smart Array 20.

Tape Drives, Tape Autoloaders, Tape Libraries & D2D Backup

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)

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Autoloaders and Tape Libraries listed below, please see the following:
http://h18000.www1.hp.com/products/quickspecs/division/10809.html (Worldwide)

NOTE: For complete listing of tape drive offerings see
http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html

NOTE: SAS Tape Drives: Connecting hard drive cage and SAS tape to the same SAS Controller using split cable (supplied with tape drive) deactivates 1 of the hard drive bays. Actual hard drive bay deactivated depends on where split cable plugs into SAS drive connector. Example: 3x SAS cable connector plugged into SAS drive connector (5-8) on the back of the hard drive cage would mean drive bay 8 is deactivated.

Storage

	Position Supported	Controller	Controller Part Number
HP StorageWorks SCSI Tape Drives, External LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-2 Ultrium 460 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 DLT VS160 SDLT 600 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter	412911-B21
HP StorageWorks USB Tape Drives, External DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP StorageWorks SAS Tape Drives, External LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS 1U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter **NOTE:** Recommended. HP Smart Array E500 Controller **NOTE:** The following SAS Smart Array controllers require ROM Flash version 2.04 or higher for SAS tape support: HP Smart Array P400/256MB Controller HP Smart Array P400/512MB Controller	416096-B21 435129-B21 405132-B21 411064-B21
HP StorageWorks SCSI Tape Automation, External DAT 72x10 Autoloader 1/8 Tape Autoloader MSL2024 MSL4048 MSL8096 MSL6000	External	HP SC11Xe Host Bus Adapter HP U320e SCSI Host Bus Adapter **NOTE:** Only valid for MSL tape libraries.	412911-B21 AH627A
HP StorageWorks SAS Tape Automation, External 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP SC44Ge Host Bus Adapter **NOTE:** Please visit http://www.hp.com/go/connect for details about minimum SAS controller firmware version and SAS cabling requirements.	416096-B21

Storage

HP StorageWorks Fibre Tape Automation, External MSL2024 MSL4048 MSL6000	External	Please consult the EBS connectivity matrix at http://www.hp.com/go/ebs for detailed connectivity information.	N/A
HP StorageWorks D2D Backup Systems D2D110 D2D120	External	Embedded Network Controller	N/A

System Unit	**Dimensions** (H x W x D) (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.19 cm)	
	Weight (approximate)	Maximum (two hard drives, power supply, and processor installed)	33.50 lb (15.20kg)
		Minimum (one hard drive, power supply, and processor installed)	26.00lb (11.79kg)
	Input Requirements (per power supply)	Range Line Voltage	90 - 132 VAC, 180 - 264 VAC
		Rated Input Current	6 A (at 100 VAC), 3 A (at 200 VAC)
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	486 W (at 100 VAC), 479 W (at 200 VAC)
	BTU Rating	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)
	Power Specifications	To review typical system power ratings use the Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls - Click on the system of interest. Example: DL320 G5p - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	400 W (at 100 VAC), 400 W (at 200 VAC)
		Maximum Peak Power	400 W (at 100 VAC), 400 W (at 200 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/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 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	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 (ECMA 109).	
		Idle	
		LWAd	6.30 B
		LpAm	52.07dBA
		Operating	
		LWAd	6.38 B
		LpAm	52.77 dBA
Power Supply	**Input voltage specifications**	Rated input voltage	100 VAC to 240 VAC
	Input Specifications	Rated input line	90 VAC to 264VAC
		Frequency range	47 to 63 Hz
		Rated input power	@ 115V input, Rated input power = 486W (assume output wattage=450W @ 230V input, Rated input power = 479W (assume output wattage=450W)
		Rated input current	6 A, 3 A (110 V, 220 V)
		Steady state power	420W (rated)
	BTU Rating	1710 BTU/hr	
	Ambient temperature range	Operating	50° to 118° F (10° to 48° C)
		Non-operating	-40° to 158° F (-40° to 70° C)
	Relative humidity (non-condensing)	Operating	55% to 85%
		Non-operating	5% to 95%
	Dielectric voltage withstand	Input to output	1800 VAC/minute
		Input to ground	1800 VAC/minute
	Maximum Wet Bulb Temperature	106.3° F (41.3° C)	

Technical Specifications

Integrated Serial ATA Controller	**Simultaneous drive transfer channels**	4 channels
	Transfer rate synchronous (maximum theoretical)	150 MB/s per channel; 300 MB/s in RAID 0 pair
	Data transfer method	Intel® 82801IR Integrated Serial ATA Host Controller (non-RAID mode) Intel® 82801IR Integrated Serial ATA Host Controller (RAID Mode)
	Drive support	Serial ATA
	Data transfer modes	Legacy Mode Combined Mode
	Protocol	Serial ATA
	Feature	NCQ (Native Command Queuing); AHCI (Advanced Host Controller Interface)
	RAID levels supported	0, 1
	RAID Features	Supports multiple logical volumes Setup through ROM based Array Configuration Utility Installation scripting support **NOTE:** This controller does not support Hot Plug functions or LED functions.
	RAID OS Support	Microsoft Windows Server 2003 **NOTE:** In order to implement integrated SATA RAID with Smart Start 7.90 on Windows 2000/2003, the use of a floppy drive is necessary. Linux (Red Hat, SuSE, UnitedLinux)

Embedded NC326i Dual Port Gigabit Server Adapter	**Network Interface**	10Base-T/ 100Base-TX/ 1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	Data Transfer Method	Four lane (x4), 100MHz PCI Express Reference Clock	
	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)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

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