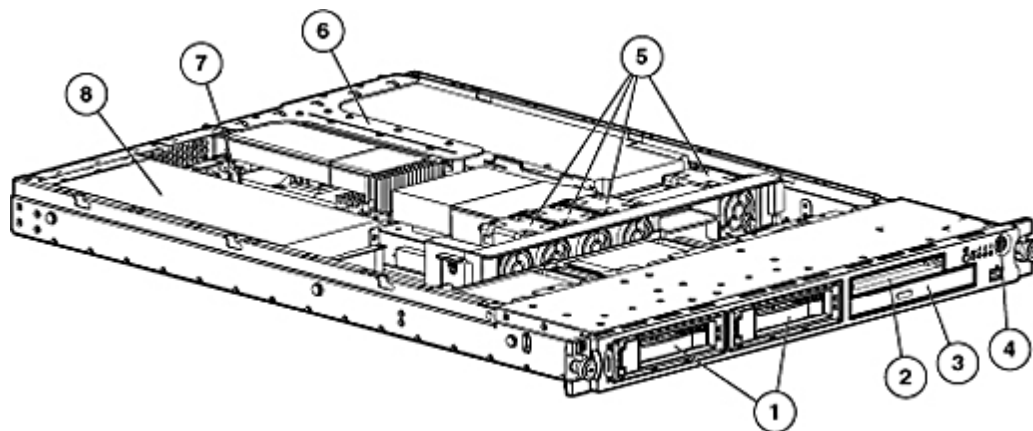


Overview



1. Support for up to two Hot Plug SATA or SAS hard drives
2. Optional 1.44MB Diskette Drive Assembly Option Kit
3. CD-ROM/DVD-ROM/DVD-RW Drive Assembly Option Kit (optional)
4. Front LED Indicators
5. Fan Assembly, 4 non hot-plug Dual Rotor Fans with N+1 Redundancy
6. Two PCI slots, PCI-Express x4 and x1 standard (x8 connectors)
7. Four PC2-4200 ECC DDR2 Memory Slots - 8 GB maximum
8. Power Supply (450 Watt)

What's New

- DL320G4 CTO Chassis 414105-B21 replaces 391654-B21
- Performance Features:
 - Dual-core Pentium D 900 series processors with 4M (2x2M) of L2 Cache
 - Single core Pentium 4 600 series processors with 2MB of L2 cache
 - Standard Dual PCI Express slots offers high performance and investment protection for customers
- Flexibility Features:
 - A full length 64-bit/133 PCI-X is available with optional PCI-X riser card for models containing the 900 series or 600 series processors
 - Up to 8 GB PC2-2400 533MHz DDR2 RAM
 - Integrated Dual Port Gigabit NIC
- Management Features:
 - Embedded iLO2 Remote Management with full sideband (UMP) support
 - Integrated Remote Console
 - Virtual KVM technology
- Ability to purchase Microsoft Windows Server 2003 for Embedded Systems with Microsoft ISA Server 2004 Standard Edition configure to order from HP
 - More details available at <http://www.hp.com/servers/DL320FW-VPN-Cache>

Overview

At a Glance

- Intel's Dual Core Pentium D, Single Core Pentium 4, and Single Core Celeron Processor options
 - 3.4 GHz, 3.2 GHz, 3.0 GHz, and 2.8 GHz Dual Core Pentium D Processors with 4MB of L2 Cache (2x2MB)
 - 3.6 GHz, 3.4 GHz, 3.0 GHz Single Core Pentium 4 Processors with 2MB of L2 Cache
 - 2.93 GHz Celeron D Processor with 256KB of L2 Cache
- Up to 8 GB of PC2-4200 ECC DDR2 UB SDRAM Memory
 - Standard configurations of 512 MB to 2 GB of memory
- Embedded NC324i PCI Express Dual Port Gigabit server adapter
- Integrated Lights Out 2 (iLO 2) Remote Management
- HP embedded 2 Port SATA Controller with RAID 0/1 support
- 1U (1.70") Form Factor
- Internal Storage capacity of 1TB (2 x 500GB SATA hard drives) or 292GB (2 x 146GB SAS hard drives)
- Optional CD,DVD, or DVD-RW drive and Floppy drive
- Four USB 2.0 ports (1 front, 1 internal and 2 rear)
- Internal USB port for flexible storage, security, or USB drive key deployment
- Two available PCI slots, including one full-length PCI Express x4 slot (x8 connector) and one half-length, low-profile PCI Express x1 slot (x8 connectors)
- Optional full-length PCI-X slot available
- Intel E7230 Chipset with 800MHz Front Side Bus (533MHz for Celeron Processors)
- Standard spring-loaded Universal sliding rails for in rack servicing
- Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU), HP System Insight Manager, Status LEDs including system health and UID and SmartStart
- Protected by HP Services and a worldwide network of resellers and service providers. Three-year Next Business Day, on-site limited global warranty. Certain restrictions and exclusions apply. Pre-Failure Notification on processors, memory, and SCSI hard drives. SATA hard drives have a one-year warranty.

Standard Features

Processor One of the following depending on Model	Intel Pentium D processor 940 with EM64T - 3.2 GHz
	Intel Pentium D processor 930 with EM64T - 3.0 GHz
	Intel Pentium D processor 920 with EM64T - 2.8 GHz
	Intel Pentium 4 processor 660 with EM64T - 3.6 GHz
	Intel Pentium 4 processor 650 with EM64T - 3.4 GHz
	Intel Pentium 4 processor 630 with EM64T - 3.0 GHz
	Intel Celeron D processor 341 with EM64T - 2.93 GHz

Processor Cache One of the following depending on Model	Pentium D models	4MB Level 2 Cache (2 x 2MB)
	Pentium 4 models	2MB Level 2 Cache (2 x 1MB)
	Celeron D models	256KB Level 2 Cache

Chipset One of the following depending on Model	Pentium D and Pentium 4 models	Intel E7230 chipset with 800MHz Front Side Bus
	Celeron D models	Intel E7230 chipset with 533MHz Front Side Bus

Memory Protection	Advanced ECC
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Memory One of the following depending on Model	Type	PC2-4200 UB DDR2 SDRAM
	Standard - Pentium D models	1 GB (1x 1024 MB)
	Standard - Pentium D models	2 GB (2 x 1024 MB)
	Standard - Celeron D model	512 MB (1 x 512 MB)
	Maximum	8 GB

Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
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Expansion Slots	Slot Number	Bus Speed	Height	Hot Plug	PCI Voltage
PCI-Express Non Hot-Plug Riser	1	PCI Express x4 (x8 connector)	Full	no	
	2	PCI Express x1 (x8 connector)	Half	no	
PCI-X Non Hot-Plug Riser (Optional)	1	64-bit/133 MHz PCI-X	Full	no	3.3 Volt
	2	PCI Express x1 (x8 connector)	Half	no	

Storage Controllers	HP embedded 2 Port SATA Controller with RAID 0/1 support. Hot Plug SAS and SATA controllers available via PCI card option.
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Standard Features

Storage	Diskette Drive	Optional 1.44 MB Diskette Drive option kit is available	
	Optical Drive	Optional CD-ROM, DVD-ROM, & DVD-RW option kits available	
	Hard Drives One of the following:	None 80GB SATA HDD	
Maximum Internal Storage Type	SATA	1TB	2 x 500GB SATA
	SAS	292GB	2 x 146GB SAS
Interfaces	Serial	1	
	USB 2.0	4 (1 front, 1 internal, 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	
	Keyboard	1	
	Mouse	1	
	Network RJ-45	2	
	iLO 2 remote management port	1	
Graphics	Integrated ATI ES1000 Video Controller with 16 MB SDRAM Video Memory		
Form Factor	Rack (1U), (1.70 in/4.45 cm)		
ProLiant Essentials Foundation Pack Software	HP Systems Insight Manager	HP's new HP Systems Insight Manager (HP SIM) helps maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM are both easy to set up work with the Insight Management Agents, integrated Lights-Out and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP SIM customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP 9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP SIM visit http://www.hp.com/go/hpsim .	
	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 7.4.	

Standard Features

Insight Management Agents	The Insight Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to HP Systems Insight Manager and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, 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 .
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: <ul style="list-style-type: none">• 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 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.• Workload Management Pack - provides easier management of complex environments, improving overall server utilization and enabling Windows® 2000 customers for the first time to confidently deploy multiple applications on a single multiprocessor ProLiant Server.• Integrated Lights-Out Advanced Pack - upgrades the Integrated Lights-Out processor to full virtual presence and control with graphical console and virtual media.• Performance Management Pack - 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.• Intelligent Networking Pack - detects and analyzes network bottlenecks or broken network linkages and steers traffic to the optimum route based on network conditions, plus it provides an extra layer of protection. The virus throttle feature of the solution slows the propagation of fast spreading virus.• Vulnerability and Patch Management Pack - identifies and remediates software security vulnerabilities due to missing patches as well operating system configurations that can be exploited by viruses,

Standard Features

worms, and other blended threats.

- Virtual Machine Management Pack - provides central management and control of virtual machines from Microsoft and VMware. Integrated approach provides the ability to manage both physical and virtual resources from a single management console.
- Server Migration Pack - The Server Migration Pack automates the manual processes required for migrating servers between physical or virtual platforms (P2V, V2P, and V2V)

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

Intelligent Manageability

Automatic Server Recovery (ASR)
iLO 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, SCSI hard drives, and memory)

Security

Power-on password
Keyboard password
Diskette drive control
Diskette boot control
USB Port control
Removable CD-ROM/Diskette Drive Assembly
Administrator's password

Server Power Cords

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

Localized cables included with geographic specific models in other world regions.

Power Supply

Auto-sensing 450-Watt PFC Power Supply, CE Mark Compliant

Standard Features

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:

<ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf>.

System Fans

4 dual rotor fans ship standard. 4 dual rotor fans total supported internally. N+1 (1 rotor only) Redundancy.

Ultra Thin Rack Deployment Overview

For the Ultra Thin Rack Deployment Overview, including best practices for the HP ProLiant DL320 G4, 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

Microsoft Windows 2000 Server

Windows Server 2003 (web and standard editions; standard edition for 64-bit extensions)

Linux (Red Hat, SuSE)

Microsoft Windows Server 2003 for Embedded Systems with Microsoft ISA Server 2004 Standard Edition

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, please see: <http://h18023.www1.hp.com/support/files/server/us/index.html>.

NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at <http://h18000.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>

NOTE: For more information on HP's Certified and Supported ProLiant Servers, please visit the VMware Server Support Matrix at:

<http://h18004.www1.hp.com/products/servers/software/vmware/hpvmwarecert.html>.

NOTE: For more information on Microsoft Windows Server 2003 Embedded Systems with Microsoft ISA Server 2004 Standard Edition, please visit the product site at:

<http://www.hp.com/servers/DL320FW-VPN-Cache>

Standard Features

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>.

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>.

Standard Features

Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of resellers and service providers. Hardware diagnostic support and repair is available for three years 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.

NOTE: Limited warranty includes 3 year parts, 1 year labor, 1 year on-site support.

NOTE: SATA drives have a 1 year warranty.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services include coverage for the HP branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as 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, 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.

NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

NOTE: Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Models

DL320R04 C2.93-256KB, 512MB 391655-xx1	Processor(s)	Intel Celeron D Processor 341 with EM64T- 2.93 GHz
	Cache Memory	256KB Level 2 cache
	Chipset	Intel E7230 chipset with 533MHz Front Side Bus
	Memory	512 MB (Standard) to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	None ship standard
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
Form Factor	Rack (1U), (1.70 in/4.45 cm)	
<hr/>		
DL320R04 PD2.8-2MB, 1GB, 80GB SATA 391656-xx1	Processor(s)	Intel Pentium D Processor 820 with EM64T - 2.8 GHz
	Cache Memory	2MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1024 MB (Standard) to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	80GB SATA HDD
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
Form Factor	Rack (1U), (1.70 in/4.45 cm)	
<hr/>		
DL320R04 P3.0-2MB, 1GB 391657-xx1	Processor(s)	Intel Pentium D Processor 830 with EM64T - 3.0 GHz
	Cache Memory	2MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1024 MB (Standard) to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	None ship standard
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
Form Factor	Rack (1U), (1.70 in/4.45 cm)	

Models

DL320R04 P3.0-2MB, 2GB, 80GB SATA 391658-xx1	Processor(s)	Intel Pentium D Processor 830 with EM64T - 3.0 GHz
	Cache Memory	2MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	2 GB (2 x 1 GB) Standard to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	80GB SATA HDD
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.45 cm)

DL320G4 P920 A80 Svr 410785-xx1	Processor(s)	Intel Pentium D Processor 920 with EM64T - 2.8 GHz
	Cache Memory	4MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1 GB (1 x 1 GB) Standard to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	80GB SATA HDD
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.45 cm)

DL320G4 P930 A80 Svr 410786-xx1	Processor(s)	Intel Pentium D Processor 930 with EM64T - 3.0 GHz
	Cache Memory	4MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1 GB (1 x 1 GB) Standard to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	80GB SATA HDD
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.45 cm)

Models

DL320G4 P930 A1 Svr 410787-xx1	Processor(s)	Intel Pentium D Processor 930 with EM64T - 3.0 GHz
	Cache Memory	4MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1 GB (1 x 1 GB) Standard to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	None ship standard
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.45 cm)

DL320G4 P650 A80 Svr 410788-xx1	Processor(s)	Intel Pentium 4 Processor 650 with EM64T - 3.4 GHz
	Cache Memory	2MB Level 2 Cache
	Chipset	Intel E7230 chipset with 800MHz Front Side Bus
	Memory	1 GB (1 x 1 GB) Standard to 8 GB (Maximum) of Advanced ECC PC2-4200 UB DDR2 SDRAM DIMM Memory
	Network Controller	Embedded NC324i PCI Express Dual Port Gigabit server adapter
	Storage Controller	Intel® 82801GR Integrated Serial ATA Host Controller
	Hard Drives	80GB SATA HDD
	Maximum Internal Storage	1TB for SATA models, 292GB for SAS models
	Optical Drive	Optional
	Diskette Drive	Optional
	Form Factor	Rack (1U), (1.70 in/4.45 cm)

Country Code Key	XX=00	NA
	XX=29	Japan
	XX=37	APD
	XX=42	EURO
	XX=AA	PRC

Configuration Information - Factory Integrated Models (North America only)

NOTE: For Configure to Order requirements within EMEA region, please consult local Sales Contact.

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 (choose one of the following configurable models)

Models	DL320G4 CTO Chassis	414105-B21
	Factory Integrated Model ships with:	
	Embedded NC324i PCI Express 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® 82801GR Integrated Serial ATA Host Controller	
	Rack (1U) form factor, (1.70 in/4.45 cm)	

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

Processors	HP C2.93/533-256K DL320G4 FIO Kit	391701-L21
	HP DL320G4 P920 FIO Kit (2.8GHz/2x2MB)	411141-L21
	HP DL320G4 P930 FIO Kit (3.0GHz/2x2MB)	411143-L21
	HP DL320G4 P650 FIO Kit (3.4GHz)	411145-L21
	HP DL320G4 P940 FIO Kit (3.2GHz/2x2MB)	411147-L21
	HP DL320G4 P630 FIO Kit (3.0GHz/2MB)	411149-L21
	HP DL320G4 P660 FIO Kit (3.6GHz/2MB)	411151-L21
Base Memory	2 GB UB PC2-4200 1 x 2GB 2RANK ALL	393354-B21
	1 GB UB PC2-4200 1 x 1GB 2RANK ALL	390824-B21
	512 MB UB PC2-4200 1 x 512 MB 1RANK ALL	390825-B21
Optical Drive	HP DL320G4 DVD-RW DRIVE OPT ALL	395498-B21
	CD ROM Drive Option Assembly Option Kit	372703-B21
	DVD-ROM Drive Assembly Option Kit	374303-B21
	Floppy Drive Assembly Option kit	372702-B21

Configuration Information - Factory Integrated Models (North America only)

Step 3: Choose Additional Factory Integratable Options

Controllers	64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2	374654-B21
	NOTE: For External Drive use only	
	HP 8 Internal Port SAS HBA with RAID	347786-B21
	NOTE: The HP 8 Internal Port SAS/SATA HBA with RAID (0,1) requires the purchase of the DL320 SAS/SATA Hot Plug Cable option kit (398307-B21)	
	DL320 Hot Plug SAS/SATA Cable Option Kit	398307-B21
	Smart Array 6402/128 Controller	273915-B21
Hard Drives	NOTE: For External Drive use only	
	Smart Array 642 Controller	291967-B21
	NOTE: For External Drive use only	
	Serial Attached SCSI - SAS	
	HP 146GB 3G SAS 15K 3.5" HDD	375872-B21
	HP 72GB 3G SAS 15K 3.5" HDD	375870-B21
	HP 36GB 3G SAS 15K 3.5" HDD	375868-B21
	Serial ATA (SATA)	
	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: Please note that SATA hot-plug capability and drive LEDs are not supported by the DL320 embedded SATA storage controller.		

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Options" section below.

Options

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

ProLiant DL320 G4
Unique Options HP ProLiant DL320 G3/G4 PCI-X Option Kit 417135-B21
NOTE: The PCI riser board assembly ships standard with two riser boards

- Full-length PCI-X riser board
- Half-length riser board
- PCI Express (ProLiant DL320 G4 server)

The PCI riser board assembly supports an optional full-length PCI Express riser board in place of the full-length PCI-X riser board.

HP DL320G4 DVD-RW DRIVE OPT ALL 395498-B21

Floppy Drive Assembly Option Kit 372702-B21

DVD-ROM Drive Assembly Option Kit 374303-B21

CD ROM Drive Option Assembly Option Kit 372703-B21

DL320 Hot Plug SAS/SATA Cable Option Kit 398307-B21

NOTE: This option is required for the HP 8 Internal Port SAS HBA with RAID.

HP ProLiant DL320 G4 Security Server (pre-installed configure to order software only) 409564-B21

ProLiant Essentials
Value Pack Software **ProLiant Essentials Integrated Lights-Out Advanced Pack**
ProLiant Essentials Integrated Lights-Out Advanced Pack, 1 server 263825-B21

Featuring: sophisticated virtual administration features for ultimate control of servers in the data centers and remote sites.

NOTE: For additional ProLiant Integrated Light-Out Advanced Pack License Kits please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/11052_div/11052_div.HTML

ProLiant Essentials Intelligent Networking Pack

ProLiant Essentials Intelligent Networking Pack, Single Server License 372906-B21

NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.

NOTE: For additional ProLiant Intelligent Networking Pack License Kits please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/12062_div/12062_div.HTML

ProLiant Essentials Intelligent Networking Pack - Linux Edition, Single Server License 397004-B21

NOTE: For additional ProLiant Intelligent Networking Pack - Linux License Kits please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/12327_div/12327_div.HTML

ProLiant Essentials Performance Management Pack

ProLiant Essentials Performance Management Pack, Single-Server License 306696-B21

NOTE: For use with a single server. Contains one license with a unique license activation key, HP Management CD and documentation.

NOTE: The most recent version of the software can always be downloaded at <http://www.hp.com/products/pmp>.

NOTE: For additional ProLiant Performance Management Pack License Kits please see the QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/11925_div/11925_div.HTML

ProLiant Essentials Rapid Deployment Pack Windows Edition

Options

Rapid Deployment Pack, Single-Server License	267196-B21
NOTE: This license allows 1 server to be deployed and managed via RDP.	
Rapid Deployment Pack, Single-Server License (Japan)	267196-291
NOTE: This license allows 1 server to be deployed and managed via RDP.	
NOTE: For additional ProLiant Essentials Rapid Deployment Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11053_div/11053_div.HTML	
ProLiant Essentials Workload Management Pack	
ProLiant Essentials Workload Management Pack, Single Server License	303284-B21
NOTE: For additional ProLiant Workload Management Pack License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11452_div/11452_div.HTML	
ProLiant Essentials Virtualization Management Software	
ProLiant Essentials Virtual Machine Management Pack, Single-Server License	372214-B21
NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	
ProLiant Essentials Server Migration Pack, Single-Migration License	375345-B21
NOTE: Contains one license, enabling 1 server migration, with a unique license activation key and documentation.	
NOTE: This license allows 1 server to be migrated from a physical server to a virtual machine. Or this license can be used to migrate a virtual machine from one virtualization layer i.e. VMware GSX to a different virtualization layer such as VMware ESX or Microsoft Virtual Server 2005.	
NOTE: For additional ProLiant Essentials Virtualization Management Software License Kits please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12328_div/12328_div.HTML	
ProLiant Essentials Vulnerability and Patch Management Pack	
ProLiant Essentials Vulnerability and Patch Management Pack, Single-Server License	371645-B21
NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	
NOTE: For additional ProLiant Vulnerability and Patch Management Pack License Kits, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12111_div/12111_div.HTML	
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 UB PC2-4200 1 x 2 GB 2RANK ALL	393354-B21
	1 GB UB PC2-4200 1 x 1 GB 2RANK ALL	390824-B21
	512 MB UB PC2-4200 1 x 512 MB 1RANK ALL	390825-B21

Options

Internal Storage	HP DL320G4 DVD-RW DRIVE OPT ALL	395498-B21
	CD-ROM Drive Assembly Option Kit	372703-B21
	Floppy Drive Assembly Option Kit	372702-B21
	DVD-ROM Drive Assembly Option Kit	374303-B21

Hard Drives

Serial Attached SCSI - SAS

HP 146GB 3G SAS 15K 3.5" HDD	375872-B21
HP 72GB 3G SAS 15K 3.5" HDD	375870-B21
HP 36GB 3G SAS 15K 3.5" HDD	375868-B21

NOTE: Serial Attached SCSI - SAS Hard Drives are only supported via Factory Integration with the HP 8 Internal Port SAS/SATA HBA with RAID option card. Please review the 'Configuration Information - Factory Integrated Models' section for configuration assistance.

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)

Serial ATA (SATA)

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: Please note that Serial ATA hot-plug capability and drive LEDs are not supported by the DL320 G4 embedded SATA storage controller. The purchase of the HP 8 Internal Port SAS HBA with RAID and the DL320 Hot Plug SAS/SATA Cable Option Kit is required for Hot Plug and LED SAS/SATA support.

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/11940_div/11940_div.HTML
(Worldwide)

Storage Controllers

NOTE: For 2M DL320 G4 Models, PCI-X is not supported.

NOTE: The HP ProLiant DL320 G3/G4 PCI-X Option Kit is required for all PCI Controllers.

SAS Controllers

HP Smart Array P400/256MB Controller	405132-B21
HP Smart Array P400 Controller/512MB and BBWC	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.

Battery-backed write cache upgrade	383280-B21
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NOTE: For Smart Array P400 Controller only.

Options

512MB Battery-backed cache upgrade NOTE: For Smart Array P400 Controller only.	405148-B21
SAS HBA	
HP 8 Internal Port SAS HBA with RAID NOTE: The HP 8 Internal Port SAS HBA with RAID requires the purchase of the DL320 SAS/SATA Hot Plug Cable option kit (398307-B21). NOTE: Please see the following QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12332_div/12332_div.HTML (HP 8 Internal Port SAS HBA)	347786-B21
SCSI Controllers	
Smart Array 6402/128 Controller NOTE: This controller is only supported via Factory Integration. Please review the 'Configuration Information - Factory Integrated Models' section for configuration assistance. NOTE: For External drive support only	273915-B21
Smart Array 642 Controller NOTE: This controller is only supported via Factory Integration. Please review the 'Configuration Information - Factory Integrated Models' section for configuration assistance. NOTE: For External drive support only	291967-B21
128-MB BBWC (Battery-Backed Write Cache) Enabler NOTE: This 128 MB BBWC supports the Smart Array 641 Controller and Smart Array 642 Controller.	351580-B21
64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2 NOTE: This controller is only supported via Factory Integration. Please review the 'Configuration Information - Factory Integrated Models' section for configuration assistance. NOTE: For External drive support only	374654-B21
64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter NOTE: This controller is only supported via Factory Integration. Please review the 'Configuration Information - Factory Integrated Models' section for configuration assistance. NOTE: Supports Wide Ultra3, Ultra320 SCSI drives only. NOTE: For External drive support only NOTE: Please see the following Controller or SCSI Adapter QuickSpecs for Technical Specifications such as PCI Bus, PCI Peak Data Transfer Rate, SCSI Protocols supported, SCSI Peak Data Transfer Rate, Channels, SCSI Ports, Drives supported, Cache, RAID support, and additional information: 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/12332_div/12332_div.HTML (HP 8 Internal Port SAS HBA) http://h18000.www1.hp.com/products/quickspecs/12067_div/12067_div.HTML (Smart Array 641) http://h18000.www1.hp.com/products/quickspecs/10429_div/10429_div.HTML (SCSI Adapter) http://h18000.www1.hp.com/products/quickspecs/11555_div/11555_div.HTML (U320 Adapter)	268351-B21

Options

Communications

NOTE: The HP ProLiant DL320 G3/G4 PCI-X Option Kit is required for all PCI-X NICs.

HP NC150T PCI 4-port Gigabit 1000T Combo Switch Adapter	367132-B21
HP NC310F PCI-X 1000SX Gigabit Server Adapter	368169-B21
HP NC320T PCI Express 1000T Gigabit Server Adapter	367047-B21
HP NC340T PCI-X 4-port 1000T Gigabit Server Adapter	391661-B21
HP NC370F PCI-X Multifunction 1000SX Gigabit Server Adapter	374193-B22
HP NC370T PCI-X Multifunction 1000T Gigabit Server Adapter	374191-B22
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC380T PCI Express Dual Port Multifunction Gigabit Server Adapter	394795-B21
HP NC1020 PCI 1000T Gigabit Server Adapter	353377-B21
HP NC7170 PCI-X Dual Port 1000T Gigabit Server Adapter	313881-B21
HP NC7771 PCI-X 1000T Gigabit Server Adapter	290563-B21
NOTE: Any NC61XX, NC71XX or NC77XX network adapter can be used for redundancy with the embedded NC7782 network adapter.	
HP NC571C PCI Express Dual-port 4x Fabric Adapter	376160-B21
HP 24-Port 4x Fabric Copper Switch	376227-B21
HP 4x Fabric 1m Copper Cable	376232-B21
HP 4x Fabric 3m Copper Cable	376232-B22
HP 4x Fabric 5m Copper Cable	376232-B23

Tape Drives

NOTE: For the complete listing of Tape Drive offerings for this server, please visit: <http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

NOTE: Optional PCI-X riser card required for SCSI tape drives connecting to HP Single Channel (374654-B21) or Dual Channel (268351-B21) SCSI Adapters
For recommended tape drive offerings for this ProLiant server see the following:

USB Tape Drives

HP StorageWorks DAT 40 USB External Tape Drive (Carbonite)	DW023A
HP StorageWorks DAT 72 USB External Tape Drive (Carbonite)	DW027A

External and Rack-Mount Ultrium Tape Drives

HP StorageWorks Ultrium 232 Internal Tape Drive (Carbonite)	DW064A
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NOTE: No internal tape drives fit inside this HP ProLiant server. The internal drive shown here is for the 1U and 3U Rack-mount Kit.

HP StorageWorks Ultrium 232 External Tape Drive (Carbonite)	DW065B
HP StorageWorks Ultrium 232 External Tape Drive (Carbonite)	DW017B
HP StorageWorks Ultrium 448 Rack-mount (Carbonite) - Single drive installed in a 1U rack-mount kit	DW028B

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)

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>.

External, Rack-Mount, and Array Module DAT Drives

HP StorageWorks DAT 72 SCSI External Tape Drive (Carbon)	Q1523B
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Options

HP StorageWorks 1U Rack-mount kit with one DAT 72 (Carbon) A7443A

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)

http://h18006.www1.hp.com/products/quickspecs/12128_div/12128_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 Rack-Mount Kit A7445B

NOTE: The 1U Rack-mount Kit (PN A7445A) can support up to (2) half-height tape drives and compatible with multiple Single-Ended and LVD SCSI tape drives including the DAT 24, DAT 40, DAT 72, DLT VS80, DLT VS160, Ultrium 215, Ultrium 232 and Ultrium 448 tape drives.

HP StorageWorks 1U USB Rack-Mount Kit A8007A

1U USB Cable Option Kit 396114-B21

NOTE: Converts a 1U SCSI rack-mount kit to a USB interface to support the USB 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)

Tape Autoloaders

HP StorageWorks 1/8 Tape Autoloader

HP StorageWorks 1/8 Ultrium 960 Tape Autoloader AF204A

HP StorageWorks 1/8 Ultrium 448 Tape Autoloader AF203A

HP StorageWorks 1/8 Ultrium 232 Tape Autoloader AF202A

1/8 Tape Autoloader Rackmount Kit C9268R

NOTE: Required to install the unit in a standard 19-inch rack; includes rails and rackmount instructions

NOTE: Please reference the 1/8 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>

Options

Tape Libraries

HP StorageWorks MSL2024 Tape Library

HP StorageWorks MSL2024 1 Ultrium 960 Drive Library AG115A

HP StorageWorks MSL2024 1 Ultrium 448 Drive Library AG116A

HP StorageWorks MSL2024 2 Ultrium 448 Drive Library AG117A

HP StorageWorks MSL4048 Tape Library

HP StorageWorks MSL4048 1 Ultrium 448 Drive Library AG320A

HP StorageWorks MSL4048 2 Ultrium 448 Drive Library AG321A

HP StorageWorks MSL4048 1 Ultrium 960 Drive Library AG322A

HP StorageWorks MSL4048 2 Ultrium 960 Drive Library AG323A

HP StorageWorks MSL6000 Tape Library

Ultrium 960 technology

HP StorageWorks MSL6030 1 Ultrium 960 Dr LVDS Library AD606B

HP StorageWorks MSL6030 1 Ultrium 960 Dr FC Library AD608B

HP StorageWorks MSL6030 2 Ultrium 960 Dr LVDS Library AD607B

HP StorageWorks MSL6030 2 Ultrium 960 Dr FC Library AD609B

Ultrium 460 technology

HP StorageWorks MSL6030 1 Ultrium 460 Dr LVDS Library AD598B

HP StorageWorks MSL6030 1 Ultrium 460 Dr FC Library AD600B

HP StorageWorks MSL6030 2 Ultrium 460 Dr LVDS Library AD599B

HP StorageWorks MSL6030 2 Ultrium 460 Dr FC Library AD601B

NOTE: Please reference the MSL2024 and MSL6000 Tape Library 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>

HP Data Protector Express Software

HP DP Express Backup Server Upgrade for ProLiant Software BB117AP

HP DP Express Package for Microsoft Small Business Server BB118AA

NOTE: Please see the HP Data Protector Express QuickSpecs for additional information regarding the purchase of HP Data Protector Express software:

http://h18000.www1.hp.com/products/quickspecs/12337_div/12337_div.html
(Worldwide)

NOTE: To obtain a free licensed copy of HP Data Protector Express for ProLiant edition software, please visit the "Protect Your Data" link accessible from your ProLiant server's System Management Homepage (SMH) software (SmartStart 7.5 or later).

HP StorageWorks Modular Smart Array 20

HP StorageWorks Modular Smart Array 20 335921-B21

NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies.

HP StorageWorks Modular Smart Array 20 Starter Kit 366172-B21

NOTE: Rack-mountable 12 (SATA) drive enclosure with U320 Host connectivity, redundant power supplies. Includes Smart Array 6402/128 Controller.

NOTE: The Modular Smart Array Enclosure 20 Family supports the SATA 1.5Gb/s 3.5" Hot Plug Hard Drives.

Options

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	Modular Smart Array 1500 Controller Shelf 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
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	
	StorageWorks 2 Gb, 64-bit/133 MHz PCI-X-to-Fibre Channel Host Bus Adapter for Windows, Linux and Netware	281541-B21
	StorageWorks 2 Gb, Dual Port, 64-Bit/133 MHz PCI-X-to-Fibre Channel Host Bus Adapter Windows, Linux and Netware	321835-B21
	HP StorageWorks 2 Gb, single channel, 133 MHz PCI-X-to-Fibre Channel Host Bus Adapter Windows and Linux	A7388A
	HP StorageWorks 2 Gb, dual channel, 133 MHz PCI-X-to-Fibre Channel Host Bus Adapter Windows and Linux	A7387A
	HP StorageWorks FC2142SR 4Gb PCI-E HBA for Windows and Linux	A8002A
	HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-E HBA for Windows and Linux	A8003A
	HP StorageWorks FC1142SR 4Gb PCI-E HBA for Windows and Linux	AE311A
	HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-E HBA for Windows and Linux	AE312A
	HP StorageWorks FC2143 4Gb PCI-X 2.0 HBA for Windows and Linux	AD167A
	HP StorageWorks FC2243 4Gb PCI-X 2.0 DC HBA for Windows and Linux	AD168A

Options

Uninterruptible Power Systems – Rack UPS	HP UPS R5500 XR, (5000VA, 4500 Watt), High Voltage (NA/Jpn)	326529-D71
	HP UPS R5500 XR, (6000VA, 5400 Watt), High Voltage (Int'l)	326529-B31
	HP UPS R1500 XR (1440VA, 1340 Watt), Low Voltage (NA)	204404-001
	HP UPS R1500 XR (1500VA, 1340 Watt), High Voltage (Int'l)	204404-B31
	HP UPS R1500 XR (1500VA, 1340 Watt), Low Voltage (Japan)	204404-291
	HP UPS R3000 XR (2880VA, 2700 Watt), Low Voltage (NA)	192186-001
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (NA)	192186-002
	HP UPS R3000 XR (2400VA, 2250 Watt), Low Voltage (Japan)	192186-291
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Japan)	192186-292
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Int'l - detachable cord)	192186-B31
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A IEC309 Plug)	192186-B32
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A CEE 7/7 SCHUKO Plug)	192186-B33
	HP UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A BS-546 Plug)	192186-AR1
	HP R3000 VA UPS, 2U, DTC, INTL	AF414A
	NOTE: Replaces non-RoHs compliant part numbers 192186-B31, 192186-B32, 192186-B33, 192186-AR1.	
	HP R3000 VA UPS, 2U, L5-30, NA	AF422A
	NOTE: Replaces non-RoHs compliant part number 192186-001.	
	HP R3000 VA UPS, 2U, L6-20, NA	AF423A
	NOTE: Replaces non-RoHs compliant part number 192186-002.	
	HP R3000 VA UPS, 2U, L6-20, JPN	AF424A
	NOTE: Replaces non-RoHs compliant part number 192186-292.	
	HP R3000 VA UPS, 2U, L5-30, JPN	AF425A
	NOTE: Replaces non-RoHs compliant part number 192186-291.	
HP UPS R5500 XR, (5000VA, 4500 Watt), High Voltage (NA/Jpn)	326529-D71	
HP UPS R5500 XR, (6000VA, 5400 Watt), High Voltage (Int'l)	326529-B31	
HP R5500 VA UPS, INTL	AF416A	
NOTE: Replaces non-RoHs compliant part number 326529-B31.		
HP R5500 VA UPS, NA/JPN	AF426A	
NOTE: Replaces non-RoHs compliant part number 326529-D71.		
HP UPS R12000 XR, N+ x (12KVA, 12KW) High Voltage (WW)	207552-B22	
NOTE: The UPS R12000 XR has a hardwired input and output connection.		

USB Options	USB Optical Scroll Mouse (Carbonite)	DD441B
	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	512MB HP Drive Key II (USB 2.0)	ED516AA

Options

ProLiant DL320 Deployment Options	Rack Adapter Kit	332815-B21
	<p>NOTE: This kit allows HP rack servers to fit in racks that are 24" wide.</p> <p>1U Cable Management Arm</p>	365403-B21
	<p>NOTE: Package contains two cable management arms.</p> <p>NOTE: Telco Rack Support - Support for all 2-post Telco racks requires the use of the standard rack kit and an additional option kit from Rack Solutions: http://www.racksolutions.com/hp</p>	
HP Rack 5000 Series (Metallic Carbonite)	HP 5642 Rack-Unassembled	358254-B21
	<p>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)</p> <p>NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.</p>	
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
	10642 G2 (42U) Rack Cabinet, without door - Shock Pallet	AF005A
	10642 G2 (42U) Rack Cabinet - with Extension, without door - Shock Pallet	AF006A
	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
	10636 G2 (36U) Rack Cabinet, without door - Shock Pallet	AF015A
	10636 G2 (36U) Rack Cabinet, with Extension, without door - Shock Pallet	AF016A
	<p>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)</p> <p>NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.</p>	

Options

HP Rack 10000 Series (Graphite Metallic)	10642 (42U) Infrastructure Rack (Low Voltage)	379006-001
	10642 (42U) Infrastructure Rack (High Voltage)	379005-001
	HP S10614 (14U) Rack Cabinet – Shock Pallet	292302-B22
	HP 10842 (42U, 800mm wide) Rack Cabinet – Pallet	257415-B21
	HP 10842 (42U, 800mm wide) Rack Cabinet – Shock Pallet	257415-B22
	HP 10647 (47U) Rack Cabinet – Pallet	245160-B21
	HP 10647 (47U) Rack Cabinet – Shock Pallet	245160-B23
	HP 10642 (42U) Rack Cabinet – Pallet	245161-B21
	HP 10642 (42U) Rack Cabinet – Shock Pallet	245161-B22
	HP 10642 (42U) Rack Cabinet – Crated	245161-B23
	HP 10636 (36U) Rack Cabinet – Pallet	245162-B21
	HP 10636 (36U) Rack Cabinet – Shock Pallet	245162-B22
	HP 10636 (36U) Rack Cabinet – Crated	245162-B23
	HP 10622 (22U) Rack Cabinet – Pallet	245163-B21
	HP 10622 (22U) Rack Cabinet – Shock Pallet	245163-B22
	HP 10622 (22U) Rack Cabinet – Crated	245163-B23

NOTE: xxxxx-B21 (pallet) used to ship empty racks shipped on a truck. xxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels). xxxxx-B23 (crated) used for air shipments of empty racks.

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
	NOTE: For a complete list of Monitors please view the following URL: http://www.hp.com/go/kvm .	
	TFT7600RKM US	AG052A
	TFT7600RKM UK	AG053A
	TFT7600RKM GR	AG054A
	TFT7600RKM FR	AG055A
	TFT7600RKM IT	AG056A
	TFT7600RKM SP	AG057A
	TFT7600RKM DEN	AG058A
	TFT7600RKM NOR	AG059A
	TFT7600RKM SE/FI	AG060A
	TFT7600RKM SWI	AG061A
	TFT7600RKM PORT	AG062A
	TFT7600RKM BEL	AG063A
	TFT7600RKM JPN2	AG064A
	TFT7600RKM RUS	AG065A

Options

TFT7600RKM INTL	AG066A
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
	2x16 Server Console Switch with Virtual Media	AF603A
	PS/2 Virtual Media Interface Adapter, 1 pack	AF604A
	NOTE: Requires PS/2 and one USB port on server.	
	IP Console Switch Box (KVM/IP), 3 x 1 x 16	262586-B21
	IP Console Switch Box (KVM/IP), 1 x 1 x 16	262585-B21
	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 1x 4 USB/PS2 KVM Switch, TT (NA/JPN)	371301-D71
	HP 1x 4 USB/PS2 KVM Switch, TT (AU/NZ)	371301-011
	HP 1x 4 USB/PS2 KVM Switch, TT (UK)	371301-031
	HP 1x 4 USB/PS2 KVM Switch, TT (EU)	371301-A21
	HP 1x 4 USB/PS2 KVM Switch, RM (ALL)	371302-B21
	HP PS2 KVM Cable with audio, 6', 2-pack	371730-B21
HP USB KVM Cable with audio, 6', 2-pack	371729-B21	

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 G4 All Models

Standard Memory

512 MB PC2-4200 ECC UB DDR2 SDRAM installed (1 x 512 MB SDRAM DIMM) on Celeron D model.

1 GB (1 x 1024 MB SDRAM DIMMs) on all Pentium D models.

Standard Memory Plus Optional Memory

Up to 8 GB memory is available with the optional installation of PC2-4200 ECC DDR2 SDRAM Memory kits.

NOTE: The chart below represents the Pentium D models with 1 GB standard memory, and does not represent all possible configurations. Memory can be populated in any order with any of the supported DIMMs listed. For optimal performance, the total amount of memory in slots 1A and 2A should equal to the total amount of memory in slots 3B and 4B.

Memory		Slot			
		1A	2A	3B	4B
Standard	1 GB	1024 MB	Empty	Empty	Empty
Optional	4 GB	2 GB	Empty	2 GB	Empty
Maximum	8 GB	2 GB	2 GB	2 GB	2 GB

Following are memory options available from HP:

- 2 GB UB PC2-4200 1 x 2 GB 2RANK ALL 393354-B21
- 1 GB UB PC2-4200 1 x 1 GB 2RANK ALL 390824-B21
- 512 MB UB PC2-4200 1 x 512 MB 1RANK ALL 390825-B21

Storage



- 1- 2 Two SATA or SAS drive bays
- A Removable 1.44 MB Diskette Drive Assembly Kit
- B Optional CD-ROM/DVD Drive Assembly Kit

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
1.44-MB Diskette Drive	Up to 1	A	Integrated
Low-profile IDE (ATAPI) CD-ROM Drive	Up to 1	B	Integrated IDE (ATAPI)
Low-profile IDE DVD-ROM or DVD-RW Drive	Up to 1	B	Integrated IDE

SAS Hard Drives

	Quantity Supported	Position Supported	Controller
HP 72GB 3G SAS 10K HP 36GB 3G SAS 10K HP 146GB 3G SAS 15K	Up to 2	1-2	HP 8 Internal Port SAS HBA with RAID

Serial ATA Hard Drives

	Quantity Supported	Position Supported	Controller
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	1-2	HP embedded 2 Port SATA Controller with RAID 0/1 support HP 8 Internal Port SAS HBA with RAID

Storage

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
Modular Smart Array 20	Please see the Modular Smart Array 20 QuickSpecs below to determine configuration requirements	External	Please see the Modular Smart Array 20 QuickSpecs below see the list of supported controllers
Modular Smart Array 30 Family	Up to 14	External	Smart Array 6402/128 Controller Smart Array 642 Controller 64-Bit/133-MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
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	Please see the Modular Smart Array 1000 QuickSpecs below to determine configuration requirements	External	Please see the Modular Smart Array 1000 QuickSpecs (URL below) for the latest list of supported HBAs

Modular Smart Array 1000: http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML (Worldwide)

Maximum Storage Capacity - (SAS drives)

Internal	292GB (2 x 146GB SAS)
External	4.20TB (1 x (14 x 300GB Ultra320))
Total	4.35TB

NOTE: In order to implement integrated SATA RAID with Smart Start 7.4 on Windows 2000/2003, the use of a floppy drive is necessary.

Maximum Storage Capacity - (SATA Drives)

Internal	1TB (2 x 500GB SATA)
External	6.0TB (1 x (12 x 500GB SATA))
Total	7.0TB

NOTE: In order to implement integrated SATA RAID with Smart Start 7.4 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

Storage

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 & 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>

For details on connecting tape drives to this server, see the following:

	Quantity Supported	Position Supported	Controller
HP StorageWorks Tape Drives, USB External DAT 24 USB DAT 40 USB DAT 72 USB	1 per USB port	External	USB port
HP StorageWorks Tape Drives, External Ultrium 232 Ultrium 448 Ultrium 460 DAT 40 DAT 72 DLT VS80 DLT VS160 SDLT 320	Up to 2	External	NOTE: Optional PCI-X riser card required to connect the following SCSI Adapters: 64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2
HP StorageWorks Tape Drives, External Ultrium 960 SDLT 600	1 per SCSI Channel	External	NOTE: Optional PCI-X riser card required to connect the following SCSI Adapters: 64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2
HP StorageWorks Autoloaders, External 1/8 Tape Autoloader	1 autoloader per SCSI channel	External	NOTE: Optional PCI-X riser card required to connect the following SCSI Adapters: 64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2
HP StorageWorks Rack-mount Tape Drive Enclosures 1U Rack-Mount Kit 3U Rack-Mount Kit 5U Rack-Mount Kit	1 per SCSI channel	External	NOTE: Optional PCI-X riser card required to connect the following SCSI Adapters: 64-Bit/133MHz Dual Channel Ultra320 SCSI Adapter 64-Bit/133-MHz Single Channel Ultra320 SCSI HBA G2

Storage

HP StorageWorks Tape Libraries

MSL2024 (Ultrium 448 and 960-based)

MSL4048 (Ultrium 448 and 960-based)

MSL6000 (Ultrium 960 and 460-based)

MSL6000 (SDLT 600-based)

MSL5026S2 (SDLT 320-based)

MSL5052S2 (SDLT 320-based)

Please reference the MSL Tape Library QuickSpecs to determine configuration requirements

External

Please consult the EBS connectivity matrix at <http://www.hp.com/go/ebs> for detailed connectivity information.

Technical Specifications

System Unit	Dimensions (HxWxD)	1.70 x 16.78 x 24.0 in (4.32 x 42.62 x 60.96 cm)	
	Weight (no drives installed)	24.0 lb (10.91 kg)	
	Weight (fully configured with two hard drives, four DIMM modules, and a PCI expansion board)	27.0 lb (12.27 kg)	
Input Requirements	Range Line Voltage	90 to 264 VAC	
	Nominal Line Voltage	100 to 120 VAC/220 to 240 VAC	
	Rated Input Current	6 A (100 to 120 VAC) to 3 A (200 to 240 VAC)	
	Rated Input Frequency	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)	
	Power Supply Output	Steady State Power	450 W (rated) NOTE: 1. +3.3V and +5V total O/P power 130W Maximum. 2. +3.3V, +5V and +12V total O/P power 324W Maximum.
Environmental Operating	Operating	Ambient Temperature	50° to 95° F (10° to 35° C)
		Temperature Derating	1.8° F per 1000 ft to 10,000 ft (1° C per 300 m to 3000 m)
		Relative Humidity	10% to 90% (non-condensing)
		Maximum wet bulb temperature	82° F (28° C)
Non-operating Storage	Temperature	-22° to 140° F (-30 to 60° C)	
	Relative Humidity	5% to 95% (non-condensing)	
	Maximum wet bulb temperature	102° F (38.7° C)	
Non-operating Shipping	Temperature	-22° to 140° F (-30 to 60° C)	
	Relative Humidity	5% to 95% (non-condensing)	
	Maximum wet bulb temperature	102° F (38.7° C)	

Technical Specifications

Acoustic Noise	Idle at 23 degree C ambient (Fixed Disk Drives Spinning)	
	L WAd (BELS)	=6.4
	Bystander L pAm (dBA)	=47
	Operating (Random Seeks to Fixed Disks)	
	L WAd (BELS)	=6.4
	Bystander L pAm (dBA)	=47

Serial ATA Hard Drives	HP 80GB 1.5G SATA 7.2K 3.5" HDD 349237-B21	Capacity	80,000 MB
		Height	1.028 in/2.611cm
		Width	4.0 in (10.16 cm)
		Interface	Serial ATA
		Transfer Rate Synchronous (Maximum)	1.5 Gb/s
		Seek Time (typical reads, including settling)	Single Track 0.9 ms Average 9.0 ms Full-Stroke 17.0 ms
		Rotational Speed	7,200 rpm
		Physical Configuration	Bytes/Sector 512 Logical Blocks 156,301,488
		Operating Temperature	41° to 131° F (5° to 55° C)

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	450W (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%	

Technical Specifications

Dielectric voltage withstand	Input to output	1800 VAC/minute
	Input to ground	1800 VAC/minute
Maximum Wet Bulb Temperature	41.3C	

Embedded NC324i PCI Express Dual Port NIC	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)	2000Mb/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)		

Integrated Dual Channel Serial ATA Controller	Simultaneous drive transfer channels	2 channels	
	Transfer rate synchronous (maximum theoretical)	150 MB/s per channel; 300MB/s in RAID 0 pair	
	Data transfer method	Intel® 82801FR Integrated Serial ATA Host Controller (non-RAID mode) Intel® 82801FR 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)		

Technical Specifications

Integrated Serial ATA Controller	Transfer rate synchronous (maximum)	150 MB/s per channel; 300MB/s in RAID 0 pair
	Protocol	Serial ATA
	Drive support	HP Universal Serial ATA
	Data transfer modes	ATA data-transfer modes supported SATA 1.0, SATA II PIO modes 0-4 Multiword DMA modes 0-2 Ultra DMA modes 0-6
RAID levels		0, 1
Feature		Supports Warranty of SATA Hard Drives Supports multiple logical volumes Setup through ROM based Array Configuration Utility Installation scripting support
OS Support		Microsoft Windows 2000 Server Microsoft Windows Server 2003 NOTE: In order to implement integrated SATA RAID with Smart Start 7.4 on Windows 2000/2003, the use of a floppy drive is necessary Linux (Red Hat, SuSE, UnitedLinux)

NOTE: This controller does not support LED functions

This controller does not support Hot Plug functions

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