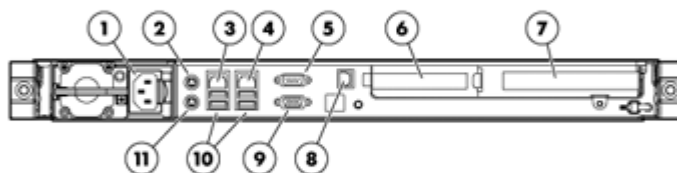
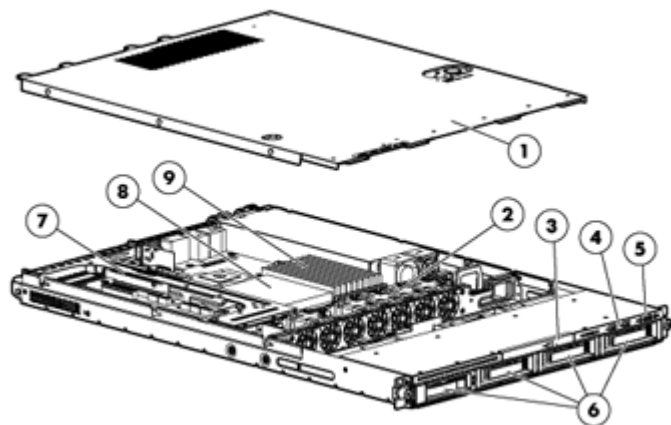


### Overview



#### Front View:

1. Cover
2. on Hot Plug Dual Rotor Fans
3. Optional Slim 9.5mm DVD ROM
4. USB connectors (2)
5. Power Button, UID button, and Front LED Indicators
6. Support for up to four SATA or SAS Hard Drives or SSD's
7. Two PCI-Express Slots (2 PCI-Express 2.0 x16 connectors standard)
8. Processor Socket (Intel Xeon, Core 2 and Quad Core)
9. Nine DDR3 Memory Slots

#### Rear View:

1. Power supply
2. Mouse connector
3. NIC 1 Port/Shared iLO 2 Management Port
4. NIC 2 Port
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. Dedicated Integrated Lights-Out 2 (ProLiant Onboard Administrator powered by integrated Lights-Out 2) management port (optional)
9. Video connector
10. USB connectors (4)
11. Keyboard connector

### What's New

- Adding Intel Xeon E5530
- Adding 400W Redundant Power Supply Kit

### At a Glance

The HP ProLiant DL320 G6 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 HP infrastructure management capabilities, combined with other Insight software, give the DL320 G6 enterprise-class management features. Support for 1 or 2 low-cost Serial ATA drives on an integrated RAID0/1 controller, with an optional upgrade to highly reliable hot plug SAS hard drives, gives the DL320 G6 flexibility to meet the needs of your datacenter. Plus, you get the

### Overview

cost-effective solution of a single-processor platform with options from the new Intel® Xeon® Processor 3000 sequence with turbo mode.

- **Processor:**
  - 1 Quad-Core or Dual-Core Intel Xeon processor 5500 series
  - Intel 5500 Chipset with up to 6.4GT/s QPI
- **Memory:**
  - Nine (9) DIMM slots
  - Up to 72GB, using DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 3 DIMMs per Channel in 9 Slots
- **Storage Controller:**
  - Entry & High Efficiency Models: HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0)  
**NOTE:** Transfer rate: 1.5Gb/s SATA
  - Performance Models: HP Smart Array P410/256MB Controller (RAID 0/1/1+0/5/5+0)  
**NOTE:** Available upgrades: Battery Kit upgrade (for BBWC), 512MB with BBWC, and Smart Array Advanced Pack (SAAP)
- **Internal Drive Support:**
  - Standard four 3.5" (Large Form Factor) hot-plug SATA or SAS hard drives
  - Internal storage capacity of up to 4TB (4 x 1TB SATA/SAS hard drives)
  - SAS drives require optional SAS Host Bus Adapter (HBA) or Smart Array Controller
  - Optional DVD or DVD-RW drive
- **Network Controller:**
  - Embedded NC326i Dual Port Gigabit Server Adapter
- **Expansion Slots:**
  - Two total slots:
    - (1) Full length PCI Express x16 slot (x16 connector)
  - Can be replaced with a full-length 64-bit /133MHz PCI-X slot
    - (1) Half-length, low-profile PCI Express x1 slot (x4 connector)
- **USB 2.0 Ports:**
  - Up to 7 Total: (2) front; (1) internal (optional); (4) rear accessible ports
  - Internal USB port (optional) for flexible storage, security, or USB drive key deployment
- **Redundancy:**
  - Hot plug power with optional redundancy (Included in Performance models)
- **Infrastructure Management:**
  - Convenient slide-out Systems Insight Display for quick and easy front view server diagnostics, along with status LEDs, Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU)
  - HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 2 management processor) for simplified server setup, health monitoring and recovery, power and thermal control, and lights-out remote administration.
  - HP Insight Control (ICE) suites, as product options, deliver essential infrastructure management that can help save time and money by making it easy to deploy, monitor, control and optimize your IT infrastructure through a single, simple management console. ICE suites support both Windows and Linux-based servers and management consoles
  - HP Insight Dynamics - VSE suite for ProLiant servers, a product option, is an integrated command center that enables you to continuously analyze and optimize your adaptive infrastructure. This advanced infrastructure management software lets you reduce the cost of common data center tasks by as much as 40 percent while keeping pace with your changing business.
- **Operating Systems and Virtualization Software Support for ProLiant Servers:**
  - Supports Windows, RHEL, SLES, OEL
- **Deployment/Serviceability:**
  - Customer Self Repair (CSR): HP products are designed with many CSR parts to minimize repair time and allow for greater flexibility in performing defective parts replacement
  - Fixed, mounting rails included with all models
- **Form Factor:**

### Overview

- 1U (1.70" / 4.32 cm) Rack Mount Chassis
- 27.56" (70.00 cm) Deep
- **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 three 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. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
  - **NOTE:** Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Standard Features

**NOTE:** For 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 Processors

Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3 1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800)

Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800)

Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800)

Intel® Xeon® Processor W3520 (2.63GHz, 8MB L3 Cache, 130W, DDR3-1066, HT, Turbo 1/1/1/2)

Intel® Xeon® Processor W3540 (2.93GHz, 8MB L3 Cache, 130W, DDR3-1066, HT, Turbo 1/1/1/2)

#### Dual-Core Processors

Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800)

**NOTE:** HT indicates that the processor model supports Intel® Hyper-Threading Technology.

**NOTE:** Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 4, 3, 2, and 1 cores active.

**NOTE:** DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

**NOTE:** For the Intel 5500 Series, the letter preceding the model number indicates the performance/wattage of the processor. ; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

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#### Cache Memory

One of the following depending on Model

4MB (1 x 4MB) Level 3 Cache

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#### Chipset

Intel 5500 Chipset

**NOTE:** For more information regarding Intel chipsets, please see the following URL:

<http://www.intel.com/products/server/chipsets/>.

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#### Memory Protection

Advanced ECC

Mirroring mode

Lock-step mode

**NOTE:** Xeon W3500 processor family does not support any of above advanced features.

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### Standard Features

Memory <i>One of the following depending on Model</i>	Type	DDR3 1067/1333 Registered (RDIMM) and Unbuffered (UDIMM)
	Standard (Entry Models)	4 GB (2 x 2 GB) RDIMM
	Standard (High Efficiency Models)	4 GB (2 x 2 GB) UDIMM
Maximum Memory	Up to 72 GB, using DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 3 DIMMs per Channel in 9 Slots. Up to 24 GB, using DDR3 Unbuffered (UDIMM) memory, operating at 1066MHz when fully populated at 2 DIMMs per Channel in 6 slots.	

Network Controller	Embedded NC326i Dual Port Gigabit Server Adapter
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### Expansion Slots

Expansion Slots #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
5 (Standard)	PCIe	x4	x16	10	Low profile (half length, half height) slot	
4 (Standard)	PCIe	x16	x16	21	Full length, full height slot	This PCIe slot can be replaced with optional PCI-X slot below
4 (Optional)	PCI-X (133MHz, 3.3Volt)	64-bit	Not applicable	24	Full length, full height slot	

\* Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number

\*\* Indicates the number of physical electrical lanes running to the connector.

Storage Controllers	Entry Models	Integrated Intel® 82801IR Serial ATA Host Controller with RAID 0/1 support. <b>NOTE:</b> Hot Plug SAS and SATA controllers available via PCI card option.
	High Efficiency Models	Integrated Intel® 82801IR Serial ATA Host Controller with RAID 0/1 support. <b>NOTE:</b> Hot Plug SAS and SATA controllers available via PCI card option.
	Performance Models	HP Smart Array P410/256MB Controller (RAID 0/1/1+0/5/5+0) <b>NOTE:</b> Available upgrades: Battery Kit upgrade (for BBWC), 512MB with BBWC, and Smart Array Advanced Pack (SAAP)

Storage	Optical Drive	Optional: 9.5mm DVD-ROM, or DVD RW drive
	Hard Drives	None ship standard

### Standard Features

Maximum Internal Storage Type	SATA (4HDD models - requires optional 4HDD cage)	4TB	4 x 1TB
	SAS (4HDD models - requires optional PCI controller)	4TB	4 x 1TB

Interfaces	Serial	1	
	Pointing Device (Mouse)	1	
	Keyboard	1	
	VGA	2 (rear)	
	Network RJ-45	2	
	USB 2.0	7 (2 front, 1 internal (optional), 4 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	Integrated ATI ES1000, 32 MB video standard		
	<ul style="list-style-type: none"><li>• 16 bit color: maximum resolution of 1600 x 1200</li><li>• 32 bit color: maximum resolution of 1280 x 1024</li></ul>		
	<b>NOTE:</b> Maximum resolution available via iLO 2 remote console is 1280 x 1024.		

Form Factor	Rack (1U), (1.70 in/4.32 cm), 26.85" deep		
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Core Infrastructure Management	HP Insight Foundation suite	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.
	ProLiant Onboard Administrator	<p>HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: <a href="http://www.hp.com/go/foundation">www.hp.com/go/foundation</a>.</p> <p>The foundation pack includes:</p> <ul style="list-style-type: none"><li>• HP SmartStart</li><li>• HP Management</li><li>• HP ProLiant Firmware Maintenance</li></ul> <p>SmartStart version supported (minimum): SmartStart 8.20 <a href="http://www.hp.com/servers/smartstart">http://www.hp.com/servers/smartstart</a></p> <p>HP ProLiant Onboard Administrator (powered by the HP Integrated Lights-Out 2 management processor) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant</p>

### Standard Features

HP Insight Control (ICE) suites	<p>ML, DL, and BL servers. HP ProLiant Onboard Administrator functions without additional software, and can be accessed from any location via a web browser. It works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and the Insight Dynamics-VSE suite helping customers unlock the value of the ProLiant platform and deliver the highest possible quality of IT service to the business. See <a href="http://www.hp.com/go/ProLiantOA">www.hp.com/go/ProLiantOA</a></p> <p>HP Insight Control (ICE) suites, as product options, deliver essential infrastructure management that can help save time and money by making it easy to deploy, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. ICE suites install and license software modules that are integrated into HP System Insight Manager.</p> <p>Two Insight Control suites are available, to serve environments requiring either Linux-based or Windows-based management consoles: HP Insight Control suite for Linux (ICE-LX), and HP Insight Control suite (ICE). See <a href="http://www.hp.com/go/insightcontrol">www.hp.com/go/insightcontrol</a></p> <p>HP Insight Control suites include one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <a href="http://www.hp.com/services/insight">http://www.hp.com/services/insight</a>.</p>
HP Insight Dynamics - VSE suite	<p>The HP Insight Dynamics - VSE suite for ProLiant, a product option, is an integrated command center that enables you to continuously analyze and optimize your adaptive infrastructure. This advanced infrastructure management software that allows you to analyze and optimize your adaptive infrastructure to manage physical and virtual resources in the same way. HP Insight Dynamics - VSE gives you a powerful toolkit to accelerate complex technology projects and simplify daily operations. It enables you to plan capacity and power continuously, balance across physical and virtual resources, ensure cost-effective high availability, and provision infrastructure consistently.</p> <p>HP Insight Orchestration, an optional extension to Insight Dynamics - VSE, enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements.</p> <p>HP Insight Recovery, also an optional extension for Insight Dynamics - VSE, enables cost-effective disaster recovery for physical and virtual environments. Application environments can be reactivated in minutes with the touch of a button to a remote location</p> <p><b>NOTE:</b> For more information, visit: <a href="http://www.hp.com/go/insightdynamics">http://www.hp.com/go/insightdynamics</a>, <a href="http://www.hp.com/go/insightorchestration">http://www.hp.com/go/insightorchestration</a>, <a href="http://www.hp.com/go/insightrecovery">http://www.hp.com/go/insightrecovery</a></p>

### Standard Features

Industry Standard Compliance	ACPI 2.0 Compliant
	PCI 3.0 Compliant
	PXE Support
	WOL Support
	Microsoft® Logo certifications
	USB 2.0 Support
	IPMI 2.0

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
	USB Port control
	Removable optical drive assembly (optional)
	Removable DVD-ROM Drive Assembly (optional)
	Dedicated iLO2 port (optional)
	Serial interface control
	Administrator's password

### Security - Trusted Platform Module

The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: [www.hp.com/go/TPM](http://www.hp.com/go/TPM)

**NOTE:** ProLiant OS pre-installed units will come with the partition required for TPM deployment.

**NOTE:** The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

### Server Power Cords

**One 6' Highline (IEC-IEC) power cord ships standard**

**NOTE:** HP ProLiant DL320 G6 servers ship standard with a C13 to C14 2M Highline jumper cord. If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: <http://www.hp.com/go/powercordmatrix>



### Standard Features

Power Supply	Entry Models	400Watts, non-redundant, 72% Efficiency
	High Efficiency Models	500Watts, non-redundant, 92% efficient
	Performance Models	(2) 400Watts, redundant hot plug power supplies

- Common Slot ProLiant
- 460Watts, Common Slot, non-redundant, 92% Efficiency
  - **NOTE:** This power supply is needed to support power capping and power monitoring

HP's ProLiant Common Slot Power 460W supply meets multiple Energy Efficiency Initiatives. Climate Savers Computing Initiative GOLD, ECOS Consulting 80PLUS GOLD and plans on offering models that meet the Energy Star for Server requirements when they are published.

UPS and PDU Power Cord Matrix

Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link:  
[www.hp.com/products/powercords](http://www.hp.com/products/powercords).

System Fans

5 dual rotor fans ship standard

Ultra Thin Rack Deployment Overview

For the Ultra Thin Rack Deployment Overview, including best practices for the HP ProLiant DL320 G6, please see the following URL: [www.hp.com/servers/proliantdl320-g6](http://www.hp.com/servers/proliantdl320-g6).

Required Cabling

For required cabling information, refer to the Web site at: [www.hp.com/servers/proliantdl320-g6](http://www.hp.com/servers/proliantdl320-g6).

Operating Systems and Virtualization Software Support for ProLiant Servers

[Microsoft Windows Server](#)  
[Microsoft Windows Server Hyper V](#)  
[Red Hat Enterprise Linux \(RHEL\)](#)  
[SUSE Linux Enterprise Server \(SLES\)](#)  
[Oracle Enterprise Linux \(OEL\)](#)

**NOTE:** Support differences will exist between the SATA and SAS configurations.

**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: [www.hp.com/go/ossupport](http://www.hp.com/go/ossupport) and our driver download site [www.hp.com/support/DL320G6](http://www.hp.com/support/DL320G6).

### Standard Features

#### Rack Airflow Requirements

##### Rack 10000 G2 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 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: [www.hp.com/servers/proliantdl320g6](http://www.hp.com/servers/proliantdl320g6).

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#### Rack Kit

Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.

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#### 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 at: <http://www.racksolutions.com/hp/>

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#### 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 MSAxxx, 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

#### HP Enterprise Configurator

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

#### 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.

<p><b>HP DL320 G6 Entry Models</b></p>	<p><b>Processors</b></p>	Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80 Watts, DDR3-800)
<p><b>HP DL320G6 E5502 505682-001</b></p>	<p><b>Cache Memory</b></p>	4MB L3 Cache
	<p><b>Memory</b></p>	4 GB (2 x 2 GB) DDR3 RDIMM
	<p><b>Network Controller</b></p>	Embedded NC326i Dual Port Gigabit Server Adapter
	<p><b>Storage Controller</b></p>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<p><b>Hard Drives</b></p>	None ship standard
	<p><b>Internal Storage</b></p>	Up to 4 x 1TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SAS requires optional PCI Controller.
	<p><b>Optical Drive</b></p>	Optional
	<p><b>Power Supply</b></p>	Auto-sensing 400-Watt PFC Power Supply, CE Mark Compliant
	<p><b>Fans</b></p>	5 dual rotor fans ship standard
	<p><b>Form Factor</b></p>	Rack (1U), (1.70 in/4.32 cm)

<p><b>HP DL320 G6 High Efficiency Models</b></p>	<p><b>Processors</b></p>	Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800)
<p><b>HP DL320G6 L5506 505683-001</b></p>	<p><b>Cache Memory</b></p>	4MB L3 Cache
	<p><b>Memory</b></p>	4 GB (2 x 2 GB) DDR3 UDIMM
	<p><b>Network Controller</b></p>	Embedded NC326i Dual Port Gigabit Server Adapter
	<p><b>Storage Controller</b></p>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<p><b>Hard Drives</b></p>	None ship standard
	<p><b>Internal Storage</b></p>	Up to 4 x 1TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SAS requires optional PCI Controller.
	<p><b>Optical Drive</b></p>	Optional
	<p><b>Power Supply</b></p>	500-Watt PFC Power Supply, CE Mark Compliant
	<p><b>Fans</b></p>	5 dual rotor fans ship standard
	<p><b>Form Factor</b></p>	Rack (1U), (1.70 in/4.32 cm)

### Models

HP DL320 G6  
Performance Models

HP DL320G6 E5530  
505684-001

<b>Processors</b>	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3 1066, HT, Turbo 1/1/2/2)
<b>Cache Memory</b>	8MB L3 Cache
<b>Memory</b>	6 GB (3 x 2 GB) DDR3 RDIMM
<b>Network Controller</b>	Embedded NC326i Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	HP Smart Array P410/256MB with BBWC Controller
<b>Hard Drives</b>	None ship standard
<b>Internal Storage</b>	4 x 1TB 3.5" Hot plug SATA/SAS
<b>Optical Drive</b>	Optional
<b>Power Supply</b>	(2) 400W Redundant Hot Plug Power Supply
<b>Fans</b>	5 dual rotor fans ship standard
<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

### Configuration Information - Factory Integrated Models

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

**NOTE:** HP does not allow factory integration of options into standard models listed above. Configure-to-order servers must start with a CTO Chassis.

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

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

<b>Models</b>	DL320G6 CTO (Configure to Order) Chassis	505768-B21
	<b>Includes:</b>	
	Embedded NC326i Dual Port Gigabit Server Adapter	
	1 full length PCI Express x16 slot and 1 half length low profile PCI Express x4 slot	
	Integrated Lights-Out 2 (ProLiant Onboard Administrator powered by Integrated Lights-Out 2) embedded (shared NIC functionality standard)	
	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)	
	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)

<b>Processors</b>	<b>Quad-Core Processors</b>	
	Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	512058-L21
	Intel® Xeon® Processor E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	512059-L21
	Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800), FIO	512063-L21
	Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3 1066, HT, Turbo 1/1/2/2), FIO	512061-L21
	Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	512060-L21
	Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	512064-L21
	Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	512062-L21
	Intel® Xeon® Processor W3520 (2.63GHz, 8MB L3 Cache, 130W, DDR3-1066, HT, Turbo 1/1/1/2), FIO	519748-L21
	Intel® Xeon® Processor W3540 (2.93GHz, 8MB L3 Cache, 130W, DDR3-1066, HT, Turbo 1/1/1/2), FIO	519749-L21
	<b>Dual-Core Processors</b>	
	Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	512057-L21
<b>Drive Cage</b>	HP 8SFF HDD Cage & Bkpln G6 FIO	515938-B21
	<b>NOTE:</b> This cage requires the P410 SAS array controller as a Primary Controller (See Step 3 below if P/N 515938-B21 is selected).	
	HP 4HDD Hot Plug Bkpln G6 Kit	512181-B21

### Configuration Information - Factory Integrated Models

Power Supply	DL320G6 400W Power Supply FIO Kit	515739-B21	
	DL320G6 460W PL Power Supply FIO Kit	515740-B21	
	DL320G6 500W NHP Power Supply FIO Kit	537150-B21	
Memory	<b>Registered Dimms (RDIMMs)</b>		
	HP 2GB 2Rx8 PC3-10600R-9	500656-B21	
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21	
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21	
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21	
	<b>Unbuffered with ECC DIMMs (UDIMMs)</b>		
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21	
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21	
	<p><b>NOTE:</b> Depending on the memory configuration and processor model the memory speed may run at 1066MHz or 800MHz. See the Online Memory Configuration Tool for details: <a href="http://www.hp.com/go/ddr3memory-configurator">http://www.hp.com/go/ddr3memory-configurator</a>.</p> <p><b>NOTE:</b> Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a>.</p>		

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

Controllers	HP Smart Array P212/256 MB w/ Battery FIO	491191-B21	
	HP Smart Array P212/256MB Controller	462834-B21	
	HP Smart Array P212/Zero Memory (ZM) Controller	462828-B21	
	HP Smart Array P410/Zero Memory FIO Controller	462860-B21	
	<b>NOTE:</b> May be selected if P/N 515938-B21 selected in Step 2 above.		
	HP Smart Array P410/256MB Controller	462862-B21	
	<b>NOTE:</b> May be selected if P/N 515938-B21 selected in Step 2 above.		
	HP Smart Array P410/256 MB w/Battery FIO	491195-B21	
	<b>NOTE:</b> May be selected if P/N 515938-B21 selected in Step 2 above.		
	HP Smart Array P410/512MB with BBWC	462864-B21	
	<b>NOTE:</b> May be selected if P/N 515938-B21 selected in Step 2 above.		
	HP Smart Array P411/256MB Controller	462830-B21	
	HP Smart Array P411/256 MB w/ Battery FIO	491193-B21	
HP Smart Array P411/512MB BBWC	462832-B21		
<b>NOTE:</b> Any factory integrated Smart Array Controller purchase automatically includes the HP HBA SAS-SATA 4x1LN Cable Kit (452130-B21).			

### Step 4: Choose Additional Options for Factory Integration

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

### Core Options

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

Memory	<b>Registered Dimms (RDIMMs)</b>	
	HP 2GB 2Rx8 PC3-10600R-9 Kit	500656-B21
	HP 4GB 2Rx4 PC3-10600R-9 Kit	500658-B21
	HP 4GB 4Rx8 PC3-8500R-7 LP Kit	500660-B21
	HP 8GB 2Rx4 PC3-10600R-9 Kit	500662-B21
	HP 8GB 2Rx4 PC3-8500R-7 Kit	516423-B21
	<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
	HP 1GB 1Rx8 PC3-10600E-9 Kit	500668-B21
	HP 2GB 2Rx8 PC3-10600E-9 Kit	500670-B21

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient).

Optical Drives	HP 9.5mm SATA DVD-ROM Optical Drive	481045-B21
	HP 9.5mm SATA DVD RW Optical Drive	481047-B21

### Hard Drives

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

**NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

#### SAS Hot Plug SFF Enterprise (ENT) Drives

HP 300GB 6G SAS 10K SFF DP ENT HDD	507127-B21
HP 300GB 3G SAS 10K SFF DP ENT HDD	492620-B21
HP 146GB 6G SAS 15K SFF DP ENT HDD	512547-B21
HP 146GB 3G SAS 15K SFF DP ENT HDD	504062-B21
HP 146GB 6G SAS 10K SFF DP ENT HDD	507125-B21
HP 146GB 3G SAS 10K SFF DP ENT HDD	418367-B21
HP 72GB 6G SAS 15K SFF DP ENT HDD	512545-B21
HP 72GB 3G SAS 15K SFF DP ENT HDD	418371-B21
HP 72GB 3G SAS 10K SFF DP ENT HDD	384842-B21

#### SAS Hot Plug 3.5" Enterprise (ENT) Drives

HP 600GB 6G SAS 15K 3.5" DP ENT HDD	516828-B21
HP 450GB 6G SAS 15K 3.5" DP ENT HDD	516816-B21
HP 450GB 3G SAS 15K 3.5" DP ENT HDD	454232-B21
HP 300GB 6G SAS 15K 3.5" DP ENT HDD	516814-B21
HP 400GB 3G SAS 10K 3.5" DP ENT HDD	459508-B21
HP 300GB 3G SAS 15K 3.5" DP ENT HDD	416127-B21



### Core Options

HP 146GB 3G SAS 15K 3.5" DP ENT HDD 384854-B21

HP 72GB 3G SAS 15K 3.5" DP ENT HDD 384852-B21

#### SAS Hot Plug SFF Midline (MDL) Drives

500GB 6G SAS 7.2K 2.5in DP MDL HDD 507610-B21

#### SAS Hot Plug 3.5" Midline (MDL) Drives

HP 1TB 3G SAS 7.2K 3.5" DP MDL HDD 461137-B21

HP 750GB 3G SAS 7.2K 3.5" DP MDL HDD 461135-B21

**NOTE:** SAS Hard Drives are only supported with optional SAS HBA or RAID cards.

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/12244\\_na/12244\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html)

#### SATA Hot Plug SFF Midline (MDL) Drives

HP 500GB 3G SATA 7.2K 2.5in MDL HDD 507750-B21

HP 160GB 3G SATA 7.2K 2.5in MDL HDD 530888-B21

#### SATA Hot Plug 3.5" Midline (MDL) Drives

HP 1TB 3G SATA 7.2K 3.5" MDL HDD 454146-B21

HP 750GB 3G SATA 7.2K 3.5" MDL HDD 458930-B21

HP 500GB 3G SATA 7.2K 3.5" MDL HDD 458928-B21

HP 250GB 3G SATA 7.2K 3.5" MDL HDD 458926-B21

#### SATA Hot Plug 3.5" Entry (ETY) Drives

HP 160GB 3G SATA 7.2K 3.5" ETY HDD 458945-B21

#### SATA Hot Plug SFF Entry (ETY) Drives

HP 250GB 3G SATA 5.4K SFF ETY HDD 460355-B21

HP 120GB 1.5G SATA 5.4K SFF ETY HDD 458924-B21

**NOTE:** SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13021\\_na/13021\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html)

#### SATA Hot Plug Midline (MDL) Solid State Drives

HP 60GB 3G SATA 2.5in MDL 1y Wty SSD 572071-B21

HP 120GB 3G SATA 3.5in MDL 1y Wty SSD 572073-B21

#### SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

HP 60GB 3G SATA 2.5in MDL 1y Wty SSD 570761-B21

HP 120GB 3G SATA 3.5in MDL 1y Wty SSD 570763-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13415\\_na/13415\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13415_na/13415_na.html)

### Core Options

#### Communications

##### Gigabit Ethernet Adapters

HP NC112T PCIe Gigabit Server Adapter	503746-B21
HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21

##### 10 Gigabit Ethernet Adapters

HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21
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**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each NC522SFP adapter.

**NOTE:** Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: [www.hp.com/go/ProLiantNICs](http://www.hp.com/go/ProLiantNICs).

### Additional Options

HP Insight Control (ICE) suites, Integrated Lights-Out Advanced, Insight Rapid Deployment software	<b>HP Insight Control suite (ICE)</b> HP Insight Control suite, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates <b>NOTE:</b> This part number can be purchased as a single license or as multiple licenses with a single activation key. Customer will receive a license entitlement certificate via e-mail. 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. Only available directly from HP and select resellers in the Americas region.	452148-B22
	<b>HP Insight Control Management Software Media Kit</b> <b>NOTE:</b> Insight Software DVD media without licenses. Contains HP Systems Insight Manager and Insight software products and components licensed by the Insight Control suite. Uses an integrated installer to perform quick and accurate software installation and updates. <b>NOTE:</b> For additional License Kits, including electronic licensing options, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html">http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html</a>	436222-B21
	<b>HP Insight Control suite for Linux (ICE-LX)</b> HP Insight Control Environment for Linux, Media pack (DVD) - No licenses included <b>NOTE:</b> This optional Media pack DVD contains the ISO image for HP Insight Control suite for Linux, HP System Insight Manager, HP Insight Power Manager, HP Insight Virtual Machine Manager, and an integrated installer. Servers must be acquired separately. <b>NOTE:</b> This Media pack is optional because the latest ISO image and latest updates may be downloaded at no cost from: <a href="http://www.hp.com/go/ice-linux">http://www.hp.com/go/ice-linux</a> (click on Download button).	464422-B22
	<b>HP Insight Control Environment for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates</b> <b>NOTE:</b> This part number can be used to purchase one (1) license with a single activation key. 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. <b>NOTE:</b> One certificate is shipped for each license. <b>NOTE:</b> For additional License Kits, including electronic licensing options, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html">http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html</a>	464423-B22
	<b>HP Integrated Lights-Out Advanced</b> HP Integrated Lights-Out Advanced, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates <b>NOTE:</b> This license allows 1 server to be deployed and managed via HP iLO Advanced. 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 Service. <b>NOTE:</b> For additional license kits, including electronic delivery options, please see the ProLiant OA/iLO QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html">http://h18000.www1.hp.com/products/quickspecs/12362_na/12362_na.html</a>	512485-B21

### Additional Options

#### HP Insight Rapid Deployment software

HP Insight Rapid Deployment software No Media 1-Server License, including 1 year of 24x7 Technical Support and Updates 452151-B21

**NOTE:** This license allows 1 server to be deployed and managed via RDP. 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 Service.

**NOTE:** For additional license kits, including electronic delivery options, please see the RDP QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/11053\\_na/11053\\_na.html](http://h18000.www1.hp.com/products/quickspecs/11053_na/11053_na.html)

**Port Options** HP DL320G6 iLO2 PORT OPT KIT 514206-B21

**Security** HP Trusted Platform Module Option Kit 488069-B21

#### Storage Controllers

##### SAS Controllers

##### Smart Array P212 Controller

HP Smart Array P212/Zero Memory Controller 462828-B21

HP Smart Array P212/256 MB Controller 462834-B21

##### Smart Array P410 Controller

HP Smart Array P410/256 MB Controller 462862-B21

HP Smart Array P410/512 MB with BBWC Controller 462864-B21

##### Smart Array P411 Controller

HP Smart Array P411/256MB Controller 482830-B21

HP Smart Array P411/512MB Battery Backed Write Cache 462832-B21

**NOTE:** Please see the following QuickSpecs for Technical Specifications and additional information:

[http://h18000.www1.hp.com/products/quickspecs/13203\\_na/13203\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html)  
(Smart Array P212 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13201\\_na/13201\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html)  
(Smart Array P410 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13202\\_na/13202\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html)  
(Smart Array P411 Controller)

##### Optional Upgrades

256 MB Cache Module 462968-B21

**NOTE:** Supported on HP Smart Array P212 Controller only.

512MB BBWC 462967-B21

**NOTE:** Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.

Battery Kit upgrade 462969-B21

**NOTE:** To enable BBWC on the 256MB cache.

**NOTE:** Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.

##### SAS HBA

### Additional Options

HP SC08Ge Host Bus Adapter 488765-B21

**NOTE:** Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.

HP HBA SAS-SATA 4x1LN Cable Kit 452130-B21

**NOTE:** This option is required for any internal port HBA or controller that has a standard 4 port SAS/SATA connector.

**NOTE:** Please see the following QuickSpecs for Technical Specifications and additional information:

[http://h18004.www1.hp.com/products/quickspecs/13082\\_na/13082\\_na.html](http://h18004.www1.hp.com/products/quickspecs/13082_na/13082_na.html)  
(SC80Ge HBA)

#### 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/12566\\_na/12566\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html)  
(SC11Xe HBA)

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### Tape Drives

**NOTE:** For the complete listing of Tape Drive offerings, please see:

<http://www.hp.com/products1/storage/compatibility/tapebackup/ISS/index.html>

#### USB Rack-Mount Tape Solutions

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

**NOTE:** Pre-configured with one DAT 160 USB tape drive.

#### SAS Rack-Mount Tape Solutions

**NOTE:** HP P212 Smart Array Controller SAS (462828-B21) is recommended for a dedicated HBA for SAS tape connection.

HP StorageWorks 1U SAS Rack-Mount Kit with one LTO-4 Ultrium 1760 EH946A

**NOTE:** Pre-configured with one LTO-4 Ultrium 1760 SAS tape drive.

HP StorageWorks DAT 160 SAS Internal Tape Drive Q1587A

**NOTE:** Mounts inside the 1U SAS Rack-Mount Kit (AE459A)

HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive DW085A

**NOTE:** Mounts inside the 1U SAS Rack-Mount Kit (AE459A)

HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive EH847A

**NOTE:** Mounts inside the 1U SAS Rack-Mount Kit (AE459A)

**NOTE:** 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>.

### Additional Options

Disk-Based Backup	<b>HP StorageWorks RDX Removable Disk Backup System</b>	
	HP StorageWorks RDX320 Internal	AJ767A
	<b>NOTE:</b> Requires HP 1U USB rack mount kit (A8007A) to install into 19" rack.	
	HP StorageWorks RDX500 Internal	AJ934A
	<b>NOTE:</b> Requires HP 1U USB rack mount kit (A8007A) to install into 19" rack.	
	<b>NOTE:</b> Please see the HP RDX QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13036_na/13036_na.html">http://h18000.www1.hp.com/products/quickspecs/13036_na/13036_na.html</a>	
	<b>D2D Backup</b>	
	HP StorageWorks D2D2502i Backup System	EJ001A
	<b>NOTE:</b> 2 TB raw capacity/1.5 TB useable capacity	
	HP StorageWorks D2D2504i Backup System	EJ002A
	<b>NOTE:</b> 4 TB raw capacity/3 TB useable capacity	
	<b>NOTE:</b> Please see the HP D2D Backup Systems QuickSpecs for additional information: <a href="http://www.hp.com/go/d2d">http://www.hp.com/go/d2d</a> .	
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Tape Autoloaders	<b>HP StorageWorks 1/8 G2 Tape Autoloader</b>	
	<b>NOTE:</b> HP P212 Smart Array Controller SAS (462828-B21) is recommended for a dedicated HBA for SAS tape connection.	
	HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	<b>NOTE:</b> Requires HP 1/8 G2 Tape Autoloader rack kit (AH166A) to install into 19" rack.	
	HP StorageWorks 1/8 G2 LTO-3 Ultrium 920 SAS Autoloader	AH558A
	<b>NOTE:</b> Requires HP 1/8 G2 Tape Autoloader rack kit (AH166A) to install into 19" rack.	
	<b>NOTE:</b> Please see the Tape Autoloader QuickSpecs at: <a href="http://www.hp.com/go/automation">http://www.hp.com/go/automation</a> for additional information.	
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Tape Libraries	<b>HP StorageWorks MSL2024 Tape Library</b>	
	HP StorageWorks MSL2024 1 LTO-4 Ultrium 1760 SAS Drive Library	AK378A
	<b>NOTE:</b> HP P212 Smart Array Controller SAS (462828-B21) is recommended for a dedicated HBA for SAS tape connection.	
	HP StorageWorks MSL2024 1 LTO-2 Ultrium 448 SCSI Drive Library	AG116A
	<b>NOTE:</b> HP U320e SCSI HBA (AH627A) recommended MSL SCSI Tape Library connect.	
	<b>HP StorageWorks MSL4048 Tape Library</b>	
HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Drive Library	AK380A	
<b>NOTE:</b> HP P212 Smart Array Controller SAS (462828-B21) is recommended for a dedicated HBA for SAS tape connection.		
	HP StorageWorks MSL4048 1 LTO-3 Ultrium 920 SAS Drive Library	AH560A
	<b>NOTE:</b> HP P212 Smart Array Controller SAS (462828-B21) is recommended for a dedicated HBA for SAS tape connection.	
	<b>NOTE:</b> Please reference the MSL Tape Library QuickSpecs at: <a href="http://www.hp.com/go/automation">http://www.hp.com/go/automation</a> for additional information. Please reference current compatibility information at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> .	

### Additional Options

#### Backup & Recovery Software

##### HP Data Protector Express

**NOTE:** One base product is required: BB117BA, BB118BA or BB117BT. Delivered as a media kit and License to Use (LTU).

HP Data Protector Express 4.0 SP1 Backup Server BB117BA

HP Data Protector Express 4.0 SP1 for Microsoft Small Business Server BB118BA

HP Data Protector Express Backup Server 4.0 SP1 Upgrade from Data Protector Express Single Server Edition BB117BT

**NOTE:** This part number allows registered owners of Data Protector Express Single Server Edition to acquire Data Protector Express at a reduced cost. The product received is exactly the same as when the Data Protector Express Backup Server (BB117BA) is ordered.

##### HP Data Protector Express options

**NOTE:** These are added to one of the base products. Delivered as a License to Use (LTU).

HP Data Protector Express 4.0 SP1 Network Server Agent BB121BA

HP Data Protector Express 4.0 SP1 Network Server Agent 3 Pack BB122BA

HP Data Protector Express 4.0 SP1 Application Online Agent BB125BA

HP Data Protector Express 4.0 SP1 Bare Metal Disaster Recovery Option BB128BA

HP Data Protector Express 4.0 SP1 D2Any2Any Option BB130BA

HP Data Protector Express 4.0 SP1 Drive Expansion Option BB133BA

**NOTE:** Please see [www.hp.com/go/dataprotectorexpress](http://www.hp.com/go/dataprotectorexpress) for additional information:

#### HP StorageWorks Modular Smart Array

##### MSA SAN Storage Arrays

HP StorageWorks 60 Modular Smart Array 418408-B21

**NOTE:** Please see the Modular Smart Array 60 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/12627\\_na/12627\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12627_na/12627_na.html)

HP StorageWorks 70 Modular Smart Array 418800-B21

**NOTE:** Please see the Modular Smart Array 70 QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/12652\\_na/12652\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12652_na/12652_na.html)

### Additional Options

#### HP StorageWorks Fibre Channel HBAs

**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>

#### Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb FC Single Port HBA	AP769A
HP 82B PCIe 8Gb FC Dual Port HBA	AP770A
HP 41B PCIe 4Gb FC Single Port HBA	AP767A
HP 42B PCIe 4Gb FC Dual Port HBA	AP768A

#### Emulex Fibre Channel HBAs

HP StorageWorks 81E 8Gb SP PCI-e FC HBA	AJ762A
HP StorageWorks 82E 8Gb Dual-port PCI-e FC HBA	AJ763A
HP StorageWorks FC2142SR 4Gb PCI-e HBA	A8002A
HP StorageWorks FC2242SR Dual Channel 4 Gb PCI-e HBA	A8003A
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

#### QLogic Fibre Channel HBAs

HP StorageWorks 81Q PCI-e FC HBA	AK344A
HP StorageWorks 82Q 8Gb Dual Port PCI-e FC HBA	AJ764A
HP StorageWorks FC1142SR 4Gb PCI-e HBA	AE311A
HP StorageWorks FC1242SR Dual Channel 4 Gb PCI-e HBA	AE312A
HP StorageWorks FC1143 4Gb PCI-X 2.0 HBA	AB429A
HP StorageWorks FC1243 Dual Channel 4Gb PCI-X 2.0 HBA	AE369A

#### StorageWorks SCSI HBA

HP U320e SCSI Host Bus Adapter	AH627A
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**NOTE:** Recommended HBA for MSL SCSI Tape Library connect.

#### Uninterruptible Power Systems

##### HP Rack-mountable UPS

##### HP R1500 G2 UPS

HP, R1.5kVA UPS, 1U	AF419A
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**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/12507\\_na/12507\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12507_na/12507_na.html)

##### HP R3000 UPS

HP R3000 VA UPS, 2U, Low Voltage L5-30	AF422A
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HP R3000 VA UPS, 2U, High Voltage L6-20	AF423A
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**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/10671\\_na/10671\\_na.html](http://h18000.www1.hp.com/products/quickspecs/10671_na/10671_na.html)

##### HP Rack-Mountable R5500 UPS

HP R5500 VA UPS	AF426A
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**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/11871\\_na/11871\\_na.html](http://h18000.www1.hp.com/products/quickspecs/11871_na/11871_na.html)

**NOTE:** For additional information on HP Uninterruptible Power Systems please go to:

[www.hp.com/servers/rackups](http://www.hp.com/servers/rackups).



### Additional Options

USB Options	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	HP USB-P/S2 Mouse	DC369A
	HP 1GB USB 2.0 Floppy Drive Key	442085-B21
Rack Kit	Rack Adapter Kit	332815-B21
	<b>NOTE:</b> This kit allows HP rack servers to fit in racks that are 24" wide.	
HP Rack Series	<b>HP Rack 5000 Series</b> (Graphite Metallic)	
	HP 5642 Rack-Unassembled	358254-B21
	<b>NOTE:</b> Please see the QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12074_na/12074_na.html">http://h18000.www1.hp.com/products/quickspecs/12074_na/12074_na.html</a>	
	<b>HP Rack 10000 G2 Series</b> (Carbon/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
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Shock Pallet	AF034A
	10642 G2 (42U) Rack Cabinet 1200mm Deep - Pallet	AF038A
	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
	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Shock Pallet	AF044A
	<b>NOTE:</b> Due to handling and shipping requirements, AF044A is only orderable through HP Factory Express. It is not for direct sales. Customer site surveys are required before an order is approved. CTO orders may require additional lead time.	
	10647 G2 (47U) Rack Cabinet 1200mm Deep - Pallet	AF045A
	<b>NOTE:</b> It is mandatory to use a shock pallet when shipping racks with equipment installed.	
	<b>NOTE:</b> xxxxx-B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels).	
	<b>NOTE:</b> Please see the QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.html">http://h18000.www1.hp.com/products/quickspecs/12402_na/12402_na.html</a>	
	<b>NOTE:</b> For additional information regarding Rack Cabinets, please see the following URL: <a href="http://www.hp.com/go/rackandpower">http://www.hp.com/go/rackandpower</a> .	

### Additional Options

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#### HP Rack Options

#### Keyboards and Monitors

TFT7600 Rackmount Keyboard Monitor AG052A

1U Rackmount Keyboard with USB AG072A

#### HP KVM Switch Options

2 x 1 x 16 IP Console Switch with Virtual Media AF601A

4 x 1 x 16 IP Console Switch with Virtual Media AF602A

2 x 16 Server Console Switch with Virtual Media AF600A

PS/2 Virtual Media Interface Adapter, 1 pack AF604A

**NOTE:** Requires PS/2 and one USB port on server.

HP Server console switch 0x2x8 AF616A

HP Server console switch 0x2x16 AF617A

PS/2 Interface Adapter, 1 pack 262588-B21

PS/2 Interface Adapter, 8 pack 262587-B21

**NOTE:** Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: <http://www.hp.com/go/kvm>.

HP 1 x 4 Console Switch AF611A

PS2 Server Console Cable, 6 ft, 2 pack AF612A

USB Server Console Cable, 6 ft, 2 pack AF613A

**NOTE:** Required for supporting USB peripherals.

**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>.

#### HP Serial Console Server Options

HP 16 Port Serial Console Server AF101A

HP 48 Port Serial Console Server 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>.

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### Additional Options

<b>Service and Support Offerings</b> (HP Care Pack Services)	<b>Hardware Services On-site Service</b>	
	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
	<b>Installation &amp; Start-up Services</b>	
	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
	<b>Support Plus</b>	
	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
<b>Support Plus 24</b>		
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	
<b>NOTE:</b> For more information, customer/resellers can contact: <a href="http://www.hp.com/hps/">http://www.hp.com/hps/</a>		

## Memory

**NOTE:** Memory configurations listed do not apply to "Factory Integrated Models".

### DDR3 memory population guidelines

**NOTE:** Charts do not represent all possible memory configurations.

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

[www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator)

Some DIMM installation guidelines are summarized below:

- For servers with nine (9) memory slots;
- There are three (3) channels per processor, per server.
- There are three (3) DIMM slots for each memory channel; nine (9) total slots.
- Memory channel 1 consists of the three (3) DIMMs that are closest to the processor.
- Memory channel 3 consists of the three (3) DIMMs that are furthest from the processor.
- DIMM slots that are white should be populated first.
- Do not mix Unbuffered memory (UDIMMs) with Registered memory (RDIMMs).
- To maximize performance, balance the total memory capacity between all installed processors.
- It is not required, but it is recommended to load the channels similarly if possible.
- You can only have up to eight (8) ranks installed per channel.
- You can only install two quad-rank DIMMs per channel.
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty.
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel.
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset.
- For memory mirroring mode, channel 3 must be unpopulated. Channels 1 and 2 are populated identically.
- For lock-step mode, channel 3 must be unpopulated. DIMMs in channels 1 and 2 will be installed in pairs. The paired slots will be 1,4; 2,5; 3,6 on a 3DPC system or 1,4; 2,5; on a 2DPC system.
- No mixing DIMM voltage; all DIMMs must be the same voltage.

### DDR3 DIMM slot/capacity/populated speed table

DIMM Type ->	Registered (RDIMMs)					Unbuffered with ECC (UDIMMs)	
	Dual Rank (2R)				Quad Rank (4R)	Single Rank	Dual Rank (2R)
DIMM Rank ->	2GB	4GB	8GB	8GB	4GB	1GB	2GB
DIMM Capacity ->	1333	1333	1066	1333	1066	1333	1333
DIMM Native Speed (MHz) ->							
<b>SLOTS THAT CAN BE POPULATED</b>							
9 slot servers	9	9	9	9	6	6	6
<b>MAXIMUM CAPACITY (GB)</b>							
9 slot servers	18	36	72	72	24	6	12
<b>POPULATED DIMM SPEED (MHz)</b>							
1 DIMM Per Channel	1333	1333	1066	1333	1066	1333	1333
2 DIMM Per Channel	1066	1066	1066	1066	800	1066	1066
3 DIMM Per Channel	800	800	800	800	*	*	*
* - not supported by HP at this time.							

### NOTES:



### Memory

- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities.
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor.
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, you still run at 1066MHz.
- If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, you run at 1066MHz.
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz.
- 95 Watt CPU's are required for 1333MHz DIMM speeds. All other CPU's are capable of up to 1066MHz.
- References to the above MHz speeds are for the various speeds of DDR3 DIMMs; 1333 refers to DDR3-1333, etc.

### DIMM slot and configuration diagrams

#### Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

9 DIMM SLOTS		
	CPU1	
	slot #	population order
Chnl 1	1	G
	2	D
	3	A
Chnl 2	4	H
	5	E
	6	B
Chnl 3	7	I
	8	F
	9	C

#### Standard memory configuration

- 6GB, consisting of three (3) 2GB dual-rank PC3-10600 RDIMMs

	CPU1	
	slot #	population order
Chnl 1	1	G; empty
	2	D; empty
	3	A; 2GB DIMM
Chnl 2	4	H; empty
	5	E; empty
	6	B; 2GB DIMM
Chnl 3	7	I; empty
	8	F; empty
	9	C; 2GB DIMM

## Memory

### Standard memory plus optional memory

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs
- 3x 2GB dual-rank PC3-10600 RDIMMs
- 6x 8GB dual-rank PC3-10600 RDIMMs

		CPU1	
	slot #	population order	
Chnl 1	1	G; 8GB DIMM	
	2	D; 8GB DIMM	
	3	A; 2GB DIMM	
Chnl 2	4	H; 8GB DIMM	
	5	E; 8GB DIMM	
	6	B; 2GB DIMM	
Chnl 3	7	I; 8GB DIMM	
	8	F; 8GB DIMM	
	9	C; 2GB DIMM	

### Standard memory replaced with optional memory

#### RDIMM maximum configuration

- 72GB, consisting of nine (9) 8GB dual-rank PC3-10600 RDIMMs

		CPU1	
	slot #	population order	
Chnl 1	1	G; 8GB DIMM	
	2	D; 8GB DIMM	
	3	A; 8GB DIMM	
Chnl 2	4	H; 8GB DIMM	
	5	E; 8GB DIMM	
	6	B; 8GB DIMM	
Chnl 3	7	I; 8GB DIMM	
	8	F; 8GB DIMM	
	9	C; 8GB DIMM	

#### UDIMM maximum configuration (2 UDIMMs per Channel limit)

- 12GB, consisting of six (6) 2GB dual-rank PC3-10600 UDIMMs

### Memory

	CPU1	
	slot #	
Chnl 1	1	G; empty
	2	D; 2GB DIMM
	3	A; 2GB DIMM
Chnl 2	4	H; empty
	5	E; 2GB DIMM
	6	B; 2GB DIMM
Chnl 3	7	I; empty
	8	F; 2GB DIMM
	9	C; 2GB DIMM

#### NOTES;

Memory configurations above do not apply to "Factory Integrated Models".  
Capacity references are rounded to the common Gigabyte values.

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:  
[www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator)

### Storage

1 - 4 Four SATA or SAS drive bays



A Optical Drive Bay: Optional 9.5mm DVD-ROM, or DVD-RW drive

### Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
All Models: 9.5mm DVD-ROM or DVD-RW Drive	Up to 1	A	HP embedded SATA Controller

#### Hard Drives

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

**NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

#### SAS Hot Plug SFF Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G 10K DP	Up to 2	1-2	HP embedded 4 Port SATA Controller with RAID 0/1 support
300GB 3G 10K DP	Up to 4	1-4	HP SC08Ge Host Bus Adapter
146GB 6G 15K DP	<b>NOTE:</b> depending on model.	<b>NOTE:</b> depending on model.	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.
146GB 3G 15K DP			HP Smart Array P212/256MB Controller
146GB 6G 10K DP			
146GB 3G 10K DP			
72GB 6G 15K DP			
72GB 3G 15K DP			
72GB 3G 10K DP			

#### SAS Hot Plug 3.5" Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G 15K DP	Up to 2	1-2	HP embedded 4 Port SATA Controller with RAID 0/1 support
450GB 6G 15K DP	Up to 4	1-4	HP SC08Ge Host Bus Adapter
450GB 3G 15K DP	<b>NOTE:</b>	<b>NOTE:</b>	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.



### Storage

400GB 3G 10K DP	depending on model.	depending on model.	HP Smart Array P212/256MB Controller
300GB 6G 15K DP			
300GB 3G 15K DP			
146GB 3G 15K DP			
72GB 3G 15K DP			

### SAS Hot Plug SFF Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 7.2K SFF DP	Up to 2	1-2	HP embedded 4 Port SATA Controller with RAID 0/1 support
	Up to 4	1-4	HP SC08Ge Host Bus Adapter
	<b>NOTE:</b> depending on model.	<b>NOTE:</b> depending on model.	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP Smart Array P212/256MB Controller

### SAS Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB SAS 7.2K DP	Up to 2	1-2	HP embedded 4 Port SATA Controller with RAID 0/1 support
750GB SAS 7.2K DP	Up to 4	1-4	HP SC08Ge Host Bus Adapter
	<b>NOTE:</b> depending on model.	<b>NOTE:</b> depending on model.	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP 8 Internal Port SAS HBA with RAID <b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS. HP Smart Array P212/256MB Controller

### SATA Hot Plug 3.5" Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	Up to 2	1-2	HP Smart Array P212/256MB Controller
750GB 3G SATA 7.2K	Up to 4	1-4	
500GB 3G SATA 7.2K	<b>NOTE:</b> depending on model.	<b>NOTE:</b> depending on model.	
250GB 3G SATA 7.2K			

### SATA Hot Plug SFF Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K	Up to 4	1-4	HP Smart Array P212/256MB Controller
120GB 1.5G SATA 5.4K			

### SATA Hot Plug SFF Midline (MDL) Drives

Quantity Supported	Position Supported	Controller
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### Storage

500GB 3G SATA 7.2K	Up to 2	1-2	HP Smart Array P212/256MB Controller
160GB 3G SATA 7.2K	Up to 4	1-4	

**NOTE:** depending on model.

**NOTE:** depending on model.

### SATA Hot Plug 3.5" Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
160GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array P212/256MB Controller

### SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD	4	1-4	HP Smart Array P212/256MB Controller
120GB 3.0G SATA SSD			

### SATA Hot Plug 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD	4	1-4	HP Smart Array P212/256MB Controller
120GB 3.0G SATA SSD			

### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
60 Modular Smart Array	Up to 8	External	HP Smart Array P411/512 BBWC Controller
	Up to 4		HP Smart Array P212/256MB Controller
70 Modular Smart Array	Up to 4	External	HP Smart Array P411/512 BBWC Controller
	Up to 2		HP Smart Array P212/256MB Controller
HP 2000sa Modular Smart Array Controller	Up to 4	External	HP SC08Ge Host Bus Adapter

### Maximum Storage Capacity – (SAS drives)

Internal	1.0 TB (2 x 500GB SAS)
External	7.0TB (1 x (14 x 500GB SAS))
Total	8.0 TB

**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.

### Storage

#### Maximum Storage Capacity – (SATA Drives)

Internal	4TB (4 x 1TB SATA)
External	12TB (1 x (12 x 1TB SATA))
Total	16TB

#### Tape and Disk-Based Backup

**NOTE:** For a complete listing of compatible tape and disk-based backup offerings, please visit: [www.hp.com/go/connect](http://www.hp.com/go/connect)

	Position Supported	Controller	Controller Part Number
<b>HP StorageWorks SCSI Tape Drives, External</b> LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 40 DAT 72 DAT 160 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Host Bus Adapter	412911-B21
<b>HP StorageWorks USB Tape Drives, External</b> DAT 40 USB DAT 72 USB DAT 160 USB 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
<b>HP StorageWorks SAS Tape Drives, External</b> DAT 160 SAS LTO-2 Ultrium 448 SAS LTO-3 Ultrium 920 SAS LTO-4 Ultrium 1760 SAS LTO-4 Ultrium 1840 SAS 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC44Ge Host Bus Adapter	416096-B21
<b>HP StorageWorks SCSI Tape Automation, External</b> DAT 72x10 Autoloader	External	HP SC11Xe Host Bus Adapter	412911-B21

### Storage

1/8 G2 Tape Autoloader MSL2024 MSL4048 MSL8096 MSL6000		HP U320e SCSI Host Bus Adapter <b>NOTE:</b> Recommended for MSL tape libraries.	AH627A
<b>HP StorageWorks SAS Tape Automation, External</b> 1/8 G2 Autoloader MSL2024 MSL4048	External	HP SC44Ge Host Bus Adapter	416096-B21
<b>HP StorageWorks Fibre Tape Automation, External</b> MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for detailed connectivity information.	N/A
<b>HP StorageWorks RDX Removable Disk Backup System</b> RDX160 RDX320 RDX500	External	USB 2.0 Port	N/A
<b>HP StorageWorks D2D Backup Systems</b> D2D120 D2D130 D2D2500i D2D4000i	External	Embedded Network Controller	N/A

### Power Specifications

#### HP 460W Power Supply

Part Number - AC 460W PSU 503296-B21 Option Kit

Input Voltage Range (Vrms) 100 to 240

Frequency Range (Nominal) (Hz) 50/60

Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Max Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Max. Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%) at Max. Rated Output Wattage	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Max. Inrush Current (A peak)	30	30	30	30	30	30	30
Max. Inrush Current duration (mS)	20	20	20	20	20	20	20
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

### Technical Specifications

<b>System Unit</b>	<b>Dimensions (H x W x D)</b> (with bezel)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.19 cm)	
	<b>Weight</b> (approximate)	Maximum	29.95 lb (13.6kg) (four hard drives, power supply, and processor installed)
		Minimum	25.52lb (11.6kg) (one hard drive, power supply, and processor installed)
<b>Input Requirements</b> (per power supply)	<b>Range Line Voltage</b>	90 - 132 VAC, 180 - 264 VAC	
	<b>Rated Input Current</b>	6 A (at 100 VAC), 3 A (at 200 VAC)	
	<b>Rated Input Frequency</b>	47 to 63 Hz	
	<b>Rated Input Power</b>	486 W (at 100 VAC), 479 W (at 200 VAC)	
<b>BTU Rating</b>	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)	
<b>Power Specifications</b>	<p><b>NOTE:</b> To review typical system power ratings use the HP Power Advisor which is available online located at url: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a> or <a href="http://www.hp.com/go/hppoweradvisor">www.hp.com/go/hppoweradvisor</a></p> <ul style="list-style-type: none"> <li>- Click on the system of interest. Example: DL320 G6</li> <li>- Follow the instructions of the next screens.</li> </ul>		
<b>Power Supply Output</b> (per power supply)	<b>Rated Steady-State Power</b>	400 W (at 100 VAC), 400 W (at 200 VAC)	
	<b>Maximum Peak Power</b>	400 W (at 100 VAC), 400 W (at 200 VAC)	
<b>System Inlet Temperature</b>	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).	
<b>Relative Humidity</b> (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.	

### Technical Specifications

<b>Altitude</b>	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).
<b>Acoustic Noise</b>	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	6.25 B
	LpAm	51.4dBA
	Operating	
	LWAd	6.25 B
LpAm	51.4 dBA	
<b>Emissions Classification (EMC)</b>	<b>FCC Rating</b>	Class A
	<b>Normative Standards</b>	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

**NOTE:** Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

<b>Power Supply</b>	<b>Input voltage specifications</b>	Rated input voltage	100 VAC to 240 VAC
	<b>Input Specifications</b>	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)
	<b>BTU Rating</b>	1710 BTU/hr	
	<b>Ambient temperature range</b>	Operating	50° to 118° F (10° to 48° C)
		Non-operating	-40° to 158° F (-40° to 70° C)
	<b>Relative humidity (non-condensing)</b>	Operating	55% to 85%
		Non-operating	5% to 95%
	<b>Dielectric voltage withstand</b>	Input to output	1800 VAC/minute
		Input to ground	1800 VAC/minute

### Technical Specifications

Maximum Wet Bulb Temperature 106.3° F (41.3° C)

Integrated Serial ATA Controller	Simultaneous drive transfer channels	4 channels
	Transfer rate synchronous (maximum theoretical)	150 MB/s per channel
	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 <b>NOTE:</b> This controller does not support Hot Plug functions or LED functions.
	RAID OS Support	Microsoft Windows Server 2003 <b>NOTE:</b> 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)	



### Technical Specifications

#### Environment-friendly Products and Approach

#### End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: <http://www.hp.com/go/green>. To recycle your product, please go to: <http://www.hp.com/go/green> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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