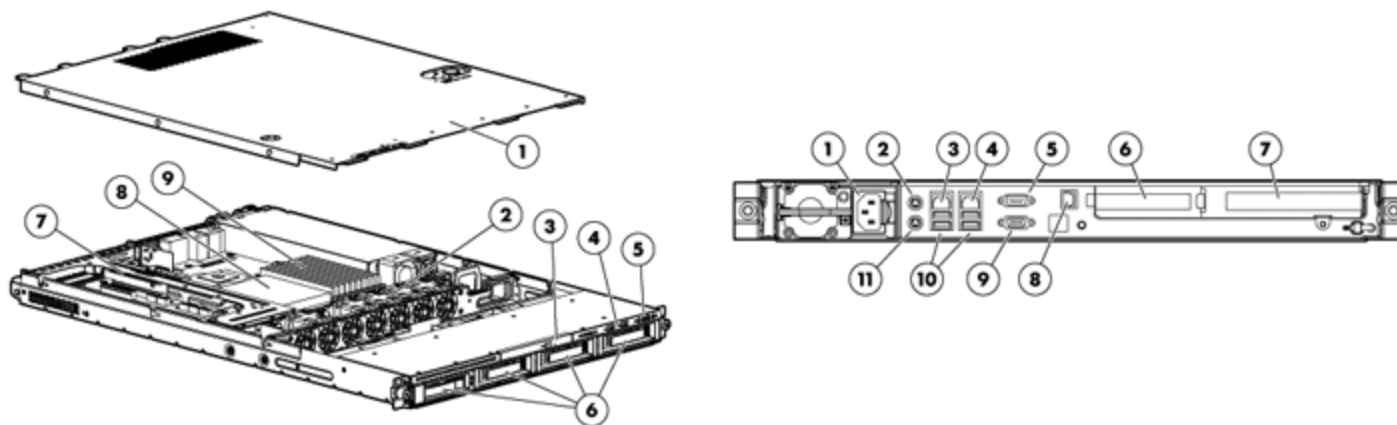


### Overview



#### Front View:

1. Cover
2. Non 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, Quad Core, and Six 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 Support for Intel Xeon Processor 5600 Series
- Adding Support for New HP Smart Array Hot Plug Advance Pack for B110i
  - Provides SATA Hot Plug and RAID 0,1,10

### 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 to 4 low-cost Serial ATA drives on an integrated RAID0/1/10 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 cost-effective solution of a single-processor platform with options from the new Intel® Xeon® Processor 3500, 3600, 5500 and 5600 sequences with turbo mode.

- **Processor:**
  - 1 Six-Core, Quad-Core, or Dual-Core Intel Xeon processor 3500, 3600, 5500, 5600 series
  - Intel 5500 Chipset with up to 6.4GT/s QPI
- **Memory:**
  - Nine (9) DIMM slots
  - Up to 96GB, using DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 6 Slots
- **Storage Controller:**
  - Entry & High Efficiency Models: HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0)
    - NOTE:** Transfer rate: 3Gb/s SATA
    - NOTE:** Available upgrade: HP Smart Array Hot Plug Advance Pack for B110i
  - 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, Flash Backed Write Cache (FBWC) 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 8TB (4 x 2TB SATA/SAS hard drives)

### Overview

- 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 x4 slot (x16 connector)
- **USB 2.0 Ports & SD:**
  - 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  
**NOTE:** In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21)
  - (1) Internal Secure Digital (SD) slot  
**NOTE:** Blank SD media devices are supported for use with VMware and Citrix only. SD media must be installed in the internal slot of the ProLiant server. Learn more at: <http://www.hp.com/go/proliantvirtualization>
- **Redundancy:**
  - Power redundancy optional (Included in Performance models)
  - Fully redundant non-hot plug fans
- **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, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, control and optimize your IT infrastructure through a single, simple management console. Insight Control supports both Windows and Linux-based central management servers.
  - HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. This ultimately enables them to dynamically keep pace with the organization's changing business requirements.
- **Operating Systems and Virtualization Software Support for ProLiant Servers:**
  - Supports Windows, RHEL, SLES, OEL, Solaris
- **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:**
  - 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

#### Six-Core Processors

Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3)

#### Quad-Core Processors

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

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

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

Intel® Xeon® Processor E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5630 (2.53 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

Intel® Xeon® Processor E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)

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

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

Intel® Xeon® Processor L5609 (1.86 GHz, 12MB Cache, 40W, DDR3-1066)

Intel® Xeon® Processor L5630 (2.13 GHz, 12MB L3 Cache, 40W, DDR3-1066, HT, Turbo 1/1/2/2)

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)

Intel® Xeon® Processor W3550 (3.06 GHz, 12MB Cache, 130W, DDR3-1333, HT, Turbo 1/1/2/2)

#### Dual-Core Processors

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

Intel® Xeon® Processor E5503 (2.00 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 6, 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.

#### Cache Memory

One of the following depending on Model

4MB (1 x 4MB) Level 3 Cache

8MB (1 x 8MB) Level 3 Cache

12MB (1 x 12MB) Level 3 Cache

#### Chipset

Intel 5500 Chipset

**NOTE:** For more information regarding Intel chipsets, please see the following URL: <http://www.intel.com/products/server/chipsets/>.

#### Memory Protection

Advanced ECC

Mirroring mode

Lock-step mode

Online spare

**NOTE:** Xeon W3500 and W3600 processor family does not support any of above advanced features.

**NOTE:** Online spare is only supported on Xeon 5600 processor series.

### Standard Features

<b>Memory</b>	Type	DDR3 1067/1333 Registered (RDIMM) and Unbuffered (UDIMM)
One of the following depending on Model	Standard (Entry Models)	4 GB (2 x 2 GB) RDIMM
	Standard (High Efficiency Models)	4 GB (2 x 2 GB) UDIMM
	Standard (Performance Models)	6 GB (3 x 2 GB) RDIMM
	Maximum Memory	Up to 96 GB, using DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 6 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

### 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.

<b>Storage Controllers</b>	Entry Models	HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0) <b>NOTE:</b> Transfer rate: 3Gb/s SATA <b>NOTE:</b> SATA Hot Plug available via Hot Plug Advance Pack for B110i <b>NOTE:</b> Hot Plug SAS and SATA controllers available via PCI card option.
	High Efficiency Models	HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0) <b>NOTE:</b> Transfer rate: 3Gb/s SATA <b>NOTE:</b> SATA Hot Plug available via Hot Plug Advance Pack for B110i <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, Flash Backed Write Cache (FBWC), and Smart Array Advanced Pack (SAAP)

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

<b>Maximum Internal Storage Type</b>	SATA (4HDD models - requires optional 4HDD cage)	8TB	4 x 2TB
	SAS (4HDD models - requires optional PCI controller)	8TB	4 x 2TB

### Standard Features

<b>Interfaces</b>	<p>Serial 1</p> <p>Pointing Device (Mouse) 1</p> <p>Keyboard 1</p> <p>VGA 1</p> <p>Network RJ-45 2</p> <p>SD Slot 1</p> <p>USB 2.0 7 (2 front, 1 internal (optional), 4 rear)</p> <p><b>NOTE:</b> Please see the following URL for additional information regarding USB support. In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21).  <a href="http://h18004.www1.hp.com/products/servers/platforms/usb-support.html">http://h18004.www1.hp.com/products/servers/platforms/usb-support.html</a></p>
<hr/>	
<b>Graphics</b>	<p>Integrated ATI ES1000, 64 MB video standard</p> <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> <p><b>NOTE:</b> Maximum resolution available via iLO 2 remote console is 1280 x 1024.</p>
<hr/>	
<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm), 26.85" deep
<hr/>	
<b>HP Insight management software suite</b>	<p>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.</p> <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 Integrated Lights-Out (iLO) for ProLiant HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit:  <a href="http://www.hp.com/go/iLO">www.hp.com/go/iLO</a></p> <p>HP Insight Control HP Insight Control, a product option, delivers 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.</p> <p>Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management servers: HP Insight Control for Linux, and HP Insight Control. See  <a href="http://www.hp.com/go/insightcontrol">www.hp.com/go/insightcontrol</a></p> <p>HP Insight Control includes 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> <p>HP Insight Dynamics for ProLiant HP Insight Dynamics for ProLiant, a product option, is advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates</p>

### Standard Features

complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also 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. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP StorageWorks Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

**NOTE:** For more information, visit:  
<http://www.hp.com/go/insightdynamics>

#### 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

Trusted Platform Module option kit

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.



### Standard Features

<b>Server Power Cords</b>	North America	One 6' Highline (IEC-IEC) power cord ships standard
	Japan	One 6' Highline (IEC) power cord and one 6' Lowline power cord ship standard
	ROW	One 6' Highline (IEC) power cord ships standard

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

<b>Power Supply</b>	Entry Models	400Watts, non-redundant, 72% Efficiency
	High Efficiency Models	500Watts, non-redundant, 92% Efficient
	Performance Models	400Watts, redundant, , 85% Efficient

**NOTE:** This power supply is needed to support power capping and power monitoring.

**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](#)  
[Red Hat Enterprise Linux \(RHEL\)](#)  
[SUSE Linux Enterprise Server \(SLES\)](#)  
[Oracle Enterprise Linux \(OEL\)](#)  
[Solaris](#)

**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/proliantdl320-g6](http://www.hp.com/servers/proliantdl320-g6).

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#### Rack Kit

The DL Fixed Rail System supports installation in racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 and HP series), with an adjustment range of 24" - 36".

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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.hp.com/go/rackandpower>

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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 MSAxxxx, 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>.

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#### 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>.

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### Standard Features

**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.

**NOTE:** Not all models are available in all regions. Check with your local country HP offices for availability.

<b>HP DL320 G6 Entry Models</b>	<b>Processors</b>	Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80 Watts, DDR3-800)
	<b>Cache Memory</b>	4MB L3 Cache
<b>HP DL320G6 E5502</b> 505682-xx1	<b>Memory</b>	4 GB (2 x 2 GB) DDR3 RDIMM
	<b>Network Controller</b>	Embedded NC326i Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<b>Hard Drives</b>	None ship standard
	<b>Internal Storage</b>	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SATA Hot Plug requires Hot Plug Advance Pack for B110i <b>NOTE:</b> SAS requires optional PCI Controller
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	Auto-sensing 400-Watt PFC Power Supply, CE Mark Compliant
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>HP DL320G6 E5503</b> 593493-xx1	<b>Processors</b>	Intel® Xeon® Processor E5503 (2.00 GHz, 4MB L3 Cache, 80 Watts, DDR3-800)
	<b>Cache Memory</b>	4MB L3 Cache
	<b>Memory</b>	4GB (2x2 GB) DDR3 RDIMM
	<b>Network Controller</b>	Embedded NC326i Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<b>Hard Drives</b>	None ship standard
	<b>Internal Storage</b>	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SATA Hot Plug requires via Hot Plug Advance Pack for B110i <b>NOTE:</b> SAS requires optional PCI Controller
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	Auto-sensing 400-Watt PFC Power Supply, CE Mark Compliant
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>HP DL320 G6 High Efficiency Models</b>	<b>Processors</b>	Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800)
	<b>Cache Memory</b>	4MB L3 Cache
<b>HP DL320G6 L5506</b> 505683-xx1	<b>Memory</b>	4 GB (2 x 2 GB) DDR3 UDIMM
	<b>Network Controller</b>	Embedded NC326i Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<b>Hard Drives</b>	None ship standard
	<b>Internal Storage</b>	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SATA Hot Plug requires Hot Plug Advance Pack for B110i <b>NOTE:</b> SAS requires optional PCI Controller
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	500-Watt PFC Power Supply, CE Mark Compliant
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>HP DL320G6 L5609</b> 593498-xx1	<b>Processors</b>	Intel® Xeon® Processor L5609 (1.86 GHz, 12MB Cache, 40W, DDR3-1066)
	<b>Cache Memory</b>	12MB L3 Cache
	<b>Memory</b>	4 GB (2 x 2 GB) DDR3 UDIMM
	<b>Network Controller</b>	Embedded NC326i Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)
	<b>Hard Drives</b>	None ship standard
	<b>Internal Storage</b>	Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE:</b> SATA Hot Plug requires Hot Plug Advance Pack for B110i <b>NOTE:</b> SAS requires optional PCI Controller
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	500-Watt PFC Power Supply, CE Mark Compliant

### Models

<b>Fans</b>	5 dual rotor fans ship standard
<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>HP DL320 G6 Performance Models</b>	<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>HP DL320G6 E5530 505684-xx1</b>	<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 Controller
	<b>Hard Drives</b>	None ship standard
	<b>Internal Storage</b>	4 x 2TB 3.5" Hot plug SATA/SAS, Maximum
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	400W Redundant Power Supply
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>HP DL320G6 E5630 593499-xx1</b>	<b>Processors</b>	Intel® Xeon® Processor E5630 (2.53 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2)
	<b>Cache Memory</b>	12MB 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 Controller
	<b>Hard Drives</b>	None Ship standard
	<b>Internal Storage</b>	4 x 2TB 3.5" Hot plug SATA/SAS, Maximum
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	400W Redundant Power Supply
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)

<b>Country Code Key</b>	xx=00	U.S.
	xx=20	Brazil
	xx=29	Japan
	xx=37	APD
	xx=42	Europe
	xx=AA	PRC

### 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>HP 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>HP Processors</b>	<b>Six-Core Processors</b>	
	Intel® Xeon® Processor X5650 (2.66 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) FIO	600743-L21
	<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 E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	512060-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 E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2), FIO	512062-L21
	Intel® Xeon® Processor E5620 (2.40 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) FIO	600739-L21
	Intel® Xeon® Processor E5630 (2.53 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) FIO	600740-L21
	Intel® Xeon® Processor E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) FIO	602252-L21
	Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800), FIO	512063-L21
	Intel® Xeon® Processor L5609 (1.86 GHz, 12MB Cache, 40W, DDR3-1066) FIO	600741-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 L5630 (2.13 GHz, 12MB L3 Cache, 40W, DDR3-1066, HT, Turbo 1/1/2/2) FIO	600742-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
	Intel® Xeon® Processor W3550 (3.06 GHz, 12MB Cache, 130W, DDR3-1333, HT, Turbo 1/1/2/2) FIO	601077-L21
	<b>Dual-Core Processors</b>	
	Intel® Xeon® Processor E5502 (1.86 GHz, 4MB L3 Cache, 80W, DDR3-800), FIO	512057-L21
	Intel® Xeon® Processor E5503 (2.00 GHz, 4MB Cache, 130W, DDR3-1333, HT) FIO	600737-L21
	<b>NOTE:</b> Xeon E5500 DP family supports both Registered DIMMs and Unbuffered DIMMs. Xeon W3500 UP family supports only Unbuffered DIMMs.	
<b>HP Drive Cage Options</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	

### Configuration Information - Factory Integrated Models

(See Step 3 below if P/N 515938-B21 is selected).

HP 4LFF HDD Hot Plug Bkpln G6 Kit FIO 512181-B21

**NOTE:** This cage requires the P212 or P410 SAS array controller as a Primary Controller (See Step below if P/N 512181-B21 is selected).

#### HP Power Supplies

HP DL320 G6 400W Power Supply Factory Integrated Kit 515739-B21

DL320G6 460W PL PSU Enablement FIO Kit 515740-B21

HP DL320 G6 500W Non-hot Plug Power Supply Factory Integrated Kit 537150-B21

HP 400 Watts 1U G6 Redundant Power Supply Option Kit 532092-B21

HP 460W HE 12V Hot Plug AC Power Supply Kit 503296-B21

#### HP Memory

##### Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500656-B21

HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21

HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21

HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593339-B21

HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604504-B21

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 516423-B21

HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 500666-B21

##### Unbuffered with ECC DIMMs (UDIMMs)

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21

**NOTE:** 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: <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).

**NOTE:** PC3L is a low voltage memory

### Configuration Information - Factory Integrated Models

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

<b>HP Storage Controllers</b>	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 MS HP CA MiniSAS to MiniSAS 33" Cable Kit (P/N 496014-B21).	
	<b>Optional Upgrades</b>	
	HP Smart Array Hot Plug Advance Pack for B110i SATA w/1 yr 24X7 Support Physical Server LTU	TC421A
	<b>SAS HBA's</b>	
	HP SC08Ge Host Bus Adapter	488765-B21
	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	
	HP SC11Xe Host Bus Adapter	412911-B21
	<b>NOTE:</b> Transfer rate: 1.5 Gb/s SATA, 3 Gb/s SAS.	
	<b>NOTE:</b> Any factory integrated SAS HBA purchase automatically includes the HP HBA SAS-SATA 4x 1 LN Cable Kit (452130-B21)	
<b>HP Insight Software</b>	HP Insight Control, No Media 1-Server License Factory-Integratable Option (FIO) including 1 year of 24x7 Technical Support and Updates	582765-B21
	HP Insight Control for Linux, No Media 1-Server License Factory-Integratable Option (FIO) including 1 year of 24x7 Technical Support and Updates	TC203A

#### 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.

<b>HP Memory</b>	<p><b>Registered DIMMs (RDIMMs)</b></p> <p>HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500656-B21</p> <p>HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500658-B21</p> <p>HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit 500660-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 593339-B21</p> <p>HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604504-B21</p> <p><b>NOTE:</b> Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 516423-B21</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit 500662-B21</p> <p>HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21</p> <p><b>NOTE:</b> Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.</p> <p>HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit 500666-B21</p> <p><b>Unbuffered with ECC DIMMs (UDIMMs)</b></p> <p>HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21</p> <p>HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21</p> <p>HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21</p> <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> <p><b>NOTE:</b> PC3L is a low voltage memory</p>
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<b>HP Optical Drives</b>	<p>HP 9.5mm SATA DVD-ROM Optical Drive 481045-B21</p> <p>HP 9.5mm SATA DVD RW Optical Drive 481047-B21</p>
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<b>HP Hard Drives</b>	<p><b>NOTE:</b> 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.</p> <p><b>NOTE:</b> Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.</p> <p><b>SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</b></p> <p>HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 507127-B21</p> <p>HP 300GB 3G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 492620-B21</p> <p>HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 512547-B21</p> <p>HP 146GB 3G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 504062-B21</p> <p>HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 507125-B21</p> <p>HP 146GB 3G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 418367-B21</p> <p>HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 512545-B21</p>
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### Core Options

HP 72GB 3G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 418371-B21

#### SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516828-B21

HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516816-B21

HP 450GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 454232-B21

HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 516814-B21

HP 300GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 416127-B21

HP 146GB 3G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive 384854-B21

#### SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507610-B21

#### SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507616-B21

HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 507614-B21

HP 1TB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 461137-B21

HP 750GB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive 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\\_div/12244\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html) (Worldwide)

#### SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive 507750-B21

HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive 530888-B21

#### SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 507632-B21

HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 454146-B21

HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive 458928-B21

#### SATA Hot Plug SFF (2.5-inch) Entry (ETY) Drives

HP 250GB 3G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive 460355-B21

HP 120GB 1.5G SATA 5.4K rpm SFF (2.5-inch) Entry 1yr Warranty Hard Drive 458924-B21

#### SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive 571230-B21

HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive 458945-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\\_div/13021\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html) (Worldwide)

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

HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive 572071-B21

HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive 572073-B21

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

HP 60GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive 570761-B21

HP 120GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive 570763-B21

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

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

### Core Options

#### HP Networking

##### 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 NC365T 4-port Ethernet Server Adapter	593722-B21
HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21

##### 10 Gigabit Ethernet Adapters

**NOTE:** No more than two 10GbE I/O devices are supported in a single ProLiant server.

**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

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

HP NC522SFP Dual Port 10GbE Server Adapter	468332-B21
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21

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

#### HP I/O Expansion Options

HP 1U PCI-X Riser Option Kit	516230-B21
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### Additional Options

#### HP Insight Software

#### HP Insight Control

HP Insight Control, Single-Server License including 1 year of 24x7 Technical Support and Updates 452148-B22

HP Insight Control suite, No Media, Electronic License including 1 year of 24x7 Technical Support and Updates T9074BAE

HP Insight Control, Electronic License for bundling with ProLiant ML/DL server, including 1 year of 24x7 Technical Support and Updates TC278AAE

HP Insight Control, Tracking License for bundling with ProLiant ML/DL server, including 1 year of 24x7 Technical Support and Updates TC275A

HP Insight Software Media Kit 436222-B21

**NOTE:** Insight Software DVD media without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Insight Dynamics, HP Insight Control for Microsoft System Center, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.

**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

**NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

**NOTE:** Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.

**NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at:

<http://www.hp.com/go/insightupdates>.

**NOTE:** For additional license options please see the Insight Control QuickSpecs at: [http://h18000.www1.hp.com/products/quickspecs/12631\\_div/12631\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html)

#### HP Insight Control for Linux

HP Insight Control for Linux, 1-server license, including one year of 24x7 Technical Support and Updates, Electronic TC213AAE

HP Insight Control for Linux, No Media, 1-Server license, including one year of 24x7 Technical Support and Updates TC209A

HP Insight Control for Linux, Media pack (DVD) - No licenses included TC208A

**NOTE:** Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.

**NOTE:** Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: <http://www.hp.com/go/ic-linux> (click on Download button).

**NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.

**NOTE:** For additional License Kits, including electronic licensing options, please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/13019\\_div/13019\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html)

#### HP Integrated Lights-Out (iLO) Advanced

HP Integrated Lights-Out Advanced, No Media, 1-Server License, including 1 year of 24x7 Technical Support and Updates 512485-B21

HP ProLiant Essentials Integrated Lights-Out Advanced Pack, Electronic, including 1 year of 24x7 Technical Support and Updates TA850AAE

**NOTE:** 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

**NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

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

[http://h18000.www1.hp.com/products/quickspecs/12362\\_div/12362\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html)

#### HP Insight Control server deployment

HP Insight Control server deployment Electronic License including 1 year 24x7 Technical Support and Updates T9082AAE

HP Insight Control server deployment 1-Server License including 1 year 24x7 Technical Support and Updates 452151-B21

### Additional Options

**NOTE:** Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at:

<http://www.hp.com/go/insightupdates>.

**NOTE:** Electronic licenses can be used to purchase multiple licenses with a single activation key, and is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.

**NOTE:** Customer will receive a license entitlement certificate, which 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 please see the Insight Control QuickSpecs at:

[http://h18004.www1.hp.com/products/quickspecs/12631\\_div/12631\\_div.html](http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html)

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<b>HP Port Options</b>	HP DL320G6 iLO2 PORT OPT KIT	514206-B21
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<b>HP Security - TPM</b>	HP Trusted Platform Module Option Kit	488069-B21
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### HP Storage Controllers SAS Controllers

**NOTE:** When using the following Smart Array Controllers the HP MS HP CA MiniSAS to MiniSAS 33" Cable Kit (P/N 496014-B21) is required.

#### Smart Array P212 Controller

HP Smart Array P212/Zero Memory Controller	462828-B21
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HP Smart Array P212/256 MB Controller	462834-B21
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#### Smart Array P410 Controller

HP Smart Array P410/256 MB Controller	462862-B21
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HP Smart Array P410/512 MB with BBWC Controller	462864-B21
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HP Smart Array P410/512MB with FBWC	578230-B21
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HP Smart Array P410/1G with FBWC	572532-B21
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#### Smart Array P411 Controller

HP Smart Array P411/256MB Controller	462830-B21
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HP Smart Array P411/512MB Battery Backed Write Cache	462832-B21
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HP Smart Array P411/512MB Flash Backed Write Cache	578229-B21
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HP Smart Array P411/1G Flash Backed Write Cache	572531-B21
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#### Smart Array P812 Controller

HP Smart Array P812/1G Flash Backed Cache Controller	487204-B21
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#### Optional Upgrades

256 MB Cache Module	462968-B21
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**NOTE:** Supported on HP Smart Array P212 Controller only.

512MB BBWC	462967-B21
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**NOTE:** Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.

Battery Kit upgrade	462969-B21
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**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.

512MB Flash Backed Write Cache	534916-B21
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1G Flash Backed Write Cache	534562-B21
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HP Smart Array Hot Plug Advance Pack for B110i SATA RAID Controller	TC421A
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**NOTE:** Please see the following QuickSpecs for Technical Specifications and additional information:

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

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

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

#### SAS HBA

HP SC08e 6Gb 2-ports Ext PCIe SAS HBA	614988-B21
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**NOTE:** This is a 2 x4 External Port HBA

**NOTE:** This is only approved for the HP StorageWorks P2000 G3 SAS Modular Smart Array.

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

[http://h18004.www1.hp.com/products/quickspecs/13651\\_div/13651\\_div.html](http://h18004.www1.hp.com/products/quickspecs/13651_div/13651_div.html)  
(SC08e 6Gb HBA)

### Additional Options

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

#### Backup & Recovery Software

##### HP Data Protector Express

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:** One of these Data Protector Express base products is required. To see available options: <http://www.hp.com/go/dataprotectorexpress>

#### Tape Backup

**NOTE:** For the complete range of StorageWorks tape drives, autoloaders, libraries and media see: <http://www.hp.com/go/tape>. For hardware and software compatibility of HP StorageWorks tape backup products see:

<http://www.hp.com/go/connect>.

HP StorageWorks DAT 320 USB Tape Drive in 1U USB Rack Kit AP835A

HP StorageWorks DAT 320 SAS Internal Tape Drive AJ830A

**NOTE:** For installation into 1U SAS rack kit (AE459B) or 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.

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

**NOTE:** For installation into 1U SAS rack kit (AE459B) or 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.

HP StorageWorks LTO-4 Ultrium 1760 Tape Drive in 1U SAS Rack Kit EH946B

**NOTE:** Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.

HP StorageWorks LTO-5 Ultrium 3000 Tape Drive in 1U SAS Rack Kit EJ014A

**NOTE:** Connection using HP Smart Array P212/Zero Memory Controller (462828-B21) recommended.

HP StorageWorks 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader BL536A

**NOTE:** Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.

HP StorageWorks MSL2024 Tape Library with one LTO-5 Ultrium 3000 SAS Drive BL537A

**NOTE:** Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.

HP StorageWorks MSL4048 Tape Library with one LTO-5 Ultrium 3000 SAS Drive BL538A

**NOTE:** Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.



### Additional Options

#### Disk Backup

**NOTE:** For the complete range of StorageWorks D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of StorageWorks RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP StorageWorks disk backup products see: <http://www.hp.com/go/connect>.

#### HP StorageWorks D2D Backup Systems with Backup Data Deduplication

HP StorageWorks D2D2502i Backup System EJ001B

**NOTE:** 1.5TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP StorageWorks D2D2504i Backup System EJ002B

**NOTE:** 3.0TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP StorageWorks D2D4004i Backup System EH938A

**NOTE:** 3.0TB (expandable to 7.5TB) of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.

HP StorageWorks D2D4112fc Backup System EH993B

**NOTE:** 9.0TB (expandable to 18.0TB) of useable network disk backup capacity. Fibre Channel SAN connected appliance. Direct server attach is not supported, requires connection via SAN fabric. See <http://www.hp.com/go/connect> for supported Fibre Channel Host Bus Adapters.

#### HP StorageWorks RDX Removable Disk Backup Systems USB

HP StorageWorks RDX320 Internal Removable Disk Backup System AJ767A

**NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.

HP StorageWorks RDX500 Internal Removable Disk Backup System AJ934A

**NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.

HP StorageWorks RDX750 Internal Removable Disk Backup System AW577A

**NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 750GB of disk capacity per data cartridge.

#### HP 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>

#### 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

#### 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

#### StorageWorks Converged Network Adapter

HP CN1000E 2P Converged Network Adapter AW520A

### Additional Options

<b>HP Disk Storage Systems</b>	<p><b>Disk Enclosures</b></p> <p>HP StorageWorks D2700 Disk Enclosure <span style="float: right;">AJ941A</span></p> <p><b>NOTE:</b> Please see the QuickSpecs for additional options and configuration information at:  <a href="http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html">http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html</a>          (Worldwide)</p>
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<b>HP Uninterruptible Power Systems</b>	<p><b>HP Rack-mountable UPS</b></p> <p><b>HP Rack-Mountable R5500 UPS</b></p> <p>HP R5500 VA UPS, INTL <span style="float: right;">AF416A</span></p> <p>HP R5500 VA UPS, NA/JPN <span style="float: right;">AF426A</span></p> <p><b>HP R/T3000 Uninterruptible Power System (UPS)</b></p> <p>HP R/T3000 UPS, High voltage, NA/JPN <span style="float: right;">AF453A</span></p> <p>HP R/T3000 UPS, High voltage, detachable inlet cord INTL <span style="float: right;">AF454A</span></p> <p><b>NOTE:</b> Additional HP Uninterruptible Power Systems (UPS) are available for this equipment. For information on all HP UPSs and accessories please go to <a href="http://www.hp.com/products/ups">www.hp.com/products/ups</a> (Worldwide)</p> <p><b>NOTE:</b> For additional information on sizing your HP UPS, please reference: <a href="http://www.upssizer.com">http://www.upssizer.com</a></p>
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<b>HP Power Distribution Units</b>	<p><b>HP Monitored Power Distribution Unit: Half Rack Version</b></p> <p>HP 4.9 kVA S124 Monitored PDU- single input, 1Ø, 24A (NA/JPN) <span style="float: right;">AF914A</span></p> <p>HP 7.3 kVA S132 Monitored PDU- single input, 1Ø, 32A (INTL) <span style="float: right;">AF915A</span></p> <p><b>HP Monitored Power Distribution Unit: Full Rack Version</b></p> <p>HP 8.6 kVA S1324 Monitored PDU- single input, 3Ø, 24A (NA/JPN) <span style="float: right;">AF504A</span></p> <p>HP 8.3 S1140 Monitored PDU- single input, 1Ø, 40A (NA/JPN) <span style="float: right;">AF506A</span></p> <p>HP 11 kVA S1316 Monitored PDU- single input, 3Ø, 16A (INTL) <span style="float: right;">AF508A</span></p> <p>HP 7.3 kVA S1132 Monitored PDU- single input, 1Ø, 32A (INTL) <span style="float: right;">AF510A</span></p> <p><b>NOTE:</b> Please see the following QuickSpecs for additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html">http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html</a>          (Worldwide)</p> <p><b>Modular Power Distribution Units 1U/0U (Up to 32 outlets)</b></p> <p><b>NOTE:</b> 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).</p> <p>HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC) (NA, Japan) <span style="float: right;">252663-D72</span></p> <p>8.3kVA Model - mPDU, 40A, High (power cord attached) (NA/JPN) <span style="float: right;">252663-D73</span></p> <p>HP Modular Power Distribution Units (mPDU), High Volt Model, 32A (200-240 VAC) (Int'l) <span style="float: right;">252663-B31</span></p> <p>HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) (WW) <span style="float: right;">252663-B24</span></p> <p><b>NOTE:</b> This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.</p> <p><b>NOTE:</b> Please see the following QuickSpecs for additional options including shorter jumper cables and country specific power cords:  <a href="http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.html">http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.html</a>          (Worldwide)</p> <p><b>NOTE:</b> For additional information on HP Power Distribution Units including accessories please go to: <a href="http://www.hp.com/go/pdu">www.hp.com/go/pdu</a>.</p>
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<b>HP USB and SD Options</b>	<p>HP 4GB SD Flash Media Kit <span style="float: right;">580387-B21</span></p> <p><b>NOTE:</b> Blank USB and SD media device is supported for use with VMware and Citrix. USB/SD media must be installed in the internal slot of the ProLiant server. Learn more at: <a href="http://www.hp.com/go/proliantvirtualization">http://www.hp.com/go/proliantvirtualization</a>.</p> <p>HP 2GB USB Flash Media Drive Key <span style="float: right;">608447-B21</span></p> <p><b>NOTE:</b> HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to <b>HP VMware Getting Started Guide</b> for installation instructions.</p>
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### Additional Options

<b>HP Rack Series</b>	<p><b>HP Rack 10000 G2 Series</b> (Carbon/Graphite Metallic)</p> <p>10642 G2 (42U) Rack Cabinet - Pallet AF001A</p> <p>10642 G2 (42U) Rack Cabinet - Shock Pallet AF002A</p> <p><b>NOTE:</b> It is mandatory to use a shock pallet when shipping racks with equipment installed.</p> <p><b>NOTE:</b> Please see the QuickSpecs for additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html">http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html</a>          (Worldwide)</p> <p><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>.</p>
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<b>HP Rack Options</b>	<p><b>HP Server Console Switches</b></p> <p>HP Server console switch 0x2x8 AF616A</p> <p>HP Server console switch 0x2x16 AF617A</p> <p><b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html">http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html</a>          (Worldwide)</p> <p><b>HP Server Console Switch G2 with Virtual Media &amp; CAC</b></p> <p>0x2x16 KVM Server Console G2 Switch with Virtual Media and CAC AF618A</p> <p>0x2x32 KVM Server Console G2 Switch with Virtual Media and CAC AF619A</p> <p><b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html">http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html</a>          (Worldwide)</p> <p><b>HP IP Console Switch G2 with Virtual Media &amp; CAC</b></p> <p>1x1Ex8 KVM IP Console Switch G2 with Virtual Media and CAC AF620A</p> <p>2x1Ex16 KVM IP Console Switch G2 with Virtual Media and CAC AF621A</p> <p>4x1Ex32 KVM IP Console Switch G2 with Virtual Media and CAC AF622A</p> <p><b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:  <a href="http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html">http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html</a>          (Worldwide)</p>
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<b>HP Care Pack Services</b>	<p><b>Hardware Services On-site Service</b></p> <p>Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic U4479E</p> <p>4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic U4480E</p> <p>4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic U4481E</p> <p>6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic U4482E</p> <p><b>Installation &amp; Start-up Services</b></p> <p>Hardware Installation, Electronic U4490E</p> <p>Installation &amp; 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</p> <p><b>Support Plus</b></p> <p>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</p> <p><b>Support Plus 24</b></p> <p>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</p> <p>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</p> <p><b>NOTE:</b> For more information, customer/resellers can contact:  <a href="http://www.hp.com/hps/">http://www.hp.com/hps/</a></p>
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### 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)		
	Single Rank (1R)	Dual Rank (2R)			Quad Rank (4R)		Single Rank	Dual Rank (2R)	
DIMM Rank ->	4GB	2GB	4GB	8GB	8GB	4GB	16 GB	1GB	2GB
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	4GB	16 GB	1GB	2GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1066	1333	1066	1066	1333	1333
<b>SLOTS THAT CAN BE POPULATED</b>									
9 slot servers	9	9	9	9	9	6	6	6	6
<b>MAXIMUM CAPACITY (GB)</b>									
9 slot servers	36	18	36	72	72	24	96	6	12
<b>POPULATED DIMM SPEED (MHz)</b>									
1 DIMM Per Channel	1333	1333	1333	1066	1333	1066	1066	1333	1333
2 DIMM Per Channel	1333	1333	1333	1066	1333	800	800	1066	1066
3 DIMM Per Channel	800	800	800	800	800	n/a*	n/a*	n/a*	n/a*

\* - not supported by HP at this time.

#### NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- 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, the maximum speed will be 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, at the maximum speed will be 1066MHz.
- If you install 3DPC in one channel (if applicable) and 1DPC in all other channels, you run at 800MHz.
- Maximum memory speed will also depend on the processor installed
- 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.

Memory

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

**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

- 16GB, consisting of six (6) 8GB dual-rank PC3-10600 RDIMMs

### Memory

CPU1		
	slot #	population order
Chnl 1	1	G; empty
	2	D; 16GB DIMM
	3	A; 16GB DIMM
Chnl 2	4	H; empty
	5	E; 16GB DIMM
	6	B; 16GB DIMM
Chnl 3	7	I; empty
	8	F; 16GB DIMM
	9	C; 16GB DIMM

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

- 24GB, consisting of six (6) 4GB dual-rank PC3-10600 UDIMMs

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)

#### Following are memory options available from HP:

##### HP Memory

##### Registered DIMMs (RDIMMs)

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
<b>NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.</b>	
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	516423-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21



### Memory

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit 604506-B21

**NOTE:** Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.

**Unbuffered with ECC DIMMs (UDIMMs)**

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500668-B21

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500672-B21

**NOTE:** 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: <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).

**NOTE:** PC3L is a low voltage memory

### Storage

1-4 Four SATA or SAS drive bays



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

1-8 Eight Hot-plug SATA/SAS hard drive bays



A Optional 9.5mm DVD-ROM, or DVD-RW drive

### Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
HP 9.5mm SATA DVD-ROM Optical Drive	Up to 1	A	HP embedded SATA Controller
HP 9.5mm SATA DVD RW Optical 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 (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
300GB 6G 10K DP	Up to 8	1-8	HP Smart Array P410/256 MB Controller
300GB 3G 10K DP			HP Smart Array P410/512 MB with BBWC Controller
146GB 6G 15K DP			
146GB 3G 15K DP			
146GB 6G 10K DP			
146GB 3G 10K DP			
72GB 6G 15K DP			
72GB 3G 15K DP			

#### SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
600GB 6G 15K DP	Up to 4	1-4	HP Smart Array P212/Zero Memory Controller
450GB 6G 15K DP			HP Smart Array P212/256 MB Controller
450GB 3G 15K DP			HP Smart Array P410/256 MB Controller
300GB 6G 15K DP			HP Smart Array P410/512 MB with BBWC Controller
300GB 3G 15K DP			
146GB 3G 15K DP			

#### SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 7.2K SFF DP	Up to 8	1-8	HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

#### SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives

### Storage

	Quantity Supported	Position Supported	Controller
2TB 6G SAS 7.2K DP	Up to 4	1-4	HP Smart Array P212/Zero Memory Controller
1TB 6G SAS 7.2K DP			HP Smart Array P212/256 MB Controller
1TB 3G SAS 7.2K DP			HP Smart Array P410/256 MB Controller
750GB 3G SAS 7.2K DP			HP Smart Array P410/512 MB with BBWC Controller

#### SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
160GB 3G SATA 7.2K			HP Smart Array P410/512 MB with BBWC Controller

#### SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array B110i SATA RAID Controller with RAID 0/1/1+0 support
1TB 3G SATA 7.2K			HP Smart Array P212/Zero Memory Controller
500GB 3G SATA 7.2K			HP Smart Array P212/256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

#### SATA Hot Plug SFF (2.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 5.4K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
120GB 1.5G SATA 5.4K			HP Smart Array P410/512 MB with BBWC Controller

#### SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array B110i SATA RAID Controller with RAID 0/1/1+0 support
160GB 3G SATA 7.2K			HP Smart Array P212/Zero Memory Controller
			HP Smart Array P212/256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

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

**NOTE:** SSD drives requires SFF drive cage.

	Quantity Supported	Position Supported	Controller
60GB 3.0G SATA SSD	8	1-8	HP Smart Array P410/256 MB Controller
120GB 3.0G SATA SSD			HP Smart Array P410/512 MB with BBWC Controller

#### 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/Zero Memory Controller
120GB 3.0G SATA SSD			HP Smart Array P212/256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB with BBWC Controller

### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2700 Disk Enclosure	Up to 2	External	HP Smart Array P212/256 MB Controller
	Up to 4		HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### Storage

#### Maximum Storage Capacity – (SAS drives)

Internal	16TB (8 x 2TB SAS)
External	48TB (1 x (16x8 x 2TB SAS))
Total	64TB

**NOTE:** In order to implement integrated SATA RAID with Smart Start 8.20 on Windows 2003, the use of a floppy drive is necessary.

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

Internal	16TB (8 x 2TB SATA)
External	24TB (16x8 x 2TB SATA))
Total	64TB

### Tape and Disk Backup

**NOTE:** For the complete range of StorageWorks tape drives, autoloaders, libraries and media, including the internal fitting models, see: <http://www.hp.com/go/tape>. For the complete range of StorageWorks D2D Backup Systems see: <http://www.hp.com/go/d2d>. For the complete range of StorageWorks RDX drives and media see: <http://www.hp.com/go/rdx>. For hardware and software compatibility of HP StorageWorks disk and tape backup products see: <http://www.hp.com/go/connect>.

	Position Supported	Controller	Controller Part Number
<b>HP StorageWorks SCSI Tape Drives</b> LTO-1 Ultrium 232 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-3 Ultrium 960 LTO4 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>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	
<b>HP StorageWorks USB Tape Drives</b> DAT 40 DAT 72 DAT 160 DAT 320 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
<b>HP StorageWorks SAS Tape Drives</b> DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000 LTO-5 Ultrium 3280 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P212/Zero Memory Controller	462828-B21
		<b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	
<b>HP StorageWorks SCSI Tape Autoloaders</b> DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Host Bus Adapter	412911-B21
		<b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	
<b>HP StorageWorks SCSI Tape Libraries, External</b> MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Controller	AH627A
		<b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	



### Storage

<b>HP StorageWorks SAS Tape Autoloaders and Libraries</b> 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/Zero Memory Controller  <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	462828-B21
<b>HP StorageWorks Fibre Channel Tape Libraries</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 connectivity information and the supported Fibre Channel HBAs shown in this QuickSpecs.	N/A
<b>HP StorageWorks USB RDX Removable Disk Backup System</b> RDX160 RDX320 RDX500 RDX750	External	USB 2.0 Port	N/A
<b>HP StorageWorks D2D Backup Systems, iSCSI</b> D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	N/A
<b>HP StorageWorks D2D Backup Systems, Fibre Channel</b> D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: <a href="http://www.hp.com/go/connect">http://www.hp.com/go/connect</a>	N/A

### Power Specifications

HP DL320 G6 500W Non-hot Plug Power Supply Factory Integrated Kit							
Part Number	537150-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	47/63						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>220</b>	<b>230</b>	<b>240</b>	
Maximum Rated Output Wattage	500	500	500	500	500	500	500
Nominal Input Current (A rms)	5.74	4.99	2.86	2.58	2.46	2.36	
Max Rated Input Wattage Rating (Watts)	568	568	562	556	556	556	
Max. Rated VA (Volt-Amp)	574	574	573	567	567	567	
Efficiency (%) at Max. Rated Output Wattage	88	88	89	90	90	90	
Power Factor	0.99	0.99	0.98	0.98	0.98	0.98	
Leakage Current (mA)	0.42	0.50	0.81	0.91	0.95	1.00	
Max. Inrush Current (A peak)	30						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)							

DL320G6 460W PL PSU Enablement FIO Kit							
Part Number	515740-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
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						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Max. Inrush Current (A peak)	30						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

HP 460W HE 12V Hot Plug AC Power Supply Kit							
Part Number	503296-B21						
Input Voltage Range ( V rms )	100 to 240						
Frequency Range (Nominal) ( Hz )	50/60						
Nominal Input Voltage ( Vrms )	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage Rating	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
Maximum Rated Input Wattage Rating ( Watts )	526	520	505	505	503	503	503
Maximum Rated VA (Volt-Amp )	548	542	527	527	524	524	524
Efficiency ( % )	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current ( mA )	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current ( A peak )	30						
Maximum Inrush Current duration ( mS )	20						
Maximum British Thermal Unit Rating ( BTU-Hr )	1794	1773	1725	1725	1715	1715	1715



### Power Specifications

<b>HP DL320 G6 400W Power Supply Factory Integrated Kit</b>	515739-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage	400	400	400	400	400	400	400
Nominal Input Current (A rms)	5.5	5.0	2.5	2.4	2.3	2.2	2.1
Max Rated Input Wattage Rating (Watts)	510	500	480	480	480	480	480
Max. Rated VA (Volt-Amp)	520	520	500	500	500	500	500
Efficiency (%) at Max. Rated Output Wattage	83.0	84.0	86.0	86.0	87.0	87.0	87.0
Power Factor	0.97						
Leakage Current (mA)	0.75	0.75	0.85	0.90	0.95	0.95	1.00
Max. Inrush Current (A peak)	35						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1739	1705	1636	1636	1636	1636	1636

<b>HP 400 Watts 1U G6 Redundant Power Supply Option Kit</b>	532092-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage	320	320	360	360	360	360	360
Nominal Input Current (A rms)	4.15	3.41	2.23	2.16	2.03	1.94	1.86
Max Rated Input Wattage Rating (Watts)	412	406	445	445	444	443	443
Max. Rated VA (Volt-Amp)	413	407	447	447	446	446	445
Efficiency (%) at Max. Rated Output Wattage	77.4	78.5	80.5	80.6	80.7	80.8	81
Power Factor	0.99						
Leakage Current (mA)	0.75	0.75	0.85	0.90	0.95	0.95	1.00
Max. Inrush Current (A peak)	35						
Max. Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1354	1334	1462	1462	1459	1456	1456

**NOTE:** To review typical system power ratings use the Active Answers Power Advisor which is available via the online tool located at URL: [www.hp.com/go/proliant-energy-efficient](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor).

### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (H x W x D) 1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.19 cm) (with bezel)							
	<b>Weight</b> (approximate)							
	<table border="0"> <tr> <td style="padding-left: 20px;">Maximum</td> <td>29.95 lb (13.6kg)</td> </tr> <tr> <td colspan="2" style="padding-left: 20px;">(four hard drives, power supply, and processor installed)</td> </tr> <tr> <td style="padding-left: 20px;">Minimum</td> <td>25.52lb (11.6kg)</td> </tr> <tr> <td colspan="2" style="padding-left: 20px;">(one hard drive, power supply, and processor installed)</td> </tr> </table>	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)
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)							
	Range Line Voltage	90 - 132 VAC, 180 - 264 VAC						
	Rated Input Current	6 A (at 100 VAC), 3 A (at 200 VAC)						
	Rated Input Frequency	47 to 63 Hz						
	Rated Input Power	486 W (at 100 VAC), 479 W (at 200 VAC)						
	<b>BTU Rating</b>	Maximum 1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)						
	<b>Power Specifications</b>							
	<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>							
	- Click on the system of interest. Example: DL320 G6							
	- Follow the instructions of the next screens.							
	<b>Power Supply Output</b> (per power supply)							
	Rated Steady-State Power	400 W (at 100 VAC), 400 W (at 200 VAC)						
	Maximum Peak Power	400 W (at 100 VAC), 400 W (at 200 VAC)						
	<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.						
	<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</b>	<b>FCC Rating</b>	Class A						

### Technical Specifications

<b>Classification (EMC)</b>	<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
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**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</b> (non-condensing)	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
	<b>Maximum Wet Bulb Temperature</b>		106.3° F (41.3° C)

<b>Integrated Serial ATA Controller</b>	<b>Simultaneous drive transfer channels</b>	4 channels
	<b>Transfer rate synchronous</b> (maximum theoretical)	150 MB/s per channel
	<b>Data transfer method</b>	HP Smart Array B110i SATA RAID Controller (non-RAID mode) HP Smart Array B110i SATA RAID Controller (RAID Mode)
	<b>Drive support</b>	Serial ATA
	<b>Data transfer modes</b>	Legacy Mode Combined Mode
	<b>Protocol</b>	Serial ATA
	<b>Feature</b>	NCQ (Native Command Queuing); AHCI (Advanced Host Controller Interface)
	<b>RAID levels supported</b>	0, 1, 1+0
	<b>RAID Features</b>	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.
	<b>RAID OS Support</b>	Microsoft Windows Server 2003/2008 <b>NOTE:</b> In order to implement integrated SATA RAID with Smart Start 8.20 on Windows 2003/2008, the use of a floppy drive is necessary. Linux (Red Hat, SuSE, UnitedLinux)

### Technical Specifications

<b>Embedded NC326i Dual Network Interface Port Gigabit Server Adapter</b>	10Base-T/ 100Base-TX/ 1000Base-TX
<b>Compatibility</b>	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX
<b>Data Transfer Method</b>	Four lane (x4), 100MHz PCI Express Reference Clock
<b>Controller</b>	BCM5715
<b>Network Transfer Rate</b>	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
<b>Connector</b>	RJ-45
<b>Cable Support</b>	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)

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	<p>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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.</p> <p>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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a>. 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.</p>
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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.