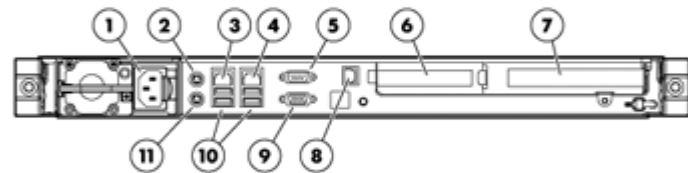
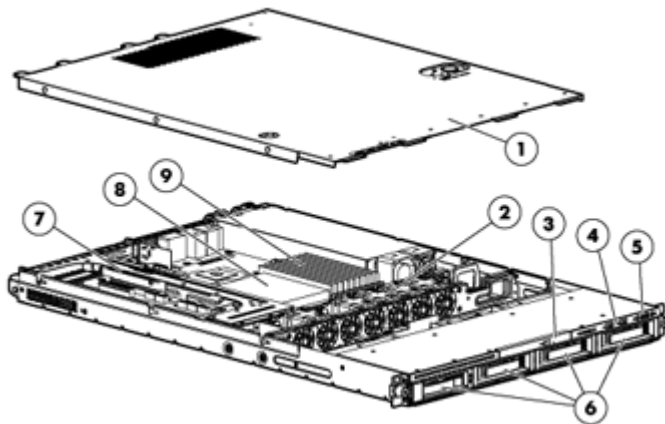


### Overview

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 Intel® Xeon® Processor 5500 and 5600 sequences with turbo mode.



#### 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

- Support for new HP hard drives, UPS and NIC.

## 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® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Processor  
 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor  
 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor

#### Quad-Core Processors

Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor  
 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) Processor  
 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor  
 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W, DDR3-800) Processor  
 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W, DDR3 1066, HT, Turbo 1/1/2/2) Processor  
 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor  
 Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W, DDR3-800) Processor  
 Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W, DDR3-1066) Processor  
 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

#### Dual-Core Processors

Intel® Xeon® E5502 (1.86GHz/2-core/4MB/80W, DDR3-800) Processor  
 Intel® Xeon® E5503 (2.00GHz/2-core/4MB/80W, DDR3-800) Processor

**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 and 5600 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 with up to 6.4GT/s QPI

**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 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> One of the following depending on Model	Type	DDR3 1067/1333 Registered (RDIMM) and Unbuffered (UDIMM)
	Standard (Entry Models)	4 GB (2 x 2 GB) RDIMM
	Standard (High Efficiency Models)	4 GB (2 x 2 GB) UDIMM
	Standard (Performance Models)	6 GB (3 x 2 GB) RDIMM
	Maximum Memory	Up to 192 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

**NOTE:** 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).

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> One of the following depending on Model	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>Internal Storage Devices</b>	Diskette Drive	None
	Optical Drive	None ship standard Optional: Optional DVD or DVD-RW drive
	Hard Drives	None ship standard
	Hard Drive Bays	Standard four 3.5" (Large Form Factor) hot-plug SATA or SAS hard drive bays; optional eight 2.5" (Small Form Factor) hot-plug SATA, SAS or SSD hard drive bays

### Standard Features

<b>Maximum Internal Storage</b>	LFF SATA (4HDD models - requires optional 4HDD cage)	12TB	4 x 3TB
	LFF SAS (4HDD models - requires optional PCI controller)	12TB	4 x 3TB
	SFF SATA, SAS, SSD (8HDD models - requires option PCI controller)	8TB	8 x 1TB

<b>Interfaces</b>	Serial	1
	Video	1
	Network RJ-45	2
	Keyboard	1
	Pointing Device (Mouse)	1
	SD Slot	1
	USB 2.0	7 (2 front, 1 internal (optional), 4 rear)

**NOTE:** 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).

<http://h18004.www1.hp.com/products/servers/platforms/usb-support.html>

**NOTE:** In order to connect a USB device internally, the internal USB Cable G6 Kit must be used (536769-B21).

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

<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 Supplies</b>	Entry Models	HP 400W Factory Integrated Power Supply, non-redundant
	High Efficiency Models	HP 500W Factory Integrated Power Supply Kit with Backplane, non-redundant
	Performance Models	HP 365W Hot Plug Redundant Power Supply Kit with Backplane, redundant

<b>System Fans</b>	5 dual rotor fans ship standard
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### Standard Features

**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 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 including how to purchase from HP, please visit our OS Support Site 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).

**Graphics** Integrated ATI ES1000, 64 MB video standard

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

**NOTE:** Maximum resolution available via iLO 2 remote console is 1280 x 1024.

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

**HP Insight management software** 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.

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:

[www.hp.com/go/foundation](http://www.hp.com/go/foundation).

The foundation pack includes:

- HP SmartStart
- HP Management DVD
- HP ProLiant Smart Update Firmware DVD

SmartStart version supported (minimum): SmartStart 8.20

<http://www.hp.com/servers/smartstart>

**NOTE:** In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a CTO SKU. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.

**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:

[www.hp.com/go/iLO](http://www.hp.com/go/iLO)

### Standard Features

#### 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

#### 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>



### Optional Features

#### HP Insight management software

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, remote control, and optimize your IT infrastructure through a single, simple management console.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See [www.hp.com/go/insightcontrol](http://www.hp.com/go/insightcontrol)

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: <http://www.hp.com/services/insight>.

#### HP Insight Dynamics for ProLiant

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. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance 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 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>

#### 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>.

#### HP Enterprise Configurator

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

### Service and Support

#### Service and Support

#### HP Technology Services for Industry Standard Servers and BladeSystem

Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

#### What HP ProLiant and BladeSystem Services can do for you

HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs:

HP Technology Services meets business challenges with services offered in three packages - **Optimized Care Package, Standard Care Package, and Basic Care Package** - available for each product group. Such packaged solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support packages for servers, storage, networking and software.

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#### Optimized Care

#### Optimized Care Package: Supports maintaining servers at optimum performance availability

##### HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

##### HP Installation and Startup for Insight Control Software

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### 3-Year HP Critical Advantage

Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW>

**Additional Services:** Microsoft or Linux or VMware education courses + Facility & technology environmental assessment services + Energy Efficiency Design, Factory Express

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### Service and Support

#### Standard Care

**Standard Care Package: Package that maintains high level of server availability**

##### **HP ProLiant Server Hardware Installation**

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

##### **HP Installation and Startup for Insight Control Software**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### **3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service**

Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EN.pdf>

##### **3-Year , HP 24x7 Software Support for Insight Control**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEEE.pdf>

**Additional Services:** Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up, and Software Support; Install and Startup Services for Insight Control; Microsoft or Linux or VMware education courses; +30 Proactive Select Credits, Factory Express

#### Basic Care

**Basic Care Package: delivers minimum recommended support service level**

##### **HP ProLiant Server Hardware Installation**

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN>

##### **HP Installation and Startup for Insight Control Software**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### **3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

##### **3-Year , HP 24x7 Software Support for Insight Control**

Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6645EEEE.pdf>

**Additional Services:** Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); +10 Proactive Select Credits, Factory Express

### *Service and Support*

**Insight Remote Support** The packages include HP Insight Remote Support that uses proven technology to deliver secure, reliable 24x7 remote monitoring, diagnoses, and problem resolution. It is available at no additional cost to all warranty, HP Care Pack Service, and service agreement customers.

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**For more information** To learn more on HP ProLiant servers and HP BladeSystem servers, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant>

### Pre-configured Models

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

**NOTE:** Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.

**NOTE:** HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.

**NOTE:** If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.

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

### Entry Models

<b>HP ProLiant DL320 G6 E5603 1P 4GB-R B110i SATA RAID 400W PS Server</b> 638328-xx1	<b>Processor(s)</b>	(1) Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor
	<b>Cache Memory</b>	4MB L3 Cache
	<b>Memory</b>	4 GB (2 x 2 GB) DDR3 RDIMM <b>NOTE: 9 DIMM slots.</b>
	<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: SATA Hot Plug requires Hot Plug Advance Pack for B110i</b> <b>NOTE: SAS requires optional PCI Controller</b>
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	HP 400W Factory Integrated Power Supply Kit
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)
<b>Warranty</b>	Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.	

<b>HP ProLiant DL320 G6 E5503 2.0GHz 2-core 1P 4GB-R B110i Hot Plug SATA 4 LFF 400W PS Server</b> 593493-xx1	<b>Processor(s)</b>	(1) Intel® Xeon® E5503 (2.00GHz/2-core/4MB/80W, DDR3-800) Processor
	<b>Cache Memory</b>	4MB L3 Cache
	<b>Memory</b>	4GB (2x2 GB) DDR3 RDIMM <b>NOTE: 9 DIMM slots.</b>
	<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: SATA Hot Plug requires via Hot Plug Advance Pack for B110i</b> <b>NOTE: SAS requires optional PCI Controller</b>
	<b>Optical Drive</b>	Optional
	<b>Power Supply</b>	HP 400W Factory Integrated Power Supply Kit
	<b>Fans</b>	5 dual rotor fans ship standard
	<b>Form Factor</b>	Rack (1U), (1.70 in/4.32 cm)
<b>Warranty</b>	Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.	

### Pre-configured Models

#### High Efficiency Models

<b>HP ProLiant DL320 G6 L5609 1P 4GB-U B110i 4 LFF 500W PS High Efficiency Server</b> 593498-xx1	<b>Processor(s)</b>  <b>Cache Memory</b> <b>Memory</b>  <b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drives</b> <b>Internal Storage</b>  <b>Optical Drive</b> <b>Power Supply</b> <b>Fans</b> <b>Form Factor</b> <b>Warranty</b>	(1) Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W, DDR3-1066) Processor 12MB L3 Cache 4 GB (2 x 2 GB) DDR3 UDIMM <b>NOTE: 9 DIMM slots.</b> Embedded NC326i Dual Port Gigabit Server Adapter HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1) None ship standard Up to 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum <b>NOTE: SATA Hot Plug requires Hot Plug Advance Pack for B110i</b> <b>NOTE: SAS requires optional PCI Controller</b> Optional HP 500W Factory Integrated Power Supply Kit with Backplane 5 dual rotor fans ship standard Rack (1U), (1.70 in/4.32 cm) Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.
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#### Performance Models

<b>HP ProLiant DL320 G6 E5630 2.53GHz 4-core 1P 6GB-R P410/256 Hot Plug SAS 4 LFF 400W RPS Server</b> 593499-xx1	<b>Processor(s)</b>  <b>Cache Memory</b> <b>Memory</b>  <b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drives</b> <b>Internal Storage</b> <b>Optical Drive</b> <b>Power Supply</b> <b>Fans</b> <b>Form Factor</b> <b>Warranty</b>	(1) Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor 12MB L3 Cache 6 GB (3 x 2 GB) DDR3 RDIMM <b>NOTE: 9 DIMM slots.</b> Embedded NC326i Dual Port Gigabit Server Adapter HP Smart Array P410/256MB Controller None Ship standard 4 x 2TB 3.5" Hot plug SATA/SAS, Maximum Optional HP 365W Hot Plug Redundant Power Supply Kit with Backplane 5 dual rotor fans ship standard Rack (1U), (1.70 in/4.32 cm) Server Warranty includes three year parts, three year labor, and three year on-site support with next business day response.
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<b>Country Code Key</b>	xx=00 xx=20 xx=29 xx=37 xx=42 xx=AA	U.S. Brazil Japan APD Europe PRC
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## 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 configurable product offerings and requirements.

**NOTE:** Configure-to-order (CTO) servers must start with a CTO Chassis.

**NOTE:** FIO indicates that this option is only available as a factory installable option.

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

<b>HP Models</b>	HP ProLiant DL320 G6 Configure-to-order Rack Server	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>	
	HP DL320 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	600743-L21
	HP DL320 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	638648-L21
	HP DL320 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	638647-L21
	<b>Quad-Core Processors</b>	
	HP DL320 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	638646-L21
	HP DL320 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) FIO Processor Kit	638645-L21
	HP DL320 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	638644-L21
	HP DL320 G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) FIO Processor Kit	512059-L21
	HP DL320 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	600739-L21
	HP DL320 G6 Intel® Xeon® E5630 (2.53GHz/4-core/12MB/80W) FIO Processor Kit	600740-L21
	HP DL320 G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	602252-L21
	HP DL320 G6 Intel® Xeon® L5609 (1.86GHz/4-core/12MB/40W) FIO Processor Kit	600741-L21
	HP DL320 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	600742-L21
	<b>Dual-Core Processors</b>	
	HP DL320 G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) FIO Processor Kit	600737-L21

**NOTE:** Xeon E5500 DP family supports both Registered DIMMs and Unbuffered DIMMs. Xeon W3500 UP family supports only Unbuffered DIMMs.

### Configuration Information - Factory Integrated Models

<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 (See Step 3 below if P/N 515938-B21 is selected).	
	HP 4 Hard Drive Hot Plug Backplane G6 Kit	512181-B21
	<b>NOTE:</b> This is a LFF Backplane kit.	
	<b>NOTE:</b> SATA Hot Plug requires Hot Plug Advance Pack for B110i.	
	<b>NOTE:</b> SAS requires optional PCI Controller.	
<b>HP Power Supplies</b>	HP 500W Factory Integrated Power Supply Kit with Backplane	537150-B21
	HP 460W Common Slot Gold Hot Plug Power Supply Kit	503296-B21
	<b>NOTE:</b> To use the HP 460W Common Slot Gold Hot Plug Power Supply with this server, you will need to purchase the 460W Power Supply FIO Enablement Kit (PN 515740-B21).	
	HP 400W Factory Integrated Power Supply Kit	515739-B21
	HP 365W Hot Plug Redundant Power Supply Kit with Backplane	532092-B21
	<b>Power Options</b>	
	DL320G6 460W PL PSU Enablement FIO Kit	515740-B21
	<b>NOTE:</b> Required to purchase if you choose to use the HP 460W Common Slot Gold Hot Plug Power Supply with this server.	
<b>HP Memory</b>	<b>Registered DIMMs (RDIMMs)</b>	
	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:</b> Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	
	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
	<b>NOTE:</b> 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
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
	<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
	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
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21
<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> .		
<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-">www.hp.com/go/proliant-energy-</a>		



*Configuration Information - Factory Integrated Models*

efficient.

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

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

**HP Storage Controllers** **NOTE:** For additional Storage Controllers and Options see Additional Options in Step 4 below. Only FIO options are displayed in Step 3.

HP Smart Array P212/256 BBWC 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller 491191-B21

HP Smart Array P410/ZM 2-ports Int PCIe x8 FIO SAS Controller 462860-B21  
**NOTE:** May be selected if P/N 515938-B21 selected in Step 2 above.

HP Smart Array P410/256 BBWC 2-ports Int PCIe x8 FIO SAS Controller 491195-B21  
**NOTE:** May be selected if P/N 515938-B21 selected in Step 2 above.

HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller 491193-B21

**HP Insight Software** HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License 582765-B21

HP Insight Control for Linux including 1yr 24x7 Support ML/DL Bundle 1 Server FIO License 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 integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

#### 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 PC3-10600 (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

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit 627812-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

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit 619488-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

#### HP Optical Drives

HP 9.5mm SATA DVD-ROM Optical Drive 481045-B21

HP 9.5mm SATA DVD-RW Optical Drive 481047-B21

#### HP 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

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Enterprise 3yr Warranty Hard Drive 619291-B21

### Core Options

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-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 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21

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

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	605835-B21
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 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	625031-B21
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

**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 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	625609-B21
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21

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

HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	628059-B21
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 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)

### Core Options

#### 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)

#### 6G SAS Hot Plug Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632492-B21

#### 6G SAS Hot Plug Enterprise Mainstream Solid State Drives

HP 800GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632506-B21
HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632504-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632502-B21

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

[http://h18000.www1.hp.com/products/quickspecs/14038\\_div/14038\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html)  
(Worldwide)

### HP Networking

#### Gigabit Ethernet Adapters

HP NC112T PCI Express Gigabit Server Adapter	503746-B21
HP NC360T PCI-E Dual Port Gigabit Server Adapter	412648-B21
HP NC364T PCI-E Quad Port Gigabit Server Adapter	435508-B21
HP NC365T 4-port Ethernet Server Adapter	593722-B21
HP NC373F PCI-E Multifunction 1000SX Gigabit Svr Adapter	394793-B21
HP NC373T PCI-E 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 NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-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 DL320 G6 PCI-X Riser Kit	516230-B21
HP Dedicated iLO Management Port Option	514206-B21



### Additional Options

**NOTE:** Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

<b>HP Insight Software</b>	<b>HP Insight Control</b>	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	T9074BAE
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Electronic License	TC278AAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Tracking License	TC275A
	HP Insight Software Media Kit	436222-B21
	<b>NOTE:</b> 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.	
	<b>NOTE:</b> Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.	
	<b>NOTE:</b> Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	<b>NOTE:</b> 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.	
	<b>NOTE:</b> Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: <a href="http://www.hp.com/go/insightupdates">http://www.hp.com/go/insightupdates</a> .	
	<b>NOTE:</b> For additional license options please see the Insight Control QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html">http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html</a>	
	<b>HP Insight Control for Linux</b>	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	<b>NOTE:</b> 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.	
	<b>NOTE:</b> Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: <a href="http://www.hp.com/go/ic-linux">http://www.hp.com/go/ic-linux</a> (click on Download button).	
	<b>NOTE:</b> Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	<b>NOTE:</b> Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.	
	<b>NOTE:</b> For additional License Kits, including electronic licensing options, please see the QuickSpecs at: <a href="http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html">http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html</a>	
	<b>HP Integrated Lights-Out (iLO) Advanced</b>	
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	<b>NOTE:</b> This license allows 1 server to be deployed and managed via HP iLO Advanced. Customer will receive a printed license entitlement certificate via	



## Additional Options

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 including 1yr 24x7 Support Electronic License T9082AAE

HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License 452151-B21

**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)

## HP Security - TPM

HP Trusted Platform Module Option 488069-B21

**NOTE:** 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.

## 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/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller 462828-B21

HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller 462834-B21

### Smart Array P410 Controller

HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller 462862-B21

HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller 462864-B21

HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller 578230-B21

HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller 572532-B21

### Smart Array P411 Controller

HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller 462830-B21

HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller 462832-B21



## Additional Options

HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
<b>Smart Array P812 Controller</b>	
HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
<b>Optional Upgrades</b>	
HP 256MB P-series Cache Upgrade	462968-B21
<b>NOTE:</b> Supported on HP Smart Array P212 Controller only.	
HP 512MB P-Series Battery Backed Write Cache Upgrade	462967-B21
<b>NOTE:</b> Supported on HP Smart Array P410 Controller and HP Smart Array P411 Controller only.	
HP 650 mAh P-Series Battery	462969-B21
<b>NOTE:</b> To enable BBWC on the 256MB cache.	
<b>NOTE:</b> Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	
HP 512MB Flash Backed Write Cache	534916-B21
HP 1GB Flash Backed Cache	534562-B21
HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU	TC421A
<b>NOTE:</b> Please see the following QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html">http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html</a> (Smart Array P212 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html">http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html</a> (Smart Array P410 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html">http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html</a> (Smart Array P411 Controller)	
<b>SAS HBA</b>	
HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter	614988-B21
<b>NOTE:</b> This is a 2 x4 External Port HBA	
<b>NOTE:</b> This is only approved for the HP P2000 G3 SAS Modular Smart Array.	
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18000.www1.hp.com/products/quickspecs/13651_div/13651_div.html">http://h18000.www1.hp.com/products/quickspecs/13651_div/13651_div.html</a> (SC08e 6Gb HBA)	
<b>SCSI HBA</b>	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
<b>NOTE:</b> Please see the following QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html">http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html</a> (SC11Xe HBA)	

## Backup & Recovery Software

### HP Data Protector Express

HP Basic Upgrade to Data Protector Express V5 for 1 Server E-LTU	TC333AAE
HP Data Protector Express V5.0 for 10 Servers E-LTU	TC332AAE
HP Data Protector Express V5.0 for 1 Server E-LTU	TC330AAE
HP Data Protector Express V5.0 for 3 Servers E-LTU	TC331AAE
<b>NOTE:</b> One of these Data Protector Express base products is required. To see available options: <a href="http://www.hp.com/go/dataprotectorexpress">http://www.hp.com/go/dataprotectorexpress</a>	

### Additional Options

#### Tape Backup

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

HP StorageWorks DAT 320 USB in 1U Rack-mount Kit

AP835B

HP StorageWorks 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader

AK377A

**NOTE:** Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP SC44Ge SAS Host Bus Adapter (416096-B21) recommended.

HP StorageWorks LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit

EH946B

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

HP StorageWorks LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rackmount

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 1 LTO-4 Ultrium 1760 SAS Tape Library

AK378A

HP StorageWorks MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library

BL537A

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

HP StorageWorks MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library

AK380A

HP StorageWorks MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library

BL538A

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

#### Disk Backup

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

##### HP 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 D2D4112 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 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.

### Additional Options

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 Storage 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 StorageWorks 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter AP769A

HP StorageWorks 82B PCIe 8Gb Fibre Channel Dual Port Host Bus Adapter AP770A

HP StorageWorks 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter AP767A

HP StorageWorks 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter AP768A

##### Emulex Fibre Channel HBAs

HP StorageWorks 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter AJ762A

HP StorageWorks 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter AJ763A

HP StorageWorks FC2142SR 4Gb PCIe Host Bus Adapter A8002A

HP StorageWorks FC2242SR 4Gb PCIe DC Host Bus Adapter A8003A

##### QLogic Fibre Channel HBAs

HP StorageWorks 81Q PCI-e Fibre Channel Host Bus Adapter AK344A

HP StorageWorks 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter AJ764A

HP StorageWorks FC1142SR 4Gb PCIe Host Bus Adapter AE311A

HP StorageWorks FC1242SR 4Gb PCIe DC Host Bus Adapter AE312A

##### Converged Network Adapter

HP StorageWorks CN1000E Dual Port Converged Network Adapter AW520A

HP CN1000Q Dual Port Converged Network Adapter BS668A

#### HP Disk Storage Systems

##### Disk Enclosures

HP StorageWorks D2600 Disk Enclosure AJ940A

HP StorageWorks D2700 Disk Enclosure AJ941A

**NOTE:** Please see the QuickSpecs for additional options and configuration information at:

[http://h18000.www1.hp.com/products/quickspecs/13404\\_div/13404\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html)  
(Worldwide)

## Additional Options

### HP Uninterruptible Power Systems

#### HP Rack-mountable UPS

##### HP Rack-Mountable R5500 UPS

HP R5500 6000VA INTL 3U Rackmount Uninterruptible Power System AF416A

HP R5500 5000kVA NA/JP 3U Rackmount Uninterruptible Power System AF426A

**NOTE:** Please see the QuickSpecs for additional options and configuration information at:

[http://h18000.www1.hp.com/products/quickspecs/13404\\_div/13404\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html)  
(Worldwide)

##### HP R/T3000 G2 Uninterruptible Power System (UPS)

HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System AF466A

HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System AF467A

HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System AF468A

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/14058\\_div/14058\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html)  
(Worldwide)

##### HP R/T3000 Uninterruptible Power System (UPS)

HP R/T3000 3300VA High Voltage NA/JPN 2U Rackmount Uninterruptible Power System AF453A

HP R/T3000 3300VA INTL 2U Rackmount Uninterruptible Power System AF454A

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/13417\\_div/13417\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13417_div/13417_div.html)  
(Worldwide)

##### HP R1500 G3 Uninterruptible Power Supply (UPS)

HP R1.5kVA G3 1U NA Uninterruptible Power System AF469A

HP R1.5kVA G3 1U JP/TW Uninterruptible Power System AF470A

HP R1.5kVA G3 1U INTL Uninterruptible Power System AF471A

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/14059\\_div/14059\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html)  
(Worldwide)

**NOTE:** Additional HP Uninterruptible Power Systems (UPS) are available for this equipment. For information on all HP UPSs and accessories please go to [www.hp.com/products/ups](http://www.hp.com/products/ups) (Worldwide)

**NOTE:** For additional information on sizing your HP UPS, please reference:

<http://www.upssizer.com>

**NOTE:** 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).

## Additional Options

<b>HP Power Distribution Units</b>	<b>HP Monitored Power Distribution Unit: Half Rack Version</b>		
	HP Single Input 1 Phase 24A Monitored Power Distribution Unit	AF914A	
	HP Single Input 1 Phase 32A Monitored Power Distribution Unit	AF915A	
	<b>HP Monitored Power Distribution Unit: Full Rack Version</b>		
	HP Single Input 3 Phase 24A Monitored Power Distribution Unit	AF504A	
	HP Single Input 1 Phase 40A Monitored Power Distribution Unit	AF506A	
	HP Single Input 3 Phase 16A Monitored Power Distribution Unit	AF508A	
	HP Single Input 1 Phase 32A INT Monitored Power Distribution Unit	AF510A	
	<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)		
	<b>Modular Power Distribution Units 1U/0U (Up to 32 outlets)</b>		
<b>NOTE:</b> 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).			
	HP 24A High Voltage Modular Power Distribution Unit	252663-D72	
	HP 40A High Voltage NA/JP Modular Power Distribution Unit	252663-D73	
	HP 32A High Voltage Modular Power Distribution Unit	252663-B31	
	HP 16A High Voltage Modular Power Distribution Unit	252663-B24	
<b>NOTE:</b> This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.			
<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)			
<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> .			
<b>NOTE:</b> 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: <a href="http://www.hp.com/products/powercords">www.hp.com/products/powercords</a> .			

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<b>HP Intelligent Power Distribution Units (iPDU)</b>	<b>iPDU Core Units</b>	
	HP 24A NA/JP Core Only Intelligent Modular Power Distribution Unit	AF520A
	HP 24A 3 Phase NA/JP Core Only Intelligent Modular Power Distribution Unit	AF522A
	HP 32A Intl Core Only Intelligent Modular Power Distribution Unit	AF525A
	HP 16A 3 Phase Intl Intelligent Modular Power Distribution Unit	AF526A
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html">http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html</a> (Worldwide)		

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### Additional Options

#### HP Rack Series

#### HP Rack 10000 G2 Series (Carbon/Graphite Metallic)

HP 10642 G2 Pallet Universal Rack	AF001A
HP 10642 G2 Shock Universal Rack	AF002A
HP 10642 G2 1200mm deep Shock Rack	AF092A
HP 10647 G2 1200mm deep Shock Rack	AF094A

**NOTE:** It is mandatory to use a shock pallet when shipping racks with equipment installed.

**NOTE:** Please see the QuickSpecs for additional information:

[http://h18000.www1.hp.com/products/quickspecs/12402\\_div/12402\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html)  
(Worldwide)

**NOTE:** For additional information regarding Rack Cabinets, please see the following URL: <http://www.hp.com/go/rackandpower>.

**NOTE:** 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 830 square inches (5,350 sq cm) 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 2.75 inches (7 cm).

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

**NOTE:** 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).

#### HP Rack Options

#### HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A

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

[http://h18000.www1.hp.com/products/quickspecs/11834\\_div/11834\\_div.html](http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html)  
(Worldwide)

#### HP Server Console Switch G2 with Virtual Media & CAC

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A

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

[http://h18000.www1.hp.com/products/quickspecs/13475\\_div/13475\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html)  
(Worldwide)

#### HP IP Console Switch G2 with Virtual Media & CAC

HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A



### Additional Options

HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software AF622A

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

[http://h18000.www1.hp.com/products/quickspecs/13474\\_div/13474\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html)  
(Worldwide)

#### HP USB and SD Options

HP 4GB Secure Digital High Capacity Flash Media Kit 580387-B21

**NOTE:** 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: <http://www.hp.com/go/proliantvirtualization>.

HP 2GB USB Flash Media Drive Key Kit 608447-B21

**NOTE:** 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 [HP VMware Getting Started Guide](#) for installation instructions.

HP Internal USB Cable G6 Kit 536769-B21

#### HP Care Pack Services Hardware Services On-site Service

HP 3 year Next business day ProLiant DL320 Hardware Support U4479E

HP 3 year 4 hour 13x5 ProLiant DL320 Hardware Support U4480E

HP 3 year 4 hour 24x7 ProLiant DL320 Hardware Support U4481E

HP 3 year 6 hour 24x7 Call to Repair ProLiant DL320 Hardware Support U4482E

#### Installation & Start-up Services

HP Install ProLiant DL320 Service U4490E

HP Startup ProLiant DL320 Service U4491E

#### Support Plus 24

HP 3 year Support Plus 24 Microsoft ProLiant DL320 Service U4493E

HP 3 year Support Plus 24 SuSE ProLiant DL320 Service U6309E

**NOTE:** For more information, customer/resellers can contact:

<http://www.hp.com/hps/>

## 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 ->										
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16 GB	1GB	2GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333
<b>SLOTS THAT CAN BE POPULATED</b>										
9 slot servers	9	9	9	9	9	9	6	6	6	6
<b>MAXIMUM CAPACITY (GB)</b>										
9 slot servers	36	18	36	72	72	144	24	96	6	12
<b>POPULATED DIMM SPEED (MHz)</b>										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1333	1066	1066	1333	1333
2 DIMM Per Channel	1333	1333	1333	1066	1333	1066/ 1333**	800	800	1066	1066
3 DIMM Per Channel	800	800	800	800	800	800***	n/a*	n/a*	n/a*	n/a*

\* - not supported by HP at this time.  
 \*\*2DPC: LV runs at 1066, Std voltage runs at 1333  
 \*\*\*3DPC: LV/Std voltage runs at 800

### 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.



## Memory

- 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.

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

## Memory

		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

		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 #	population order	
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.

## Memory

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB

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 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
<b>NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.</b>	
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-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
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-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

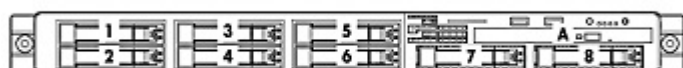
### Storage

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
900GB 6G SAS 10K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
600GB 6G SAS 10K			HP Smart Array P410/512 MB with BBWC Controller
450GB 6G SAS 10K			
300GB 6G SAS 10K			
146GB 6G SAS 15K			
146GB 6G SAS 10K			
72GB 6G SAS 15K			

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

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



### Storage

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

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
500GB 7.2K SFF			HP Smart Array P410/512 MB with BBWC Controller

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

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

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

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	Up to 8	1-8	HP Smart Array P410/256 MB Controller
500GB 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
3TB 3G SATA 7.2K	Up to 4	1-4	HP Smart Array B110i SATA RAID Controller with RAID 0/1/1+0 support
2TB 3G SATA 7.2K			HP Smart Array P212/Zero Memory Controller
1TB 3G SATA 7.2K			HP Smart Array P212/256 MB Controller
500GB 3G SATA 7.2K			HP Smart Array P410/256 MB Controller
			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
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## Storage

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

### 6G SAS Hot Plug Enterprise Performance Solid State Drives

	Quantity Supported	Position Supported	Controller
200GB 6G SAS SLC SFF SSD	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller
400GB 6G SAS SLC SFF SSD			HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB with BBWC Controller

### 6G SAS Hot Plug Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller
800GB 6G SAS MLC SFF SSD	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller HP Smart Array P212/256 MB Controller
400GB 6G SAS MLC SFF SSD			HP Smart Array P410/256 MB Controller HP Smart Array P410/512 MB with BBWC Controller
200GB 6G SAS MLC SFF SSD			

## External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2600 Disk Enclosure	Up to 4	External	HP Smart Array P212/256 MB Controller
	Up to 8		HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller
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 P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### Maximum Storage Capacity – (SAS drives)

Internal	12TB (4 x 3TB SAS)
External	128TB (1 x (16x8 x 1TB SAS))
Total	140TB

**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	12TB (4 x 3TB SATA)
External	128TB (1 x (16+8) x 1TB SATA))
Total	140TB

## Storage

### Tape and Disk Backup

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

	Position Supported	Controller	Controller Part Number
<b>HP 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 Ultra320 Single Channel/ PCIe x4 SCSI 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 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 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/ZM 1-ports Int/1-ports Ext PCIe x8 SAS 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 SCSI Tape Autoloaders</b> DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI 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 SCSI Tape Libraries, External</b> MSL2024 MSL4048 MSL8096 MSL6000	External	HP StorageWorks U320e SCSI Dual Channel Host Bus Adapter	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>	
<b>HP SAS Tape Autoloaders and Libraries</b> 1/8 G2 Autoloader	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21

## Storage

1/8 G2 AutoLoader  
MSL2024  
MSL4048  
MSL8096

**NOTE:** Please check the full compatibility information at:  
<http://www.hp.com/go/connect>

<p><b>HP Fibre Channel Tape Libraries</b> MSL2024 MSL4048 MSL8096 MSL6000</p>	External	<p>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.</p>	N/A
<p><b>HP USB RDX Removable Disk Backup System</b> RDX160 RDX320 RDX500 RDX750 RDX1TB</p>	External	USB 2.0 Port	N/A
<p><b>HP D2D Backup Systems, iSCSI</b> D2D2500i D2D4000i</p>	External	<p>Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.</p>	N/A
<p><b>HP D2D Backup Systems, Fibre Channel</b> D2D4000fc</p>	External	<p>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></p>	N/A

## Power Specifications

HP 500W Factory Integrated Power Supply Kit with Backplane							
Part Number	537150-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	47/63						
Nominal Input Voltage (Vrms)	100	120	200	220	230	240	
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)							

HP 460W Common Slot Gold Hot Plug 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 )	100	120	200	208	220	230	240
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

HP 400W Factory Integrated Power Supply Kit							
Part Number	515739-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage	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



## Power Specifications

HP 365W Hot Plug Redundant Power Supply Kit with Backplane							
Part Number	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>Maximum</td> <td>29.95 lb (13.6kg)</td> </tr> <tr> <td colspan="2">(four hard drives, power supply, and processor installed)</td> </tr> <tr> <td>Minimum</td> <td>25.52lb (11.6kg)</td> </tr> <tr> <td colspan="2">(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)	<table border="0"> <tr> <td>Range Line Voltage</td> <td>90 - 132 VAC, 180 - 264 VAC</td> </tr> <tr> <td>Rated Input Current</td> <td>6 A (at 100 VAC), 3 A (at 200 VAC)</td> </tr> <tr> <td>Rated Input Frequency</td> <td>47 to 63 Hz</td> </tr> <tr> <td>Rated Input Power</td> <td>486 W (at 100 VAC), 479 W (at 200 VAC)</td> </tr> </table>	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)
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>	<table border="0"> <tr> <td>Maximum</td> <td>1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)</td> </tr> </table>	Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)						
Maximum	1836 BTU/hr (at 100 VAC), 1706 BTU/hr (at 200 VAC)									
	<b>Power Specifications</b>	<p><b>NOTE:</b> To review typical system power ratings use the <a href="http://www.hp.com/go/proliant-energy-efficient">HP Power Advisor</a> which is available online located at url: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a> or <a href="http://www.hp.com/go/hppoweradvisor">www.hp.com/go/hppoweradvisor</a></p> <ul style="list-style-type: none"> <li>- Click on the system of interest. Example: DL320 G6</li> <li>- Follow the instructions of the next screens.</li> </ul>								
	<b>Power Supply Output</b> (per power supply)	<table border="0"> <tr> <td>Rated Steady-State Power</td> <td>400 W (at 100 VAC), 400 W (at 200 VAC)</td> </tr> <tr> <td>Maximum Peak Power</td> <td>400 W (at 100 VAC), 400 W (at 200 VAC)</td> </tr> </table>	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)				
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>	<table border="0"> <tr> <td>Operating</td> <td>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).</td> </tr> <tr> <td>Non-operating</td> <td>-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).</td> </tr> </table>	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).				
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)	<table border="0"> <tr> <td>Operating</td> <td>10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.</td> </tr> <tr> <td>Non-operating</td> <td>5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.</td> </tr> </table>	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.				
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>	<table border="0"> <tr> <td>Operating</td> <td>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).</td> </tr> <tr> <td>Non-operating</td> <td>9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).</td> </tr> </table>	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).				
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).									

### Technical Specifications

#### Acoustic Noise

Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

#### Idle

LWAd	6.25 B
LpAm	51.4dBA

#### Operating

LWAd	6.25 B
LpAm	51.4 dBA

#### Emissions

**FCC Rating** Class A

#### Classification (EMC)

**Normative Standards** CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

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

#### Power Supply

#### Input voltage specifications

Rated input voltage 100 VAC to 240 VAC

#### Input Specifications

Rated input line 90 VAC to 264VAC

Frequency range 47 to 63 Hz

Rated input power @ 115V input, Rated input power = 486W (assume output wattage=450W)  
@ 230V input, Rated input power = 479W (assume output wattage=450W)

Rated input current 6 A, 3 A (110 V, 220 V)

Steady state power 420W (rated)

#### BTU Rating

1710 BTU/hr

#### Ambient temperature range

Operating 50° to 118° F (10° to 48° C)

Non-operating -40° to 158° F (-40° to 70° C)

#### Relative humidity (non-condensing)

Operating 55% to 85%

Non-operating 5% to 95%

#### Dielectric voltage withstand

Input to output 1800 VAC/minute

Input to ground 1800 VAC/minute

#### Maximum Wet Bulb Temperature

106.3° F (41.3° C)

## Technical Specifications

<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)

<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 Controller</b>	Four lane (x4), 100MHz PCI Express Reference Clock 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)	

### Technical Specifications

**Environment-friendly  
Products and  
Approach****End-of-life  
Management and  
Recycling**

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

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

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