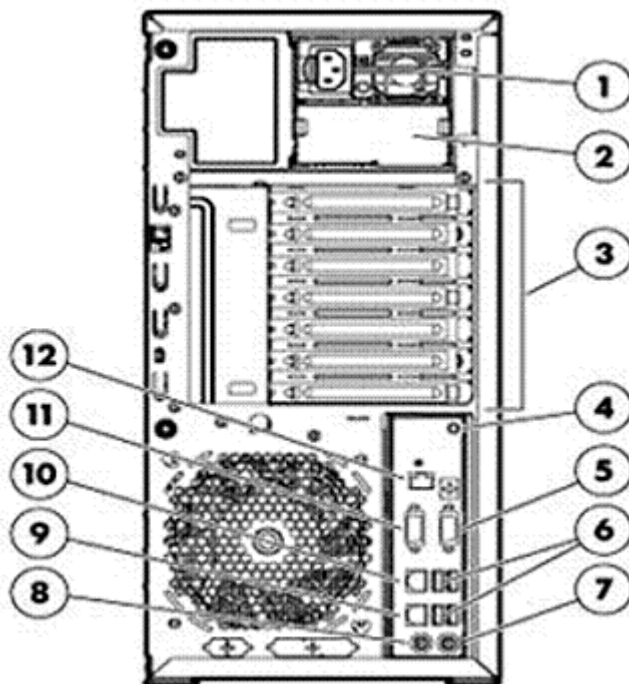
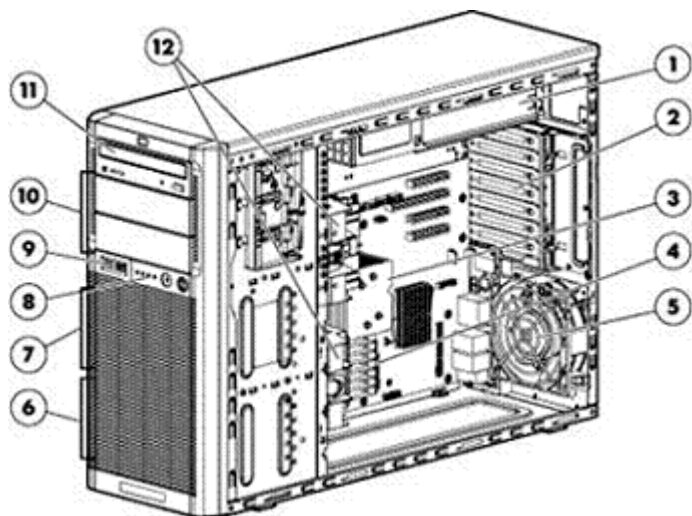


### Overview

The HP ProLiant ML330 G6 is a dual processor tower platform built on the latest Intel Xeon processors with QPI technology to create unique system architecture. This unique architecture allows the businesses to scale their businesses as needed so they can optimize their IT spending dollars. The HP ProLiant ML330 G6 delivers to businesses the industry's most powerful embedded management technology with the HP Integrated Lights-Out 2 (iLO 2) allowing them to manage the servers anytime and from anywhere.



#### Front View:

1. Power supply
2. Expansion slots
3. First processor socket
4. Nine DIMM slots (for 1<sup>st</sup> processor)
5. Video port
6. Hard drive bays 5-8
7. Hard drive bays 1-4
8. LED indicators and power button
9. USB connectors (2)
10. Removable media bays (2)
11. Optical drive bay
12. Front system fans (2)

#### Rear View:

1. Power supply 1
2. Optional power supply for redundancy
3. Expansion slots
4. UID button/LED
5. Video ports
6. USB ports (4)
7. PS/2 keyboard port
8. PS/2 mouse port
9. Network port 1 (shared iLO management port)
10. Network port 2
11. Serial port
12. Dedicated iLO2 management port (optional)

### 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® E5649 (2.53GHz/6-core/12MB/80W) Processor

Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor

##### Quad-Core Processors

Intel® Xeon® E5620 (2.40GHz/4-core/80W/12MB) Processor

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® E5507 (2.26 GHz/4-core/80W/4MB) Processor

Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor

Intel® Xeon® E5504 (2.0GHz/4-core/4MB/80W) Processor

##### Dual-Core Processors

Intel® Xeon® E5503 (2.0GHz/2-core/80W/4MB) Processor

**NOTE:** For the Intel 5500 and 5600 Series, the letter preceding the model number indicates the performance/wattage of the processor. "X" denotes High Performance/Wattage; "E" denotes Enterprise Performance/Wattage (Mainstream); and "L" denotes Lower Wattage.

#### Cache Memory

One of the following depending on Model

12MB (1x 12MB) level 3 cache

**NOTE:** For X5600 and E5600 series processors.

8MB (1 x 8MB) Level 3 cache

**NOTE:** For E5606/E5607 processors.

4MB (1 x 4MB) Level 3 cache

**NOTE:** For E5603/E5507/E5506/E5504/E5503 processors

#### Chipset

Intel® 5500 Chipset

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

#### Upgradeability

Upgradeable to 2 processors (2, 4, or 6 core)

#### Memory Protection

Mirroring

Lock-step mode

Advanced ECC

Online Spare (Requires X5600 or E5600 processor family)

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

### Standard Features

<b>Memory</b>	Type	DDR3 Registered (RDIMM) and Unbuffered (UDIMM)
One of the following depending on model	Standard (Performance Model)	6GB (3 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs
	Standard (Base Models)	4GB (2 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs 4GB (2 x 2GB) PC3-10600E (DDR3-1333) Unbuffered DIMMs
	Standard (Entry Models)	2GB (1 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs 2GB (1 x 2GB) PC3-10600E (DDR3-1333) Unbuffered DIMMs
	Maximum (RDIMM)	192GB (12 DIMM slots x16GB) for Registered Memory configurations
	Maximum (UDIMM)	48GB (12 DIMM slots x 4GB) for Unbuffered Memory configurations

**NOTE:** Depending on the memory configuration and processor model, the memory speed may run at 1333MHz, 1066MHz, or 800MHz. Please see the Online Memory Configuration Tool at: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** If only one processor is installed, only half the DIMM slots are available

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**Network Controller** Embedded NC326i PCI Express Dual Port Gigabit Server Adapter

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### Expansion Slots

**NOTE:** Four total expansion slots. One (1) PCI-Express x8 Gen1 (x1 speed); One (1) PCI-Express x16 Gen2 (x16 speed); Two (2) PCI-Express x8 Gen2 (x4 speed). Optional PCI-X Expander provides additional two (2) 64-bit/100-MHz PCI-X slots by using a single PCI Express slot (only on slot 5).

Expansion Slot #	Technology	Bus Width**	Connector Width	Bus Number*	Form Factor	Notes
6	PCI Express Gen2	x4	x8	4	Standard Height/ Half Length	
5	PCI Express Gen2	x4	x8	10	Standard Height/ Half Length	
4	PCI Express Gen2	x16	x16	13	Standard Height/Length	
3	PCI Express Gen1	x1	x8	7	Standard Height/Length	

\* 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.

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### Standard Features

<b>Storage Controller</b>	Entry Models	Non hot plug SATA model with HP Smart Array B110i SATA RAID Controller (RAID 0/1/1+0)
	Base Models	Hot plug SAS model with integrated HP Smart Array P410/Zero memory SAS Controller (RAID 0/1/1+0) Hot plug SATA model with integrated HP Smart Array B110i SATA RAID controller and hot plug advanced key
	Performance Models	Hot plug SATA model with integrated HP Smart Array B110i SATA RAID controller and hot plug advanced key

Available upgrades: 256MB, 512MB with BBWC, 512MB with FBWC, 1G with FBWC, Battery kit upgrade (for the 256MB cache), and Smart Array Advanced Pack (SAAP)

<b>Internal Storage Devices</b>	Diskette Drive	None
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
	Hard Drives	Hot Plug Model: None ship standard
	One of the following depending on Model	Non-Hot Plug Model: HP 250GB 3G SATA 7.2K NHP 3.5" ETY HDD

<b>Maximum Internal Storage</b>	Hot Plug LFF SATA	24TB	8 x 3TB
	Hot Plug LFF SAS	24TB	8 x 3TB
	Hot Plug LFF SATA SSD	3.2TB	8 x 400GB

<b>Interfaces</b>	Serial	1
	Network RJ-45	3 (1 dedicated for HP Integrated Lights-Out 2 (iLO 2))
	Keyboard	1
	Pointing Device (Mouse)	1
	Graphics	1
	SD Slot	1 (internal)
	USB 2.0 Ports	8 (2 front, 4 rear, 2 internal)

**NOTE:** Please see the following URL for additional information regarding USB support:  
<http://h18004.www1.hp.com/products/servers/platforms/usb-support.html>.

<b>Industry Standard Compliance</b>	ACPI V2.0 Compliant
	PCI-Express Gen2
	PXE Support
	WOL Support
	PCI-X 1.0a Compliant
	Microsoft® Logo certifications
	USB 2.0

### Standard Features

#### Server Power Cords

**NOTE:** If customers require a local power cord, they can check the power cord matrix for the appropriate county specific sku. Please see the following power cord matrix for details:  
<http://www.hp.com/go/powercordmatrix>

#### Common Slot Power Supplies

It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your need. The HP Power Advisor is located at [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor)

HP has a new design for ProLiant power supplies. The new Common Slot (CS) Power Supply provides the customer with commonality in power supplies across multiple platforms to save on the cost of spares and allows HP to offer multiple power solutions to fit the customers' needs. Many HP ProLiant Servers come with or are compatible with high-efficiency HP CS Power Supplies. These power supplies are designed to provide high-efficiency power without degrading performance of the ProLiant server. HP CS Power Supplies options for this server have efficiency ratings up to 92%. There are three Right Size power options available, depending on the configuration of your server. To make sure you select the correct power supply to meet your configuration, we suggest that you use the HP Power Advisor to decide the "Right-Size" for your configuration. All HP Common Slot power sources are UL, CE Mark Compliant, Hot Plug and Redundant.

HP's ProLiant CS Power supplies meet multiple Energy Efficiency Initiatives, including Climate Savers Computing Initiative GOLD, ECOS Consulting 80PLUS GOLD and they meet the standard specifications for Energy Star for Servers Power Supply requirements.

#### System Fans

3 fans ship standard. System supports a total of 4 fans.

**NOTE:** Does not include power supply or processor heat sink fans. Processor heat sink fans are packed in the processor option kit.

**NOTE:** If customer orders the standalone redundant fan option kit, he/she will receive two (2) fans in a two-fan packaged box. Only one (1) fan is required for system redundancy. The other one can be saved as a spare part. If customer orders the redundant fan kit along with the server, he/she will not be receiving the extra fan.

#### Operating Systems and Virtualization Software Support for ProLiant Servers

[Microsoft Windows Server](#)  
[Microsoft Windows Server Hyper V](#)  
[Red Hat Enterprise Linux \(RHEL\)](#)  
[SUSE Linux Enterprise Server \(SLES\)](#)  
[VMware](#)  
[Citrix Essentials for XenServer](#)

**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page [www.hp.com/support/ML330G6](http://www.hp.com/support/ML330G6).

#### Graphics

Integrated ATI RN50, 64MB 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 HP Integrated Lights-Out 2 (iLO 2) remote console is 1280 x 1024.

### Standard Features

#### Form Factor

Tower (5U)

**NOTE:** Rack mounting available via HP Tower to Rack Conversion Tray, Universal Kit. Please see the options section in this QuickSpecs:

- Square or round hole racks 24"- 36" deep, including HP Rack System /E and HP Systems
- Telco racks with 3rd part option kit from Rack Solutions [www.hp.com/go/rackandpower](http://www.hp.com/go/rackandpower)

#### HP Insight management software

HP Service Pack for ProLiant

HP Service Pack for ProLiant (SPP) and HP Smart Update Manager (HP SUM) version 5 provide a new, comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new HP server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation HP SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire BladeSystem enclosures. Further improving system uptime and stability is the fact that HP provides 12 months of support on each Service Pack for ProLiant.

The user experience around HP SUM and the SPP has been improved in several ways, starting with the web download. A single web page provides access to a single download containing both the latest version of HP SUM version 5 and the latest SPP. Optional smaller subsets with only specific types of servers or specific operating systems are offered to save on download time. The HP SUM application has been re-written to provide a more straightforward, intuitive user interface that guides the user through the steps of discovery, analyses and update, providing comprehensive information on available updates, criticality and interdependencies. This information is also available in reports. By providing the option of multiple local or shared repositories which can be easily updated from hp.com, HP SUM provides the tools to optimize stability and consistency throughout the company. While HP SUM and the SPP will recommend the combinations of firmware and system software that HP has found to be the best practice, the application gives customers the flexibility to set their own specific baseline.

The Service Pack for ProLiant has been rigorously tested with specific attention for interaction between firmware, drivers and agents both within the server as well as in interaction with the BladeSystem enclosure components (Onboard Administrator and Virtual Connect). This testing ensures the highest quality as well as providing the input for HP SUM to deploy updates taking into account all interdependencies, when determining the correct updates and order of update deployment.

The Service Pack for ProLiant (which includes HP SUM 5) can be downloaded from: [www.hp.com/go/spp/download](http://www.hp.com/go/spp/download). More information can be found: <http://www.hp.com/go/spp> and <http://www.hp.com/go/hpsum>

HP Insight Foundation

Insight Foundation is being baselined at version v8.70 which means the following:

- Its Media Kit (contains 2 SmartStart CDs, the Firmware DVD, and the Management DVD) will continue to ship with all supported ProLiant G7

### Standard Features

or earlier BTO servers until the last supported server is no longer shipping.

- The Media Kit will not be updated past version 8.70.
- ProLiant G7 or earlier CTO servers are able to order the Media Kit with the understanding that the media is not updated. Please check specific server QuickSpecs for availability of CTO Kit.
- PSP and Firmware DVD downloads will be updated through 2Q 2012 at the HP Insight Foundation Suite for ProLiant downloads tab:  
<http://www.hp.com/go/foundation>

Customers are urged to use the replacement product, HP Service Pack for ProLiant, instead of Insight Foundation Suite which is found at these location:

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

HP Integrated Lights-Out 2 (iLO 2)

HP Integrated Lights-Out 2 (iLO 2) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO 2 functions without additional software and can be accessed from any location via a web browser. HP iLO 2 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)

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#### Intelligent Manageability

HP Systems Insight Manager  
SmartStart  
Redundant ROM  
System Firmware Update  
ROMPaq  
ProLiant RBSU (ROM-Based Setup Utility)  
Automatic Server Recovery-2 (ASR-2)  
Dynamic Sector Repairing (with Smart Array Controller)  
Drive Parameter Tracking (with Smart Array Controller)  
Pre-Failure Warranty (covers processors, memory, and SAS hard drives)  
Dynamic power capping (with 750W PSU)

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#### HP Insight Online

HP Insight Online is a new capability available through the HP Support Center portal for one stop, secure access to product and HP support information specific to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime. [www.hp.com/go/insightonline](http://www.hp.com/go/insightonline)

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### Standard Features

<b>Security</b>	Power-on password Setup password Serial interface control Power switch security Front bezel/side access panel Lock Padlock and Kensington lock available Keyboard/Mouse/USB port lock
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### Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. 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 3-Year Parts, 1-Year Labor, 1-Year Onsite 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

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 advanced infrastructure management software that enables IT staff to instantly adjust their environments to meet dynamic business demands by provisioning, optimizing and protecting complex infrastructure in minutes. It's a powerful toolkit, integrated-by-design, that accelerates complex technology projects and simplifies daily operations, transforming data center economics. With Insight Dynamics IT professionals can plan capacity and power continuously, balance workloads across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP StorageWorks Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location.

**NOTE:** For more information, visit:

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

### Optional Features

**Factory Express Portfolio for Servers and Storage** HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.

Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches.

For more information on Factory Express services for your specific server model please contact your sales representative or go to: <http://www.hp.com/go/factory-express>.

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### HP Enterprise Configurator

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

### 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

### 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/5981-6645EEE.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

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#### 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>

##### **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>

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

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#### 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

<p><b>Quad-Core Models</b>  <b>HP ProLiant ML330 G6</b>  <b>E5603 1P 2GB-U B110i</b>  <b>Non-hot Plug SATA 250GB</b>  <b>460W PS Server</b>          637079-xx1</p>	<p><b>Processor(s)</b></p> <p><b>Cache Memory</b></p> <p><b>Memory</b></p> <p><b>Network Controller</b></p> <p><b>Storage Controller</b></p> <p><b>Hard Drive</b></p> <p><b>Internal Storage</b></p> <p><b>Optical Drive</b></p> <p><b>Power Supply</b></p> <p><b>Fans</b></p> <p><b>Accessories</b></p> <p><b>Form Factor</b></p> <p><b>Warranty</b></p>	<p>(1) Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor</p> <p>4MB (1 x 4MB) Level 3 cache</p> <p>2 GB (1 x 2 GB) PC3-10600E (DDR3-1333) Unbuffered DIMMs  <b>NOTE: 12 DIMM slots.</b></p> <p>Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</p> <p>Embedded HP Smart Array B110i SATA RAID Controller (RAID 0/1/0+1)</p> <p>One (1) 250GB 3G SATA 7.2K NHP 3.5" ETY HDD</p> <p>(4) LFF Non Hot Plug SATA HDD Bays only</p> <p>HP Half-Height SATA DVD-ROM Optical Drive</p> <p>460 Watt power supply (NHP, Non Redundant)</p> <p>3 fans ship standard</p> <p>PS/2 Keyboard and Mouse ship standard</p> <p>Tower (5U)</p> <p>Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.</p>
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### Base Models

<p><b>Quad-Core Models</b>  <b>HP ProLiant ML330 G6</b>  <b>E5606 1P 4GB-U B110i</b>  <b>460W PS Server</b>          637080-xx1</p>	<p><b>Processor(s)</b></p> <p><b>Cache Memory</b></p> <p><b>Memory</b></p> <p><b>Network Controller</b></p> <p><b>Storage Controller</b></p> <p><b>Hard Drive</b></p> <p><b>Internal Storage</b></p> <p><b>Optical Drive</b></p> <p><b>Power Supply</b></p> <p><b>Fans</b></p> <p><b>Accessories</b></p>	<p>(1) Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) Processor</p> <p>8MB (1 x 8MB) Level 3 cache</p> <p>4 GB (2 x 2 GB) PC3-10600E (DDR3-1333) Unbuffered DIMMs  <b>NOTE: 12 DIMM slots.</b></p> <p>Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</p> <p>Embedded HP Smart Array B110i SATA RAID Controller Hot plug advanced key (RAID 0/1/0+1)</p> <p>None ship standard</p> <p>(4) LFF Hot Plug SATA HDD Bays; upgradeable to (8)</p> <p>HP Half-Height SATA DVD-ROM Optical Drive</p> <p>460 Watt power supply (NHP, Non Redundant)</p> <p>3 fans ship standard</p> <p>PS/2 Keyboard and Mouse ship standard</p>
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### Pre-configured Models

<b>Form Factor</b>	Tower (5U)
<b>Warranty</b>	Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.

### Performance Model

<b>Quad-Core Models</b>	<b>Processor(s)</b>	(1) Intel® Xeon® E5620 (2.40GHz/4-core/80W/12MB) Processor
<b>HP ProLiant ML330 G6</b>	<b>Cache Memory</b>	12MB (1 x 12MB) Level 3 cache
<b>E5620 1P 6GB-R B110i Hot Plug SATA LFF 460W PS Perf Server</b>	<b>Memory</b>	6 GB (3 x 2 GB) PC3-10600R (DDR3-1333) Registered DIMMs <b>NOTE: 18 DIMM slots.</b>
600911-xx1	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Embedded HP Smart Array B110i SATA RAID Controller Hot plug advanced key (RAID 0/1/0+1)
	<b>Hard Drive</b>	None ship standard
	<b>Internal Storage</b>	(4) LFF Hot Plug SATA HDD Bays; upgradeable to (8)
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	460 Watt power supply (NHP, Non Redundant)
	<b>Fans</b>	3 fans ship standard
	<b>Accessories</b>	PS/2 Keyboard and Mouse ship standard
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.

### Country Code Key

xx=00  
xx=01  
xx=03  
xx=04  
xx=05  
xx=20  
xx=29  
xx=37  
xx=42  
xx=AA

### Tower Code Key

U.S.  
Australia  
UK  
Germany  
France  
Brazil  
Japan  
APD  
Europe  
(Excludes USB Keyboard)  
PRC

### Rack Code Key

U.S.  
N/A  
N/A  
N/A  
N/A  
N/A  
Japan  
APD  
Europe  
PRC

### Configuration Information - Factory Integrated Models

**NOTE:** This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on 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 ML330 G6 Configure-to-order Tower Server	504271-B21
	<b>Includes:</b>	
	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter	
	Integrated Smart Array B110i SATA RAID Controller	
	Four (4) LFF HDD bays	
	Four (4) PCIe slots	
	Eight (8) USB ports	
	Tower Form Factor	
	PS/2 Keyboard and Mouse (selection required)	

### 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 ML330 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	637700-L21
	HP ML330 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	637701-L21
	<b>Quad-Core Processors</b>	
	HP ML330 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	601052-L21
	HP ML330 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	637702-L21
	HP ML330 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) FIO Processor Kit	637703-L21
	HP ML330 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	637704-L21
	<b>NOTE:</b> Xeon E5500 DP family supports both Registered DIMMs and Unbuffered DIMMs. Xeon W3500 UP family supports only Unbuffered DIMMs.	
<b>HP 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) 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

### Configuration Information - Factory Integrated Models

#### Unbuffered with ECC DIMMs (UDIMMs)

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

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

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

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

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

#### HP Drive Cage Options

##### Non-Hot Plug HDD Model

HP 5U G6 Large Form Factor Non-hot Plug Cage Factory Integrated Kit 500448-B21

##### Hot Plug HDD Model

HP 5U Large Form Factor (LFF) Hot Plug Drive Cage Kit 487737-B21

**NOTE:** Hot Plug SATA/SAS model and Non-hot plug SAS model requires a HP SATA or SAS RAID Controller.

**NOTE:** Non-hot plug model supports up to 4 drives only and at least one NHP hard drive is required.

**NOTE:** Embedded B110i controller can be enabled with hot plug functionality with the purchase of Smart Array Hot Plug Advance Pack (TC421A) and at least 1 hot plug HDD.

**NOTE:** For 8 LFF Drive maximum support, 2 Hot Plug HDD Drive Cages and Smart Array controller 8 ports or 2x 4 ports.

#### HP Power supplies

**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor).

HP 460W Factory Integrated Power Supply Kit 500447-B21

HP 750W Common Slot Gold Hot Plug Power Supply Kit 512327-B21

**NOTE:** The HP 750W power supply requires purchasing the Redundant Power Supply Enablement Kit (P/N 508544-B21).

##### Power Options

HP 5U G6 Redundant Power Supply Enablement Kit 508544-B21

**NOTE:** The Redundant Power Supply Enablement kit does not integrate any power supply. Two (2) units of 750W power supply are required to achieve redundancy.

### Configuration Information - Factory Integrated Models

#### Step 3: Choose Additional Factory Integratable Options

<b>HP Storage Controllers</b>	<b>NOTE:</b> SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.	
	<b>NOTE:</b> HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21) is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.	
	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
	HP Smart Array P410/256 BBWC 2-ports Int PCIe x8 FIO SAS Controller	491195-B21
<b>HP Insight Software</b>	HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller	491193-B21
	<b>NOTE:</b> SAS Controller supports RAID 0/1/1+0/5.	
	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" or "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 Processors

##### Six-Core Processors

HP ML330 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	637705-B21
HP ML330 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	637706-B21

##### Quad-Core Processors

HP ML330 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	603976-B21
HP ML330 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor Kit	637707-B21
HP ML330 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) Processor Kit	637708-B21
HP ML330 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor Kit	637709-B21
HP ML330 G6 Intel® Xeon® E5507 (2.26 GHz/4-core/4MB/80W) Processor Kit	603975-B21
HP ML330 G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	512713-B21
HP ML330 G6 Intel® Xeon® E5504 (2.0GHz/4-core/4MB/80W) Processor Kit	512712-B21

##### Dual-Core Processors

HP ML330 G6 Intel® Xeon® E5503 (2.0GHz/2-core/4MB/80W) Processor Kit	603974-B21
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**NOTE:** Each processor kit includes (1) processor/(1) heatsink/ (1) Processor board. The processor board is integrated with (1) processor socket and (9) DIMM slots.

**NOTE:** When two (2) Xeon E5500 processors are installed, the system QPI will be locked at 4.8 GT/s.

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

#### 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) 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
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##### 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

### Core Options

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

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

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<b>HP Optical Drives</b>	HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
	HP Half-Height SATA DVD-RW Optical Drive	447328-B21

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<b>HP Drive Cage Options</b>	HP 5U Large Form Factor (LFF) Hot Plug Drive Cage Kit	487737-B21
	<b>NOTE:</b> To reach maximum 8 LFF Drive support, it is required to purchase 2 Hot Plug HDD Drive Cages and Smart Array controller 8 ports or 2x 4 ports.	

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### 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.

**NOTE:** SAS Non-Hot Plug and SAS Hot Plug Models require HP SAS Smart Array Controller.

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

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516830-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516826-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516824-B21

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

HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) 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:** 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 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

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### Core Options

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

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

HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive 507774-B21

HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive 507772-B21

HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Midline 1yr Warranty Hard Drive 458941-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

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

HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive 571232-B21

HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Non-hot Plug Entry 1yr Warranty Hard Drive 458947-B21

**NOTE:** Please see the [QuickSpecs for Technical Specifications and additional information:](#)

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

#### **SATA Hot Plug 3.5" Enterprise Mainstream Solid State Drives**

HP 400GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636611-B21

HP 200GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636609-B21

HP 100GB 3G SATA MLC LFF (3.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive 636607-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:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

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

HP NC522SFP Dual Port 10GbE Gigabit Server Adapter 468332-B21

### Core Options

HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://www.hp.com/go/ProLiantNICs">www.hp.com/go/ProLiantNICs</a>	

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<b>HP I/O Expansion Options</b>	HP Dedicated iLO Management Port Option	514206-B21
	HP Non-Hot Plug Internal SAS/SATA 4 Port Cable Kit	487734-B21
	<b>NOTE:</b> SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.	
	HP ML350/ML330G6 2 Slot PCI-X Riser Kit	488413-B21

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<b>HP Power Supplies</b>	<b>NOTE:</b> Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: <a href="http://www.hp.com/go/hppoweradvisor">www.hp.com/go/hppoweradvisor</a> .	
	HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
	<b>NOTE:</b> The HP 750W power supply requires purchasing the Redundant Power Supply Enablement Kit (P/N 508544-B21).	
	<b>Power Options</b>	
	HP 5U G6 Redundant Power Supply Enablement Kit	508544-B21
	<b>NOTE:</b> The Redundant Power Supply Enablement kit does not integrate any power supply. Two (2) units of 750W power supply are required to achieve redundancy.	

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<b>HP Cooling Options</b>	HP 5U G6 Redundant fan kit	513927-B21
	<b>NOTE:</b> Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.	
	<b>NOTE:</b> If customer orders the standalone redundant fan option kit, he/she will receive two (2) fans in a two-fan packaged box. Only one (1) fan is required for system redundancy. The other one can be saved as a spare part. If customer orders the redundant fan kit along with the server, he/she will not be receiving the extra fan.	

### 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.

#### HP Insight Software

#### HP Insight Control

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 Management Media Kit 436222-B21

**NOTE:** HP Insight Management Media Kit contains DVDs without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Matrix Operating Environment, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.

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

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

**NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

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

#### HP Insight Control for Linux

HP Insight Control for Linux 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

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

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

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

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

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

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

HP iLO Advanced Pack Electronic License with 3yr 24x7 Tech Support and Updates BD506AAE

HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates BD505A

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License TA850AAE

### Additional Options

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License 512485-B21

**NOTE:** This license allows 1 server to be deployed and managed via HP iLO Advanced. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service.

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

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

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

#### HP Insight Control server deployment

HP Insight Control Server Deployment 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:** 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:** SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.

#### Smart Array P800 Controller

HP Smart Array P800/512 BBWC 2-ports Int/2-ports Ext PCIe x8 SAS Controller 381513-B21

#### 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

### Additional Options

#### Smart Array P410 Controller

**NOTE:** HP NHP Internal SAS/SATA 4 Port Cable Kit (487734-B21) is required when adding Smart Array P410 Controller on Non-Hot Plug SATA/SAS server models.

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
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

#### Smart Array P812 Controller

HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
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#### Upgrade Options

HP Mini SAS to Mini SAS 33in Cable Assembly	496014-B21
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**NOTE:** This cable option kit is needed to upgrade from hot plug SATA to hot plug SAS.

HP Hot Plug Internal SATA to Mini SAS Cable Kit	600732-B21
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**NOTE:** This cable needed when upgrade from non-hot plug SATA to hot plug SATA.

HP 256MB P-series Cache Upgrade	462968-B21
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**NOTE:** Supported on HP Smart Array P212 and P410/ZM Controllers only.

HP 512MB P-Series Battery Backed Write Cache Upgrade	462967-B21
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HP 650 mAh P-Series Battery	462969-B21
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**NOTE:** To enable BBWC on the 256MB cache.

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

HP 8484 to Mini SAS 33in Cable Assembly	591734-B21
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**NOTE:** Cable used to connect the Smart Array P800 Controller to internal hard disk drives on selected HP ProLiant G6 Servers.

HP 512MB Flash Backed Write Cache	534916-B21
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HP 1GB Flash Backed Cache	534562-B21
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HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License	516471-B21
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**NOTE:** This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.

HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU	TC421A
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**NOTE:** Please see the following QuickSpecs additional information:

[http://h18000.www1.hp.com/products/quickspecs/12616\\_div/12616\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html)  
(Smart Array P800 Controller)

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

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

### Additional Options

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

[http://h18000.www1.hp.com/products/quickspecs/13558\\_div/13558\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html)  
(Smart Array P812 Controller)

[http://h18000.www1.hp.com/products/quickspecs/13200\\_div/13200\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html)  
(Smart Array Advanced Pack)

[http://h18000.www1.hp.com/products/quickspecs/13495\\_div/13495\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13495_div/13495_div.html)  
(Smart Array Hot Plug Advance Pack for B110i)

#### SAS HBA

HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter

614988-B21

**NOTE:** This is a 2 x4 External Port HBA

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

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

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

#### SCSI HBA

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter

412911-B21

**NOTE:** Recommended for SCSI tape drive connection.

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

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

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#### HP Backup & Recovery Software

##### Data Protector Express

HP Data Protector Express V5.0 for 1 Server E-LTU

TC330AAE

HP Data Protector Express V5.0 for 3 Servers E-LTU

TC331AAE

HP Data Protector Express V5.0 for 10 Servers E-LTU

TC332AAE

HP Basic Upgrade to Data Protector Express V5 for 1 Server E-LTU

TC333AAE

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

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### 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/storage/SPOCK>.

#### Rack-Mount Tape Solutions

HP DAT 160 SCSI Internal Tape Drive	Q1573A
HP DAT 160 USB Internal Tape Drive	Q1580A
HP DAT 320 USB Internal Tape Drive	AJ825A
HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
<b>NOTE:</b> Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation.	
HP DAT 320 SAS Internal Tape Drive	AJ830A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP Ultrium 448 SAS Internal Drive	DW085A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP Ultrium 920 SAS Internal Tape Drive	EH847A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP LTO-4 Ultrium 1760 SAS Internal WW Tape Drive	EH919A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP LTO-4 Ultrium 1840 SAS External WW Drive	EH861A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP LTO-5 Ultrium 3000 SAS External Tape Drive	EH958A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A
<b>NOTE:</b> Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. <b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library	AK378A
HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	
HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library	AK380A
HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A
<b>NOTE:</b> Recommended to use HP P212 SAS Smart Array Controller (462828-B21) for connection.	

### Additional Options

#### 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/storage/SPOCK>.

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

HP 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 D2D2502i Backup System EJ001C

HP 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 D2D2504i Backup System EJ002C

HP 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.

HP D2D4112 Backup System EH993C

#### HP RDX Removable Disk Backup Systems USB

HP RDX160 Internal Removable Disk Backup System AJ765A

**NOTE:** 160GB of disk capacity per data cartridge.

HP RDX320 Internal Removable Disk Backup System AJ767A

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

HP 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 RDX1000 Internal Removable Disk Backup System BV847A

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

#### HP Storage Options

##### Storage SCSI HBA

HP U320e SCSI Dual Channel Host Bus Adapter AH627A

**NOTE:** Recommended HBA for MSL SCSI Tape Library connect.

### Additional Options

#### HP Disk Storage Systems MSA SAN Storage Arrays

HP MSA70 Array 418800-B21

**NOTE:** Please see the QuickSpecs for additional options and configuration information at: [http://h18000.www1.hp.com/products/quickspecs/12652\\_div/12652\\_div.html](http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html) (Worldwide)

#### Disk Enclosures

HP D2600 Disk Enclosure AJ940A

HP 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)

#### HP Uninterruptible Power Systems HP Tower UPS

##### HP T1000 G3 UPS Models

HP T1000 G3 1000VA NA Tower Uninterruptible Power System AF448A

HP T1000 G3 1000VA INTL Tower Uninterruptible Power System AF449A

HP T1000J JP Uninterruptible Power System AF457A

##### HP T1500 G3 UPS Models

HP T1500 G3 1400VA NA Tower Uninterruptible Power System AF450A

HP T1500 G3 1400VA INTL Tower Uninterruptible Power System AF451A

HP T1500J JP Uninterruptible Power System AF458A

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

[http://h18000.www1.hp.com/products/quickspecs/13160\\_div/13160\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html) (Worldwide)

##### R5000 Uninterruptible Power System (UPS)

HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System AF461A

HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System AF460A

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

[http://h18000.www1.hp.com/products/quickspecs/14109\\_div/14109\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html) (Worldwide)

##### R7000 Uninterruptible Power System (UPS)

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System AF462A

HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System AF463A

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

[http://h18000.www1.hp.com/products/quickspecs/14110\\_div/14110\\_div.html](http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html) (Worldwide)

**NOTE:** For additional information on HP Uninterruptible Power Systems please go to: [www.hp.com/servers/rackups](http://www.hp.com/servers/rackups).

**NOTE:** For additional information on sizing your server, 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

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#### HP Rack Series

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

HP 10642 G2 Shock Universal Rack

AF002A

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

**NOTE:** Please see the QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:

[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.

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#### HP Rack Options

##### HP USB Keyboard and Mouse

HP USB BFR with PVC Free INDIA Keyboard/Mouse Kit

672097-D63

HP USB BFR with PVC Free AP-INTL Keyboard/Mouse Kit

672097-373

HP USB BFR with PVC Free INTL Keyboard/Mouse Kit

672097-B33

HP USB BFR with PVC Free PORT Keyboard/Mouse Kit

672097-133

HP USB BFR with PVC Free TURK Keyboard/Mouse Kit

672097-143

HP USB BFR with PVC Free CZ Keyboard/Mouse Kit

672097-223

HP USB BFR with PVC Free FIN Keyboard/Mouse Kit

672097-353

HP USB BFR with PVC Free SWE Keyboard/Mouse Kit

672097-103

HP USB BFR with PVC Free SWIS Keyboard/Mouse Kit

672097-113

HP USB BFR with PVC Free KOR Keyboard/Mouse Kit

672097-KD3

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

[http://h18000.www1.hp.com/products/quickspecs/13972\\_div/13972\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13972_div/13972_div.html)  
(Worldwide)

### Additional 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

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)

#### Rack Kit

HP Tower to Rack Conversion Tray Universal Kit 417705-B21

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#### HP USB and SD Options

HP USB 2-Button Optical Scroll Mouse DC172B

HP USB 04 Standard Keyboard DT528A#ABA

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

**NOTE:** Blank SD media device is supported for use with VMware and Citrix. 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.

### Additional Options

#### HP Care Pack Services

#### Hardware Services

HP 3 year Next business day ProLiant ML330 Hardware Support	UM870E
HP 3 year 4hour 13x5 ProLiant ML330 Hardware Support	UM872E
HP 3 year 4hour 24x7 ProLiant ML330 Hardware Support	UM874E
HP 3 year 6hour 24x7 Call to Repair ProLiant ML330 Hardware Support	UM876E

#### Other Services

HP 4 year 4hour 13x5 ProLiant ML330 Hardware Support	UM880E
HP 4 year 4hour 24x7 ProLiant ML330 Hardware Support	UM882E
HP 5 year 4 hour 13x5 ProLiant ML330 Hardware Support	UM888E
HP 5 year 4 hour 24x7 ProLiant ML330 Hardware Support	UM890E

#### Support Plus

HP 3 year SupportPlus24 Microsoft ProLiant ML330 Service	UM894E
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**NOTE:** For more information, customer/resellers can contact:  
<http://www.hp.com/services/carepack>

### Memory

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

#### DDR3 memory population guidelines

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 eighteen (18) memory slots:
  - There are three (3) channels per processor; six (6) channels per server
  - There are three (3) DIMM slots for each memory channel; eighteen (18) 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)
- Do not install DIMMs if the corresponding processor is not installed
- If only one processor is installed in a 2CPU system, only half of the DIMM slots are available
- 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
- If any Quad rank DIMMs are installed, all channels are limited to only 2 DIMMs 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
- Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors
- If mixing DIMM voltage is a requirement, please note that the DIMMs will run at 1.5V since all 1.35V are capable of supporting 1.5V operations

**DIMM slot/capacity/populated speed table**

DIMM Type	Registered DIMMs (RDIMMs)						Unbuffered with ECC DIMMs (UDIMMs)			
	Single Rank (1R)	Dual Rank (2R)			Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)		
DIMM Capacity	4GB	2GB	4GB	8GB	8GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz)	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
Voltage	LV/Reg	Reg	Reg	Reg	LV/Reg	Reg	Reg	Reg	Reg	Reg
<b>SLOTS THAT CAN BE POPULATED</b>										
18 slot servers	18	18	18	18	18	12	12	12	12	12
<b>MAXIMUM CAPACITY (GB)</b>										
	72	36	72	144	144	48	192	12	24	48
<b>POPULATED DIMM SPEED (MHz)</b>										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
2 DIMM Per Channel	1333*	1333*	1333*	1066	1333*	800	800	1333	1333	1333*

### Memory

3 DIMM Per Channel	800	800	800	800	800	n/a	n/a	n/a	n/a	n/a
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#### NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- If you install 1x 1066MHz DIMM in channel 1 and 1x 1333MHz DIMM in channel 2, the maximum speed will be 1066MHz If you install 1x 1066MHz DIMM in channel 1 and 5x 1333MHz DIMMs with 1 DIMM Per Channel (DPC) in each of the other channels, 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, you run at 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.

18 DIMM SLOTS (9 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 0	1	G	1	G	Chnl 0
	2	D	2	D	
	3	A	3	A	
Chnl 1	4	H	4	H	Chnl 1
	5	E	5	E	
	6	B	6	B	
Chnl 2	7	I	7	I	Chnl 2
	8	F	8	F	
	9	C	9	C	

#### Standard memory configuration (1 CPU model)

- 4GB, consisting of two (2) 2GB dual-rank PC3-10600 RDIMMs (Base model)

### Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; empty	2	D; empty	
	3	A; 2GB RDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; empty	5	E; empty	
	6	B; 2GB RDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; empty	8	F; empty	
	9	C; empty	9	C; empty	

#### Standard memory plus optional memory (1 CPU model)

- 60GB, consisting of two (2) 2GB RDIMMs plus seven (7) 8GB RDIMMs
  - 2x 2GB dual-rank PC3-10600 RDIMMs
  - 7x 8GB dual-rank PC3-8500 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; 8GB RDIMM	1	G; empty	Chnl 1
	2	D; 8GB RDIMM	2	D; empty	
	3	A; 2GB RDIMM	3	A; empty	
Chnl 2	4	H; 8GB RDIMM	4	H; empty	Chnl 2
	5	E; 8GB RDIMM	5	E; empty	
	6	B; 2GB RDIMM	6	B; empty	
Chnl 3	7	I; 8GB RDIMM	7	I; empty	Chnl 3
	8	F; 8GB RDIMM	8	F; empty	
	9	C; 8GB RDIMM	9	C; empty	

#### Standard memory replaced with optional memory (1 CPU model) RDIMM maximum configuration

- 96GB, consisting of six (6) 16GB dual-rank PC3-8500 RDIMMs

### Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 16GB RDIMM	2	D; empty	
	3	A; 16GB RDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 16GB RDIMM	5	E; empty	
	6	B; 16GB RDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 16GB RDIMM	8	F; empty	
	9	C; 16GB RDIMM	9	C; empty	

#### UDIMM maximum configuration (1 CPU model)

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

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 4GB UDIMM	2	D; empty	
	3	A; 4GB UDIMM	3	A; empty	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 4GB UDIMM	5	E; empty	
	6	B; 4GB UDIMM	6	B; empty	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 4GB UDIMM	8	F; empty	
	9	C; 4GB UDIMM	9	C; empty	

#### Standard memory replaced with optional memory (2 CPU model)

##### RDIMM maximum configuration

- 192GB, consisting of eighteen (12) 16GB dual-rank PC3-8500 RDIMMs

### Memory

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 16GB RDIMM	2	D; 16GB RDIMM	
	3	A; 16GB RDIMM	3	A; 16GB RDIMM	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 16GB RDIMM	5	E; 16GB RDIMM	
	6	B; 16GB RDIMM	6	B; 16GB RDIMM	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 16GB RDIMM	8	F; 16GB RDIMM	
	9	C; 16GB RDIMM	9	C; 16GB RDIMM	

### UDIMM maximum configuration (2 CPU model)

- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 UDIMMs

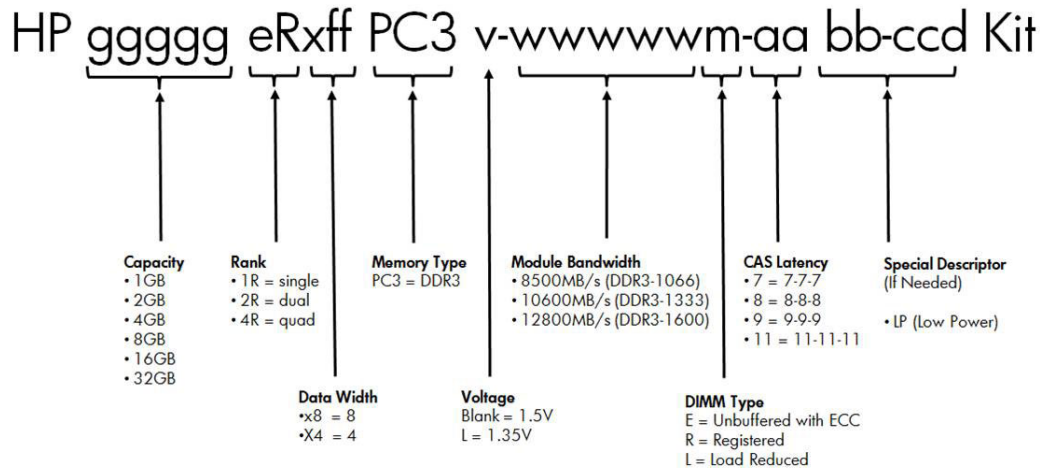
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	G; empty	1	G; empty	Chnl 1
	2	D; 4GB UDIMM	2	D; 4GB UDIMM	
	3	A; 4GB UDIMM	3	A; 4GB UDIMM	
Chnl 2	4	H; empty	4	H; empty	Chnl 2
	5	E; 4GB UDIMM	5	E; 4GB UDIMM	
	6	B; 4GB UDIMM	6	B; 4GB UDIMM	
Chnl 3	7	I; empty	7	I; empty	Chnl 3
	8	F; 4GB UDIMM	8	F; 4GB UDIMM	
	9	C; 4GB UDIMM	9	C; 4GB UDIMM	

**NOTE:** Capacity references are rounded to the common Gigabyte values.

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

### DDR3 memory options part number decoder

### Memory



### 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) 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

#### Unbuffered with ECC DIMMs (UDIMMs)

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

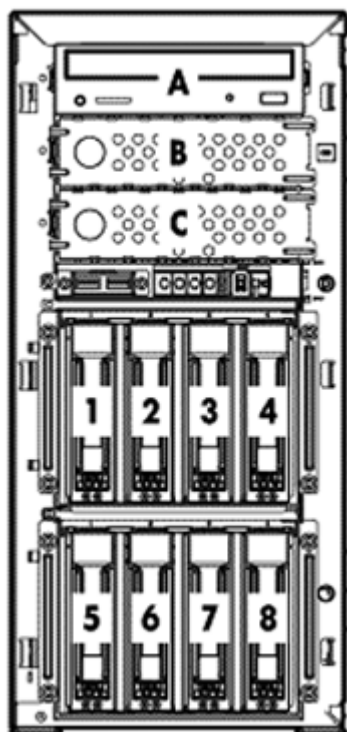
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit 500670-B21

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

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

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

### Storage



A Optical Drive

B,C Removable Media Bays (2)- 1 full-height drive or 2 half-height drives

1-4 4 x 3.5" (LFF) Hot plug or Non hot-plug SATA/SAS hard drive bays (Standard)

5-8 4 x 3.5" (LFF) Hot plug SATA/SAS hard drive bays (Optional)

### Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
SATA DVD-ROM Optical Drive	Up to 2	A, B	Integrated SAS Controller
SATA DVD RW Optical Drive	Up to 2	A, B	Integrated SATA Controller

#### Hard Drives

**NOTE:** Transfer rates of drives are dependent on the maximum transfer rate supported by the HBA or Controller. Refer to the HBA or Controller technical specifications for details.

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

**NOTE:** Supports up to Eight (8) SAS/SATA hard drives via 2nd Hot plug Hard Disk Drive module option kit and HP Smart Array P410 Controller.

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller
450GB 6G SAS 15K			HP Smart Array P212/Zero Memory Controller
300GB 6G SAS 15K			HP Smart Array P212/ 256 MB Controller

### Storage

HP Smart Array P410/256 MB Controller  
 HP Smart Array P410/512 MB BBWC Controller  
 HP Smart Array P410/512 MB FBWC Controller  
 HP Smart Array P410/1G FBWC Controller  
 HP Smart Array P411/256 MB Controller  
 HP Smart Array P411/512 MB BBWC Controller  
 HP Smart Array P411/512 MB FBWC Controller  
 HP Smart Array P411/1G FBWC Controller  
 HP Smart Array P812/1G Flash Backed Cache Controller

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller
450GB 6G SAS 15K			HP Smart Array P212/Zero Memory Controller
300GB 6G SAS 15K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

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

	Quantity Supported	Position Supported	Controller
3TB 6G SAS 7.2K	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller
2TB 6G SAS 7.2K			HP Smart Array P212/Zero Memory Controller
1TB 6G SAS 7.2K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

**NOTE:** Transfer rates of drives are dependent on the maximum transfer rate supported by the HBA or Controller. Refer to the HBA or Controller technical specifications for details.

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

Quantity Supported	Position Supported	Controller
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### Storage

3TB 3G SATA 7.2K	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller
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 BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller
			HP Smart Array Hot Plug Advance Pack for B110i

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

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K	Up to 4	1-4	Embedded Smart Array B110i SATA RAID Controller
1TB 3G SATA 7.2K			HP Smart Array P800/512 BBWC Controller
500GB 3G SATA 15K			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 BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

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

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 7.2K	Up to 8	1-8	HP Smart Array P800/512 BBWC Controller
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 BBWC Controller
			HP Smart Array P410/512 MB FBWC Controller
			HP Smart Array P410/1G FBWC Controller
			HP Smart Array P411/256 MB Controller
			HP Smart Array P411/512 MB BBWC Controller
			HP Smart Array P411/512 MB FBWC Controller
			HP Smart Array P411/1G FBWC Controller
			HP Smart Array P812/1G Flash Backed Cache Controller

### Storage

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

	Quantity Supported	Position Supported	Controller
250GB 3G SATA 15K	Up to 4	1-4	Embedded Smart Array B110i SATA RAID Controller HP Smart Array P800/512 BBWC Controller 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 BBWC Controller HP Smart Array P410/512 MB FBWC Controller HP Smart Array P410/1G FBWC Controller HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/512 MB FBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812/1G Flash Backed Cache Controller
160GB 3G SATA 15K			

**NOTE:** To support 8 drives, the purchase of the optional HP HDD cage and possibly purchase a second SATA/SAS controller are required.

**NOTE:** SAS non-hot plug drives require the Non-Hot Plug Internal SAS/SATA 4 port Cable kit (P/N 487734-B21) and a HP SAS/Smart Array Controller.

**NOTE:** Hot Plug SATA/SAS model and Non-hot plug SAS model requires A HP SAS Controller.

#### Maximum Storage Capacity - SAS Models

Internal	24.0TB (8 x 3TB SAS hard drives)
Total	24.0TB (8 x 3TB SAS hard drives)

#### Maximum Storage Capacity - SATA Models

Internal	24.0TB (8 x 3TB SATA drives)
Total	24.0TB (8 x 3TB SATA drives)

### External Storage

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

### 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/storage/SPOCK>.

### Storage

	<b>Position Supported</b>	<b>Controller</b>	<b>Controller/HBA Option Kit Part Number</b>
<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	Internal or External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter  HP U320e SCSI Dual Channel Host Bus Adapter	412911-B21  AH627A
<p><b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a></p>			
<b>HP SCSI Rack Mount Kits</b> 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
<b>HP USB Tape Drives</b> DAT 40 DAT 72 DAT 160 DAT 320	Internal or External	USB 2.0 Port	N/A
<b>HP USB Rack Mount Kits</b> 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	Internal or External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
<p><b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a></p>			
<b>HP SAS Rack Mount Kits</b> 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
<p><b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a></p>			
<b>HP SCSI Tape Autoloaders, External</b> DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter HP U320e SCSI Dual Channel Host Bus Adapter	412911-B21 AH627A
<p><b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a></p>			

### Storage

<b>HP SCSI Tape Libraries, External</b> MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Host Bus Adapter  <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	AH627A
<b>HP SAS Tape Autoloaders and Libraries, External</b> 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller  <b>NOTE:</b> Please check the full compatibility information at: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	462828-B21
<b>HP Fibre Channel Tape Libraries</b> MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: <a href="http://www.hp.com/go/ebs">http://www.hp.com/go/ebs</a> for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpec.	
<b>HP USB RDX Removable Disk Backup System</b> RDX160 RDX320 RDX500 RDX750 RDX1TB	Internal or External	USB 2.0 port	N/A
<b>HP D2D Backup Systems, iSCSI</b> D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
<b>HP D2D Backup Systems, Fibre Channel</b> D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: <a href="http://www.hp.com/storage/SPOCK">http://www.hp.com/storage/SPOCK</a>	

### Power Specifications

<b>HP 460W Factory Integrated Power Supply Kit</b>							
Part Number	500447-B21						
Operational Input Voltage Range (Vrms)	90 to 135						
Frequency Range (Nominal) (Hz)	47 to 66 Hz						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>115</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>	
Max Rated Output Wattage Rating	460	460	460	460	460	460	460
Nominal Input Current (A rms)	10	10	5	5	5	5	5
Max Rated Input Wattage Rating (Watts)	760	760	700	700	700	700	700
Max. Rated VA (Volt-Amp)	850	850	830	830	830	830	830
Efficiency (%)	65	65	65	65	65	65	65
Power Factor	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Leakage Current (mA)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Maximum Inrush Current (A peak)	450	450	450	450	450	450	450
Maximum Inrush Current duration (mS)							

<b>HP 750W Common Slot Gold Hot Plug Power Supply Kit</b>							
Part Number	512327-B21						
Input Voltage Range ( V rms )	100 to 240						
Frequency Range (Nominal) ( Hz )	50/60						
Nominal Input Voltage ( Vrms )	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current ( A rms )	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating ( Watts )	857	847	824	824	820	820	820
Maximum Rated VA ( Volt-Amp )	894	884	859	854	854	854	
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 )	2925	2892	2812	2812	2797	2797	2797

**NOTE:** It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your need. The HP Power Advisor is located at: [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) (W/O foot stand)	7.87 x 16.81 x 24.13 in (200 x 427 x 613 mm)	
	<b>Weight</b> (approximate)	Maximum: (All hard drives, power supplies and processors installed)	66.14 lb (30 kg)
		Minimum: (One hard drive, power supply and processor installed)	35.27 lb (16 kg)
<b>Input Requirements</b> (per power supply)	<b>Input Requirements</b> (per power supply)	Rated Line Voltage	100 to 240 VAC
		Rated Input Current	7.1 Amps (at 120VAC) to 3.5 Amps (at 240 VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	852 W
<b>BTU Rating</b>	<b>BTU Rating</b>	Maximum	460W - 1773 BTU / hr (at 120 VAC), 1715 (at 240 VAC) 750W - 2892 BTU / hr (at 120 VAC), 2797 (at 240 VAC) 1200W - 3530 BTU / hr (at 120 VAC), 4600 (at 240 VAC)
<b>Power Specifications</b>	<b>Power Specifications</b>	To review typical system power ratings use the Power Calculator which is available via the online tool 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>	
		<ul style="list-style-type: none"> <li>- Click on the system of interest. Example: ML330 G6</li> <li>- Follow the instructions of the next screens.</li> </ul>	
<b>Power Supply Output</b> (per power supply)	<b>Power Supply Output</b> (per power supply)	Rated Steady-State Power	460 (750) W (at 100 VAC), 460 (750) W (at 200 VAC)
		Maximum Peak Power	460 (750) W (at 100 VAC), 460 (750) W (at 200 VAC)
		<b>NOTE:</b> See Power Supply Specifications tables for complete details on 460W PSU and optional 750W.	
<b>System Inlet Temperature</b>	<b>System Inlet Temperature</b>	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per 1,000 ft (1.0° C per every 305 m) above seal level to a maximum of 10,000 ft (3050 m) no direct sustained sunlight . Maximum rate of change is 18°F/hr (10°C/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 86°F (30°C).
		Non-Operating	-22° to 140° F (-30° to 60° C)
<b>Relative Humidity</b> (non-condensing)	<b>Relative Humidity</b> (non-condensing)	Operating	10% to 90% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.

### Technical Specifications

	Non-operating**	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.	
<b>Altitude</b>	Operating	10,000 ft (3000m). Maximum allowable altitude change rate is 1°C per 300m.	
	Non-Operating	30,000 ft (9144m). Maximum allowable altitude change rate is 1°C per 300m.	
<b>Acoustic Noise</b>	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).		
	Idle (Fixed Disk Drives Spinning)		
	L WAd (BELS)	460W SPS (w/ non-redundant fan): 4.9B 460W SPS (w/ redundant fan): 5.1B 750W RPS (w/ non-redundant fan): 5.1B 750W RPS (w/ redundant fan): 5.3B	
	L-pAm	460W SPS (w/ non-redundant fan): 31.4 dBA 460W SPS (w/ redundant fan): 33.7 dBA 750W RPS (w/ non-redundant fan): 33.4 dBA 750W RPS (w/ redundant fan): 33.8 dBA	
	Operating (Random Seeks to Fixed Disks)		
	L WAd (BELS)	460W SPS (w/ non-redundant fan): 4.9B 460W SPS (w/ redundant fan): 5.2B 750W RPS (w/ non-redundant fan): 5.3B 750W RPS (w/ redundant fan): 5.4B	
	L WAd (BELS)	460W SPS (w/ non-redundant fan): 31.4 dBA 460W SPS (w/ redundant fan): 33.9 dBA 750W RPS (w/ non-redundant fan): 34.6 dBA 750W RPS (w/ redundant fan): 35.2 dBA	
	<b>NOTE:</b> The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.		
	<b>Emissions Classification (EMC)</b>	<b>FCC Rating</b>	Class B
		<b>Normative Standards</b>	CISPR 22; EN55022; EN55024; 47 CFR, FCC Rules and Regulations Part 15 Subpart B; VCCI Class B ITE; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3.

**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.

### Technical Specifications

<b>HP Smart Array B110i SATA RAID Controller (RAID 0,1,10)</b>	<b>Dimensions</b>	N/A (embedded)
	<b>Disk Drive and Enclosure Protocol Support Architecture</b>	3.0 Gbps SATA 64-bit
	<b>SAS Connectors</b>	4 internal x1 SATA connectors
	<b>Software Upgradeable Firmware</b>	Yes. HP Smart Array hot plug Advanced Pack No Media 1-Server license including 1yr 24x7 Technical Support
	<b>Maximum Capacity</b>	2TB
	<b>Memory Addressing</b>	6GB (maximum)
	<b>Logical Drives Supported</b>	2 (maximum)
	<b>RAID Support</b>	RAID 1 (Mirroring) RAID 0 (Striping) RAID 10

<b>HP 250GB 3G SATA 7.2K NHP 3.5" ETY HDD</b>	<b>Capacity</b>	250,059MB	
	<b>Height</b>	1.028 in (26.1 mm)	
	<b>Width</b>	4.00 in (101.6 mm)	
	<b>Depth</b>	5.787 in (147.0 mm)	
	<b>Interface</b>	Serial ATA	
	<b>Transfer Rate (Maximum)</b>	3Gb/s	
	<b>Native Command Queuing</b>	Supported	
	<b>Seek Time</b> (typical reads, including settling)	Single Track	2.0 ms
		Average	11 ms
		Full-Stroke	21.0 ms
<b>Physical Configuration</b>	Rotational Speed	7,200 rpm	
	Bytes/Sector	512	
	Logical Blocks	488,397,168	
<b>Operating Temperature</b> (system inlet air temperature)	50° to 95° F (10° to 35° C)		

### Technical Specifications

<b>Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</b>	<b>Network Interface</b>	10Base-T/100Base-TX/1000Base-TX	
	<b>Compatibility</b>	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	<b>Data Transfer Method</b>	PCI Express, four lanes (x4)	
	<b>Controller</b>	BCM5715C	
	<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)		2000Mb/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)	

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