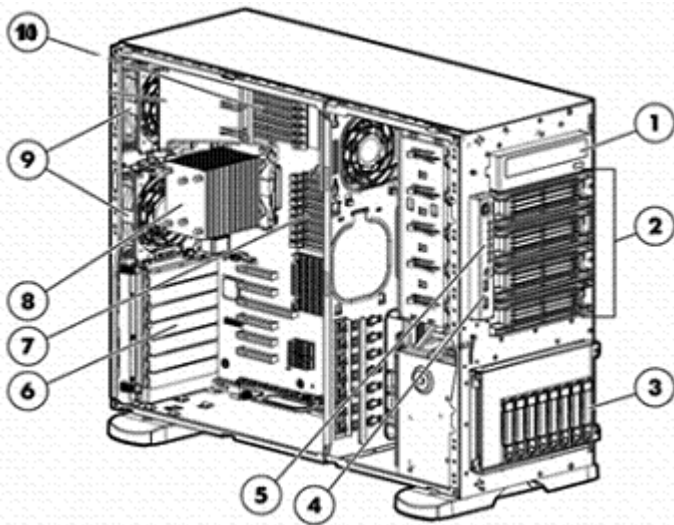


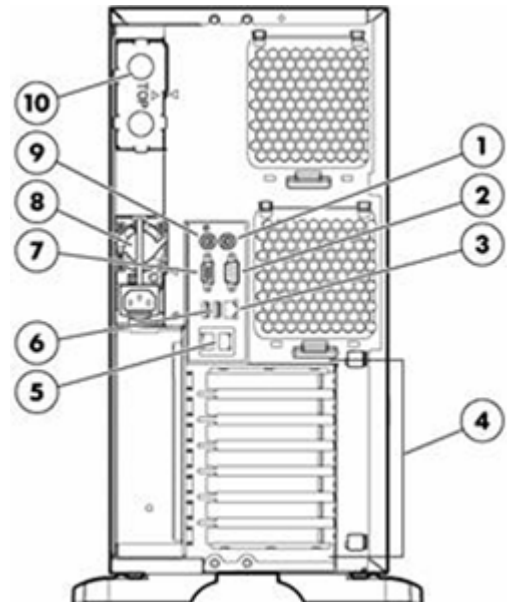
### Overview

The HP ProLiant ML350 G6 is the best price-performance, dual-processor Tower server that delivers excellence with performance, expandability and availability. The G6 server has more memory capacity and HDD expandability than previous generations. It combines the latest Intel Xeon 5600 processors with QPI technology, best-in-class availability features, and unsurpassed flexibility in a system ideal for growing businesses and especially well suited to meet the needs of remote branch offices.



#### Front View:

1. SATA DVD ROM or DVD RW optical drive
2. Four (4) removable media bays
3. Eight (8) 2.5" (shown) or six (6) 3.5" SAS or SATA hot plug drive bays
4. Two (2) USB ports
5. LEDs: System power, Health, Power cap, NIC 1&2, UID
6. Six (6) expansion slots
7. Nine (9) DIMM slots (Processor 2): DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory
8. Processor heatsink
9. Three (3) system fans
10. Nine (9) DIMM slots (Processor 1): DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory



#### Rear View:

1. PS/2 mouse port
2. Serial port
3. Dedicated remote management port
4. Six (6) expansion slots
5. Two (2) network ports
6. Two (2) USB ports
7. Video port
8. Power supply bay 1
9. PS/2 keyboard port
10. Power supply bay 2

### What's New

- Support for new HP Hard Drive.

### 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® X5675 (3.06GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

#### Quad-Core Processors

Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo) Processor

Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor

Intel® Xeon® X5570 (2.93GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor

Intel® Xeon® X5560 (2.80GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor

Intel® Xeon® X5550 (2.66GHz/4-core/8MB/95W, DDR3-1333, HT, Turbo 2/2/3/3) Processor

Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor

Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W, DDR3-1066, HT, Turbo 1/1/2/2) Processor

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

Intel® Xeon® E5606 (2.13 GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2/3/3) Processor

#### Dual-Core Processors

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

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

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

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

**NOTE:** For the Intel 5600 and 5500 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.

**NOTE:** Customers transitioning from 5500 series processors to 5600 series processors must include a third fan along with the two fans present on the server

### Standard Features

**Cache Memory**

One of the following depending on Model

12MB (1 x 12MB) Level 3 cache

**NOTE:** For 5600 series processors (other than those indicated below)

8MB (1 x 8MB) Level 3 cache

**NOTE:** For E5606/E5607/X5570/X5560/X5550/E5540/L5520 processors

4MB (1 x 4MB) Level 3 cache

**NOTE:** For E5603/E5507/E5502/L5506 processors

**Chipset**

Intel® 5520 Chipset

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

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

**Upgradeability**

Upgradeable to two processors

**NOTE:** total 4, 8 or 12 cores

**Memory Protection**

Advanced ECC

Mirroring mode

Lock-step mode

Online Spare (Requires X5600 or E5600 processor family)

**Memory**

One of the following depending on model

Type DDR3 Registered (RDIMM) or Unbuffered (UDIMM)

Standard (Performance Models) 12 GB (6 x 2 GB) RDIMM

Standard (Base Models) 6 GB (3 x 2 GB) RDIMM

Standard (Entry Models) 4 GB (2 x 2 GB) RDIMM

Standard (Entry Models) 4 GB (1 x 4 GB) RDIMM

Maximum (RDIMM) 288 GB (18 x 16 GB) RDIMM

Maximum (UDIMM) 48 GB (12 x 4 GB)

**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:** The 16 GB memory module is a quad ranked 800MHz DDR3 memory.

**Network Controller**

Embedded NC326i PCI Express Dual Port Gigabit Server Adapter

### Standard Features

#### Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
6	PCI Express Gen2	x4	x8	5	Standard Height/Length	
5	PCI Express Gen2	x4	x8	8	Standard Height/Length	
4	PCI Express Gen2	x8	x16	11	Standard Height/Length	
3	PCI Express Gen2	x8	x8	14	Standard Height/Length	
2	PCI Express Gen2	x4	x8	17	Standard Height/Length	
1	PCI Express Gen2	x4	x8	20	Standard Height/Length	

**NOTE:** Bus number - 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.

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

#### Storage Controller One of the following depending on model

Entry Models	Embedded HP Smart Array P410i/Zero Memory Controller (RAID 0/1/1+0)
Base Models	Embedded HP Smart Array P410i/256MB Controller (RAID 0/1/1+0/5/5+0) Embedded HP Smart Array P410i/512 MB BBWC Controller (RAID 0/1/1+0/5/5+0)
Performance Models	Embedded HP Smart Array P410i/1GB FBWC Controller
Available upgrades: 256MB, 512MB with BBWC, Battery kit upgrade (for BBWC), and Smart Array Advanced Pack (SAAP)	

#### Internal Storage Devices

Diskette Drive	None included standard (not supported)
Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive
Hard Drives	None standard

#### Maximum Internal Storage One of the following depending on model

Hot Plug LFF SAS	24TB	8 x 3TB
Hot Plug LFF SATA	24TB	8 x 3TB
Hot Plug SFF SAS	16TB	16 x 1TB
Hot Plug SFF SATA	16TB	16 x 1TB
Hot Plug SFF SSD	6.4TB	16 x 400GB

### Standard Features

<b>Interfaces</b>	Serial	1
	Network RJ-45	3 (1 dedicated for HP Integrated Lights-Out 2 (iLO2))
	Keyboard	1
	Pointing Device (Mouse)	1
	Graphics	1
	SD slot	1 (internal)
	USB 2.0 Ports	6 (2 front, 2 rear, 2 internal)

<b>Industry Standard Compliance</b>	ACPI V2.0 Compliant
	PCI-Express Gen2
	PXE Support
	WOL Support
	PCI-X 1.0a Compliant
	Novell Certified
	Microsoft® Logo certifications
	USB 2.0 Support
SMBIOS 2.6.1	

### Server Power Cords

ProLiant ML servers in a rack-mount configuration no longer ship standard with NEMA power cords that allow connection to 110V US wall outlets in a home or office. These servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant ML rack-mount server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. The 12' cord (AF556A) or 6' cord (187335-001) can be purchased online at HP.COM. In a tower configuration, the servers ship standard with a 6' country specific NEMA power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: <http://www.hp.com/go/powercordmatrix>.

### Power Supply

One of the following depending on Model

HP 750W CS HE Gold Power Supply (standard on some models)  
HP 460W CS HE Gold Power Supply (standard on some models)

### Standard Features

#### Common Slot Power Supplies

HP has a new design for ProLiant power- the new Common Slot Power Supply bay. This design 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 Common Slot, High Efficiency and Right-Size Power Supplies. The new HP Common Slot power supplies are designed for the highest power efficiency without degrading performance of the ProLiant server. Power Supplies 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, please use the HP Power Advisor 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). All HP Common Slot power sources are UL, CE Mark Compliant, Hot Plug and Redundant.

It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs.

The HP ProLiant Common Slot Power supplies meet multiple Energy Efficiency Initiatives: Climate Savers Computing Initiative GOLD and ECOS Consulting 80PLUS GOLD for the 460w and 750w Power Supplies and Climate Savers Computing Initiative Silver, ECOS Consulting 80PLUS Silver for 1200w Power Supply. HP has also been working with the EPA on developing an ENERGY STAR? Computer Server specification and plans on offering models that meet the requirements when they are published. Please visit the ENERGY STAR website at [www.energystar.gov](http://www.energystar.gov) for updates on the specification development process and approved platforms.

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)

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#### System Fans

3 system fans ship standard

**NOTE:** Does not include power supply or processor heat sink fans.

N+1 fan redundancy optional with redundant fan kit

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#### Required Cabling

For required cabling information, refer to the HP ProLiant ML350 G6 cabling matrix at: <http://www.hp.com/servers/proliantML350>.

**NOTE:** Please see the "Storage" section of this QuickSpecs for important information on controllers and cables required to support SAS or SATA hard drives as well as storage management software available for SATA hard drives.

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

[Microsoft Windows Server](#)

[Red Hat Enterprise Linux \(RHEL\)](#)

[SUSE Linux Enterprise Server \(SLES\)](#)

[NetWare](#)

**NOTE:** NetWare support on Intel Xeon 5500 family only.

[VMware](#)

[HP 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>

### Standard Features

#### 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 iLO remote console is 1280 x 1024.

#### Form Factor

Tower or Rack (5U)

**NOTE:** Rack models (with a Tower to Rack conversion kit) support:

- 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  
<http://www.racksolutions.com/hp>

#### HP Insight Management

HP Insight Foundation

Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters.

HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: <http://www.hp.com/go/foundation>

The foundation pack includes:

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

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

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. For more information, visit: [www.hp.com/go/iLO](http://www.hp.com/go/iLO)

### Standard Features

**Intelligent Manageability** 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)

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**Security** Power-on password  
Setup password  
Serial interface control  
Disk configuration lock  
Power switch security

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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, 3-Year Labor, 3-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

<b>HP Insight Management</b>	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. For more information, see <a href="http://www.hp.com/go/insightcontrol">http://www.hp.com/go/insightcontrol</a> .
		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, see: <a href="http://www.hp.com/services/insight">http://www.hp.com/services/insight</a> .
	HP Insight Dynamics	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 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. <b>NOTE:</b> For more information, visit: <a href="http://www.hp.com/go/insightdynamics">http://www.hp.com/go/insightdynamics</a>

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<b>HP Proactive Insight experience</b>	Prevent problems with innovative, automated monitoring tools and proactive services. The HP Proactive Insight experience consist of using Insight Online, Insight Remote Support, and Proactive Care Support Service as one integrated solution. The Proactive Insight experience provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: <a href="http://www.hp.com/go/proactiveinsightexperience">www.hp.com/go/proactiveinsightexperience</a>
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<b>Factory Express Portfolio for Servers and Storage</b>	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.
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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.

### Optional Features

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 Simple Configurator**

SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, 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.

#### 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

#### 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**

### Service and Support

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

### Basic Care Package

**Delivers minimum recommended support service level**

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

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

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

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

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

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

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

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

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf>

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

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

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

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

### 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.

### 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.

### Entry Models

<b>HP ProLiant ML350 G6 E5606 1P 4GB-R P410i/ZM 460W RPS LFF Tower Server 638180-001</b>	<b>Processor</b> <b>Cache Memory</b> <b>Memory</b> <b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drive</b> <b>Internal Storage</b> <b>Optical Drive</b> <b>Power Supply</b> <b>Fans</b> <b>Accessories</b>  <b>Form Factor</b> <b>Warranty</b>	(1) Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W, DDR3-1066, HT, Turbo 1/1/2/2/3/3) Processor 8MB (1 x 8MB) L3 cache 4GB (1 x 4GB) PC3-10600R (DDR3-1333) Registered DIMMs Embedded NC326i PCI Express Dual Port Gigabit Server Adapter HP Smart Array P410i/Zero Memory Controller None ship standard (6) LFF SATA/SAS HDD bays; upgradeable to (8) in total HP Half-Height SATA DVD-ROM Optical Drive (1) 460 Watt Hot-Plug (Redundancy enabled) power supply 3 fans ship standard PS/2 Keyboard and Mouse ship standard <b>NOTE: EURO (-421) Models excludes the keyboard.</b> Tower (5U) Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response
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### Base Models

<b>HP ProLiant ML350 G6 E5645 1P 6GB-R P410i/256 750W RPS SFF Server 638181-001</b>	<b>Processor</b> <b>Cache Memory</b> <b>Memory</b> <b>Network Controller</b> <b>Storage Controller</b> <b>Hard Drive</b> <b>Internal Storage</b> <b>Optical Drive</b> <b>Power Supply</b> <b>Fans</b> <b>Accessories</b> <b>Form Factor</b>	(1) Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processor 12MB (1 x 12MB) L3 cache 6GB (3 x 2GB) PC3-10600 (DDR3-1333) Registered DIMMs Embedded NC326i PCI Express Dual Port Gigabit Server Adapter Embedded HP Smart Array P410i/256MB Controller None ship standard (8) SFF SAS/SATA HDD Bays; upgradeable to (16) HP Half-Height SATA DVD-ROM Optical Drive (1) 750 Watt Hot-Plug (Redundancy enabled) power supply 3 fans ship standard PS/2 Keyboard and Mouse ship standard Tower (5U)
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### Pre-configured Models

**Warranty** Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

<p><b>HP ProLiant ML350 G6 E5620 1P 6GB-R P410i/256 460W RPS Tower Server 594869-001</b></p>	<p><b>Processor</b> (1) Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W, DDR3-1066, HT, Turbo (1/1/2/2) Processor</p> <p><b>Cache Memory</b> 12MB (1 x 12MB) L3 cache</p> <p><b>Memory</b> 6GB (3 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs</p> <p><b>Network Controller</b> Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</p> <p><b>Storage Controller</b> Embedded HP Smart Array P410i/256MB Controller</p> <p><b>Hard Drive</b> None ship standard</p> <p><b>Internal Storage</b> (8) SFF SAS/SATA HDD Bays; upgradeable to (16)</p> <p><b>Optical Drive</b> SATA DVD ROM</p> <p><b>Power Supply</b> (1) 460 Watt Hot-Plug (Redundancy enabled) power supply</p> <p><b>Fans</b> 3 fans ship standard</p> <p><b>Accessories</b> PS/2 Keyboard and Mouse ship standard</p> <p><b>Form Factor</b> Tower (5U)</p> <p><b>Warranty</b> Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response</p>
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### Performance Models

<p><b>HP ProLiant ML350 G6 X5650 2P 12GB-R P410i/1GB FBWC 750W RPS Tower Server 594874-001</b></p>	<p><b>Processor</b> (2) Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W, DDR3-1333, HT, Turbo 1/1/2/2/3/3) Processors</p> <p><b>Cache Memory</b> 12MB (1 x 12MB) L3 cache</p> <p><b>Memory</b> 12 GB (6 x 2GB) PC3-10600R (DDR3-1333) Registered DIMMs</p> <p><b>Network Controller</b> Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</p> <p><b>Storage Controller</b> Embedded HP Smart Array P410i/1G FBWC Controller</p> <p><b>Hard Drive</b> None ship standard</p> <p><b>Internal Storage</b> (8) SFF SAS/SATA HDD Bays; upgradeable to (16)</p> <p><b>Optical Drive</b> SATA DVD ROM</p> <p><b>Power Supply</b> (2) 750 Watt Hot-Plug Redundant power supplies</p> <p><b>Fans</b> 4 full Redundant fans</p> <p><b>Accessories</b> PS/2 Keyboard and Mouse ship standard</p> <p><b>Form Factor</b> Tower (5U)</p> <p><b>Warranty</b> Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response</p>
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### Smart Buys

The ProLiant Smart Buy program offers a collection of promotional server and option products that are configured with SMB in mind, offered at discounted prices, and positioned for quick delivery. Smart Buy server offers are available for a limited time only.

<b>S-Buy ML350TG6 E5506</b> <b>2GB LFF</b> 516283-005	<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5506 (2.13 GHz, 80 W, DDR3-800)
	<b>Cache Memory</b>	4MB Level 3 cache
	<b>Memory</b>	2 GB (2Rx8 PC3-10600R-9)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i/ZM Controller (RAID 0/1/1+0)
	<b>Hard Drive</b>	None Ship Standard
	<b>Internal Storage</b>	Up to 6 LFF standard, up to 8 LFF with additional drive cage
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1) HP 750W CS HE Power Supply Kit
	<b>Fans</b>	2 Standard, 4 total fans supported (1 included in additional processor kit and 1 optional HP ML350G6 Redundant Fan Kit)
	<b>Form Factor</b>	Tower (5U)

<b>S-Buy ML350TG6 E5520</b> <b>4GB LFF</b> 517429-005	<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5520 (2.26 GHz, 80 W, DDR3-1066)
	<b>Cache Memory</b>	8MB Level 3 cache
	<b>Memory</b>	4 GB (2x2GB 2Rx8 PC3-10600R-9 Kit)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
	<b>Hard Drive</b>	None Ship Standard
	<b>Internal Storage</b>	Up to 6 LFF standard, up to 8 LFF with additional drive cage
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1) HP 750W CS HE Power Supply Kit
	<b>Fans</b>	2 Standard, 4 total fans supported (1 included in additional processor kit and 1 optional HP ML350G6 Redundant Fan Kit)
	<b>Form Factor</b>	Tower (5U)

### Smart Buys

<b>S-Buy ML350TG6 E5520</b> <b>4GB SFF</b> 517430-005	<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5520 (2.26 GHz, 80 W, DDR3-1066)
	<b>Cache Memory</b>	8MB Level 3 cache
	<b>Memory</b>	4 GB (2x2GB 2Rx8 PC3-10600R-9 Kit)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
	<b>Hard Drive</b>	None Ship Standard
	<b>Internal Storage</b>	Up to 8 SFF standard, up to 16 SFF with additional drive cage
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1) HP 750W CS HE Power Supply Kit
	<b>Fans</b>	2 Standard, 4 total fans supported (1 included in additional processor kit and 1 optional HP ML350G6 Redundant Fan Kit)
<b>Form Factor</b>	Tower (5U)	

<b>S-Buy ML350TG6 E5530</b> <b>6GB HP 3x146GB SFF SAS</b> <b>SBS 2008</b> 517431-005	<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5530 (2.40 GHz, 80 W, DDR3-1066)
	<b>Cache Memory</b>	8MB Level 3 cache
	<b>Memory</b>	6 GB (3x2GB 2Rx8 PC3-10600R-9 Kit)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
	<b>Hard Drive</b>	3x146GB 3G SAS 10K SFF DP ENT HDD included
	<b>Internal Storage</b>	Up to 8 SFF standard, up to 16 SFF with additional drive cage
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(2) HP 750W CS HE Power Supply Kit
	<b>Fans</b>	3 included (2 standard + included Redundant Fan Kit), 4 total fans supported (1 included in additional processor kit)
<b>Form Factor</b>	Tower (5U)	
<b>Operating System</b>	Windows Small Business Server (SBS) 2008	



### Smart Buys

**S-Buy ML350TG6 E5506**  
**2GB LFF**  
 600424-005

<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5506 (2.13 GHz, 80 W, DDR3-800)
<b>Cache Memory</b>	4MB Level 3 cache
<b>Memory</b>	2 GB (2Rx8 PC3-10600R-9)
<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	Smart Array P410i/ZM Controller (RAID 0/1/1+0)
<b>Hard Drive</b>	None Ship Standard
<b>Internal Storage</b>	Up to 6 LFF standard
<b>Optical Drive</b>	HP Half-Height SATA DVD-RW Drive
<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
<b>Power Supply</b>	(1) HP 460W CS HE Power Supply
<b>Fans</b>	3 included standard, up to 4 total fans supported
<b>Form Factor</b>	Tower (5U)

**S-Buy ML350TG6 E5620**  
**4GB LFF**  
 600425-005

<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5620 (2.40 GHz, 80W, DDR3-1066, HT, Turbo (1/1/2/2))
<b>Cache Memory</b>	12MB Level 3 cache
<b>Memory</b>	4 GB (2x2GB 2Rx8 PC3-10600R-9 Kit)
<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
<b>Hard Drive</b>	None Ship Standard
<b>Internal Storage</b>	Up to 6 LFF standard
<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
<b>Power Supply</b>	(1) HP 460W CS HE Power Supply
<b>Fans</b>	3 included standard, up to 4 total fans supported
<b>Form Factor</b>	Tower (5U)

### Smart Buys

<b>S-Buy ML350TG6 E5620</b> <b>4GB SFF</b> 600426-005	<b>Processor(s)</b>	Intel® Xeon® Processor E5620 (2.40 GHz, 80W, DDR3-1066, HT, Turbo (1/1/2/2))
	<b>Cache Memory</b>	12MB Level 3 cache
	<b>Memory</b>	4 GB (2x2GB 2Rx8 PC3-10600R-9 Kit)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
	<b>Hard Drive</b>	None Ship Standard
	<b>Internal Storage</b>	Up to 8 SFF standard
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1) HP 460W CS HE Power Supply
	<b>Fans</b>	3 included standard, up to 4 total fans supported
	<b>Form Factor</b>	Tower (5U)

<b>S-Buy ML350TG6 E5630</b> <b>6GB HP 2x146GB SFF SAS</b> <b>SBS 2008</b> 600427-005	<b>Processor(s)</b>	(1) Intel® Xeon® Processor E5630 (2.53 GHz, 80W, DDR3-1066, HT, Turbo (1/1/2/2))
	<b>Cache Memory</b>	12MB Level 3 cache
	<b>Memory</b>	6 GB (3x2GB 2Rx8 PC3-10600R-9 Kit)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i Controller with HP 256MB P-series cache module upgrade
	<b>Hard Drive</b>	2x146GB 3G SAS 15K rpm SFF (2.5-inch) DP ENT HDD included
	<b>Internal Storage</b>	Up to 8 SFF standard
	<b>Optical Drive</b>	Half-Height SATA DVD-ROM Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1) HP 750W CS HE Power Supply
	<b>Fans</b>	3 included standard, up to 4 total fans supported
	<b>Form Factor</b>	Tower (5U)
	<b>Operating System</b>	Windows Small Business Server (SBS) 2008

### Smart Buys

**S-Buy ML350TG6 E5606**  
**4GB SFF**  
 654078-S01

<b>Processor(s)</b>	(1) Intel® Xeon® E5606 (2.13GHz/4-core/4MB/80W)
<b>Cache Memory</b>	4MB Level 3 cache
<b>Memory</b>	4GB (1x4GB 1Rx4 PC3-10600R-9)
<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	Smart Array P410i/ZM Controller (RAID 0/1/1+0)
<b>Hard Drive</b>	None Ship Standard
<b>Internal Storage</b>	Up to 8 SFF standard
<b>Optical Drive</b>	HP Half-Height SATA DVD-RW Drive
<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
<b>Power Supply</b>	(1) HP 460W CS HE Power Supply
<b>Fans</b>	3 included standard, up to 4 total fans supported
<b>Form Factor</b>	Tower (5U)

**ML350TG6 E5645**  
**16GB SFF Server**  
 656764-S01

<b>Processor(s)</b>	(2) Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W)
<b>Cache Memory</b>	12MB Level 3 cache
<b>Memory</b>	16GB (4x4GB 1Rx4 PC3-10600R-9)
<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	Smart Array P410i/512MB FBWC Controller
<b>Hard Drive</b>	None Ship Standard
<b>Internal Storage</b>	Up to 8 SFF standard
<b>Optical Drive</b>	HP Half-Height SATA DVD-RW Drive
<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
<b>Power Supply</b>	(2) HP 750W Common Slot High Efficiency Power Supply
<b>Fans</b>	3 included standard, up to 4 total fans supported
<b>Form Factor</b>	Tower (5U)
<b>Management</b>	Insight Control

### Smart Buys

<b>ML350TG6 E5645 4GB SFF Server</b> 661326-S01	<b>Processor(s)</b>	(1) Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W)
	<b>Cache Memory</b>	12MB Level 3 cache
	<b>Memory</b>	4GB (1x4GB 1Rx4 PC3-10600R-9)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i/256MB Controller
	<b>Hard Drive</b>	None Ship Standard
	<b>Internal Storage</b>	Up to 8 SFF standard
	<b>Optical Drive</b>	HP Half-Height SATA DVD-RW Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	(1 HP 460W Common Slot High Efficiency Power Supply)
	<b>Fans</b>	3 included standard, up to 4 total fans supported
	<b>Form Factor</b>	Tower (5U)

<b>S-Buy ML350TG6 E5620 8GB SFF SBS 2011</b> 659192-S01	<b>Processor(s)</b>	(1) Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W)
	<b>Cache Memory</b>	12MB Level 3 cache
	<b>Memory</b>	8GB (2x4GB Single Rankx4 PC3-10600R-9)
	<b>Network Controller</b>	Embedded NC326i PCI Express Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	Smart Array P410i/512MB FBWC Controller
	<b>Hard Drive</b>	None included
	<b>Internal Storage</b>	Up to 8 SFF standard, up to 16 SFF with additional drive cage
	<b>Optical Drive</b>	Half-Height SATA DVD-RW Drive
	<b>PCI-Express Slots</b>	Six expansion slots (six PCI-Express Gen2)
	<b>Power Supply</b>	HP 460W HE Hot Plug AC Power Supply
	<b>Fans</b>	3 included (2 standard + included Redundant Fan Kit), 4 total fans supported (1 included in additional processor kit)
	<b>Form Factor</b>	Tower (5U)
<b>Operating System</b>	Windows Small Business Server (SBS) 2011 (not installed)	

### 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)

#### HP Models

#### ML350G6 Tower Models

HP ProLiant ML350 G6 SFF Configure-to-order Tower Chassis 483447-B21

#### Includes:

Embedded NC326i PCI Express Dual Port Gigabit Server Adapter  
 Embedded Smart Array P410i Controller  
 Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays  
 Seven (7) HDD blanks  
 Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed)  
 Six (6) USB ports  
 PS/2 Keyboard & Mouse (selection required)  
 Tower Form Factor

HP ProLiant ML350 G6 LFF Configure-to-order Tower Chassis 483448-B21

#### Includes:

Embedded NC326i PCI Express Dual Port Gigabit Server Adapter  
 Embedded Smart Array P410i Controller  
 Six (6) Hot-Plug (LFF) SAS/SATA Drive Bays  
 Five (5) HDD blanks  
 Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2(x8 speed); Four PCI-Express x8 Gen2 (x4 speed)  
 Six (6) USB ports  
 P/S 2 Keyboard & Mouse (selection required)  
 Tower Form Factor

#### ML350G6 Rack Models

HP ProLiant ML350 G6 SFF Configure-to-order Rack Server 483443-B21

#### Includes:

Embedded NC326i PCI Express Dual Port Gigabit Server Adapter  
 Embedded Smart Array P410i Controller  
 Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays  
 Seven (7) HDD blanks  
 Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed)  
 Six (6) USB ports  
 Rack (5U) Form Factor

HP ProLiant ML350 G6 LFF Configure-to-order Rack Server 483444-B21

#### Includes:

Embedded NC326i PCI Express Dual Port Gigabit Server Adapter  
 Embedded Smart Array P410i Controller  
 Six (6) Hot-Plug (LFF) SAS/SATA Drive Bays

### Configuration Information - Factory Integrated Models

Five (5) HDD blanks  
 Six (6) Expansion slots: One Express x16 Gen2 (x8 speed); One PCI-Express x8 Gen2 (x8 speed); Four PCI-Express x8 Gen2 (x4 speed)  
 Six (6) USB ports  
 Rack (5U) Form Factor

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

#### HP Processors

##### Six-Core Processors

HP ML350 G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) FIO Processor Kit	638315-L21
HP ML350 G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) FIO Processor Kit	601238-L21
HP ML350 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) FIO Processor Kit	601240-L21
HP ML350 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) FIO Processor Kit	638316-L21
HP ML350 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) FIO Processor Kit	638317-L21

##### Quad-Core Processors

HP ML350 G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) FIO Processor Kit	638314-L21
HP ML350 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) FIO Processor Kit	601246-L21
HP ML350 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	638318-L21
HP ML350 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) FIO Processor Kit	638319-L21
HP ML350 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) FIO Processor Kit	638320-L21
HP ML350 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	601252-L21

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

#### HP Memory

##### Registered DIMMs (RDIMMs)

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

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604506-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21

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

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

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration

### Configuration Information - Factory Integrated Models

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

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:

<http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

#### 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 Common Slot Gold Hot Plug Power Supply Kit	503296-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

### Step 3: Choose Additional Factory Integratable Options

<b>HP Storage Controllers</b>	HP Smart Array P212/256 BBWC 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller	491191-B21
	<b>NOTE:</b> SAS Controller supporting RAID 0/1/1+0/5.	
	HP Smart Array P411/256 BBWC 2-ports Ext PCIe x8 FIO SAS Controller	491193-B21
	<b>NOTE:</b> SAS Controller supporting RAID 0/1/1+0/5.	
	<b>Upgrade Options</b>	
	HP 256MB Factory Integrated P-Series Cache Module	534108-B21
	<b>NOTE:</b> Available for P410i only.	
<b>HP Insight Software</b>	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	582765-B21

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

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

### Core Options

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

<b>HP Unique Options</b>	HP ML350 G6 Redundant Fan/Baffle Kit	515081-B21
	HP ML350/ML330G6 2 Slot PCI-X Riser Kit	488413-B21
	<b>NOTE:</b> The HP PCI-X Expander kit converts a single PCI Express slot (Slot 1) into two full height, full length 64-bit 100MHz PCI-X slots. The PCI-X Expander Kit can only be plug in Slot 1.	
	HP ML350G6 Tower to Rack Conversion Kit	534534-B21
	<b>NOTE:</b> See "Redundant Options" section below for Hot Plug Redundant Power supplies.	
	HP 2.5 Hard Disk Drive Blank Kit	503771-B21

### HP Processors

#### Six-Core Processors

HP ML350 G6 Intel® Xeon® X5675 (3.06GHz/6-core/12MB/95W) Processor Kit	638315-B21
HP ML350 G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	601236-B21
HP ML350 G6 Intel® Xeon® X5660 (2.80GHz/6-core/12MB/95W) Processor Kit	601238-B21
HP ML350 G6 Intel® Xeon® X5650 (2.66GHz/6-core/12MB/95W) Processor Kit	601240-B21
HP ML350 G6 Intel® Xeon® E5649 (2.53GHz/6-core/12MB/80W) Processor Kit	638316-B21
HP ML350 G6 Intel® Xeon® E5645 (2.40GHz/6-core/12MB/80W) Processor Kit	638317-B21

#### Quad-Core Processors

HP ML350 G6 Intel® Xeon® X5672 (3.20GHz/4-core/12MB/95W) Processor Kit	638314-B21
HP ML350 G6 Intel® Xeon® E5620 (2.40GHz/4-core/12MB/80W) Processor Kit	601246-B21
HP ML350 G6 Intel® Xeon® E5607 (2.26GHz/4-core/8MB/80W) Processor Kit	638318-B21
HP ML350 G6 Intel® Xeon® E5606 (2.13GHz/4-core/8MB/80W) Processor Kit	638319-B21
HP ML350 G6 Intel® Xeon® E5603 (1.60GHz/4-core/4MB/80W) Processor Kit	638320-B21
HP ML350 G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) Processor Kit	601252-B21

### HP Memory

#### Registered RDIMMs

HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-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) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21

#### Unregistered with ECC UDIMMs



### Core Options

HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

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

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

### HP Drive Cage Options

HP ML350/370 G6 8 Small Form Factor (SFF) 2nd Drive Cage Kit	507803-B21
<b>NOTE:</b> The Second drive cage installation replaces 2 internal optical bays. It is required to purchase a SAS RAID controller or SAS Expander Card to support over 8 HDD	
<b>NOTE:</b> To cover an empty SFF HDD slot, please order the following SFF hard drive blank spare kit: 392613-001	
HP ML350/ML/DL370G6 2 Large Form Factor Drive Kit	487936-B21
<b>NOTE:</b> The Second drive cage installation replaces 2 internal optical bays.	
<b>NOTE:</b> To cover an empty LFF HDD slot, please order the following LFF hard drive blank spare kit: 389015-001	

### HP Optical Drives

HP Half-Height SATA DVD-ROM Optical Drive	447326-B21
HP Half-Height SATA DVD-RW Optical Drive	447328-B21
<b>NOTE:</b> Please note that some of the earlier BTO models may not support adding SATA Optical Drives. To ensure compatibility of the SATA Optical Drives, please add additional optical drives only on models with Quad-Core 5400 Series.	

### HP Hard Drives

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

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

#### SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) Hot Plug Enterprise 3 yr Warranty Hard Drive	627117-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21

#### 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

### Core Options

HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
<b>SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
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
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html">http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html</a> (Worldwide)	
<b>SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives</b>	
HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	605835-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
<b>SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives</b>	
HP 1TB 3G SATA 7.2K rpm SFF (2.5-inch) Hot Plug Midline 1yr Warranty Hard Drive	625609-B21
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21
<b>SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
HP 3TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	628059-B21
HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
<b>SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives</b>	
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
<b>NOTE:</b> SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html">http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html</a> (Worldwide)	
<b>3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 400GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636597-B21
HP 200GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636595-B21
HP 100GB 3G SATA MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	636593-B21
<b>3G SATA MLC Hot Plug LFF (3.-5inch) Enterprise Mainstream Solid State Drives</b>	
HP 400GB 3G SATA MLC SFF (2.5-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
<b>6G SAS SLC Hot Plug Enterprise Performance Solid State Drives</b>	
HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21

### Core Options

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

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

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

#### Hard Drive Kits

HP 2.5 Hard Disk Drive Blank Kit 503771-B21

### 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

**NOTE:** Does not support Windows 2000.

**NOTE:** There is a maximum of five NC364T PCI Express Quad Port Gigabit Server Adapter NICs allowed in this server.

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

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

HP NC523SFP 10Gb 2-port Server Adapter 593717-B21

HP NC550SFP Dual Port 10GbE Server Adapter 581201-B21

HP NC552SFP 10Gb 2-port Ethernet Server Adapter 614203-B21

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

### HP I/O Expansion Options

HP ML350/ML330G6 2 Slot PCI-X Riser Kit 488413-B21

**NOTE:** The HP PCI-X Expander kit converts a single PCI Express slot (Slot 1) into two full height, full length 64-bit 100MHz PCI-X slots. The PCI-X Expander Kit can only be plug in Slot 1.

### Core Options

#### 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).

#### Power Supplies

HP 460W Common Slot Gold Hot Plug Power Supply Kit	503296-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

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#### HP Cooling Options

HP ML350 G6 Redundant Fan/Baffle Kit	515081-B21
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### 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 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.

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:** 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. Media kits can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

**NOTE:** For additional license options please see the QuickSpecs at:

[http://h18000.www1.hp.com/products/quickspecs/12631\\_na/12631\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12631_na/12631_na.html)

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

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

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

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

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

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

**NOTE:** For additional license options please see the QuickSpecs at:

[http://h18004.www1.hp.com/products/quickspecs/14276\\_na/14276\\_na.html](http://h18004.www1.hp.com/products/quickspecs/14276_na/14276_na.html)

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

### Additional Options

#### HP I/O Accelerator Options

##### Second Generation Accelerators

HP 365GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673642-B21
HP 785GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673644-B21
HP 1205GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673646-B21
HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo for ProLiant Servers	673648-B21

##### First Generation Accelerators

HP 160GB Single Level Cell PCIe ioDrive for ProLiant Servers	600278-B21
<b>NOTE:</b> A low-profile PCI bracket is included for use in low-profile slots.	
HP 320GB Multi Level Cell PCIe ioDrive for ProLiant Servers	600279-B21
<b>NOTE:</b> A low-profile PCI bracket is included for use in low-profile slots.	
HP 320GB Single Level Cell PCIe ioDrive Duo for ProLiant Servers	600281-B21
HP 640GB Multi Level Cell PCIe ioDrive Duo for ProLiant Servers	600282-B21
HP 1.28TB Multi Level Cell PCIe ioDrive Duo for ProLiant Servers	641027-B21

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

[http://h18000.www1.hp.com/products/quickspecs/13587\\_na/13587\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13587_na/13587_na.html)

#### HP Graphics Options

HP 350/370G6 Graphic Card Cable Kit	537721-B21
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#### HP Security

HP Trusted Platform Module Option	488069-B21
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**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

##### HP 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

##### HP Smart Array P410 Controller

HP Smart Array P410/256 2-ports Int PCIe x8 SAS Controller	462862-B21
HP Smart Array P410/512 BBWC 2-ports Int PCIe x8 SAS Controller	462864-B21
HP Smart Array P410/512 FBWC 2-ports Int PCIe x8 SAS Controller	578230-B21

### Additional Options

HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21
<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.	
<b>HP Smart Array P411 Controller</b>	
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
<b>Smart Array P812 Controller</b>	
HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
<b>Optional Upgrades</b>	
HP 256MB P-series Cache Upgrade	462968-B21
<b>NOTE:</b> Supported on HP Smart Array P212 & HP Smart Array P410/ZM Controller only.	
HP 512MB P-Series Battery Backed Write Cache Upgrade	462967-B21
<b>NOTE:</b> Supported on HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	
HP 650 mAh P-Series Battery	462969-B21
<b>NOTE:</b> Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	
HP 15 Position 24in SFP Battery Cable Assembly	496029-B21
<b>NOTE:</b> Supported on HP Smart Array P212 Controller, HP Smart Array P410 Controller, and HP Smart Array P411 Controller only.	
HP 512MB Flash Backed Write Cache	534916-B21
<b>NOTE:</b> Supported on the Smart Array P410i Controller only.	
HP 1GB Flash Backed Cache	534562-B21
<b>NOTE:</b> Supported on the Smart Array P410i Controller only.	
HP 24 Bay SAS Expander Card	468406-B21
HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License	516471-B21
<b>NOTE:</b> 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.	
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html">http://h18000.www1.hp.com/products/quickspecs/13203_na/13203_na.html</a> (Smart Array P212 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html">http://h18000.www1.hp.com/products/quickspecs/13201_na/13201_na.html</a> (Smart Array P410 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html">http://h18000.www1.hp.com/products/quickspecs/13202_na/13202_na.html</a> (Smart Array P411 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13558_na/13558_na.html">http://h18000.www1.hp.com/products/quickspecs/13558_na/13558_na.html</a> (Smart Array P812 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/13200_na/13200_na.html">http://h18000.www1.hp.com/products/quickspecs/13200_na/13200_na.html</a> (Smart Array Advanced Pack)	

### Additional Options

#### SAS HBA

HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter 614988-B21

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

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

#### SCSI HBA

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter 412911-B21

**NOTE:** Supports external drive attach.

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

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

### HP 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> and [www.hp.com/go/ebs](http://www.hp.com/go/ebs).

HP StoreEver DAT 160 SAS Internal Tape Drive Q1587B

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

HP StoreEver LTO-2 Ultrium 448 SAS Internal Tape Drive DW085B

HP StoreEver LTO-4 Ultrium 1760 SAS Internal WW Tape Drive EH919B

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

HP StoreEver LTO-4 Ultrium 1840 SAS External Tape Drive EH861B

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

HP StoreEver LTO-5 Ultrium 3000 SAS Internal Tape Drive EH957B

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

HP LTO-5 Ultrium 3000 SAS External Tape Drive EH958B

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

HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit COL99A

HP StoreEver LTO-6 Ultrium 6650 Internal Tape Drive EH963A

HP StoreEver LTO-6 Ultrium 6650 External Tape Drive EH964A

HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive EH969A

HP StoreEver LTO-6 Ultrium 6250 External Tape Drive EH970A



### Additional Options

#### HP Disk Backup

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

HP StoreOnce D2D4112 Backup System	EH993C
HP StoreOnce D2D2502i Backup System	EJ001C
HP StoreOnce D2D2504i Backup System	EJ002C

#### HP RDX Removable Disk Backup Systems USB

HP RDX320 USB3.0 Internal Disk Backup System	B7B62A
HP RDX500 USB3.0 Internal Disk Backup System	B7B64A
HP RDX1000 USB3.0 Internal Disk Backup System	B7B67A

#### HP StoreOnce Backup systems

HP StoreOnce 2620 iSCSI Backup	BB852A
HP StoreOnce 4220 Backup	BB855A

#### HP Storage Options

**NOTE:** The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: <http://h18006.www1.hp.com/storage/saninfrastructure/hba.html>

#### Brocade Fibre Channel HBAs

HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP770B
HP 81B 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP769B
HP 41B 4Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP767B
HP 42B 4Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP768B

#### Emulex Fibre Channel HBAs

HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ763B
HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A
HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AJ762B
HP FC2142SR 4Gb 1-port PCIe Fibre Channel Host Bus Adapter	A8002B
HP FC2242SR 4Gb 2-port PCIe Fibre Channel Host Bus Adapter	A8003B

#### QLogic Fibre Channel HBAs

HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AK344A
HP FC1142SR 4Gb 1-port PCIe Fibre Channel Host Bus Adapter	AE311A
HP FC1242SR 4Gb 2-port PCIe Fibre Channel Host Bus Adapter	AE312A

#### Converged Network Adapter

HP CN1100E Dual Port Converged Network Adapter	BK835A
HP CN1000Q Dual Port Converged Network Adapter	BS668A

### Additional Options

#### HP Disk Storage Systems **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\\_na/13404\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13404_na/13404_na.html)

#### HP Uninterruptible Power Systems **HP Tower UPS**

##### **HP T1500 G3 UPS Models**

HP T1500 G3 1400VA NA Tower Uninterruptible Power System	AF450A
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**NOTE:** Please see the QuickSpecs for additional information:

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

##### **HP T1000 G3 UPS Models**

HP T1000 G3 1000VA NA Tower Uninterruptible Power System	AF448A
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##### **HP R1500 G3 Uninterruptible Power Supply (UPS)**

HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
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**NOTE:** Please see the QuickSpecs for additional information:

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

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

HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A
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**NOTE:** Please see the QuickSpecs for additional information:

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

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

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
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HP R5KVA and R7KVA 3U Extended Runtime Module	AF464A
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**NOTE:** Please see the QuickSpecs for additional information:

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

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

HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
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HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A
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**NOTE:** Please see the QuickSpecs for additional information:

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

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

**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

#### HP Power Distribution Units

##### Monitored PDUs

##### HP Monitored Power Distribution Unit: Full Rack Version

HP 8.6kVA 24A Single Input Three Phase Monitored Power Distribution Unit AF504A

HP 8.3kVA 40A Single Input Single Phase Monitored Power Distribution Unit AF506A

##### HP Monitored Power Distribution Unit: Half Rack Version

HP 4.9kVA 24A Single Input Single Phase Monitored Power Distribution Unit AF914A

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

[http://h18000.www1.hp.com/products/quickspecs/12118\\_na/12118\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12118_na/12118_na.html)

##### Modular PDUs 1U/0U

**NOTE:** 1U/0U mounting brackets shipped with the unit (optimized for 10000 G2 and 9000 series racks).

HP 4.9kVA 24A High Voltage Modular Power Distribution Unit 252663-D72

HP 8.3kVA 40A High Voltage Modular Power Distribution Unit 252663-D73

**NOTE:** For additional information on HP Power Distribution Units including accessories please go to: [www.hp.com/go/pdu](http://www.hp.com/go/pdu).

**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).

**NOTE:** This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.

**NOTE:** Please see the following QuickSpecs for additional options including shorter jumper cables and country specific power cords:

[http://h18000.www1.hp.com/products/quickspecs/11041\\_na/11041\\_na.html](http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.html)

#### HP Intelligent Power Distribution Units (iPDU)

##### iPDU Core Units

HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit AF520A

HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit AF522A

##### iPDU Extension Bars

HP 5xC13 Intelligent PDU Extension Bar G2 Kit AF547A

HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar AF528A

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

[http://h18000.www1.hp.com/products/quickspecs/13650\\_na/13650\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13650_na/13650_na.html)

### Additional Options

#### HP Rack Options

#### HP TFT7600 G2 KVM Console Rackmount Keyboard Monitor

HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor AZ870A

HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor AZ885A

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

[http://h18000.www1.hp.com/products/quickspecs/13731\\_na/13731\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13731_na/13731_na.html)

#### HP 1U Rackmount Keyboard with USB

HP 1U US Rackmount Keyboard with USB AG072A

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

[http://h18000.www1.hp.com/products/quickspecs/12465\\_na/12465\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12465_na/12465_na.html)

#### HP USB Keyboard and Mouse

HP USB BFR with PVC Free IN Keyboard/Mouse Kit 672097-D63

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

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

**NOTE:** For additional information regarding Rack Options, please see the following URL:

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

#### HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch AF616A

HP Server Console 0x2x16 Port Analog Switch AF617A

HP TAA 0x2x16xKVM Server Console G2 Switch AF626A

HP KVM CAT5 1-pack USB Interface Adapter 336047-B21

#### 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

HP KVM CAT5 1-pack USB Interface Adapter 336047-B21

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

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

#### 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\\_na/13474\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13474_na/13474_na.html)

#### Rack Kits

HP ML350G6 Tower to Rack Conversion Kit 534534-B21

### Additional Options

<b>HP USB and SD Options</b>	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	<b>NOTE:</b> HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.	
	HP 4GB Secure Digital High Capacity Flash Media Kit	580387-B21
	<b>NOTE:</b> 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 <a href="http://www.hp.com/go/proliantvirtualization">http://www.hp.com/go/proliantvirtualization</a> .	
	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB Standard Keyboard US	DT528A#ABA

### HP Care Pack Services

#### Hardware Services On-site Service

HP 3 year 4 hour 13x5 ProLiant ML350(p) Hardware Support	U4512E
HP 3 year 4 hour 24x7 ProLiant ML350(p) Hardware Support	U4513E
HP 3 year 6 hour 24x7 Call to Repair ProLiant ML350(p) Hardware Support	U4514E

#### Proactive Care Personalized Support Option

**NOTE:** To add an onsite Account Support Manager (ASM) to Proactive Care. ASM is an assigned resource who delivers support planning and brings technical expertise and best practices advice for the customer's environment.

HP 3yr Provides annual personalized proactive supp for existing Proactive Care ISS centric environmt	U6W98E
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#### Installation Services

**NOTE:** Reduce the time required to get your system up and running and help minimize disruptions to your business.

HP Install ProLiant ML350(p) Service	U4522E
HP Startup ProLiant ML350(p) Service	U4523E

**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

<b>DIMM slot/capacity/populated speed table</b>											
DIMM Type ->	Registered DIMMs (RDIMMs)								Unbuffered with ECC DIMMs (UDIMMs)		
DIMM Rank ->	Single Rank (1R)	Dual Rank (2R)				Quad Rank (4R)		Single Rank (1R)	Dual Rank (2R)		
DIMM Capacity ->	4GB	2GB	4GB	8GB	8GB	16GB	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1067	1333	1333	1067	1067	1333	1333	1333
Voltage	LV/Std	Std	Std	Std	LV/Std	LV/Std	Std	Std	Std	Std	Std
<b>SLOTS THAT CAN BE POPULATED</b>											
18 slot servers	18	18	18	18	18	18	12	12	12	12	12
<b>MAXIMUM CAPACITY (GB)</b>											

### Memory

18 slot servers	72	36	72	144	144	288	48	192	12	24	48
<b>POPULATED DIMM SPEED (MHz)</b>											
1 DIMM Per Channel	1333	1333	1333	1067	1333	1333	1067	1067	1333	1333	1333
2 DIMM Per Channel	1333*	1333*	1333*	1067	1333*	1066/ 1333**	800	800	1333	1333	1333*
3 DIMM Per Channel	800	800	800	800	800	800***	n/a	n/a	n/a	n/a	n/a
* Supported with ROM update via ROM Based Setup Utility (RBSU). UDIMM support is only on 12-slot servers.											
** 2DPC: LV runs at 1066, Std voltage runs at 1333											
** 3DPC: LV/Std voltage runs at 800											

#### NOTES:

- PC3-10600 DIMMs have a maximum speed of 1333MHz. PC3-8500 DIMMs have a maximum speed of 1066MHz
- Mixing DIMM speeds is allowed, but the system processor speed rules always override the DIMM capabilities
- If you do mix DIMM speeds, the memory bus will default to the minimum clock rate of all DIMMs in the system - even if the slower DIMM is on the other processor
- 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 1	1	G	1	G	Chnl 1
	2	D	2	D	
	3	A	3	A	
Chnl 2	4	H	4	H	Chnl 2
	5	E	5	E	
	6	B	6	B	
Chnl 3	7	I	7	I	Chnl 3
	8	F	8	F	
	9	C	9	C	

### Memory

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

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

	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; 2GB RDIMM	9	C; empty	

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

- 54GB, consisting of three (3) 2GB RDIMMs plus six (6) 8GB RDIMMs (Base Model)
  - 3x 2GB dual-rank PC3-10600 RDIMMs
  - 6x 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; 2GB RDIMM	9	C; empty	

#### Standard memory replaced with optional memory (1 CPU model)

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

- 96GB, consisting of six (6) 16GB quad-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 (2 CPU model)

- 288GB, consisting of eighteen (18) 16GB dual-rank PC3L-10600 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)

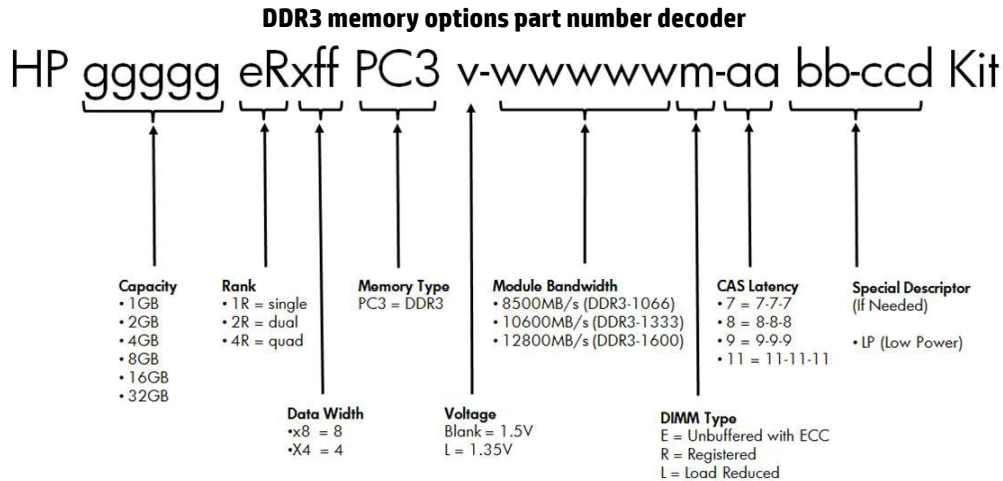
- 48GB, consisting of twelve (12) 4GB dual-rank PC3-10600 UDIMMs

	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
- 16GB = 16384MB

### Memory



**Following are memory options available from 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) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit	604504-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) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit	627812-B21
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**Unbuffered with ECC DIMMs (UDIMMs)**

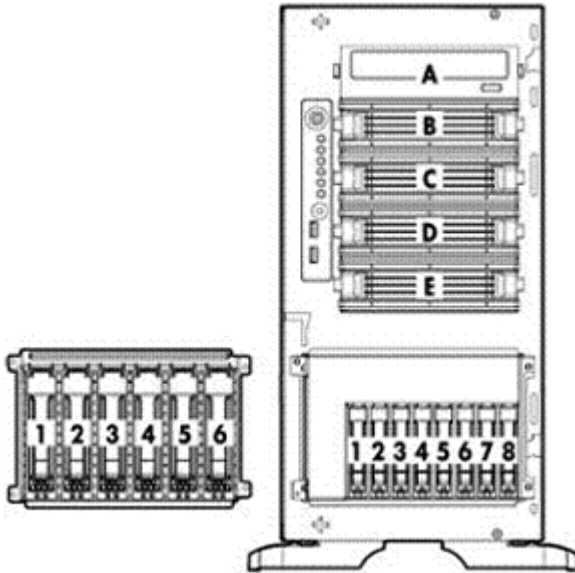
HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600 (DDR3-1333) Unbuffered CAS-9 Low Power Memory Kit	619488-B21

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

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see:

<http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>

### Storage



1 - 6 6 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays

Or

1 - 8 8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays

B,C,D,E Available half height media bays

A-E Removable Optical Drive

D+E 8 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays  
or  
2 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays

### Drive Support

	Quantity Supported	Position Supported	Controller
<b>Removable Media</b>			
HP Half-Height SATA DVD-ROM Optical Drive	Up to 1	A-E	Integrated SATA Controller
HP Half-Height SATA DVD RW Optical Drive	Up to 1	A-E	Integrated SATA Controller

### Hard Drives

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

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

### SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K	Up to 16 SFF	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
600GB 6G SAS 10K			HP Smart Array P212/ 256 MB Controller
450GB 6G SAS 10K			HP Smart Array P410/256 MB Controller
300GB 6G SAS 10K			HP Smart Array P410/512 MB BBWC Controller
300GB 6G SAS 15K			HP Smart Array P410/512 MB FBWC Controller
146GB 6G SAS 15K			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

### Storage

HP Smart Array P812/1G Flash Backed Cache Controller

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 8 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
450GB 6G SAS 15K			HP Smart Array P212/ 256 MB Controller
300GB 6G SAS 15K			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB 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 6 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
2TB 6G SAS 7.2K			HP Smart Array P212/ 256 MB Controller
1TB 6G SAS 7.2K			HP Smart Array P410/256 MB Controller
			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 SFF (2.5-inch) Midline (MDL) Drives

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 16 SFF	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
500GB 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

### Storage

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

	Quantity Supported	Position Supported	Controller
1TB 3G SATA 7.2K	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
500GB 3G SATA 7.2K			HP Smart Array P212/ 256 MB Controller
			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB 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

	Quantity Supported	Position Supported	Controller
<b>SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>			
3TB 3G SATA 7.2K	Up to 6 LFF	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
2TB 3G SATA 7.2K			HP Smart Array P212/ 256 MB Controller
1TB 3G SATA 7.2K			HP Smart Array P410/256 MB Controller
500GB 3G SATA 7.2K			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	1-6 and D+E	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 Hot Plug 2.5" Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 3G SATA MLC SFF	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
200GB 3G SATA MLC SFF			HP Smart Array P212/ 256 MB Controller
100GB 3G SATA MLC SFF			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 3.5" Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 3G SATA MLC LFF	Up to 8	1-6 and D+E	HP Smart Array P212/Zero Memory Controller
200GB 3G SATA MLC LFF			HP Smart Array P212/ 256 MB Controller
100GB 3G SATA MLC LFF			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

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

	Quantity Supported	Position Supported	Controller
400GB 6G SAS SLC SFF	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
200GB 6G SAS SLC SFF			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

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

### Storage

	Quantity Supported	Position Supported	Controller
800GB 6G SAS MLC SFF	Up to 16	1-8 and D+E	HP Smart Array P212/Zero Memory Controller
400GB 6G SAS MLC SFF			HP Smart Array P212/ 256 MB Controller
200GB 6G SAS MLC SFF			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

### External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2700 Disk Enclosure	Up to 2 Up to 4	External	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

### Tape and Disk-Based 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>.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
<b>HP SCSI Tape Drives</b>	Internal or External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
LTO-1 Ultrium 232		<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>	
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			
<b>HP SCSI Rack Mount Kits</b>	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
1U Rack-Mount Kit			
3U Rack-Mount Kit			



### Storage

<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	
<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 <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 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 <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 SCSI Tape Autoloaders</b> DAT 72x10 Autoloader 1/8 G2 Autoloader	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
<b>HP SCSI Tape Libraries</b> MSL2024 MSL4048 MSL8096 MSL6000	External	<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>	
<b>HP SAS Tape Autoloaders and Libraries</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.	

### Storage

<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

HP 460W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	503296-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage Rating	460	460	460	460	460	460	460
Nominal Input Current (A rms)	5.5	4.5	2.6	2.5	2.4	2.3	2.2
Maximum Rated Input Wattage Rating (Watts)	526	520	505	505	503	503	503
Maximum Rated VA (Volt-Amp)	548	542	527	527	524	524	524
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	1794	1773	1725	1725	1715	1715	1715

HP 750W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	512327-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage 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	825	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	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

### Power Specifications

HP 1200W Common Slot Silver Hot Plug Power Supply Kit							
Part Number	500172-B21						
Input Voltage Range (Vrms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	<b>100</b>	<b>120</b>	<b>200</b>	<b>208</b>	<b>220</b>	<b>230</b>	<b>240</b>
Maximum Rated Output Wattage Rating	800	900	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	9.7	9.0	7.0	6.8	6.4	6.1	5.9
Maximum Rated Input Wattage Rating	930	1034	1348	1348	1348	1348	1348
Maximum Rated VA (Volt-Amp)	970	1079	1406	1406	1406	1406	1406
Efficiency (%)	86	87	89	89	89	89	89
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)	3174	3530	4600	4600	4600	4600	4600

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

**NOTE:** Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

### Technical Specifications

<b>System Unit</b>	<b>Tower Dimensions</b> (H x W x D) (with feet/bezel)	18.5 x 8.59 x 23.46 in (47 x 21.8 x 59.6 cm)	
	<b>Rack Dimensions</b> (H x W x D) (with feet/bezel)	8.54 x 17.5 x 21.9 in. (21.7 x 44.5 x 55.7cm)	
	<b>Tower Weight</b> (approximate)	Maximum (all hard drives, power supplies, and processors installed)	70 lb (31.8 kg)
		Minimum (one hard drive, power supply, and processor installed)	54 lb (24.5 kg)
	<b>Rack Weight</b> (approximate)	Maximum (all hard drives, power supplies, and processors installed)	66 lb (29.9 kg)
		Minimum (one hard drive, power supply, and processor installed)	48 lb (21.8 kg)
	<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>	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>	
		To review typical system power ratings use the HP Power Advisor 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>	
	<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 and 1200W Power Supply Options.	
	<b>System Inlet</b>	Operating	10° to 35°C (50° to 95°F) at sea level with an

### Technical Specifications

<b>Temperature</b>		altitude derating of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
<b>Relative Humidity (non-condensing)</b>	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
<b>Altitude</b>	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
<b>Acoustic Noise</b>	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
	Idle	
	<b>L WAd</b>	4.7 B (1P Non-Redundant) 4.6 B (2P Redundant)
	<b>L pAm</b>	32.48dB (1P Non-Redundant) 31.18dB (2P Redundant)
	Operating	
	<b>L WAd</b>	4.8 B (1P Non-Redundant) 4.7 B (2P Redundant)
	<b>L pAm</b>	32.39dB (1P Non-Redundant) 31.62dB (2P Redundant)
	<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; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
	<b>NOTE:</b> 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>Smart Array P410i Controller</b>	<b>Dimensions</b>	Embedded		
	<b>Disk Drive and Enclosure Interface - Transfer rate</b>	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)		
	<b>SAS Connectors</b>	2 internal 4X connectors		
	<b>Cache Memory Speed</b>	DDR2-800MHz with 40 or 72-bit wide bus		
	<b>Server Interface</b>	x4 PCIe 2.0 provides 2GB/s maximum bandwidth		
	<b>SAS Speed</b>	8 6Gb/s SAS links provide 4.8GB/s maximum bandwidth		
	<b>Cache Memory</b>	Zero Memory RAID has no cache memory 40-bit 256MB ECC protected cache (battery upgrade available) 72-bit 512MB BBWC or 72-bit 512MB and 1G FBWC		
	<b>Logical Drives Supported</b>	Zero Memory, Up to 2 logical volumes (8 physical drives) Up to 64 logical drives with cache		
	<b>Host Memory Addressing</b>	64-bit, supporting greater than 4GB server memory space		
	<b>RAID Support</b>	RAID 6, 6+0 (Advanced Data Guarding) <b>NOTE:</b> RAID 6, 6+0 can be enabled with one of the following combinations: <ul style="list-style-type: none"> <li>• 256 MB cache, Battery kit and Smart Array Advanced Pack License key option upgrades</li> <li>• 512 MB BBWC/FBWC and Smart Array Advanced Pack License key option upgrades</li> <li>• 1G FBWC and Smart Array Advanced Pack License key option upgrades</li> </ul> RAID 5, 5+0 (Distributed Data Guarding) <b>NOTE:</b> A minimum of 256 MB cache is required to enable RAID 5, 5+0 support RAID 1+0 (Striping & Mirroring) RAID 0 (Striping), RAID 1 (Mirroring)		
	<b>Embedded NC326i PCI Express Dual Port Gigabit Server Adapter</b>	<b>Network Interface Compatibility</b>	10Base-T/100Base-TX/1000Base-TX 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>	BCM5715	
<b>Network Transfer Rate</b>		10Base-T (Half-Duplex)	10 Mb/s	
		10Base-T (Full-Duplex)	20 Mb/s	
		100Base-TX (Half-Duplex)	100 Mb/s	
		100Base-TX (Full-Duplex)	200 Mb/s	
		1000Base-TX (Half and Full-Duplex)	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)		

### Technical Specifications

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

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

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

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