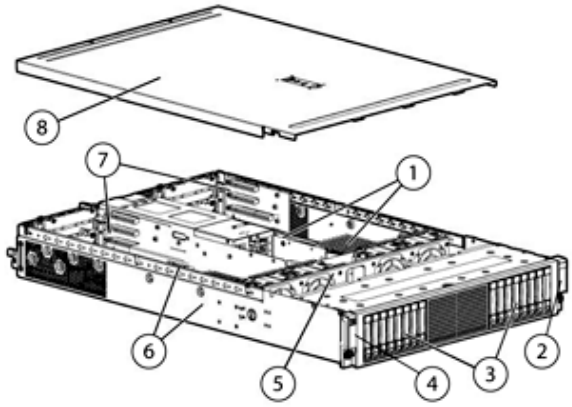
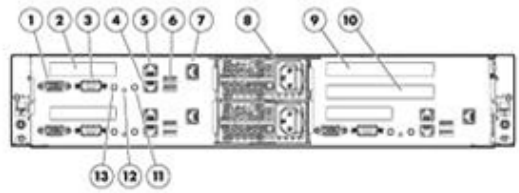
Overview

The HP ProLiant DL1000 Multi Node Server is the first multi node DL server designed for higher density and increased power efficiency yet is flexible enough to be optimally configured for varying application requirements. The DL1000 supports up to four independent HP ProLiant DL170h G6 Servers in the 2U HP ProLiant h1000 G6 Chassis. The servers share power supplies and fans, providing greater power and cooling efficiencies. The HP ProLiant DL170h G6 Server is a two socket Intel server with 16 DDR3 DIMM slots.

3 Node 16SFF HDD Model Illustrated





Front View:

1. 16 DDR3 DIMM slots
2. Optional Right Power Buttons, Health LEDs and UID bezel
3. 16 2.5" SFF SAS/SATA hard drive bays (alternate configuration available with 8 3.5" LFF SAS/SATA hard drive bays)
4. Optional Left Power Buttons, Health LEDs bezel
5. 4 x 80mm system fans
6. Quad-Core Intel® Xeon® 5500 series processors (supports up to two per node)
7. Low Profile PCIe x16 Gen2 Slot
8. Access panel

Rear View:

1. Video Port
2. Low-Profile PCI Express x16 Gen2 slot
3. Serial Port
4. One GbE LAN port (RJ-45)
5. One GbE LAN port with shared management (RJ-45)
6. Two USB ports
7. Optional dedicated management port (RJ-45)
8. Power supply cable socket
9. Full height / full length PCIe Gen2 Slot
10. Full height / half length PCIe Gen2 Slot
11. Power Button
12. Health LED
13. UID Button

What's New

- New high efficiency power supplies.
- New low voltage UDIMM

Standard Features

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

Processor One of the following depending on Model	Six-Core Processors Intel® Xeon® Processor X5670 (2.93 GHz, 12MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/2/2/3/3) Quad-Core Processors Intel® Xeon® Processor E5640 (2.66 GHz, 12MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor L5630 (2.13 GHz, 12MB L3 Cache, 40W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor X5570 (2.93 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) Intel® Xeon® Processor X5560 (2.80 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo 2/2/3/3) Intel® Xeon® Processor X5550 (2.66 GHz, 8MB L3 Cache, 95W, DDR3-1333, HT, Turbo, 2/2/3/3) Intel® Xeon® Processor E5540 (2.53 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor E5530 (2.40 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor E5520 (2.26 GHz, 8MB L3 Cache, 80W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor L5530 (2.40 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor L5520 (2.26 GHz, 8MB L3 Cache, 60W, DDR3-1066, HT, Turbo 1/1/2/2) Intel® Xeon® Processor L5506 (2.13 GHz, 4MB L3 Cache, 60W, DDR3-800) Intel® Xeon® Processor E5506 (2.13 GHz, 4MB L3 Cache, 80W, DDR3-800) Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology NOTE: Turbo indicates the maximum potential frequency increment when using Intel® Turbo Boost Technology, with 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: Up to 2 processors supported. Mixing different processor models is not supported.
Cache Memory	12MB (1 x 12MB) Level 3 cache NOTE: All 5600 processor models. 8MB (1 x 8MB) Level 3 cache NOTE: All 5500 series processor models except for those identified below. 4MB (1 x 4MB) Level 3 cache NOTE: For processors L5506, E5506 and E5504.
Chipset	Intel® 5520 Chipset NOTE: For more information regarding Intel chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/

Standard Features

Upgradeability

Upgradeable to two processors (12 cores)
NOTE: DL170h G6 servers purchased with Intel Xeon 5500 Series processors are not upgradeable to Intel Xeon 5600 series processors.

Memory Protection

Advanced ECC (multi-bit error protection)
Mirroring mode
Lockstep mode

Memory

Type	DDR3 Registered (RDIMM) and Unbuffered (UDIMM)
Standard (UDIMM) (per server node)	6GB (3 x 2GB) PC3-10600E (DDR3-1333)
Maximum (RDIMM) (per server node)	192GB (12 x 16GB) PC3-8500R (DDR3-800)
Maximum (UDIMM) (per server node)	48GB (12 x 4GB) PC3-10600E (DDR3-1333)

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 http://www.hp.com/go/ddr3memory-configurator

Network Controller

HP NC362i Integrated Dual Port Gigabit Server Adapter

Expansion Slots

- Half Height Nodes (1U): One available PCI Express Gen 2.0 slots: (standard on 4-node BTO model).
  - Slot 1: Low profile PCI-Express 2.0 x16
- Full Height Nodes (2U): three available riser options:
  - Option 1: Up to three available PCI-Express Gen 2.0 slots:
    - Slot 1: full-length/full-height PCI-Express 2.0 x16
    - Slot 2: full-length/half-height PCI-Express 2.0 x4
    - Slot 3: low-profile PCI-Express 2.0 x4
  - Option 2: Up to three available PCI-Express Gen 2.0 slots:
    - Slot 1: full-length/full-height PCI-Express 2.0 x8
    - Slot 2: full-length/half-height PCI-Express 2.0 x8
    - Slot 3: low-profile PCI-Express 2.0 x8
  - Option 3: Up to two available PCI-Express Gen 2.0 slots: (standard on 2-node BTO model)
    - Slot 1: full-length/full-height PCI-Express 2.0 x16
    - Slot 2: low-profile PCI-Express 2.0 x8

Full-height PCIe Riser Option	Expansion Slots #	Technology	Bus Width**	Connector Width*	Bus Number	Form Factor	Notes
	1	PCI-Express 2.0	x16	x16	4	Full length, full height	3.3 volts
	2	PCI-Express 2.0	x4	x4	6	Full length, half height	3.3 volts
	3	PCI-Express 2.0	x4	x4	7	Low Profile	3.3 volts

Full-height PCIe Riser	Expansion	Technology	Bus Width**	Connector	Bus Number	Form Factor	Notes

Standard Features

Option	Slots #			Width*			
	1	PCI-Express 2.0	x8	x8	4	Full length, full height	3.3 volts
	2	PCI-Express 2.0	x8	x8	5	Full length, half height	3.3 volts
	3	PCI-Express 2.0	x8	x8	7	Low Profile	3.3 volts
Full-height PCIe Riser Option (Standard in 2 Node BTO Models)	**Expansion Slots #**	**Technology**	**Bus Width****	**Connector Width***	**Bus Number**	**Form Factor**	**Notes**
	1	PCI-Express 2.0	x16	x16	4	Full length, full height	3.3 volts
	3	PCI-Express 2.0	x8	x8	6	Low Profile	3.3 volts
Half-height PCIe Riser (Standard in 4 Node BTO Models and with half-height nodes)	**Expansion Slots #**	**Technology**	**Bus Width****	**Connector Width***	**Bus Number**	**Form Factor**	**Notes**
	1	PCI-Express 2.0	x16	x16	4	Low Profile	3.3 volts

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.

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

Storage Controller	Non-Hot Plug SATA Models	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) NOTE: Transfer rate: up to 3 Gb/s SATA NOTE: To enable RAID on Embedded SATA (Windows and Linux only), use the HP Smart Array B110i SATA Raid controller, To enable use of the B110i, enter the ROM based setup utility(RBSU). The option for enabling RAID can be found in the advanced section of the RBSU. For additional details www.hp.com/go/SATARAID. For RAID on Solaris, a Smart Array Controller must be purchased.
	Hot Plug SATA Models	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) NOTE: Transfer rate: up to 3Gb/s SATA NOTE: The HP Smart Array B110i SATA Raid Hot Plug Advance Pack provides the hot-plug and RAID support for the embedded SATA controller. The Hot Plug Advance kit is a License to enable the RAID support on Hot Plug models. It supports up to six 3G SATA hard disk drives. It will support a maximum of two (2) logical drives. It supports Raid 0, 1 and 1+0. For additional details www.hp.com/go/SATARAID
	Hot Plug SAS/SATA Models	HP Smart Array Controller RAID 0,1,10, 5 NOTE: Transfer rate: up to 6GB/s SAS, 3Gb/s SATA

NOTE: SAS Upgrade: A HP Smart Array Controller is required for SAS HDD support. Transfer rate: 6.0 Gb/s SAS supported.

NOTE: When adding a Smart Array Controller to an 8 LFF SAS HDD configuration, a HP h1000 LFF SAS CONTROLLER CABLE OPTION KIT (P/N 519503-B21) must be ordered to connect the Smart Array Controller to the hard drive backplane. When a controller is added during a CTO buildup, the appropriate cables are included and this kit is not required. This cable kit is only needed for BTO configurations or if a CTO customer upgrades to a Smart Array Controller after initial purchase.

Standard Features

NOTE: When adding a Smart Array Controller to a 16SFF SAS HDD configuration, an HP h1000 SFF SAS CONTROLLER CABLE OPTION KIT (P/N 519507-B21) must be ordered to connect the Smart Array Controller to the hard drive backplane. When a controller is added during a CTO buildup, the appropriate cables are included and this kit is not required. This cable kit is only needed if a CTO customer upgrades to a Smart Array Controller after initial purchase.
NOTE: An external diskette drive, USB floppy drive key or virtual FDD using LO100 Advanced Pack is needed to install storage controller drivers during a Windows operating system installation from a CD.

Internal Storage Devices	Diskette Drives	Via USB only
	Optical Drives	DVD drive via USB only NOTE: External support only.
	Hard Drives	None ship standard
	Drive Bays One of the following depending on Model	Up to 8 Hot plug SAS/SATA 3.5" drives Up to 16 Hot plug SAS/SATA 2.5" drives

Maximum Internal Storage	LFF 3.5" Hot Plug SATA	16.0TB	8 x 2TB
	LFF 3.5" Hot Plug SAS	16.0TB	8 x 2TB
	SFF 2.5" Hot Plug SATA	8.0TB	16 x 500GB
	SFF 2.5" Hot Plug SAS	4.8TB	16 x 300GB

Interfaces	Serial	1
	Network RJ-45 (Ethernet)	2 10/100/1000 NIC ports (1 NIC shared for the HP ProLiant Lights Out 100i Remote Management)
	Graphics	1
	Management	1 Optional Dedicated LO100i Management Port
	Health LED	1 rear per server node (Optional front health LED per server node)
	Power	1 rear per server node (Optional front power button per server node)
	UID	1 rear per server node (Optional front UID per chassis)
	USB	3 (two rear, one internal) NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.

Industry Standard Compliance	ACPI V2.0 Compliant
	PCI 2.2 Compliant
	PXE Support
	WOL Support
	Microsoft® Logo certifications
	IPMI 2.0, DCMI 1.0. SMASH CLP compliant

Standard Features

Graphics	Integrated Matrox Graphics G200e, 32MB Standard • 16 bit color: maximum resolution of 1600 x 1200 • 32 bit color: maximum resolution of 1280 x 1024 The following NVIDIA graphics cards are supported in the DL1000: • NVIDIA Quadro FX5800 512MB PCIe x 16 graphics card NOTE: For more information on the latest visualization and acceleration qualification status, please see http://www.hp.com/go/accelerators. NOTE: An HP DL170h Graphics Bracket/Cable Kit (P/N 536860-B21) is required when installing this NVIDIA card. The FX5800 can only be installed in the 2 slot full-height riser option: HP DL170h I/O Riser PCIe x16 x8 FIO option (P/N 512481-B21).
Server Power Cords	One 6' Highline (IEC-IEC) power cord ships standard NOTE: HP ProLiant DL servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. NOTE: Japan BTO and CTO configurations get the 6' 4165151-291 power cord in addition. China BTO and CTO configurations get the 6' 416151-AA1 power cord in addition. NOTE: If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix
Advanced Power Management: Power Management Controller	In addition to the efficiencies gained by the shared power infrastructure, the DL1000 contains advanced power metering and capping capabilities. The embedded Power Management Controller (PMC) is able to monitor power consumption and throttle the speed of the processors and memory in each node within the chassis in order to maintain a pre-set power budget. HP provides a simple command-line utility, called HP ProLiant Power Interface Control (PPIC) Utility, for reading and configuring the power control logic of the server nodes. Versions are available for MS Windows Server OS (2008 and 2008 R2) and Linux OS (RHEL5 and SLES11) with the requirement that the OS IPMI Driver be installed. The following Power Management modes for power redundancy are standard and are configurable in the controller: • No Redundancy - power control disabled. No power throttling will occur. • (DEFAULT) AC Redundancy with Throttling. This mode allows all nodes to share both power supplies and run at maximum performance. Power control logic will only throttle the performance of each node when the power draw by the chassis attempts to exceed the load supported by the power supplies. In this mode, the box is expected to survive an unexpected AC Power loss to one of the power supplies. • Full AC/DC Redundancy - power control logic will maintain a power cap value for the chassis at the DC rating of a single power supply (750W, or 1200W), such that if one power supply experiences a DC or AC failure, the chassis should remain on-line and operational. Dynamic Power Capping is included with the LO100 Advanced Pack: • Dynamic Power Capping - User specifies the power envelope for the 2U chassis, within the capabilities of the hardware installed. Users run a utility to calibrate the minimum and maximum power consumption envelope for the chassis. In order to avoid any impact to performance due to throttling, a User selectable Power Cap value should not be set below the minimum power value provided by the utility.

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 94%. There are multiple 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 or www.hp.com/go/hppoweradvisor. All HP Common Slot power sources are UL, CE Mark Compliant, Hot Plug and Redundant. There is a low cost, Industry Standard 1500W (2x750W) Power Supply option that does not support hot-pluggability, redundancy or power capping functionality. NOTE: Mixing of power supplies in the same chassis is not supported. All power supplies must be of the same type, all 460W, all 750W 94%, all 750W 92%, all 1200W 94%, or all 1200W 90%. If non-matched power supplies are inserted you will get errors and operation will fail. It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs. HP offers several Common Slot Power Supply Options for this platform. HP's ProLiant Common Slot Power supplies meet multiple Energy Efficiency Initiatives. NOTE: The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on 80Plus.org. Optional power supplies can be purchased through power supply option kits (see Power Supply Options for part numbers).
System Fans	4 x 80mm system fans ship standard; Non-hot plug, Non-redundant.
Required Cabling	For required cabling information, refer to the HP Web site at: www.hp.com/servers/dl170h.
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris VMware ESX Citrix 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 including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/ossupport and our driver download page www.hp.com/support/DL170hG6

Standard Features

Form Factor

HP ProLiant h1000 G6 Chassis - 2U Chassis can support up to four DL170h server nodes in the 2U chassis.

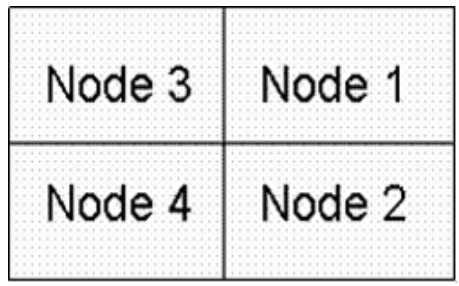
HP ProLiant DL170h G6 Server - Half-width system board. Half-height (1U) or full-height (2U) depending on riser option selected.

HP offers two different drive cages for the 2U HP ProLiant h1000 G6 Chassis: 8 LFF HDD Cage or 16 SFF HDD Cage.

The 2U chassis can support three server node configurations:

- Two full height nodes
- One full height node and two half-height nodes
- Four half-height nodes

4 Node Configuration - Front View



NOTE: For 2 node configurations, Nodes 2 and 4 are ordered. For 3 node configurations, Nodes 1, 2 and 4 are ordered.
NOTE: Additional nodes cannot be added later to 2 or 3 node configurations.

Embedded Manageability

HP LO100 Advanced

HP Lights-Out 100 with Optional LO100 Advanced Licenses for Virtual KVM and Virtual Media.

Standard Features:

- IPMI 2.0 & SMASH CLP support
- ROM Setup Utility
- Improvements to virtual media with the addition of USB 2.0 drives and protocol support for much faster transfer speeds and DVD-ROM support plus simplified virtual media (floppy and CD with no FTTP server requirements)
- Enhanced browser interface and embedded KVM over IP provides OS-independent remote graphical console
- 24x7 Technical Support and Update (TSU) 1 year support and license upgrades included in Advanced license

For more information, see: www.hp.com/go/lo100.

Standard Features

Security	Power-on password Setup password Diskette boot control Secure Sockets Layer (SSL) Secure Shell (SSH)

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year 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 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Optional Features

HP Insight Control management software	HP Insight Control for Linux	HP Insight Control for Linux (IC-Linux), as a product option, delivers essential lifecycle management that can help save time and money by integrating discovery, server deployment, firmware updates & provisioning, health & performance management, remote management, and virtualization. This makes it easy to optimize your IT infrastructure through a single, simple management console. The IC-Linux suite installs and licenses software modules that are integrated into HP System Insight Manager (HP SIM). HP Insight Control for Linux serves environments requiring Linux-based management consoles. See www.hp.com/go/ic-linux. HP Insight Control for Linux includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.
	HP Insight Control server deployment	HP Insight Control server deployment is a deployment solution for HP ProLiant and Integrity servers hosted on a Windows CMS. It automates the process of deploying and provisioning server software, enabling companies to quickly and easily adapt to changing business demands. Insight Control server deployment includes software optimizations for HP servers, including the HP scripting toolkits, configuration jobs for leading industry-standard operating systems, sample unattended files, and HP server support packs that include software drivers, management agents, and important documentation. Deploying servers can be accomplished either through imaging or through scripting. Insight Control server deployment is hosted on a Windows server and is intended for heterogeneous environments deploying Windows, Linux, VMware ESX and Microsoft Hyper-V systems. Insight Control server deployment includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.

Optional Features

Core Server Management	ProLiant 100 Series G6 Core Management Software for ProLiant 100 Series Servers	HP provides management solutions that are designed to simplify a server's installation, configuration, and maintenance throughout the entire server lifecycle. This provides the customers with higher levels of operational efficiency and highly reliable systems. While ProLiant 100 series G6 servers do not support the Insight Foundation Suite for ProLiant, they support a key subset of this important suite software tools and utilities which are very suitable for this class of server: SIM, SMH, agents, providers, and a SmartStart 'like' deployment CD called Easy Set-up which greatly simplifies server set-up. Additionally the DL100 and SL100 G6 models support the SmartStart Scripting Toolkit (SSSTK), an automated scalable deployment utility. Information on core management supported on ProLiant 100 series G6 servers can be found at these URLS: ● Core Management: www.hp.com/go/coremanagement ● HP ProLiant 100 series Easy Set-up CDs: www.hp.com/servers/easysetup
Core Infrastructure Management	HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) provides a unified, secure and extensible standards-based environment to centrally manage servers, storage and other infrastructure devices, (both HP and non-HP) across multiple operating system platforms.
	Insight Management Agents	HP Insight Management Agents and Insight Management Providers are available for HP Systems Insight Manager (SIM) Integration. ProLiant 100-series G6 servers can use the same SNMP based Insight Management Agents supported by other ProLiant servers. As a result, administrators can use HP Systems Insight Manager (SIM) 5.3 and greater to manage ProLiant 100-series G6 servers. Administrators can also use any other SNMP- based management tool. These agents are obtained as part of the ProLiant 100-series model-specific "Easy Set-up" CDs, or through http://www.hp.com/servers/easysetup The following capabilities are enabled on the 100-series G6 servers by the SNMP agents: ● Health monitoring capabilities, including monitoring for drives, fans, network, power supplies, and temperature ● Alerting capabilities, including basic alert notification for Smart Array drive pre-failure only ● Performance monitoring capabilities providing information on processor, memory, disk free space, network utilization For additional information, please see: http://www.hp.com/go/insight
	Easy Set-up CD	Easy Set-up CDs are available on all 100-series G6 servers and are also available as an ISO image web download. HP ProLiant Easy Set-up CDs provide easy, step-by-step, single and multi-server server utilities for the ProLiant 100-series G6 servers to streamline server setup for 100-series G6

servers. The user experience is consistent with SmartStart and offers the following capabilities:

- Boot environment and GUI
- Assisted Installation: Windows 2003 Server and Windows 2008 Server drivers
- Manual installation: Windows 2003 Server, Windows 2008 Server, and Linux drivers (specific OS support varies by server. Refer to each server's QuickSpecs for supported versions)
- HP Insight Diagnostics
- AutoRun
- Array Configuration Utility (ACU) has been combined with Array Diagnostics Utility (ADU) to offer both configuration of array controllers and storage devices and testing of array controller hardware
- SmartStart Scripting Toolkit (SSSTK) and Smart Components for software and drivers

NOTE: OS and SW available for Manual Installation are listed on each servers' QuickSpecs.

SmartStart Scripting Toolkit (SSSTK)	The SmartStart Scripting Toolkit is a server deployment product that delivers an unattended automated installation for high-volume server deployments. The SmartStart Scripting Toolkit includes a set of utilities for configuring and deploying servers in a customized, predictable, and unattended manner. These utilities enable you to duplicate the configuration of a source server on target servers with minimum user interaction. The Toolkit is designed for IT experts with experience in scripting operating system installations and configuring ProLiant server hardware. For additional information, please see: http://h18004.www1.hp.com/products/servers/management/toolkit/index.html
Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at: http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
ROMPaq, software and latest drivers	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options; downloaded from Software and Drivers download pages website at: http://www.hp.com/go/support and from www.hp.com/servers/easysetup. Contains the following: • HP Insight Management Agents for Systems Insight Manager (SIM) Integration • HP Systems Management Homepage • Array Configuration Utility (ACU) • Array Diagnostics Utility (ADU) • HP Insight Diagnostics

Optional Features

High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and Novell SLES, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	HP HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
	HP Cluster Management Utility	HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu
	HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. HP HPC Linux Value Pack

Factory Express Portfolio for Servers and Storage

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

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

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

HP Enterprise Configurator

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

Service and Support	**HP 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	**Optimized Care Package: Supports maintaining servers at optimum performance availability** **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN **HP Installation and Startup for Insight Control Software** Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf **3-Year HP Critical Advantage** Provides end-to-end infrastructure support solution for business critical applications running on virtualized/x86 infrastructures, enabling the customers to cost effectively build, operate, and continuously improve their IT environment. http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-1772ENW **Additional Services**: Microsoft or Linux or VMware education courses + Facility & technology environmental assessment services + Energy Efficiency Design, Factory Express

Service and Support

Standard Care	Standard Care Package: Package that maintains high level of server availability HP ProLiant Server Hardware Installation Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN HP Installation and Startup for Insight Control Software Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf 3-Year HP 6 hour Hardware Support Onsite Call-to-Repair Service Provides an IT manager with a team of support specialists who will quickly begin troubleshooting the system to help return the hardware to operating condition within 6 hours of the initial service request to the HP Global Solution Center http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-6636ENN 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	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.
NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

Eight Drive Non-Hot-Plug Serial ATA (SATA) 2 Node Models

NOTE: Only hot-plug form-factor HDDs are supported but are used in a cold-swap manner in the base configuration. Upgrading to 8 Hot Plug SATA requires the addition of the B110i Hot-Plug Advance Pack or storage controller. Upgrading to SAS hard drives requires the addition of a storage controller. Adding a storage controller (Smart Array P212/256MB recommended) requires one HP h1000 LFF SAS CTTLR CABLE OPT KIT per controller (P/N 519503-B21).

HP ProLiant DL2x170h G6 E5504 1P 6GB-U Hot Plug 8 LFF 1200W PS Server 503581-xx1	Processor(s)	One Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) / server node
	Cache Memory	4MB shared L3 cache
	Memory	6GB (3 x 2GB) PC3-10600E (UDIMM) / server node
	Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10)
	Hard Drive	None ship standard
	Internal Storage	16.0TB (8 x 2TB Hot Plug 3.5" SATA hard drives), Maximum 16.0TB (8 x 2TB Hot Plug 3.5" SAS hard drives), Maximum NOTE: SAS and/or hot-plug functionality requires the addition of a Smart Array controller.
	Optical Drive	External support only
	Power Supply	1 x 1200Watts, 90% Efficiency, Common Slot Power Supply Standard 2nd 1200W, 90% Efficiency, Power Supply Optional
	Fans	4 x 80mm system fans ship standard; Non-hot plug, Non-redundant
	Form Factor	HP ProLiant h1000 G6 Chassis - 2U HP ProLiant DL170h G6 Server - Half-width server node

Pre-configured Models

Eight Drive Non-Hot-Plug Serial ATA (SATA) 4 Node Models

NOTE: Only hot-plug form-factor HDDs are supported but are used in a cold-swap manner in the base configuration. Upgrading to 8 Hot Plug SATA requires the addition of the B110i Hot-Plug Advance Pack or storage controller. Upgrading to SAS hard drives requires the addition of a storage controller. Adding a storage controller (Smart Array P212/256MB recommended) requires one HP h1000 LFF SAS CTTLR CABLE OPT KIT per controller (P/N 519503-B21)

HP ProLiant DL4x170h G6 E5504 1P 6GB-U Hot Plug 8 LFF 1200W PS Server 503578-xx1	Processor(s)	One Intel® Xeon® Processor E5504 (2.00 GHz, 4MB L3 Cache, 80W, DDR3-800) / server node
	Cache Memory	4MB shared L3 cache
	Memory	6GB (3 x 2GB) PC3-10600E (UDIMM) / server node
	Network Controller	HP NC362i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10)
	Hard Drive	None ship standard
	Internal Storage	16.0TB (8 x 2TB Hot Plug 3.5" SATA hard drives), Maximum 16.0TB (8 x 2TB Hot Plug 3.5" SAS hard drives), Maximum NOTE: SAS and/or hot-plug functionality requires the addition of a Smart Array controller and SAS Controller Cable Option Kit.
	Optical Drive	External support only
	Power Supply	1 x 1200Watts, 90% Efficiency, Common Slot Power Supply Standard 2nd 1200W, 90% Efficiency, Power Supply Optional
	Fans	4 x 80mm system fans ship standard; Non-hot plug, Non-redundant
	Form Factor	HP ProLiant h1000 G6 Chassis - 2U HP ProLiant DL170h G6 Server - Half-width server node

Country Code Key	xx = 00	U.S.
	xx = 29	Japan
	xx = 37	AP
	xx = 42	Europe
	xx = AA	PRC

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 from each list unless otherwise noted)

HP Chassis	HP ProLiant h1000 G6 2U Chassis	507653-B21
	HP h1000 2 Node Side by Side FIO Kit	516030-B21
	HP h1000 3 Node FIO Kit	518028-B21
	HP h1000 4 Node FIO Kit	518029-B21
HP Nodes	HP ProLiant DL170h G6 Node 1 Configure-to-order Server	507638-B21
	HP ProLiant DL170h G6 Node 2 Configure-to-order Server	507639-B21
	HP ProLiant DL170h G6 Node 3 Configure-to-order Server	507640-B21
	HP ProLiant DL170h G6 Node 4 Configure-to-order Server	507641-B21
	NOTE: A minimum of two nodes are required per 2U chassis. There are only three options for ordering DL170h G6 Nodes. 1) 2 Node Config: user must order Nodes 2 and 4; 2) 3 Node Config: user must order Nodes 1, 2 and 4; or 3) 4 Node Config: user must order Nodes 1, 2, 3 and 4. NOTE: Additional nodes cannot be added later to 2 or 3 node configurations.	
HP Drive Cage Options	HP h1000 G6 8 LFF Drive Cage FIO Kit NOTE: This selection requires that only SATA drives can be selected and SAS Controller cannot be added to any node.	507654-B21
	HP h1000 G6 8 LFF Drive SAS Ctlr Cage FIO Kit NOTE: With this selection, SAS and SATA drives can be selected but a SAS controller must be selected for each node.	538666-B21
	HP h1000 G6 16 SFF Drive Cage FIO Kit NOTE: This selection requires that only SATA drives can be selected and SAS Controller cannot be added to any node.	507655-B21
	HP h1000 G6 16 SFF Drive SAS Ctlr Cage FIO Kit NOTE: With this selection, a SAS controller must be selected for each node.	538667-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 NOTE: Selection of a Common Slot High Efficiency or Platinum Power Supply requires the purchase of a Common Slot Power Supply Backplane FIO Kit (P/N: 516136-B21).	
	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 750W Common Slot Platinum Hot Plug Power Supply Kit	593831-B21
	HP 1200W Common Slot Platinum Hot Plug Power Supply Kit	578322-B21
	HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21
	HP 750W Factory Integrated Power Supply Kit NOTE: Selection of an Industry Standard Power Supply requires the purchase of a Fan Controller FIO Kit (P/N: 516000-B21).	515997-B21

Power Supplies - Enablement Kits	
HP h1000 Common Slot PS BP FIO Kit NOTE: This backplane must be ordered with any Common Slot High Efficiency Power Supply.	516136-B21
HP h1000 Power Supply Fan Controller Factory Integrated Kit NOTE: This fan controller kit must be ordered with the 750W Industry Standard Power Supply (P/N: 515997-B21).	516000-B21

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

HP Processors

NOTE: DL170h G6 servers purchased with Intel Xeon 5500 Series processors are not upgradeable to Intel Xeon 5600 series processors.
NOTE: If 2 processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

Six Core Processors	
HP DL170h G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) FIO Processor Kit	600545-L21
Quad-Core Processors	
HP DL170h G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) FIO Processor Kit	600543-L21
HP DL170h G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB/40W) FIO Processor Kit	600541-L21
HP DL170h G6 Intel® Xeon® X5570 (2.93GHz/4-core/8MB/95W) FIO Processor Kit	507889-L21
HP DL170h G6 Intel® Xeon® X5560 (2.80GHz/4-core/8MB/95W) FIO Processor Kit	538757-L21
HP DL170h G6 Intel® Xeon® X5550 (2.66GHz/4-core/8MB/95W) FIO Processor Kit	503582-L21
HP DL170h G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) FIO Processor Kit	507890-L21
HP DL170h G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) FIO Processor Kit	583381-L21
HP DL170h G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) FIO Processor Kit	503583-L21
HP DL170h G6 Intel® Xeon® L5530 (2.40GHz/4-core/8MB/60W) FIO Processor Kit	583133-L21
HP DL170h G6 Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W) FIO Processor Kit	507891-L21
HP DL170h G6 Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W) FIO Processor Kit	503585-L21
HP DL170h G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) FIO Processor Kit	583383-L21
HP DL170h G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) FIO Processor Kit	503584-L21

Configuration Information - Factory Integrated Models

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: 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. NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient NOTE: PC3L is a low voltage memory. NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel) NOTE: Memory Min and Max depends on number of processors and type of memory: 1 Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6 2 Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12	

HP I/O Expansion Options	Full-height (or 2U nodes)	
	HP DL170h I/O Riser PCIe x16 x4 x4 FIO	514005-B21
	HP DL170h I/O Riser PCIe x8 x8 x8 FIO	503587-B21
	HP DL170h I/O Riser PCIe x16 x8 FIO	512481-B21
	NOTE: The 2 slot riser (P/N: 512481-B21) is the only riser option that supports the NVIDIA FX5800 graphics card.	
	Half-height (or 1U nodes)	
	HP DL170h I/O Riser PCIe x16 FIO	503586-B21
	NOTE: This is the only riser option for 4 Node configurations.	

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

HP Front Power option	HP h1000 Front Power Right FIO Kit	516022-B21
	HP h1000 Front Power Left FIO Kit	516001-B21
	NOTE: Each ProLiant DL170h Server comes with a rear UID, Power Button and Health LED. These options provide a front facing option that will power up to two nodes each. If a 3 or 4 Node Setting kit is selected in Step 1, then both power button kits must be ordered. If the 2 Node Setting kit is selected in Step 1, then only the Right Power Kit (P/N: 516022-B21) is needed.	
HP Storage Controllers	NOTE: Non-Hot-Plug SATA Models: The embedded HP Smart Array B110i SATA RAID supports RAID 0,1,10 and cold-plug capability with hot-plug form factor drives. Non-hot-plug form factor hard disk drives are not supported in the DL1000. NOTE: Hot-Plug SATA Models: A HP Smart Array B110i SATA RAID Hot-Plug Advanced Pack per server or virtual machine is required for hot-plug SATA using the embedded B110i SATA RAID controller.	
	NOTE: SAS Models: A minimum of one SAS Controller per server node is required when purchasing a SAS HDD Model (P/N 538666-B21 or 538667-B21). NOTE: The P410 Controller is not supported in a Low Profile PCIe G2 slot. For all 8 LFF SAS HDD configurations, a P212 is required. For 16 SFF SAS HDD configurations with 4 nodes, a P212 is required. For 16 SFF SAS HDD configurations with 2 nodes, a P410 is required and the card must be populated in the FH/FL or FH/HL PCI slot. In a 16 SFF SAS HDD configuration with 3 nodes, a P212 is required for both half-height nodes, each supporting 4 HDDs, and a P410 is required for the full height node, supporting 8 HDDs and must be populated in the FH/FL or FH/HL PCI slot.	
	HP Smart Array P410/ZM 2-ports Int PCIe x8 FIO SAS Controller	462860-B21
	HP Smart Array P411/256 2-ports Ext PCIe x8 FIO SAS Controller	491193-B21
	HP Smart Array P410/256 2-ports Int PCIe x8 FIO SAS Controller	491195-B21
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 FIO SAS Controller	491191-B21
	Optional Upgrades	
	HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU	TC421A

Step 4: Choose Additional Options for Factory Integration

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

Core Options

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

HP Unique Options	HP DL170h Dedicated Management Port OPT Kit NOTE: Each ProLiant DL170h G6 Server comes standard with sideband support for LO100i through the shared, system NIC. Order this option (P/N 575498-B21) if a dedicated management network is desired.	575498-B21
	HP h1000 G6 Large Form Factor SAS Cable Kit NOTE: When adding a Smart Array Controller to an 8LFF SAS HDD configuration, a HP h1000 LFF SAS CONTROLLER CABLE OPTION KIT (P/N 519503-B21) must be ordered to connect the Smart Array Controller to the hard drive backplane. When a controller is added during a CTO buildup, the appropriate cables are included and this kit is not required. This cable kit is only needed for BTO configurations or if a CTO customer upgrades to a Smart Array Controller after initial purchase.	519503-B21
	HP h1000 G6 Small Form Factor SAS Cable Kit NOTE: When adding a Smart Array Controller to a 16SFF SAS HDD configuration, a HP h1000 SFF SAS CONTROLLER CABLE OPTION KIT (P/N 519507-B21) must be ordered to connect the Smart Array Controller to the hard drive backplane. When a controller is added during a CTO buildup, the appropriate cables are included and this kit is not required. This cable kit is only needed if a CTO customer upgrades to a Smart Array Controller after initial purchase.	519507-B21
	HP DL170h Graphics Brkt/Cable Kit NOTE: This option must be ordered if an NVIDIA FX5800 is installed in a full-height 2 slot riser. The FX5800 can only be installed in the 2 slot riser option: HP DL170h I/O Riser PCIe x16 x8 FIO option, part number 512481-B21.	536860-B21

HP Processors	NOTE: DL170h G6 servers purchased with Intel Xeon 5500 Series processors are not upgradeable to Intel Xeon 5600 series processors.	
	Six Core Processors	
	HP DL170h G6 Intel® Xeon® X5670 (2.93GHz/6-core/12MB/95W) Processor Kit	600545-B21
	Quad-Core Processors	
	HP DL170h G6 Intel® Xeon® E5640 (2.66GHz/4-core/12MB/80W) Processor Kit	600543-B21
	HP DL170h G6 Intel® Xeon® L5630 (2.13GHz/4-core/12MB//40W) Processor Kit	600541-B21
	HP DL170h G6 Intel® Xeon® X5570 (2.93GHz/4-core/8MB/95W) Processor Kit	507889-B21
	HP DL170h G6 Intel® Xeon® X5560 (2.80GHz/4-core/8MB/95W) Processor Kit	538757-B21
	HP DL170h G6 Intel® Xeon® X5550 (2.66GHz/4-core/8MB/95W) Processor Kit	503582-B21
	HP DL170h G6 Intel® Xeon® E5540 (2.53GHz/4-core/8MB/80W) Processor Kit	507890-B21
	HP DL170h G6 Intel® Xeon® E5530 (2.40GHz/4-core/8MB/80W) Processor Kit	583381-B21
	HP DL170h G6 Intel® Xeon® E5520 (2.26GHz/4-core/8MB/80W) Processor Kit	503583-B21
	HP DL170h G6 Intel® Xeon® L5530 (2.40GHz/4-core/8MB/60W) Processor Kit	583133-B21
	HP DL170h G6 Intel® Xeon® L5520 (2.26GHz/4-core/8MB/60W) Processor Kit	507891-B21
	HP DL170h G6 Intel® Xeon® L5506 (2.13GHz/4-core/4MB/60W) Processor Kit	503585-B21
	HP DL170h G6 Intel® Xeon® E5506 (2.13GHz/4-core/4MB/80W) Processor Kit	583383-B21
	HP DL170h G6 Intel® Xeon® E5504 (2.00GHz/4-core/4MB/80W) Processor Kit	503584-B21

Core Options

HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21
	NOTE: 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. NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient NOTE: PC3L is a low voltage memory. NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel) NOTE: Memory Min and Max depends on number of processors and type of memory: 1 Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6 2 Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12	
HP Hard Drives	NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	

NOTE: If using SAS hard drives, a Smart Array controller is required. For BTO configurations only, and For 3.5" drive cable kit P/N 519503-B21 or for 2.5" cable kit P/N 519507-B21.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
HP 146GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507125-B21
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21
SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516828-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516816-B21
HP 300GB 6G SAS 15K rpm LFF (3.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	516814-B21
SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507610-B21
SAS Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507616-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	507614-B21
HP 750GB 3G SAS 7.2K rpm LFF (3.5-inch) Dual Port Midline 1yr Warranty Hard Drive	461135-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)

SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives	
HP 500GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	507750-B21
HP 160GB 3G SATA 7.2K rpm SFF (2.5-inch) Midline 1yr Warranty Hard Drive	530888-B21
SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 2TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	507632-B21
HP 1TB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	454146-B21
HP 500GB 3G SATA 7.2K rpm LFF (3.5-inch) Midline 1yr Warranty Hard Drive	458928-B21
SATA Hot Plug LFF (3.5-inch) Entry (ETY) Drives	
HP 250GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	571230-B21
HP 160GB 3G SATA 7.2K rpm LFF (3.5-inch) Entry 1yr Warranty Hard Drive	458945-B21

Core Options

	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)	
	SATA Hot Plug Midline (MDL) Solid State Drives	
	HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21
	HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
	SATA Hot Plug 3.5" Midline (MDL) Solid State Drives	
	HP 60GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570761-B21
	HP 120GB 3G SATA LFF (3.5-inch) Midline 1yr Warranty Solid State Drive	570763-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13415_div/13415_div.html (Worldwide)	
HP Networking	Gigabit Ethernet adapters	
	HP NC112T PCIe Gigabit Server Adapter	503746-B21
	HP NC360T PCI Express Dual Port Gigabit Server Adapter	412648-B21
	HP NC364T PCI Express Quad Port Gigabit Server Adapter	435508-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP NC373F PCI Express Multifunction Gigabit Server Adapter	394793-B21
	HP NC373T PCI Express Multifunction Gigabit Server Adapter	394791-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	10 Gigabit Ethernet Adapters NOTE: No more than two 10GbE I/O devices are supported in a single ProLiant server. NOTE: A minimum of two Gigabytes (2 GB) of server memory is required per each adapter. NOTE: Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.	
	HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs.	
HP InfiniBand	HP IB 4X QDR CX-2 PCI-e G2 Dual Port HCA	592520-B21
	HP IB 4X DDR CX-2 PCI-e G2 Dual Port HCA	592521-B21
	QLogic 4X QDR IB PCI-e G2 HCA	583211-B21
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html	

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	
	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 750W Common Slot Platinum Hot Plug Power Supply Kit	593831-B21
	HP 1200W Common Slot Platinum Hot Plug Power Supply Kit	578322-B21
	HP 1200W Common Slot Silver Hot Plug Power Supply Kit	500172-B21

Additional Options

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

HP Remote Management	HP LO100i Advanced Pack, No Media 1-Server License including 1 year of 24x7 Technical Support and Updates	530521-B21
	NOTE: For additional information, please see the Lights-Out 100i QuickSpecs at www.hp.com/go/lo100	
HP Insight Software	HP Insight Control for Linux	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	NOTE: Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.	
	NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).	
	NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.	
	NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
	HP Insight Control server deployment	
	HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License	T9082AAE
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.	
	NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.	
	NOTE: Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.	
	NOTE: Licenses ship without media. The Insight Software Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightcontrol (click on Download button).	
	NOTE: For additional license options please see the Insight Control QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	

Additional Options

High Performance Clusters	**HP Cluster Management Utility**	
	HP Cluster Management Utility Compute Node Flexible License NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	QL803A
	HP Cluster Management Utility License and Media NOTE: Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required. NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html	433257-B21
	HP HPC Linux Value Pack	
	HP High Performance Computing Linux Value Pack 1 Processor Flexible License NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	TC293B
	HP High Performance Computing Linux Value Pack Media Kit NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer. NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html	TC294A
HP Security - TPM	HP Trusted Platform Module Option Kit 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. 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.	488069-B21
HP Storage Controllers	**HP Smart Array P800 Controller**	
	HP Smart Array P800/512 BBWC 2-ports Int/2-ports Ext PCIe x8 SAS Controller	381513-B21
	HP Smart Array P212 Controller	
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21

Additional Options

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
HP Smart Array P410/1G FBWC 2-ports Int PCIe x8 SAS Controller	572532-B21
HP Smart Array P411 Controller	
HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
HP Smart Array P411/512 BBWC 2-ports Ext PCIe x8 SAS Controller	462832-B21
HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
Smart Array P812 Controller	
HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
Optional Upgrades	
HP 256MB P-series Cache Upgrade NOTE: Supported on HP Smart Array P212 Controller only.	462968-B21
HP 512MB P-Series Battery Backed Write Cache Upgrade	462967-B21
HP 8484 to Mini SAS 33in Cable Assembly	591734-B21
HP 650 mAh P-Series Battery NOTE: To enable BBWC on the 256MB cache. NOTE: Requires 256 MB Cache Module. When used with the embedded HP Smart Array P410i controller, this battery module also requires a 24 inch SFP Battery Cable (496029-B21).	462969-B21
HP 512MB Flash Backed Write Cache	534916-B21
HP 1GB Flash Backed Cache	534562-B21
HP Smart Array Hot Plug Advance Pack for B110i w/1y 24x7 Supp Physical 1 Svr LTU	TC421A
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12616_div/12616_div.html (Smart Array P800 Controller) http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13201_div/13201_div.html (Smart Array P410 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html (Smart Array P411 Controller) http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html (Smart Array P812 Controller)	
SCSI HBA	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SCSI HBA)	

Additional Options

HP Tape Backup	NOTE: For the complete range of StorageWorks tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP StorageWorks tape backup products see: http://www.hp.com/go/connect.	
	HP StorageWorks 1/8 G2 LTO-5 Ultrium 3000 Fibre Channel Tape Autoloader	BL541A
	HP StorageWorks MSL2024 1 LTO-5 3280 FC Tape Library	BL531A
	HP StorageWorks MSL2024 1 LTO-5 Ultrium 3000 Fibre Channel Tape Library	BL542A
	HP StorageWorks MSL4048 1 LTO-5 3280 FC Tape Library	BL532A
	HP StorageWorks MSL4048 2 LTO-5 Ultrium 3000 Fibre Channel Tape Library	BL543A
HP Disk Backup	NOTE: For the complete range of StorageWorks D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of StorageWorks RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP StorageWorks disk backup products see: http://www.hp.com/go/connect.	
	HP StorageWorks D2D Backup Systems with Backup Data Deduplication	
	HP StorageWorks D2D2504i Backup System NOTE: 3.0TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	EJ002B
	HP StorageWorks D2D4112 Backup System NOTE: 9.0TB (expandable to 18.0TB) of useable network disk backup capacity. Fibre Channel SAN connected appliance. Direct server attach is not supported, requires connection via SAN fabric.	EH993B
HP StorageWorks Options	StorageWorks Fibre Channel HBA	
	NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	Brocade Fibre Channel HBAs	
	HP StorageWorks 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter	AP769A
	HP StorageWorks 82B PCIe 8Gb Fibre Channel Dual Port Host Bus Adapter	AP770A
	HP StorageWorks 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter	AP767A
	HP StorageWorks 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter	AP768A
	Emulex Fibre Channel HBAs	
	HP StorageWorks 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter	AJ762A
	HP StorageWorks 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ763A
	HP StorageWorks FC2142SR 4Gb PCIe Host Bus Adapter	A8002A
	HP StorageWorks FC2242SR 4Gb PCIe DC Host Bus Adapter	A8003A
	QLogic Fibre Channel HBAs	
	HP StorageWorks 81Q PCI-e Fibre Channel Host Bus Adapter	AK344A
	HP StorageWorks 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ764A
	HP StorageWorks FC1142SR 4Gb PCIe Host Bus Adapter	AE311A
	HP StorageWorks FC1242SR 4Gb PCIe DC Host Bus Adapter	AE312A
	StorageWorks SCSI HBA	

Additional Options

	HP StorageWorks U320e SCSI Dual Channel Host Bus Adapter	AH627A
	NOTE: Recommended HBA for MSL SCSI Tape Library connect.	
	StorageWorks Converged Network Adapter	
	HP StorageWorks CN1000E Dual Port Converged Network Adapter	AW520A
	HP CN1000Q Dual Port Converged Network Adapter	BS668A
HP Disk Storage Systems	MSA SAN Storage Arrays	
	HP StorageWorks 60 Modular Smart Array	418408-B21
	NOTE: Rack-mountable 12-drive (3.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies. NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12627_div/12627_div.html (Worldwide)	
	HP StorageWorks 70 Modular Smart Array	418800-B21
	NOTE: Rack-mountable 25-drive (2.5" 3G SAS/1.5G SATA) 2U enclosure with 3Gb/s SAS host connectivity and redundant power supplies. NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12652_div/12652_div.html (Worldwide)	
	Disk Enclosures	
	HP StorageWorks D2600 Disk Enclosure	AJ940A
	HP StorageWorks D2700 Disk Enclosure	AJ941A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)	
HP Uninterruptible Power Systems	HP Rack-mountable UPS	
	HP R1500 G2 UPS	
	HP R1500 G2 1440VA Low Voltage NA 1U Rackmount Uninterruptible Power System	AF419A
	HP R1500 G2 1440VA INTL 1U Rackmount Uninterruptible Power System	AF418A
	HP R1500 G2 1200kVA Low Voltage JP 1U Rackmount Uninterruptible Power System	AF421A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12507_div/12507_div.html (Worldwide)	
	HP Rack-Mountable R5500 UPS	
	HP R5500 6000VA INTL 3U Rackmount Uninterruptible Power System	AF416A
	HP R5500 5000kVA NA/JP 3U Rackmount Uninterruptible Power System	AF426A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13129_div/13129_div.html (Worldwide)	
	HP R/T3000 Uninterruptible Power System (UPS)	

Additional Options

	HP R/T3000 3300VA High Voltage NA/JPN 2U Rackmount Uninterruptible Power System	AF453A
	HP R/T3000 3300VA INTL 2U Rackmount Uninterruptible Power System	AF454A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13417_div/13417_div.html (Worldwide)	
	NOTE: Additional HP Uninterruptible Power Systems (UPS) are available for this equipment. For information on all HP UPSs and accessories please go to: www.hp.com/products/ups (Worldwide)	
	NOTE: For additional information on sizing your HP UPS, please reference: http://www.upssizer.com	
HP Power Distribution Units	HP Monitored Power Distribution Unit: Half Rack Version	
	HP 4.9 kVA S124 Monitored PDU- single input, 1Ø, 24A (NA/JPN)	AF914A
	HP 7.3 kVA S132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF915A
	HP Monitored Power Distribution Unit: Full Rack Version	
	HP 8.6 kVA S1324 Monitored PDU- single input, 3Ø, 24A (NA/JPN)	AF504A
	HP 8.3 S1140 Monitored PDU- single input, 1Ø, 40A (NA/JPN)	AF506A
	HP 11 kVA S1316 Monitored PDU- single input, 3Ø, 16A (INTL)	AF508A
	HP 7.3 kVA S1132 Monitored PDU- single input, 1Ø, 32A (INTL)	AF510A
	NOTE: Please see the following QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html (Worldwide)	
	Modular Power Distribution Units 1U/0U (Up to 32 outlets)	
	NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).	
	HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC) (NA, Japan)	252663-D72
	8.3kVA Model - mPDU, 40A, High (power cord attached) (NA/JPN)	252663-D73
	HP Modular Power Distribution Units (mPDU), High Volt Model, 32A (200-240 VAC) (Int'l)	252663-B31
	HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) (WW)	252663-B24
	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_div/11041_div.html (Worldwide)	
	NOTE: For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu.	

Additional Options

HP Rack Series	HP Rack 10000 G2 Series (Carbon/Graphite Metallic)	
	HP 10642 G2 Pallet Universal Rack	AF001A
	HP 10642 G2 Shock Universal Rack	AF002A
	NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.	
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.	
	NOTE: The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors. CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm). CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.	
	NOTE: Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.	

HP Rack Options	HP Server Console Switches	
	HP Server console switch 0x2x8	AF616A
	HP Server console switch 0x2x16	AF617A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html (Worldwide)	
	HP Server Console Switch G2 with Virtual Media & CAC	
	0x2x16 KVM Server Console G2 Switch with Virtual Media and CAC	AF618A
	0x2x32 KVM Server Console G2 Switch with Virtual Media and CAC	AF619A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html (Worldwide)	
	HP IP Console Switch G2 with Virtual Media & CAC	
	1x1Ex8 KVM IP Console Switch G2 with Virtual Media and CAC	AF620A
	2x1Ex16 KVM IP Console Switch G2 with Virtual Media and CAC	AF621A

Additional Options

	4x1Ex32 KVM IP Console Switch G2 with Virtual Media and CAC	AF622A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html (Worldwide)	
HP USB and SD Options	HP USB-P/S2 Mouse	DC369A
	HP USB 04 Standard Keyboard	DT528A#ABA
HP Care Pack Services	Hardware Services 4-Hour On-site Service	
	13-Hour x 5-Day Coverage, 3 Years, Electronic	UM828E
	24-Hour x 7 Day Coverage, 3 Years, Electronic	UM829E
	Hardware Services Next Business Day On-Site Service	
	9-Hour x 5-Day Coverage, 3 Years, Electronic	UM827E
	Hardware Services 6-Hour Call to Repair On-Site Service	
	HP 3y 6h 24x7 CTR DL1000 HW Supp	UM830E
	Hardware Installation, Electronic	UM857E
	HP LO100i Advanced Pack 3 year 24x7 Software Support	UM748E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack	

Memory

HP ProLiant DL170h G6 Server

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

Standard Memory

6GB (3 x 2GB)/server node, PC3-10600E Unregistered DIMM memory, with ECC

Maximum Memory

Up to 192GB, using PC3-8500R DDR3 Registered (RDIMM) memory, operating at 800MHz when fully populated at 2 DIMMs per Channel in 12 slots

Up to 48GB, using PC3-10600E DDR3 Unbuffered (UDIMM) memory, operating at 1333MHz when fully populated at 2 DIMMs per Channel in 12 slots

NOTE: RDIMMs and UDIMMs cannot be in the same system so the maximum RDIMM memory configuration can only be achieved with BTO models by replacing all of the UDIMMs.

NOTE: Chart does not represent all possible memory configurations.

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

- Some DIMM installation guidelines are summarized below:
- For servers with sixteen (16) memory slots
- There are three (3) channels per processor; six (6) channels per server
- There are two (3) DIMM slots for two memory channels and one (2) DIMM slots for one memory channel; sixteen (16) total slots
- Memory channel 1 consists of the two (2) DIMM slots that are closest to the processor
- Memory channels 2 and 3 consist of the six (6) DIMM slots 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
- You can only have up to eight (8) ranks installed per channel
- You can only install two quad-rank DIMMs per channel
- You can only install two UDIMMs per channel; if available, the third slot in the channel must remain empty
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the chipset
- Low Voltage DIMMs can only be used with Intel Xeon 5600 series processors.
- 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
- 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.

Memory

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	4GB	16GB	1GB	2GB	4GB
DIMM Native Speed (MHz) ->	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
Voltage	LV/Reg	Reg	Reg	Reg	LV/Reg	Reg	Reg	Reg	Reg	Reg
SLOTS THAT CAN BE POPULATED										
16 slot servers	16	16	16	16	16	12	12	12	12	12
MAXIMUM MEMORY CAPACITY (GB)										
16 slot servers	64	32	64	128	128	48	192	12	24	48
POPULATED DIMM SPEED (MHz)										
1 DIMM Per Channel	1333	1333	1333	1066	1333	1066	1066	1333	1333	1333
2 DIMMs Per Channel	1333*	1333*	1333*	1066	1333*	800	800	1066	1066	1333*
3 DIMMs Per Channel (on 2 channels)	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)

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 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. Channel 1 is channel furthest away from the CPU and Channel 3 is channel closest to CPU.

Memory

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

Standard memory configuration (1 CPU model)

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

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

Standard memory plus optional memory (1 CPU model)

- 12GB, consisting of three (3) 2GB UDIMMs plus three (3) 2GB UDIMMs
  - 6x 2GB dual-rank PC3-10600E UDIMMs

Memory

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

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

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

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

Standard memory replaced with optional memory (2 CPU model)
RDIMM maximum configuration

- 192GB, consisting of sixteen (16) 16GB quad rank PC3-8500 RDIMMs

Memory

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

UDIMM maximum configuration

- 48GB, consisting of twelve (12) 2GB dual-rank PC3-10600 UDIMMs

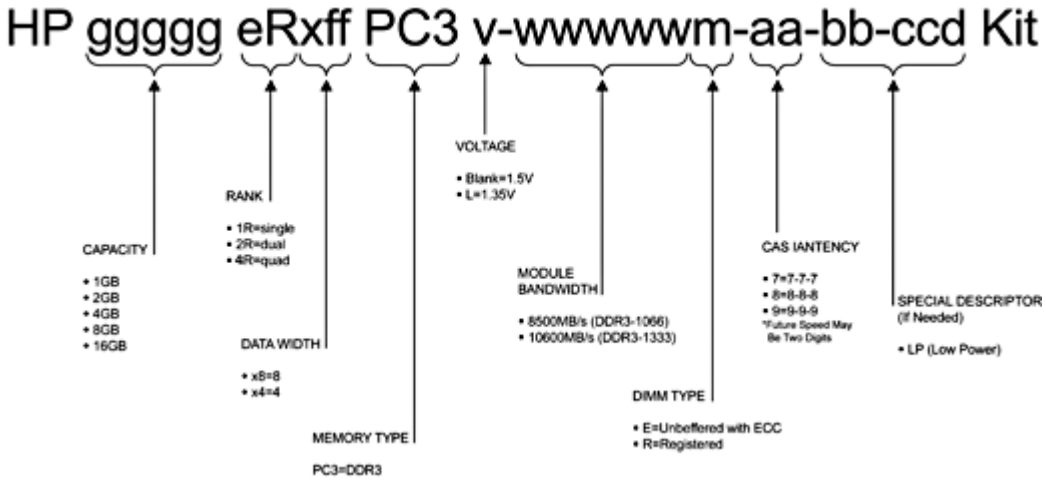
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 4GB DIMM	1	A; 4GB DIMM	Chnl 1
	2	D; 4GB DIMM	2	D; 4GB DIMM	
	3	G; empty	3	G; empty	
Chnl 2	4	B; 4GB DIMM	4	B; 4GB DIMM	Chnl 2
	5	E; 4GB DIMM	5	E; 4GB DIMM	
	6	H; empty	6	H; empty	
Chnl 3	7	C; 4GB DIMM	7	C; 4GB DIMM	Chnl 3
	8	F;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

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

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

DDR3 memory options part number decoder

Memory



Following are memory options available from HP:

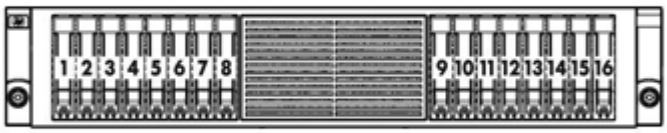
HP Memory	Registered DIMMs (RDIMMs)	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500658-B21
	HP 4GB (1x4GB) Quad Rank x8 PC3-8500 (DDR3-1066) Registered CAS-7 Low Power Memory Kit	500660-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604504-B21
	HP 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	500666-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500662-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit NOTE: Low Voltage DIMMs can only be used with Intel® Xeon® processor 5600 series processors.	604506-B21
	Unbuffered with ECC DIMMs (UDIMMs) NOTE: Maximum 12 DIMMs supported per node.	
	HP 1GB (1x1GB) Single Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500668-B21
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500670-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-10600 (DDR3-1333) Unbuffered CAS-9 Memory Kit	500672-B21

NOTE: 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.
NOTE: Kits described as LV include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient
NOTE: PC3L is a low voltage memory.
NOTE: There is a maximum support limitation of 8 ranks per memory channel (maximum of 2 quad rank DIMMs per channel)
NOTE: Memory Min and Max depends on number of processors and type of memory:
1 Processor -> R-Dimm: Min 1 // Max 8 U-Dimm: Min 1 // Max 6
2 Processors -> R-Dimm: Min 2 // Max 16 U-Dimm: Min 2 // Max 12

1-8 Eight 3.5" Hot-plug SAS/SATA hard drive bays



1-16 Sixteen 2.5" Hot-plug SAS/SATA hard drive bays



Drive Support

Removable Media

	Quantity Supported	Position Supported	Controller
DVD-ROM	Up to 2 per node	External	USB
DVD/CD RW	Up to 2 per node	External	USB

Hard Drives

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

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

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

	Quantity Supported	Position Supported	Controller
300GB 6G SAS 10K DP	16	1-16	HP Smart Array P212/Zero Memory Controller
146GB 6G SAS 15K DP			HP Smart Array P212/256 MB Controller
146GB 6G SAS 10K DP			HP Smart Array P410/256 MB Controller
72GB 6G SAS 15K DP			HP Smart Array P410/512 MB BBWC Controller

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

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K DP	Up to 8	1-8	HP Smart Array P212/Zero Memory Controller
450GB 6G SAS 15K DP			HP Smart Array P212/256 MB Controller
300GB 6G SAS 15K DP			HP Smart Array P410/256 MB Controller
			HP Smart Array P410/512 MB BBWC Controller

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

	Quantity Supported	Position Supported	Controller
500GB 6G SAS 7.2K	Up to 16	1-16	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

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

	Quantity Supported	Position Supported	Controller
2TB 6G SAS 7.2K 1TB 6G SAS 7.2K 750GB 3G SAS 7.2K	Up to 8	1-8	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

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

	Quantity Supported	Position Supported	Controller
500GB 3G SATA 7.2K 160GB 3G SATA 7.2K	16	1-16	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) 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

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

	Quantity Supported	Position Supported	Controller
2TB 3G SATA 7.2K 1TB 3G SATA 7.2K 500GB 3G SATA 7.2K	Up to 8	1-8	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) 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

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

	Quantity Supported	Position Supported	Controller

Storage

250GB 3G SATA 7.2K 160GB 3G SATA 7.2K	Up to 8	1-8	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) 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

SATA Hot Plug Midline (MDL) Solid State Drives

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA SSD 60GB 3.0G SATA SSD	16	1-16	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) 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

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

	Quantity Supported	Position Supported	Controller
120GB 3.0G SATA SSD 60GB 3.0G SATA SSD	Up to 8	1-8	Embedded HP Smart Array Hot Plug Advanced Pack for B110i (RAID 0, 1, 10) 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

External Storage

	Quantity Supported	Position Supported	Controller
60 Modular Smart Array	Up to 8	External	HP Smart Array P800/512 BBWC Controller HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller
	Up to 4	External	HP Smart Array P212/ 256 MB Controller
70 Modular Smart Array	Up to 4	External	HP Smart Array P800/512 BBWC Controller HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller
	Up to 2	External	HP Smart Array P212/ 256 MB Controller

Power Specifications

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

HP 750W Common Slot Gold Hot Plug Power Supply Kit							
Part Number	512327-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.9	7.4	4.3	4.1	3.9	3.7	3.6
Maximum Rated Input Wattage Rating (Watts)	857	847	824	824	820	820	820
Maximum Rated VA (Volt-Amp)	894	884	859	854	854	854	
Efficiency (%)	87.5	88.5	91	91	91.5	91.5	91.5
Power Factor	0.97						
Leakage Current (mA)	0.42	0.50	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30						
Maximum Inrush Current duration (mS)	20						
Maximum British Thermal Unit Rating (BTU-Hr)	2925	2892	2812	2812	2797	2797	2797

Power Specifications

HP 750W Common Slot Platinum Hot Plug Power Supply Kit							
Part Number	593831-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	750	750	750	750	750	750	750
Nominal Input Current (A rms)	8.6	7.1	4.2	4.0	3.8	3.6	3.4
Maximum Rated Input Wattage Rating (Watts)	841	828	809	808	807	806	805
Maximum Rated VA (Volt-Amp)	863	850	830	829	828	827	826
Efficiency (%)	89.2	90.6	92.7	92.8	93	93.1	93.2
Power Factor	0.985						
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)	2868	2825	2761	2757	2753	2749	2747

HP 1200W Common Slot Platinum Hot Plug Power Supply Kit							
Part Number	578322-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	800	900	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	9.3	8.6	6.7	6.5	6.1	5.8	5.6
Maximum Rated Input Wattage Rating (Watts)	889	989	1290	1290	1290	1290	1290
Maximum Rated VA (Volt-Amp)	927	1031	1345	1345	1345	1345	1345
Efficiency (%)	90	91	93	93	93	93	93
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)	10						
Maximum British Thermal Unit Rating (BTU-Hr)	3033	3375	4403	4403	4403	4403	4403

Power Specifications

HP 1200W Common Slot Silver Hot Plug Power Supply Kit							
Part Number	500172-B21						
Input Voltage Range (V rms)	100 to 240						
Frequency Range (Nominal) (Hz)	50/60						
Nominal Input Voltage (Vrms)	100	120	200	208	220	230	240
Maximum Rated Output Wattage Rating	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 (Watts)	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

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

To drill down to calculators:
- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: HP ProLiant DL1000 G6
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Power		
ProLiant DL170h G6 Fully Configured	115V/60Hz	220V/50Hz
Fully Loaded System Input Wattage (W)	651	638
Fully Loaded System Input Current (A rms)	5.7	3.0
Fully Loaded System Thermal (BTU- Hr)	2218	2174
Fully Loaded System VA (Volt-Amp)	657	657
System Leakage with all power supplies loaded (mA)	1.58	3.03
System Inrush Current with all power supplies loaded (A)	19	37
Power cord requirements	Nema 5-15P to IEC320-C13	IEC320-C13 to IEC320-C14
NOTE: Power shown is for a fully configured system consisting of (2) CPUs, (16) DIMMs, (2) HDDs, and (1) PCI card per node.		
Power Cord		AF556A

Server Power Cords

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

NOTE: ProLiant DL servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant DL server using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately.

NOTE: Japan BTO and CTO configurations get the 6' 4165151-291 power cord in addition. China BTO and CTO configurations get the 6' 416151-AA1 power cord in addition.

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

System Unit	**Dimensions** (H x W x D) (with bezel)	3.44 x 17.64 x 28.91 in (8.74 x 44.81 x 73.43 cm)	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	72.00 lb (32.7 kg)
		Minimum (one hard drive, power supply, and processor installed)	40.00 lb (18.2 kg)
	Input Requirements (per power supply)	Rated Line Voltage	90 to 140 VAC 180 to 264 VAC
		Rated Input Current	7.31A at 115VAC 3.6A at 230VAC
		Rated Input Frequency	47 to 63 Hz
		Rated Input Power	855W (at 100 VAC), 840.72W (at 200 VAC)
	Power Specifications	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 or www.hp.com/go/hppoweradvisor	
	Power Supply Output (per power supply)	Rated Steady-State Power	653.10W (at 100 VAC), 653.08W (at 200 VAC)
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	40° to 140° F (-40° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10% to 85% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.
		Non-operating	10% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3050 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
		Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (L_{WAd}) and declared	

		average bystander position A-Weighted sound pressure levels (L_{pAm}) 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
		L_{WAd} 7.3
		L_{pAm} 55dBA
		Operating
		L_{WAd} 7.3
		L_{pAm} 55dBA
	Emissions Classification (EMC)	FCC Rating: Class A
		Normative Standards: CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
		NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

HP Smart Array B110i SATA RAID Controller	Simultaneous drive transfer channels	4 channels
	Transfer rate synchronous (maximum theoretical)	1.5 Gb/s
	Data transfer method	Intel® ICH10R
	Drive support	Serial ATA
	Data transfer modes	Legacy Mode Combined Mode
	Protocol	Serial ATA
	Feature	NCQ (Native Command Queuing); AHCI (Advanced Host Controller Interface)
	RAID levels supported	0, 1, 10
	RAID Features	Supports multiple logical volumes Setup through ROM based Array Configuration Utility Installation scripting support NOTE: Hot-Plug functions require the purchase of the HP Smart Array Hot Plug Advance Pack for B110i.
	RAID OS Support	Microsoft Windows Server 2003 x32 and x64 Editions Microsoft Windows Server 2008 x32 and x64 Editions. Red Hat Enterprise Linux 4 (x86) Red Hat Enterprise Linux 5 (x86) Red Hat Enterprise Linux 5 (AMD64/EM64T) SUSE Linux Enterprise Server 10 (x86) SUSE Linux Enterprise Server 10 (AMD64/EM64T) SUSE Linux Enterprise Server 11 (x86) SUSE Linux Enterprise Server 11 (AMD64/EM64T)

Embedded NC362i PCIe Gigabit Server Adapter	Network Interface	Integrated 10/100/1000BASE-T Transceiver Combines a triple-speed IEEE 802.3TM - Compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver.
	Data Transfer Method	Compliant to x4 PCIe Specification
	Controller	Intel® 82576
	Network Transfer Rate	10Base-T (Half-Duplex) 10 Mb/s 10Base-T (Full-Duplex) 20 Mb/s 100Base-TX (Half-Duplex) 100 Mb/s 100Base-TX (Full-Duplex) 200 Mb/s 1000Base-TX (Half and Full-Duplex) 2000Mb/s
	Connector	RJ-45 connector
	Cable Support	Performs all the physical layer functions for 10BASE-T, 100BASE-T, and 1000BASE-T Ethemet on standard Category 5 UTP

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.