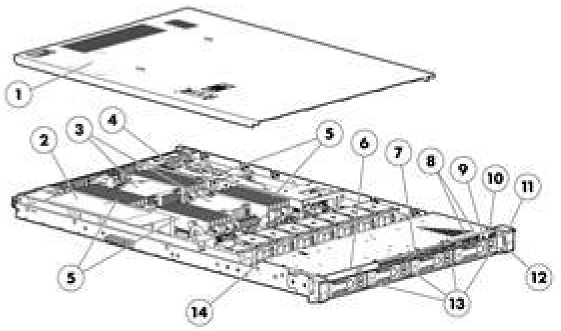
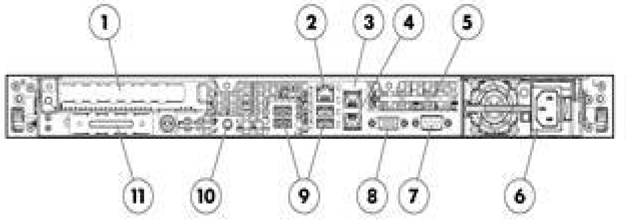
HP ProLiant DL160 Generation 8 (Gen8)

The HP ProLiant DL160 Gen8 is a dual-socket, high-performance, dense rack server with enhanced manageability and scalability suited for High Performance Computing (HPC) environments, web serving and other hyperscale environments.





Front View:

1. Access panel
2. Power supply (500 Watts multi-output - standard, common slot power supply factory installable options available)
3. Up to two Intel® Xeon® E5-2600 Series processors
4. FlexibleLOM slot
5. Up to 24 DIMM slots: DDR3 Registered (RDIMM), Load Reduced (LRDIMM) or Unbuffered (UDIMM) memory
6. Optical Disk Drive Bay
7. Serial label pull tab
8. (2) Front USB connectors
9. UID LED button
10. Power On/Standby button
11. Health LED
12. Aggregate network LED
13. Up to 4 LFF SAS/ SATA Hard drives
14. Up to seven Non hot plug redundant Fans

Rear View:

1. PCIe 3.0 I/O slot
2. Integrated Lights-Out Management Engine port
3. 1 GbE LAN port for NIC 1 (RJ-45)
4. 1 GbE LAN port for NIC 1 (RJ-45)
5. Torx tool
6. Power supply cable socket
7. Serial connector
8. Video connector
9. USB connectors
10. UID LED button
11. FlexibleLOM slot

What's New

- Support for 12G SAS High Endurance Hot Plug SFF (2.5-inch) Enterprise Performance and Enterprise Mainstream Solid State Drives

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	**Eight -Core Processors** Intel® Xeon® E5-2680 (2.7GHz/8-core/20MB/8GT-s QPI/130W, DDR3-1600, HT, Turbo2-4/4/5/5/5/7/8/8) Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/8GT-s QPI/115W, DDR3-1600, HT, Turbo2-4/4/5/5/6/6/7/7) Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/8GT-s QPI/115W, DDR3-1600, HT, Turbo2-4/4/5/5/6/6/7/7) Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/8GT-s QPI/95W, DDR3-1600, HT, Turbo2-5/5/6/6/7/7/8/8) Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/8GT-s QPI/95W, DDR3-1600, HT, Turbo2-4/4/5/5/5/7/8/8) Intel® Xeon® E5-2650L (1.8GHz/8-core/20MB/8.0 GT-s QPI/70W, DDR3-1600, HT, Turbo2-2/2/3/3/4/4/5/5) **Six-Core Processors** Intel® Xeon® E5-2667 (2.9GHz/6-core/15MB/8GT-s QPI/130W, DDR3-1600, HT, Turbo2- 3/3/3/4/5/6) Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) Intel® Xeon® E5-2630 (2.3GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/8.0GT-s QPI/60W, DDR3-1333, HT, Turbo2-3/3/4/4/5/5) Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) **Quad- Core Processors** Intel® Xeon® E5-2609 (2.4GHz/4-core/10MB/6.4GT-s QPI/80W) Intel® Xeon® E5-2603 (1.8GHz/4-core/10MB/6.4GT-s QPI/80W) **NOTE:** Up to 2 processors supported. **NOTE:** HT indicates that the processor model supports Intel® Hyper-Threading Technology. **NOTE:** Turbo 2 indicates the maximum potential bin increments when using Intel® Turbo Boost Technology, with 8,7,6,5,4,3,2 and 1 cores active DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed (options for 1600, 1333, 1066MHz). **NOTE:** For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version number.
Cache Memory One of the following depending on Model	20MB (1x20MB) Level 3 **NOTE:** For Eight-core processors. 15MB (1x15MB) Level 3 **NOTE:** For Six-core processors. 10MB (1x10MB) Level 3 **NOTE:** For Quad-core processors. 5MB (1x5MB) Level 3 **NOTE:** For Dual-core processors. **NOTE:** All processor models above list the L3 Cache associated with that particular processor.
Chipset	Intel® C600 Chipset Intel® E5-2600 processor Family

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

Upgradeability

Upgradeable to two processors (16 Cores)
Up to 24 DIMM slots available for higher Memory capacity
Up to 8 SFF Hard Drive Bays; Or 4 LFF Drive Bay
2 PCIe Generation 3 IO slots for additional communications and storage expansion
Optical Drive Bay

On System Management Chipset

HP iLO (Firmware: HP iLO 4)
NOTE: For more information, visit: http://www.hp.com/go/ilo.

Memory Protection

Advanced memory protection
Lockstep Mode

Memory
One of the following depending on Model

Type	HP SmartMemory PC3-10600R Registered DDR3 (1333MHz)
DIMM Slots Available	24 DIMM slots
Standard (Entry Models)	4 GB (1 x 4 GB) RDIMM
Standard (Base Models)	8 GB (2 x 4 GB) RDIMM
Standard (Performance / Energy Star Models)	16 GB (4 x 4 GB) RDIMM
Maximum (RDIMM)	384 GB (24 x 16 GB)
Maximum (LRDIMM)	768 GB (24 x 32 GB)
Maximum (UDIMM)	128 GB (16 x 8 GB)

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.
NOTE: If only one processor is installed, only 12 DIMM slots are available. When populating with two processors 24 DIMM slots are available. For maximum speed on some memory options on 16 DIMM slots may be populated.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz, 1333MHz, or 1066MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

Network Controller

HP 361i Integrated Dual Port Gigabit Server Adapter

Expansion Slots #	Technology	Bus Width	Connector Width*	Form Factor	Notes
1	PCIe 3.0	X16	x16	Half length, full height or Full length, full height	
2	PCIe 3.0	X8	x8	Low Profile	Internal only

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

NOTE: In order to access expansion slot #2 (the low profile internal only slot), expansion slot #1 may only be populated with a half length, full height form factor card. If full length card is installed on the slot #1, low profile internal only slot will be inaccessible.

Standard Features

HP Server ROM

HP ROM (Read Only Memory) is now digitally signed using HP's Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HP ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.
HP ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.
HP's ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (Integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration (using the HP ROM-Based Setup Utility (RBSU).

NOTE: For further information, please refer to HP's RBSU (ROM based setup utility) user guide: http://www.hp.com/support/rbsu.

Storage Controller
One of the following depending on Model

Entry Models	HP Dynamic Smart Array B120i controller
Base Models	HP Dynamic Smart Array B120i controller
Performance Models	HP Smart Array P420/1GB FBWC controller

NOTE: Available upgrades: 512MB FBWC for B120i, 2GB FBWC for P420 Controller/ 1GB FBWC controller
NOTE: HP Dynamic Smart Array B120i controller supports up to 3Gb/s speed in HP ProLiant DL160 Gen8. HP Smart Array controller is required in PCIe slot to achieve 6Gb/s.

Internal Storage Devices

Diskette Drives	Via USB only
Optical Drives	Optional SATA 9.5mm DVD-ROM Optical Drive
	Optional SATA 9.5mm DVD RW Optical Drive
Drive Bays One of the following depending on Model	Up to 4 Hot plug SAS/SATA 3.5" drives
	Up to 8 Hot plug SAS/SATA 2.5" drives

Maximum Internal Storage
One of the following depending on Model

Hot Plug LFF SATA	16.0TB	4 x 4TB
Hot Plug LFF SATA SSD	3.2TB	4 x 800GB
Hot Plug LFF SAS	16.0TB	4 x 4TB
Hot Plug SFF SATA	8.0TB	8 x 1TB
Hot Plug SFF SATA SSD	6.4TB	8 x 800GB
Hot Plug SFF SAS	9.6TB	8 x 1.2TB
Hot Plug SAS SSD	6.4TB	8 x 800GB
Non-Hot Plug LFF SATA	12.0TB	4 x 3TB
Non-Hot Plug LFF SAS	2.4TB	4 x 600GB

Interfaces

Network RJ-45(Ethernet)	2 NIC ports, 1 dedicated iLO port

Serial	1 (Rear)
Pointing Device (Mouse)	0 (via USB only)
Graphics	2 VGA ports(1 rear, 1 front)
Keyboard	0 (via USB only)
USB 2.0 Ports	7 (two front, one internal, four rear)

NOTE: In order to use internal USB port, the internal USB Cable Gen8 Kit (P/N: 662961-B21) is required. Please note that this is a Factory installable Only (FIO) option and cannot be bought standalone.
NOTE: Front Video Graphic Adapter Kit (PN 655915-B21) is required for enabling front VGA port.

Industry Standard Compliance

ACPI 2.0 Compliant
PCIe 3.0 Compliant
PXE Support
WOL Support
Microsoft® Logo certifications
IPMI 2.0, SMASH CLP, DCMI 1.0 compliant
USB 2.0 Support

Server Power Cords

One 6' Highline (IEC-IEC) power cord ships standard
NOTE: HP ProLiant DL servers no longer ship standard with a 12-foot NEMA 5-15P to C13 power cords that allow connection to 110V US wall outlets in a home or office. HP ProLiant DL servers are primarily connected to PDU's in data center racks and now ship standard with only a PDU 6-foot C-14 to C13 power cord (142258-001). If a user wishes to power a ProLiant DL server using a110V receptacle (NEMA-15), the 12-foot NEMA 5-15 to C13 power cord.
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.

Power Specifications

To review typical system power ratings, use the HP Power Advisor tool available at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor.

NOTE: Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html

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Common Slot Power Supplies

HP's Common Slot (CS) power supplies allow for commonality of power supplies across a wide range of ProLiant and Integrity servers, as well as HP Storage solutions, and are designed to provide the highest power supply efficiency without degrading system performance. HP CS power supplies are tested by the Electric Power Research Institute (EPRI) and certified through the ECOS 80 Plus power supply program. HP CS power supply options provide efficiency ratings of up to 94% and are available in three power output options - 460W, 750W and 1200W - allowing the customer to "right-size" a power supply for their specific server configuration. All HP Common Slot power sources are UL, CE Mark Compliant, hot-plug and support redundant configurations.

HP CS Platinum Plus power supplies are required when enabling HP's Intelligent Power Discovery (IPD) solution. IPD is the first technology to create an automated, energy-aware network between IT systems and facilities. This allows your company to reclaim millions of dollars in wasted power capacity and downtime costs across data centers. For more information on HP's IPD solution, go to www.hp.com/go/ipd.

NOTE: It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs. HP Power Advisor can be accessed at: www.hp.com/go/hppoweradvisor.

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. **NOTE:** Common Slot power supplies require a new power backplane kit (p/n: 662959-B21) for installation. The Common Slot power supply and power backplane kits must be factory installed - neither should be bought as a standalone option for HP ProLiant DL160 Gen8. **NOTE:** 10GbE FlexibleLOM mandatorily need common slot power supply and are not supported with 500W multi-output power supply. These FlexibleLOM options require Aux power connector that comes with the common slot power supply. Please see the options section for specific details. **NOTE:** Since DL160 Gen8 only has only one power supply slot, above mentioned power supplies will not be Hot Plug in case of DL160 Gen8. **NOTE:** Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html
System Fans One of the following depending on Model	5 non-hot plug redundant fans ship standard in 1P models 7 non-hot plug redundant fans ship standard in 2P models **NOTE:** The processor option kit contains two additional fan modules when upgrading from one processor to two processor models.
Required Cabling	For required cabling information, refer to the Web site at: www.hp.com/servers/dl160 Gen8
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Oracle Solaris Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) VMware **NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page http://www.hp.com/support/DL160cGen8.
Graphics	Integrated Matrox G200 video standard • 1280 x 1024 (32 bpp) • 1920 x 1200 (16 bpp) HP iLO 4 On System Management Memory • 16 MB Flash • 256 MB DDR 3 with ECC (112 MB after ECC and video)
Form Factor One of the following depending on Model	Rack (1U), (1.75 in/4.45 cm) 8 SFF Models 1.7" (43.2mm) Height x 17.1" (434.6mm) Width x 27.5" (699mm) Length 4 LFF Models 1.7" (43.18mm) Height x 17.11" (434.6mm) Width x 29.5" (750mm) Length
On System Management	**HP iLO Management** HP iLO Management Engine is a complete set of embedded management

Engine

features supporting the complete lifecycle of the server, from initial deployment, through ongoing management, to service alerting and remote support. HP iLO Management Engine comes standard on all HP ProLiant Gen8 Servers. HP iLO Management Engine portfolio includes:

- **HP iLO:** The HP iLO management processor is the core foundation for HP iLO Management Engine. HP iLO for HP ProLiant servers simplify server setup, engage health monitoring and power and thermal control, and promote remote administration for HP ProLiant ML, DL, BL and SL servers. Furthermore with the new HP iLO is the ability to access, deploy, and manage your server anytime from anywhere with your Smartphone device.
- **HP Agentless Management:** With HP iLO Management Engine in every HP ProLiant Gen8 server, the base hardware monitoring and alerting capability is built into the system (running on the HP iLO chipset) and starts working the moment that a power cord and an Ethernet cable is connected to the server.
- **HP Active Health System:** HP Active Health System is an essential component of the HP iLO Management Engine. It provides: Diagnostics tools/scanners wrapped into one; Always on, continuous monitoring for increased stability and shorter downtimes; Rich configuration history; Health and service alerts; Easy export and upload to Service and Support.
- **HP Active Health System:** HP Active Health System is an essential component of the HP iLO Management Engine. It provides customers with: Diagnostics tools/scanners wrapped into one; Always on, continuous monitoring for increased stability and shorter downtimes; Rich configuration history; Health and service alerts; Easy export and upload to Service and Support.
- **HP Intelligent Provisioning:** HP Intelligent Provisioning includes everything you need for painless system setup and deployment. All your HP Gen8 ProLiant servers and Gen8 ProLiant server blades are ready to set-up right out-of-the box. The firmware, drivers, and tools that you need to quickly get your systems online are embedded on a NAND flash chip on the server motherboard- no more SmartStart CDs or firmware DVDs needed. Intelligent Provisioning is agentless for improved performance, but you still have the ability to run agents if needed.
    - To start Intelligent Provisioning:
        - Press the F10 key during the ProLiant Gen8 server boot process (also known as power on self test or POST).
        - Please go to the Intelligent Provisioning website at www.hp.com/go/intelligentprovisioning for additional information and to view usage videos.
        - Use the Service Pack for ProLiant (SPP) at: http://www.hp.com/go/sppto get firmware and software updates.

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

HP Insight management software

HP Service Pack for ProLiant (SPP)

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

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

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

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

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 parts replacement is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
NOTE: Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ). Additional information regarding worldwide limited warranty and technical support is available at:
http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html.

Optional Features

HP Insight management software	HP Insight Control	HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, visit : www.hp.com/go/insightcontrol. HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight. **NOTE:** HP Insight Control 7.2 introduces Insight Control server provisioning, a new capability ideal for multi-server OS and firmware provisioning to ProLiant and BladeSystem servers. Insight Control server provisioning is included and licensed as part of HP Insight Control. A media kit, "HP Insight Control server provisioning USB media kit" (# BD883A), including a USB, is available for customers who require a physical copy of the media loaded with Insight Control server provisioning software. Please note that this media kit is separate and in addition to the "HP Insight Management DVD media kit" (#C6N31A).
	HP Matrix Operating Environment	The HP Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business. The HP Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HP CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS). **NOTE:** For more information, visit: http://www.hp.com/go/matrixoe
	HP iLO Scale-Out	The HP iLO Scale-Out license ideal for web/hosting/cloud service providers and High Performance Computing environments. This license is a specific subset of iLO Advanced functionality, provides fast remote access through Text Console via SSH, lower operational cost with Dynamic power capping, and faster time to resolution through Email-based Alerting and proactive notifications. With this newly designed HP iLO Scale-Out HPC customers now have a server management package solely design and priced for their massive data environments. HP iLO Scale-Out is available on all HP ProLiant Gen8 SL and BL and DL 160 servers. For more information, see: http://www.hp.com/go/iLO/scale-out
	HP iLO Advanced	HP Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HP ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: http://www.hp.com/go/iloadvanced
HP OneView	The HP OneView architecture combines server, storage, and networking with control of datacenter environmentals into a single, integrated management platform. Architected to deliver lifecycle management for the complete Converged Infrastructure, it facilitates collaboration, removes friction,	

Optional Features

collapses cycle times, eliminates error-prone work, and accelerates time to value. HP OneView v1.0 combines management of servers and virtual connect with open integration to automate and customize existing tools and processes. With OneView, you'll work smarter-with greater visibility and control-and fully capitalize on the benefits of a Converged Infrastructure.

For more information on HP OneView management, see: http://www.hp.com/go/oneview.

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 SUSE Linux Enterprise Server, 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 Insight Cluster Management Utility	HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of 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

Storage Software

Whether you need to solve a specific data protection, archiving, or storage command and control challenge, or deliver on strategic consolidation, compliance, or continuity initiatives, look no further than HP storage software. Our storage software helps you reduce costs, simplify storage infrastructure, protect vital assets and respond faster to business opportunities.

Storage software that gets the job done:

- **Data Protection and Recovery Software**
  Whether you're a large enterprise or a smaller business, HP data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.
- **Data Archive and Migration Software**
  HP's storage software enables you to comply with data retention and retrieval requirements, improve application performance, and reduce costs by efficiently migrating infrequently accessed or less valuable data to lower cost storage.
- **Storage Resource Management Software (SRM)**
  HP's storage resource management software reduces operational costs and provides the command and control foundation you need to efficiently manage and visualize your physical and virtual environments.
- **Data Replication Software**
  HP offers array-based and host-based replication software for use in disaster recovery, testing, application development and reporting.
- **Storage Device Management Software**
  Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.
- **HP StoreVirtual VSA**
  With HP StoreVirtual VSA you can use the power of virtualization to turn a set of heterogeneous and disconnected physical disk drives in your servers and storage devices into a single pool of logical storage capacity.

NOTE: For more information available Storage Software including QuickSpecs, please see: www.hp.com/go/storage/software.

Optional Features

HP Insight Online	HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime. www.hp.com/go/insightonline
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 Simple Configurator	SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support

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. Foundation Care services portfolio consists of scalable, reactive support services for HP industry-standard servers and software. If you are running business critical environments, HP offers Proactive Care. These services help deliver high levels of application availability through proactive service management and advanced technical response.

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 support recommendations - **Optimized Care, Standard Care, and Basic Care** - available for each product group. Such support solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support recommendations for servers, storage, networking and software.

All three service recommendations include support services from the broader portfolio of Foundation Care and Proactive Care services.

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.pdf

3-Year HP 24x7 4 hour Response, Proactive Care
Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you.

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat)) Installation and Start Up and Software Support plus Microsoft or Linux education courses +30 Proactive Select Credits, Factory Express.

Standard Care Package

Support recommendation 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.pdf

HP Foundation Care 24x7 Service
Provides problem resolution support across the stack of HW, firmware, and HP and 3rd party SW. In

case the issue is with 3rd party SW, HP does known issue resolution. If HP cannot solve the issue, it will contact the third-party vendor and create a problem incident on your behalf.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-8232ENW.pdf

Additional Services: Software support service with 24X7 availability with a 2 hour response, Training courses on Microsoft, Linux (Red Hat and SUSE), VMware, and HP Insight Software, +60 Proactive Select Credits, Factory Express.
http://www8.hp.com/us/en/business-services/it-ervices.html?compURI=1078865

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.pdf

3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service
Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged
http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat)) Installation and Start Up and Software Support, Factory Express.

Insight Remote Support

Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more
http://www.hp.com/go/insightremotesupport

HP Support Center

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc

HP's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.
HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

*HP' Support Center Mobile App is subject to local availability.

Warranty / Service Coverage

For ProLiant servers and storage systems, the services cover HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.
The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

Service and Support

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: All Pre-configured Models come populated with some hard drive blanks installed. Should the customer need additional hard drive blanks, they can order more using either P/N 666987-B21: HP SFF Gen8 Hard Drive Blank Kit or P/N 666986-B21: HP LFF Gen8 Hard Drive Blank Kit.
NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

Entry Model

HP ProLiant DL160 Gen8 E5-2603 1P 4GB-R SATA 4 LFF 500W PS Entry Server 662082-xx1	**Processor(s)**	(1) Intel® Xeon® E5-2603 (1.8GHz/4-core/10MB/6.4GT-s QPI/80W)
	Cache Memory	10MB (1 x 10MB) L3 cache
	Memory	4GB (1 x 4GB DDR3-1333MHz RDIMMs) **NOTE:** Total of 24 DIMM slots
	Network Controller	HP 361i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Dynamic Smart Array B120i controller **NOTE:** Provides data transmission speeds up to 3Gb/s.
	Hard Drive	None ship standard; includes 3 LFF hard drive blanks
	Internal Storage	Up to 4 large form factor drives
	Optical Drive	(1) (Optional: DVD-ROM, DVD-RW)
	Power Supply	500W Platinum FIO Power Supply with Backplane (ships standard)
	Fans	(5) Non hot plug redundant fans
	Management	HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control
	Form Factor	1U **NOTE:** Includes Rack Mounting Gen8 non-telescoping Friction Rail Kit which does not allow for in rack serviceability. The HP 1U Gen8 Cable Management Arm is not available when using Friction Rails. Caution: HP recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation
	Warranty	Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ)

Base Model

HP ProLiant DL160 Gen8 E5-2620 1P 8GB-R SATA 4 LFF 500W PS Base Server 662083-xx1	**Processor(s)**	(1) Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) processor
	Cache Memory	15MB (1 x 15MB) L3 cache
	Memory	8GB (2x4GB DDR3-1333MHz RDIMMs **NOTE:** Total of 24 DIMM slots
	Network Controller	HP 361i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Dynamic Smart Array B120i controller **NOTE:** Provides data transmission speeds up to 3Gb/s.
	Hard Drive	None ship standard; includes 3 LFF hard drive blanks
	Internal Storage	Up to 4 large form factor drives

	Optical Drive	(1) (Optional: DVD-ROM, DVD-RW)
	Power Supply	500W Platinum FIO Power Supply with Backplane (ships standard)
	Fans	(5) Non hot plug redundant fans
	Management	HP iLO Management Engine (standard)
		Optional:HP iLO Scale-Out or HP Insight Control
	Form Factor	1U **NOTE:** Includes Rack Mounting Gen8 non-telescoping Friction Rail Kit which does not allow for in rack serviceability. The HP 1U Gen8 Cable Management Arm is not available when using Friction Rails. Caution: HP recommends that a minimum of two people is required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation
	Warranty	Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ)

Energy Star- Performance Model

HP ProLiant DL160 Gen8 E5-2640 2P 16GB-R P420 Hot Plug 8 SFF 500W PS Perf Server 662084-xx1	**Processor(s)**	(2) Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) processor
	Cache Memory	15MB (1 x 15MB) L3 cache
	Memory	16GB (4x 4GB DDR3-1333MHz RDIMMs) **NOTE:** Total of 24 DIMM slots
	Network Controller	HP 361i Integrated Dual Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P420/ 1G FBWC controller
	Hard Drive	None ship standard; includes 7 SFF hard drive blanks
	Internal Storage	Up to 8 small form factor drives
	Optical Drive	(1) (Optional: DVD-ROM, DVD-RW)
	Power Supply	500W Platinum FIO Power Supply with Backplane (ships standard)
	Fans	(7) Non hot plug redundant fans
	Management	HP iLO Management Engine (standard)
		Optional: HP iLO Scale-Out or HP Insight Control
	Form Factor	1U **NOTE:** Includes Rack Mounting Gen8 non-telescoping Friction Rail Kit which does not allow for in rack serviceability. The HP 1U Gen8 Cable Management Arm is not available when using Friction Rails. Caution: HP recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation
	Warranty	Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ)

Country Code Key	xx=00	U.S.
	xx=29	Japan
	xx=37	APD
	xx=42	Euro
	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.
NOTE: Rail kits and cable management solutions are optional in CTO. See "Step 3: Choose Additional Factory Integratable Options" for details on ordering.
NOTE: The DL160 ships standard with the HP Dynamic Smart Array B120i Controller which provides support for up to 4 SATA drives (data transmission speeds up to 3Gb/s). Customers requiring more than 4 drives or SAS support are required to choose a HP Smart Array controller
NOTE: Power Supply not included - choose from Power Options section.
NOTE: All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server

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

HP Models	HP ProLiant DL160 Gen8 SFF Configure-to-order Server	666281-B21
	Factory Integrated Model ships with:	
	2 x HP Smart Socket Guides for fast processor installation HP 361i Integrated Dual Port Gigabit Server Adapter Drive cage: Eight small form factor I/O Slots- Two std (1) FH/FL x16 PCIe 3.0 or (1) FH/HL x16 PCIe3.0 and (1)low profile x8 PCIe 3.0 (1)FlexibleLOM slot for networking upgrade (24) DIMM slots for DIMMs installation HP Dynamic Smart Array B120i controller (5) Non-hot plug redundant fans (7) USB ports-4 rear, 2 front, 1 internal HP iLO Management Engine (standard) Rack (1U), (1.75 in / 4.45 cm) Power supply not included- Please choose from the power supply option section in Step 2 below.	
	HP ProLiant DL160 Gen8 LFF Configure-to-order Server	666282-B21
	Factory Integrated Model ships with:	
	2 x HP Smart Socket Guides for fast processor installation HP 361i Integrated Dual Port Gigabit Server Adapter Drive cage: Four large form factor I/O Slots- Two std (1) FH/FL x16 PCIe 3.0 or (1) FH/HL x16 PCIe3.0 and (1)low profile x8 PCIe 3.0 (1)FlexibleLOM slot for networking upgrade (24) DIMM slots for DIMMs installation HP Dynamic Smart Array B120i controller (5) Non-hot plug redundant fans (7) USB ports-4 rear, 2 front, 1 internal HP iLO Management Engine (standard) Rack (1U), (1.75 in / 4.45 cm) Power supply not included- Please choose from the power supply option section in Step 2 below.	
	HP ProLiant DL160 Gen8 Non-hot Plug LFF Configure-to-order Server	685622-B21
	Factory Integrated Model ships with:	
	2 x HP Smart Socket Guides for fast processor installation HP 361i Integrated Dual Port Gigabit Server Adapter Drive cage: Four large form factor	

I/O Slots- Two std
(1) FH/FL x16 PCIe 3.0 or (1) FH/HL x16 PCIe3.0 and (1)low profile x8 PCIe 3.0
(1)FlexibleLOM slot for networking upgrade
(24) DIMM slots for DIMMs installation
HP Dynamic Smart Array B120i controller
(5) Non-hot plug redundant fans
(7) USB ports-4 rear, 2 front, 1 internal
HP iLO Management Engine (standard)
Rack (1U), (1.75 in / 4.45 cm)
Power supply not included- Please choose from the power supply option section in Step 2 below.

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

HP Processors

NOTE: If 2 processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

Eight-Core Processors	
HP DL160 Gen8 Intel® Xeon® E5-2680 (2.7GHz/8-core/20MB/130W) FIO Processor Kit	662933-L21
HP DL160 Gen8 Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/115W) FIO Processor Kit	662932-L21
HP DL160 Gen8 Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/115W) FIO Processor Kit	662925-L21
HP DL160 Gen8 Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/95W) FIO Processor Kit	662924-L21
HP DL160 Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	662931-L21
HP DL160 Gen8 Intel® Xeon® E5-2650L (1.8GHz/8-core/20MB/70W) FIO Processor Kit	668863-L21
Six-Core Processors	
HP DL160 Gen8 Intel® Xeon® E5-2667 (2.9GHz/6-core/15MB/130W) FIO Processor Kit	662927-L21
HP DL160 Gen8 Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/95W) FIO Processor Kit	662930-L21
HP DL160 Gen8 Intel® Xeon® E5-2630 (2.3GHz/6-core/15MB/95W) FIO Processor Kit	662929-L21
HP DL160 Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) FIO Processor Kit	662928-L21
HP DL160 Gen8 Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/60W) FIO Processor Kit	662921-L21
Quad-Core Processors	
HP DL160 Gen8 Intel® Xeon® E5-2609 (2.4GHz/4-core/10MB/80W) FIO Processor Kit	662923-L21
HP DL160 Gen8 Intel® Xeon® E5-2603 (1.8GHz/4-core/10MB/80W) FIO Processor Kit	662922-L21

NOTE: Up to 2 processors supported. Energy Star - Performance Model and Energy Star Certified configurations include two processors with 7 Non-hot Plug Redundant fans. Not all options are energy star qualified.
NOTE: For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version number.

HP Memory

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.

Registered DIMMs (RDIMMs)

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647895-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647897-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647899-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	690802-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647901-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672631-B21

Unbuffered with ECC DIMMs (UDIMMs)

HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669322-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-B21

Load Reduction DIMMs (LRDIMMs)

HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647903-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: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at: www.hp.com/go/ddr3memory-configurator.

NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.

NOTE: For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: PC3L is a low voltage memory.

NOTE: Not all Intel E5 processor series support 1600MHz or 1333MHz speeds. Memory speed is a function of the processor QPI speed.

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:** HP ProLiant DL160 Gen8 has only one power supply slot, above mentioned power supplies will not be Hot Plug for DL160 Gen8.	
	HP 500W Platinum Factory Integrated Power Supply Kit with Backplane **NOTE:** Since this power supply is not common slot it does not allow iPDU to obtain HP Location Discovery Services information. iLO Advanced Pack is required for Discovery Services in DL160 Gen8.	656365-B21
	HP Common Slot Platinum Plus Power Supply Kits **NOTE:** The following Power Supplies offer 94% Efficiency with support for Intelligent Power Discovery. **NOTE:** Common slot power supplies need an enablement kit(P/N: 662959-B21) in DL160 Gen8.	
	HP 460W Common Slot Platinum Plus Hot Plug Power Supply Kit **NOTE:** Requires Power Backplane kit (p/n: 662959-B21).	656362-B21
	HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit **NOTE:** Requires Power Backplane kit (p/n: 662959-B21).	656363-B21
	HP Common Slot -48VDC Power Supplies	
	HP 750W Common Slot -48VDC Hot Plug Power Supply Kit **NOTE:** Requires Power Backplane kit (p/n: 662959-B21).	636673-B21
	NOTE: The HP 750W Common Slot -48VDC power supply does not ship with a power cable. It has been designed with a terminal block connection allowing for custom design of power cords by the user. **NOTE:** Option Kits for AC power supplies include the power supply and one PDU IEC cable. **NOTE:** HP ProLiant servers ship with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs). For a full list of optional HP power cords please go to www.hp.com/products/powercords	
	NOTE: Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html	
	Enablement Kit	
	HP DL160 Gen8 FIO Power Backplane Kit **NOTE:** When configuring the HP ProLiant DL160 Gen8 with a Common Slot power supply, the HP Power Backplane DL160 Gen8 FIO Kit (PN 662959-B21) must be used for proper installation. The Common Slot power supply and power backplane kit for the DL160 Gen8 must be factory installed and cannot be purchased as separate options.	662959-B21
	NOTE: Common Slot power supply is mandatory with 10Gigabit FlexibleLOM. **NOTE:** Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html	

Step 3: Choose Additional Factory Integratable Options

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
Converged Infrastructure Management Software	**HP OneView with iLO Advanced - Server hardware required on same purchase order**	
	HP OneView for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic	E5Y43A
	HP OneView incl 3yr 24x7 Supp Bundle 1 Svr E-LTU	E5Y43AAE

Configuration Information - Factory Integrated Models

HP Optical Drives	HP 9.5mm SATA DVD-ROM JackBlack Optical Drive	652238-B21
	HP 9.5mm SATA DVD-RW JackBlack Optical Drive	652241-B21
HP USB and SD Options	HP Gen8 FIO Internal USB Kit **NOTE:** Required to enable the internal USB port.	662961-B21
HP Rack Options	HP 1U FIO Friction Rail Kit **NOTE:** Includes Rack Mounting Gen8 non-telescoping Friction Rail Kit which does not allow for in rack serviceability. The HP 1U Gen8 Cable Management Arm is not available when using Friction Rails. Caution: HP recommends that a minimum of two people is required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation. **NOTE:** Additional Rack Options can be found in the "Additional Options" section of this QuickSpecs.	663200-B21

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional "Core Options" and "Additional Options", please refer to the "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 DL160 Gen8 VGA Power Cable Kit **NOTE:** Required with NVIDIA Quadro 4000 graphic card.	662965-B21
	HP DL360 Gen8 Front Video Adapter Kit **NOTE:** Required to enable the front video port.	655915-B21
HP Processors	**Eight-Core Processors**	
	HP DL160 Gen8 Intel® Xeon® E5-2680 (2.7GHz/8-core/20MB/130W) Processor Kit	662933-B21
	HP DL160 Gen8 Intel® Xeon® E5-2670 (2.6GHz/8-core/20MB/115W) Processor Kit	662932-B21
	HP DL160 Gen8 Intel® Xeon® E5-2665 (2.4GHz/8-core/20MB/115W) Processor Kit	662925-B21
	HP DL160 Gen8 Intel® Xeon® E5-2660 (2.2GHz/8-core/20MB/95W) Processor Kit	662924-B21
	HP DL160 Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) Processor Kit	662931-B21
	HP DL160 Gen8 Intel® Xeon® E5-2650L (1.8GHz/8-core/20MB/70W) Processor Kit	668863-B21
	Six-Core Processors	
	HP DL160 Gen8 Intel® Xeon® E5-2667 (2.9GHz/6-core/15MB/130W) Processor Kit	662927-B21
	HP DL160 Gen8 Intel® Xeon® E5-2640 (2.5GHz/6-core/15MB/95W) Processor Kit	662930-B21
	HP DL160 Gen8 Intel® Xeon® E5-2630 (2.3GHz/6-core/15MB/95W) Processor Kit	662929-B21
	HP DL160 Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) Processor Kit	662928-B21
	HP DL160 Gen8 Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/60W) Processor Kit	662921-B21
	Quad-Core Processors	
	HP DL160 Gen8 Intel® Xeon® E5-2609 (2.4GHz/4-core/10MB/80W) Processor Kit	662923-B21
	HP DL160 Gen8 Intel® Xeon® E5-2603 (1.8GHz/4-core/10MB/80W) Processor Kit	662922-B21
	NOTE: Up to 2 processors supported. Energy Star - High Performance Model and Energy Star Certified configurations include two processors with 7 non- Hot Plug Redundant fans. **NOTE:** For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version number.	
HP Memory	**NOTE:** HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html. **NOTE:** LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.	
	Registered DIMMs (RDIMMs)	
	HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647895-B21
	HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647897-B21
	HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647899-B21

Core Options

	HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	690802-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647901-B21
	HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672631-B21
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
	HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669322-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-B21
	Load Reduction DIMMs (LRDIMMs)	
	HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647903-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: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at: www.hp.com/go/ddr3memory-configurator.

NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.

NOTE: For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

NOTE: PC3L is a low voltage memory.

NOTE: Not all Intel E5 processor series support 1600MHz or 1333MHz speeds. Memory speed is a function of the processor QPI speed.

HP Optical Drives	HP 9.5mm SATA DVD-ROM JackBlack Optical Drive	652238-B21
	HP 9.5mm SATA DVD-RW JackBlack Optical Drive	652241-B21

HP Hard Drives

NOTE: HP ProLiant Gen8 Smart Storage solutions are equipped with entirely re-designed Small Form Factor (SFF 2.5 in) and Large Form Factor (LFF 3.5 in) hot plug carriers for HP Qualified Hard Drives and Solid State Drives. These new carriers provide status and activity indicators as well as caution indicators for "Do Not Remove".

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, 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.

Core Options

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

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	697574-B21
HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HP 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21

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

HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21

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

HP 600GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652620-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) SC Enterprise 3yr Warranty Hard Drive	652615-B21

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

HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	695510-B21
HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652766-B21
HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652757-B21
HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	652753-B21

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

6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) Drives

HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21

6G SATA Hot Plug with SmartDrive LFF (3.5-inch) Midline (MDL) Drives

HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	693687-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	628061-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658079-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	657750-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21

NOTE: Please see QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html
(Worldwide)

12G SAS High Endurance Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives

HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741159-B21
HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741155-B21
HP 200GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741151-B21

12G SAS Mainstream Endurance Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741146-B21
HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741142-B21
HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive **NOTE:** This drive supports Gen8 servers only.	741138-B21

6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21

6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Boot Solid State Drives

NOTE: These drives support Gen8 servers only.

HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734360-B21

6G SATA Value Endurance Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives

NOTE: These drives support Gen8 servers only.

HP 800GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718189-B21
HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718183-B21
HP 300GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	739890-B21
HP 600GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	739900-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718177-B21

6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21

6G SATA Value Endurance Hot Plug LFF (3.5-inch) Enterprise Boot Solid State Drives

NOTE: These drives support Gen8 servers only.

HP 1.6TB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	762272-B21
HP 800GB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	762270-B21
HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid	739898-B21

State Drive	
HP 300GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739888-B21
HP 80GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734362-B21
HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	718171-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
NOTE: These drives support Gen8 servers only.	
HP 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762263-B21
HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762261-B21
HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717973-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717971-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717969-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	717965-B21
6G SATA ME Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives	
HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691860-B21
HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691856-B21
HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691854-B21
HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691852-B21
6G SATA Non-hot Plug LFF (3.5-inch) Midline (MDL) Drives	
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	628065-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21
SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives	
HP 600GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516830-B21
HP 450GB 6G SAS 15K rpm LFF (3.5-inch) Non-hot Plug Dual Port Enterprise 3yr Warranty Hard Drive	516826-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)	

	Hard Drive Kits	
	HP SFF Gen8 Hard Drive Blank Kit	666987-B21
	HP LFF Gen8 Hard Drive Blank Kit	666986-B21
HP Networking	**Gigabit Ethernet Adapters**	
	HP NC112T PCI Express Gigabit Server Adapter	503746-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP Ethernet 1Gb 2-port 332T Adapter	615732-B21
	HP Ethernet 1Gb 4-port 331T Adapter	647594-B21
	HP Ethernet 1Gb 2-port 361T Adapter	652497-B21
	10 Gigabit Ethernet Adapters **NOTE:** No more than two10GbE I/O devices are supported in a single ProLiant server. **NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter. **NOTE:** Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately.	
	HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
	HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21
	HP Ethernet 10Gb 2-port 530SFP Adapter	652503-B21
	HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
	HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21
	HP Ethernet 10Gb 2-port 561T Adapter	716591-B21
	FlexibleLOM Adapters	
	HP Ethernet 1Gb 4-port 331FLR Adapter	629135-B21
	HP FlexFabric 10Gb 2-port 526FLR-SFP+ Adapter	629138-B21
	HP FlexFabric 10Gb 2-port 554FLR-SFP+ Adapter	629142-B21
	HP Ethernet 10Gb 2-port 530FLR-SFP+ Adapter	647581-B21
	HP Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
	HP Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-B21
	HP Ethernet 1Gb 4-port 331FLR FIO Adapter	684208-B21
	HP Ethernet 10Gb 2-port 530FLR-SFP+ FIO Adapter	684210-B21
	HP Ethernet 10Gb 2-port 561FLR-T Adapter	700699-B21
	HP FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
	HP FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
	NOTE: HP ProLiant DL160 Gen8 has a dedicated slot for FlexibleLOM. PCIe slots need not be consumed for installing FlexibleLOM. **NOTE:** Please note that common slot power supply is mandatorily required with 10Gb FlexibleLOM and 10Gb Ethernet adapters. Common slot power supplies are factory installable only and cannot be bought as standalone option kit in HP ProLiant DL160 Gen8. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs.	
HP Secure Encryption	HP Secure Encryption No Media E-LTU per Drive	D8S85AAE
	HP Secure Encryption No Media Flexible License per Drive	D8S84A
	NOTE: HP Secure Encryption is supported on the HP Smart Array P731m and the P230i as an option. HP Secure Encryption licensing is based on the number of physical drives requiring encryption.	

	NOTE: For more information about HP Secure Encryption, go to www.hp.com/go/hpsecureencryption.	
HP InfiniBand	HP InfiniBand 4X QDR ConnectX-2 PCIe G2 Dual Port HCA	592520-B21
	HP InfiniBand FDR 2-port 545QSFP Adapter	702211-B21
	HP Infiniband FDR/Ethernet 10Gb/40Gb 2-port 544QSFP Adapter	649281-B21
	HP Infiniband FDR/Ethernet 10Gb/40Gb 2-port 544FLR-QSFP Adapter	649282-B21
	HP Infiniband QDR/Ethernet 10Gb 2-port 544FLR-QSFP Adapter	649283-B21
	QLogic InfiniBand 4X QDR PCI-E G2 Dual Port HCA **NOTE:** Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html	583211-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:** Field upgrade is possible only from 460W Common Slot Power Supply to either of the below mentioned Common Slot Power Supplies. The 500W multi output power supplies are not field upgradable.	
	HP Common Slot Platinum Plus Power Supply Kits **NOTE:** The following AC Power Supplies offer 94% Efficiency with support for Intelligent Power Discovery.	
	HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
	HP Common Slot -48VDC Power Supplies **NOTE:** The following Power Supplies offer 92% Efficiency	
	HP 750W Common Slot -48VDC Hot Plug Power Supply Kit **NOTE:** The HP 750W Common Slot -48VDC power supply does not ship with a power cable. It has been designed with a terminal block connection allowing for custom design of power cords by the user. **NOTE:** Option Kits for AC power supplies include the power supply and one PDU IEC cable. **NOTE:** HP ProLiant servers ship with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs). For a full list of optional HP power cords please go to www.hp.com/products/powercords	636673-B21
	NOTE: Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html	
HP Graphics Options	HP DL160 Gen8 VGA Power Cable Kit **NOTE:** Required with NVIDIA Quadro 4000 graphic card.	662965-B21
	HP DL360 Gen8 Front Video Adapter Kit **NOTE:** Required to enable the front video port.	655915-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 Insight software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	C6N27A
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	C6N28ABE
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle FIO Electronic License	C6N36ABE
	HP Insight Control Server Provisioning Media Kit	BD883A
	HP Insight Management Media Kit	C6N31A
	NOTE: HP Insight Management Media Kit contains DVDs without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Matrix Operating Environment, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.	
	NOTE: HP Insight Control 7.2 introduces Insight Control server provisioning, a new capability ideal for multi-server OS and firmware provisioning to ProLiant and BladeSystem servers. Insight Control server provisioning is included and licensed as part of HP Insight Control. A media kit, "HP Insight Control server provisioning USB media kit" (# BD883A), including a USB, is available for customers who require a physical copy of the media loaded with Insight Control server provisioning software. Please note that this media kit is separate and in addition to the "HP Insight Management DVD media kit" (#C6N31A).	
	HP Integrated Lights-Out (iLO)	
	HP Integrated Lights-Out (iLO) Advanced for ProLiant	
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U59ABE
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE
	HP iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates	BD506AAE
HP iLO Advanced License	HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U64ABE
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	HP Integrated Lights-Out (iLO)	
	HP iLO Scale Out	
	HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License	BD776A
	HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License	BD778A
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD776AAE
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD778AAE
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License	BD777A

Additional Options

	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License **NOTE:** Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service. **NOTE:** For additional license kits, including electronic delivery options, please see the iLO QuickSpecs at http://www.hp.com/go/iLO	BD779A
Converged Infrastructure Management Software	**HP OneView**	
	HP OneView with iLO Advanced	
	HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y34A
	HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU	E5Y35AAE
	HP OneView Media Kit Phys No Lic	E5Y37A
	HP OneView without iLO Advanced	
	HP OneView w/o iLO Adv incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y38A
	HP OneView w/o iLO Adv inc 3yr 24x7 Supp Flex Qty E-LTU	E5Y39AAE
	NOTE: For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/14621_div/14621_div.html.	
HP High Performance Clusters	**HP Cluster Management Utility**	
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	HP Insight Cluster Management Utility for ConvergedSystem 3yr 24x7 Flexible License	G2E81A
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License **NOTE:** These part numbers can be used to purchase one certificate for multiple licenses and support 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. Customer also will receive a support agreement.	BD476A
	HP Insight Cluster Management Utility 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	BD477A
HP I/O Accelerator Options	**Second Generation Accelerators**	
	HP 365GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673642-B21
	HP 785GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673644-B21
	HP 1205GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673646-B21
	HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo for ProLiant Servers	673648-B21
	HP 3TB G2 FH/HL PCIe ioDrive2 IO Accelerator for ProLiant Servers	721458-B21
	NOTE: When the Full length Graphic card is installed in the system, no additional PCIe slots is available and only embedded storage controller B120i is available for up to 4 SATA HDDs configuration	
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/13587_div/13587_div.html (Worldwide)	

Additional Options

HP PCIe Workload Accelerator Options	**Mainstream Endurance (ME) PCIe Workload Accelerators**	
	HP 1.4TB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729307-B21
	HP 700GB HH/HL Mainstream Endurance (ME) PCIe Workload Accelerator	729305-B21
	High Endurance (HE) PCIe Workload Accelerators	
	HP 700GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708090-B21
	HP 350GB HH/HL High Endurance (HE) PCIe Workload Accelerator	708088-B21
	Value Endurance (VE) PCIe Workload Accelerators	
	HP 6.4TB FH/HL Value Endurance (VE) PCIe Workload Accelerator	763840-B21
	HP 3.2TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763838-B21
	HP 1.6TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763836-B21
	HP 1.3TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763834-B21
	Light Endurance (LE) PCIe Workload Accelerators	
	HP 5.2TB FH/HL Light Endurance (LE) PCIe Workload Accelerator	775672-B21
	HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775670-B21
	HP 1.3TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775668-B21
	HP 1.0TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775666-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/14528_div/14528_div.html (Worldwide)	
HP Security	HP Trusted Platform Module Option	488069-B21
	NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: www.hp.com/go/TPM.	
	NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.	
	NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	
	HP 1U Security Gen8 Bezel Kit	664918-B21
HP Storage Controllers	**NOTE:** Embedded HP B120i Dynamic Smart Array controller supports only up to 4 SATA drives. For SAS support and more than 4 drives support (in 8SFF models), a HP Smart Array controller is required.	
	SAS Controllers	
	Smart Array P222 Controller	
	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller **NOTE:** Mini SAS 700mm cable (PN 662963-B21) required with this controller.	631667-B21
	NOTE: HP Smart Array P222 controller can only be installed in the external PCI-e slot.	
	NOTE: HP Smart Array P222 controller is supported on LFF models only.	

Additional Options

HP Smart Array P420 Controller	
HP Smart Array P420/2GB FBWC 6Gb 2-ports Int SAS Controller	631671-B21
HP Smart Array P420/1GB FBWC 6Gb 2-ports Int SAS Controller	631670-B21
NOTE: HP Smart Array P420 controller can only be installed in the internal PCI-e slot. It is not supported on external PCI-e slot.	
HP Smart Array P421 Controller	
HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller	631674-B21
HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller	631673-B21
HP Smart Array P822 Controller	
HP Smart Array P822/2GB FBWC 6Gb 2-ports-Int/4-ports Ext SAS Controller	615418-B21
NOTE: Requires two cable kits (P/N: 676895-B21 and P/N: 662963-B21) with 8SFF models.	
Optional upgrades	
HP 1GB P-series Smart Array Flash Backed Write Cache	631679-B21
HP 2GB P-series Smart Array Flash Backed Write Cache	631681-B21
HP SmartCache No Media 24x7 Technical Support 1 Svr License	D7S26A
HP SmartCache No Media 24x7 Technical Support Flexible License	D7S27A
HP SmartCache No Media 24x7 Technical Support Electronic License	D7S27AAE
HP 512MB B-series 36 inch Dynamic Smart Array Flash Backed Write Cache for ML/DL **NOTE:** This upgrade is for HP Dynamic Smart Array B120i controller. It is required for implementing RAID 5.	631922-B21
HP Mini SAS 800mm Gen8 Cable Kit **NOTE:** This cable option kit is required with HP Smart Array P822/ 2GB FBWC controller.	676895-B21
HP Mini SAS 700mm Gen8 Cable Kit **NOTE:** This cable option kit is required with HP Smart Array P822/ 2GB FBWC controller, HP Smart Array P222/512 FBWC controller and H222 Host bus adapter.	662963-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14227_div/14227_div.html (Smart Array P222 Controller) http://h18000.www1.hp.com/products/quickspecs/14228_div/14228_div.html (Smart Array P420 Controller) http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html (Smart Array P421 Controller) http://h18000.www1.hp.com/products/quickspecs/14337_div/14337_div.html (Smart Array P822 Controller)	
HP Smart Array Advanced Pack	
http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html (SAAP)	
Host Bus Adapter	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
NOTE: Supports SCSI Tapes only, no RAID support. **NOTE:** HBA is recommended for SCSI tape drive support.	
HP H220 Host Bus Adapter	650933-B21
HP H221 PCIe 3.0 SAS Host Bus Adapter	729552-B21
HP H222 Host Bus Adapter **NOTE:** Mini SAS 700mm cable (PN 662963-B21) required with this controller **NOTE:** HP H222 Host Bus Adapter is supported on LFF models only.	650926-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18004.www1.hp.com/products/quickspecs/12566_div/12566_div.html (SC11Xe HBA)
http://h18004.www1.hp.com/products/quickspecs/14336_div/14336_div.html (HBA 220)
http://h18004.www1.hp.com/products/quickspecs/14222_div/14222_div.html (HBA 221)
http://h18004.www1.hp.com/products/quickspecs/14337_div/14337_div.html (HBA 222)

HP Tape Backup

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

NOTE: For Internal drives to be connected to DL servers please make sure that you order rack mount kit as well.

HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit	C0L99A
HP StoreEver LTO-6 Ultrium 6650 SAS Internal Tape Drive	EH963A
HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive	EH964A
HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive	EH969A
HP StoreEver LTO-6 Ultrium 6250 External Tape Drive	EH970A
HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader	C0H19A

HP Tape Storage Systems

HP StoreEver MSL6480

HP StoreEver MSL6480 Scalable Base Module	QU625A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14604_div/14604_div.html (Worldwide)

HP Disk Backup

NOTE: For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk backup products see: http://www.hp.com/storage/SPOCK.

HP RDX Removable Disk Backup System

HP RDX320 USB3.0 External Disk Backup System	B7B63A
HP RDX500 USB3.0 Internal Disk Backup System	B7B64A
HP RDX500 USB3.0 External Disk Backup System	B7B66A
HP RDX1000 USB3.0 Internal Disk Backup System	B7B67A
HP RDX1000 USB3.0 External Disk Backup System	B7B69A
HP RDX 2TB USB3.0 Internal Disk Backup System	E7X52A
HP RDX 2TB USB3.0 External Disk Backup System	E7X53A

NOTE: Please see the QuickSpecs for additional part numbers, Technical Specifications, and additional information:
http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html (Worldwide)

Additional Options

HP Disk Storage Systems

Disk Enclosures

HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle	E7W32A

NOTE: Please see the QuickSpecs for additional part numbers, Technical Specifications, and additional information: http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)

HP D6000 w/70 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 280TB Bundle	E7W31A
HP D6000 w/35 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 140TB Bundle	E7W30A
HP D6000 w/70 3TB 6G SAS 7.2K LFF Dual port MDL HDD 210TB Bundle	QQ700A
HP D6000 w/35 3TB 6G SAS 7.2K LFF Dual port MDL HDD 105TB Bundle	QQ699A
HP D6000 w/70 2TB 6G SAS 7.2K LFF Dual port MDL HDD 140TB Bundle	QQ698A
HP D6000 w/35 2TB 6G SAS 7.2K LFF Dual port MDL HDD 70TB Bundle	QQ697A
HP D6000 Dual I/O Module Disk Enclosure	QQ695A

NOTE: Please see the QuickSpecs for additional part numbers, Technical Specifications, and additional information: http://h18000.www1.hp.com/products/quickspecs/14419_div/14419_div.html (Worldwide)

HP Storage Options

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 81B 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AP769B
HP 82B 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AP770B

Emulex Fibre Channel HBAs

HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AJ762B
HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ763B
HP StoreFabric SN1100E 16Gb Single Port Fibre Channel Host Bus Adapter	C8R38A
HP StoreFabric SN1100E 16Gb Dual Port Fibre Channel Host Bus Adapter	C8R39A

QLogic Fibre Channel HBAs

HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter	AK344A
HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter	AJ764A
HP StoreFabric SN1000Q 16GB 1-port PCIe Fibre Channel Host Bus Adapter	QW971A
HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter	QW972A

Converged Network Adapter

HP CN1100E Dual Port Converged Network Adapter	BK835A
HP StoreFabric CN1100R Dual Port Converged Network Adapter	QW990A

HP Uninterruptible Power Systems

HP Rack-mountable UPS

HP R1500 G3 Uninterruptible Power Supply (UPS)

HP R1.5kVA G3 1U INTL Uninterruptible Power System	AF471A
HP R1.5kVA G3 1U JP/TW Uninterruptible Power System	AF470A
HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html

(Worldwide)

HP R/T3000 G2 Uninterruptible Power System (UPS)

HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System	AF468A
HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html (Worldwide)

R5000 Uninterruptible Power System (UPS)

HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A
HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html (Worldwide)

R7000 Uninterruptible Power System (UPS)

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System	AF463A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html (Worldwide)

NOTE: For additional information on HP Uninterruptable Power Systems please go to: www.hp.com/servers/rackups.
NOTE: For additional information on sizing your server, please reference: http://www.upssizer.com

NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.

HP Remote Monitoring Power Distribution Units (mPDU)

HP Remote Monitored Power Distribution Unit: 1U Version

HP 2.8kVA 120 Volt L5-30 Input (12xNEMA 5-20R)NA/JP Monitored PDU	D9N43A
HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Monitored PDU	D9N46A
HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU	D9N44A

HP Remote Monitored Power Distribution Unit: Half Height Version

HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU	D9N45A

HP Remote Monitored Power Distribution Unit: Mid Height Version

HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU	D9N47A
HP 7.3kVA 230 Volt IEC309 32A Input (20xC13/4xC19) INTL Monitored PDU	D9N48A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU	D9N51A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU	D9N52A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU	D9N53A
HP 11kVA 400 Volt IEC309 16A 3-Phase Input (18xC13/3xC19) INTL Monitored PDU	D9N55A

HP Remote Monitored Power Distribution Unit: Full Height Version

	HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU	D9N49A
	HP 7.3kVA 230 Volt IEC309 32A Input (32xC13/4xC19) INTL Monitored PDU	D9N50A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N57A
	HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU	D9N58A
	HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU	D9N61A
	HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU	D9N62A
	HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU	D9N54A
	HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU	D9N59A
	HP 17.3kVA 208 Volt IEC309 60A 3-Phase Watertight Input (12xC13/12xC19) NA/JP Monitored PDU	G9Z07A
	HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU	D9N63A
	HP 22kVA 400 Volt IEC309 32A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N56A
	HP 22kVA 400 Volt IEC309 32A 3-Phase Input (12xC13/12xC19) INTL Monitored PDU	D9N60A
	HP 22kVA 400 Volt IEC309 32A 3-Phase Watertight Input (12xC13/12xC19) INTL Monitored PDU	G9Z08A
	HP Environmental Sensor for Remote Monitored PDUs	
	HP Environmental Sensor for Remote Monitored PDUs	E2D53A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14669_div/14669_div.html (Worldwide)	
HP Intelligent Power Distribution Units (iPDU)	**iPDU Core Units**	
	HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
	HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF521A
	HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
	HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF523A
	HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit	AF525A
	HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF526A
	HP 22kVA 32A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF527A
	HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit	AF533A
	PDU Kits with Standard Extension Bars	
	HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit	AF531A
	HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit	AF532A
	HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit	AF534A
	HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF535A
	HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF537A
	HP 22kVA 32A 400V Three Phase 12 Outlet Core INTL Intelligent Power Distribution Unit	AF538A
	HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
	iPDU Extension Bars	
	HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
	HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A

Additional Options

HP Basic Power Distribution Units	HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU	H5M54A
	HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU	H5M55A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Basic PDU	H5M56A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU	H5M57A
	HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU	H5M58A
	HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU	H5M59A
	HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU	H5M60A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU	H5M61A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU	H5M62A
	HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU	H5M63A
	HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU	H5M64A
	HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU	H5M67A
	HP 7.3kVA 230 Volt IEC309 32A Input (20xC13) INTL Basic PDU	H5M68A
	HP 7.3kVA 230 Volt IEC309 32A Input (24xC13/6xC19) INTL Basic PDU	H5M70A
	HP 11kVA 230 Volt IEC309 63A Input (30xC13/6xC19) INTL Basic PDU	H5M71A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/6xC19) INTL Basic PDU	H5M72A
	HP 11kVA 400 Volt IEC309 16A 3-Phase Input (36xC13/6xC19) INTL Basic PDU	H5M73A
	HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU	H5M75A
	HP 13.2kVA 480 Volt IEC309 30A 3-Phase Input (15 Outlet) NA Basic PDU	H3X07A
	HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU	H3X08A
	HP 277 Volt options for H3X07A and H3X08A	
	HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer	H3X09A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14557_div/14557_div.html
(Worldwide)
NOTE: Additional HP Power Distribution Units are available. For a complete list of all HP PDUs and additional information please visit: www.hp.com/go/rackandpower.

HP Rack Series	**Rack Intelligent Series rack**	
	HP 636 1075mm Pallet Intelligent Series Rack	BW895A
	HP 636 1075mm Shock Intelligent Series Rack	BW896A
	HP 642 1075mm Pallet Intelligent Series Rack	BW903A
	HP 642 1075mm Shock Intelligent Series Rack	BW904A
	HP 647 1075mm Pallet Intelligent Series Rack	BW911A
	HP 647 1075mm Shock Intelligent Series Rack	BW912A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14223_div/14223_div.html
(Worldwide)

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

5,350 sq cm (830 square inches) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches).
CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.
NOTE: High Airflow Inserts (High Air Flow Rack Door Insert for the 7142 Rack (single) - PN: 327281-B21; or High Air Flow Rack Door Insert for the 7142 Rack (6-pack) - PN: 327281-B22) are required to support the HP ProLiant DL160 in 7000 series racks. Cable Management Arm is not supported on 7000 series racks.
NOTE: Cable management arm must be removed to access power supplies when the cable management arm is mounted on the right.

HP Rack Options

HP Location Discovery Services

HP 36U Location Discovery Kit	BW945A
HP 42U Location Discovery Kit	BW946A
HP 47U Location Discovery Kit	BW947A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14429_div/14429_div.html (Worldwide)

HP USB Keyboard and Mouse

HP USB BFR with PVC Free US Keyboard/Mouse Kit	631341-B21
HP USB BFR with PVC Free UK Keyboard/Mouse Kit	631344-B21
HP USB BFR with PVC Free FR Keyboard/Mouse Kit	631346-B21
HP USB BFR with PVC Free ES Keyboard/Mouse Kit	631348-B21
HP USB BFR with PVC Free DE Keyboard/Mouse Kit	631358-B21
HP USB BFR with PVC Free JP Keyboard/Mouse Kit	631360-B21
HP USB BFR with PVC Free IT Keyboard/Mouse Kit	631362-B21
HP USB BFR with PVC Free CN Keyboard/Mouse Kit	631364-B21
HP USB BFR with PVC Free AE Keyboard/Mouse Kit	638212-B21
HP USB BFR with PVC Free RU Keyboard/Mouse Kit	638214-B21
HP USB BFR with PVC Free IN Keyboard/Mouse Kit	672097-D63
HP USB BFR with PVC Free AP-Intl Keyboard/Mouse Kit	672097-373
HP USB BFR with PVC Free Intl Keyboard/Mouse Kit	672097-B33
HP USB BFR with PVC Free PT Keyboard/Mouse Kit	672097-133
HP USB BFR with PVC Free TR Keyboard/Mouse Kit	672097-143
HP USB BFR with PVC Free CZ Keyboard/Mouse Kit	672097-223
HP USB BFR with PVC Free FI Keyboard/Mouse Kit	672097-353
HP USB BFR with PVC Free SE Keyboard/Mouse Kit	672097-103
HP USB BFR with PVC Free CH Keyboard/Mouse Kit	672097-113
HP USB BFR with PVC Free KR Keyboard/Mouse Kit	672097-KD3

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

Additional Options

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

HP TFT7600 G2 KVM Console Rackmount Keyboard Monitor

HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
HP TFT7600 G2 KVM Console Rackmount Keyboard UK Monitor	AZ871A
HP TFT7600 G2 KVM Console Rackmount Keyboard DE Monitor	AZ872A
HP TFT7600 G2 KVM Console Rackmount Keyboard FR Monitor	AZ873A
HP TFT7600 G2 KVM Console Rackmount Keyboard IT Monitor	AZ874A
HP TFT7600 G2 KVM Console Rackmount Keyboard ES Monitor	AZ875A
HP TFT7600 G2 KVM Console Rackmount Keyboard DK Monitor	AZ876A
HP TFT7600 G2 KVM Console Rackmount Keyboard NO Monitor	AZ877A
HP TFT7600 G2 KVM Console Rackmount Keyboard SE/FI Monitor	AZ878A
HP TFT7600 G2 KVM Console Rackmount Keyboard CH Monitor	AZ879A
HP TFT7600 G2 KVM Console Rackmount Keyboard PT Monitor	AZ880A
HP TFT7600 G2 KVM Console Rackmount Keyboard BE Monitor	AZ881A
HP TFT7600 G2 KVM Console Rackmount Keyboard JP Monitor	AZ882A
HP TFT7600 G2 KVM Console Rackmount Keyboard RU Monitor	AZ883A
HP TFT7600 G2 KVM Console Rackmount Keyboard Intl Monitor	AZ884A
HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor	AZ885A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13731_div/13731_div.html (Worldwide)

HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A
HP TAA 0x2x16xKVM Server Console G2 Switch	AF626A
HP KVM Console USB Interface Adapter	AF628A

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

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
HP KVM Console USB 2.0 Virtual Media CAC Interface Adapter	AF629A
HP KVM CAT5 1-pack USB Interface Adapter	336047-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html (Worldwide)

HP 1x4 USB/PS2 KVM Console Switch

HP 1x4 USB/PS2 KVM Console Switch	AF611A
HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A

Additional Options

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html (Worldwide)

	Rack Kits	
	HP Rack Cable Management Velcro Clips	379820-B21
	HP 1U Small Form Factor Ball Bearing Gen8 Rail Kit **NOTE:** For SFF models.	663201-B21
	HP 1U Cable Management Arm for Ball Bearing Gen8 Rail Kit	663203-B21
	HP 1U Large Form Factor Ball Bearing Gen8 Rail Kit **NOTE:** For LFF models.	663202-B21
	NOTE: For additional information regarding Rack Cabinets and Telco Rack support, please see the following URL: www.hp.com/go/rackandpower.	
HP Flash Media Kits for USB Drives	**HP Enterprise Mainstream Flash Media Kits for Memory Cards**	
	HP 8GB SD Enterprise Mainstream Flash Media Kit	726113-B21
	HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit	737953-B21
	HP 32GB SD Enterprise Mainstream Flash Media Kit	700136-B21
HP Care Pack Services	**Proactive Care** - Collaborative Support plus Proactive services delivered by the on shore/near shore Advanced Solution Center (ASC) and backed by the global delivery organization, end-to-end case ownership from a Technical Solution Specialists and Technical Account Manager who remotely delivers firmware/software revision management, proactive scans and incident trend reports. Recommended for customers running a virtualized infrastructure and/or customers who desire an enhanced call support experience.	
	HP 3 year Next business day ProLiant DL16x Proactive Care Service	U3A12E
	Proactive Care Personalized Support Environmental Option - to add an onsite Account Support Manager (ASM) to Proactive Care. ASM is an assigned resource who delivers support planning and brings technical expertise and best practices advice for the customer's environment.	
	HP 3 year ISS ProactiveCare Personalized Support	U6W98E
	HP 3 year 6 hour Call To Repair 24x7 withDefective Media Retention ProLiant DL16x Proactive Care SVC	U3A25E
	HP 3 year 4 hour 24x7 ProLiant DL16x Proactive Care Service	U3A18E
	HP 3 year Next business day with Defective Media Retention ProLiant DL16x Proactive Care Service	U3A15E
	HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL16x Proactive Care Service	U3A21E
	HP 3 year 6 hour Call To Repair 24x7 ProLiant DL16x Proactive Care Service	U3A24E
	HP 3 year Next business day ProLiant DL16x Collaborative Support	U1J92E
	HP 3 year 4 hour 24x7 ProLiant DL16x Collaborative Support	U1J98E
	HP 3 year Next business day with Defective Media Retention ProLiant DL16x Collaborative Support	U1J95E
	HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL16x Collaborative Support	U1K01E
	HP 3 year 6 hour Call To Repair 24x7 ProLiant DL16x Collaborative Support	U1K04E
	HP 3 year 6hr Call To Repair 24x7 withDefective Media Retention ProLiant DL16x Collaborative Support	U1K05E

Additional Options

HP 3 year 6 hour 24x7 Call to Repair with Defective Media Retention BL6xxc Server Blade HW Support	UK121E
UH745E - reduce the time required to get your system up and running and help minimize disruptions to your business.	
HP Install ProLiant DL14x and DL16x Service	U9520E
HP Installation of ProLiant Add On/In Options Service	UH745E

Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc

Memory

HP SmartMemory

New HP SmartMemory now provides additional protection for your servers. With HP Authentication it can verify that you have true HP Qualified Memory in your HP ProLiant Gen8 server. With HP SmartMemory your new HP ProLiant server can take advantage of additional Gen8 enhancements in performance, durability and future manageability support through HP Active Health System.

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:
www.hp.com/go/ddr3memory-configurator

HP ProLiant DL160 Gen8
NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

Standard Memory
4GB (1x4GB) , 8GB (2 x 4GB) or 16GB(4 x 4GB) depending on model, DDR3-1333MHz Registered RDIMM memory

Maximum Memory
Up to 768GB
NOTE: Charts do not represent all possible memory configurations.
DDR3 memory population guidelines

NOTE: 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 twenty-four (24) memory slots:
    - There are four (4) channels per processor; eight (8) channels per server
    - There are three (3) DIMM slots for each memory channel; twenty-four (24) total slots
- White DIMM slots denote the first slot of a channel. For 1 DPC (DIMM per channel) populate white slots only.
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- When two processors are installed, balance the DIMMs across the two processors.
- To maximize performance, balance the total memory capacity between all installed processors
    - 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 processor
- Do not mix UDIMMs, RDIMMs or LRDIMMs
- LR DIMMs are supported up to 3 DIMMs per channel.
- DIMMs of different voltages (1.35V & 1.5V) may be mixed in any order
- The system will power them at the higher voltage
- DIMMs of different speed grades may be mixed in any order
    - The system will select a common optimal speed
- To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html (Worldwide)

DIMM slot/capacity/populated speed table					
DIMM Type	**Registered DIMMS (RDIMMs)**		**Load Reduced (LRDIMMs)**	**Unbuffered with ECC DIMMs (UDIMMs)**	
DIMM Rank	**Single Rank (1R)**	**Dual Rank (2R)**	**Quad Rank (4R)**	**Single Rank**	**Dual Rank (2R)**

Memory

								(1R)					
DIMM Capacity	4GB	4GB	8GB	8GB	8GB	16GB	16GB	32GB	2GB	2GB	4GB	4GB	8GB	8GB
DIMM Native Speed (MHz)	1333	1600	1600	1333	1600	1333	1600	1333	1600	1333	1600	1333	1333	1600
	LV	Std	Std	LV	Std	LV	Std	LV	Std	LV	Std	LV	LV	Std
SLOTS THAT CAN BE POPULATED														
24 slot servers	24	24	24	24	24	24	24	24	16	16	16	16	16	16
MAXIMUM CAPACITY (GB)*														
	96	96	192	192	192	384	384	768	32	32	64	64	128	128
POPULATED DIMM SPEED (MHz)														
1 DIMM Per Channel	1333	1600	1600	1333	1600	1333	1600	1333***	1600	1333	1600	1333	1333	1600
2 DIMM Per Channel	1333	1600	1600	1333	1600	1333	1600	1333***	1600	1333****	1600	1333****	1333****	1600
3 DIMM Per Channel	1066**	1333##	1333##	1066**	1333##	1066**	1333##	1066	n/a	n/a	n/a	n/a	n/a	n/a

NOTES:

Memory speed is a function of the processor QPI bus speed.
* Maximum capacity will vary based on individual server platform qualification schedule
** For HP SmartMemory, RDIMM support 3DPC@1066 at 1.35V. Third party memory may only support up to 3DPC@1066 at 1.5V.
*** LRDIMM enables 3 DIMMs per channel. HP SmartMemory will support up to 3DPC@1066 at 1.35V. Third party memory may only support 3DPC @1066 at 1.5V.
**** For HP SmartMemory, UDIMM is supported at 2DPC@1333. Third party memory may only support up to 2DPC@1066
RBSU setting required

Memory Speed by Processor Model

Processor Models	Supported Memory Speeds
E5-2680, E5-2670, E5-2667, E5-2665, E5-2660, E5-2650, E5-2650L	1600/1333/1066MHz
E5-2640, E5-2630, E5-2630L, E5-2620	1333/1066MHz
E5-2609, E5-2603	1066MHz

Standard and Maximum Memory Capacity (Pre-configured Models)			
Pre-Configured Models	**Standard Memory**	**Maximum Memory Plus Optional Memory**	**Standard Memory Replaced with Optional Memory**
Intel Xeon E5-2640	16GB (4x 4GB)	336GB (20x16GB, 4x4GB)	768GB (24 x 32GB)
Intel Xeon E5-2620	8GB (2x 4GB)	360GB (22x16GB, 2x4GB)	768GB (24 x 32GB)
Intel Xeon E5-2603	4GB (1x 4GB)	372GB (23x16GB, 1x4GB)	768GB (24 x 32GB)

DIMM slot and configuration diagrams

Memory

Basic memory slot & population diagram

- Population order; start with "A" first, "B" second, "C" third, etc.

24 DIMM SLOTS (12 per CPU node)					
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A	1	C	Chnl 1
	2	E	2	G	
	3	I	3	K	
Chnl 2	4	B	4	D	Chnl 2
	5	F	5	H	
	6	J	6	L	
Chnl 3	7	L	7	J	Chnl 3
	8	H	8	F	
	9	D	9	B	
Chnl 4	10	K	10	I	Chnl 4
	11	G	11	E	
	12	C	12	A	

Standard memory configuration (1 CPU model)

- 8GB, consisting of four (4) 2GB dual-rank PC3-10600 UDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 2GB DIMM	1	C; empty	Chnl 1
	2	E; empty	2	G; empty	
	3	I; empty	3	K; empty	
Chnl 2	4	B; 2GB DIMM	4	D; empty	Chnl 2
	5	F; empty	5	H; empty	
	6	J; empty	6	L; empty	
Chnl 3	7	L; empty	7	J; empty	Chnl 3
	8	H; empty	8	F; empty	
	9	D; 2GB DIMM	9	B; empty	
Chnl 4	10	K; empty	10	I; empty	Chnl 4
	11	G; empty	11	E; empty	
	12	C; 2GB DIMM	12	A; empty	

Standard memory plus optional memory (1 CPU model)

- 60GB, consisting of three (3) 4GB RDIMMs plus six (6) 8GB RDIMMs

- 3x 4GB dual-rank PC3-10600 RDIMMs
- 6x 8GB dual-rank PC3-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 4GB DIMM	1	C; empty	Chnl 1
	2	E; 8GB DIMM	2	G; empty	
	3	I; 8GB DIMM	3	K; empty	
Chnl 2	4	B; 4GB DIMM	4	D; empty	Chnl 2
	5	F; 8GB DIMM	5	H; empty	
	6	J; empty	6	L; empty	
Chnl 3	7	L; empty	7	J; empty	Chnl 3
	8	H; 8GB DIMM	8	F; empty	
	9	D; 8GB DIMM	9	B; empty	
Chnl 4	10	K; empty	10	I; empty	Chnl 4
	11	G; 8GB DIMM	11	E; empty	
	12	C; 4GB DIMM	12	A; empty	

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

- 192GB, consisting of twelve (12) 16GB quad-rank PC3L-10600 RDIMMs

	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 16GB DIMM	1	C; empty	Chnl 1
	2	E; 16GB DIMM	2	G; empty	
	3	I; 16GB DIMM	3	K; empty	
Chnl 2	4	B: 16GB DIMM	4	D; empty	Chnl 2
	5	F; 16GB DIMM	5	H; empty	
	6	J; 16GB DIMM	6	L; empty	
Chnl 3	7	L; 16GB DIMM	7	J; empty	Chnl 3
	8	H; 16GB DIMM	8	F; empty	
	9	D; 16GB DIMM	9	B; empty	
Chnl 4	10	K; 16GB DIMM	10	I; empty	Chnl 4
	11	G; 16GB DIMM	11	E; empty	
	12	C; 16GB DIMM	12	A; empty	

UDIMM maximum configuration (1 CPU model)

- 64GB, consisting of eight (8) 4GB dual-rank PC3-10600 UDIMMs

Memory

	CPU1		**CPU2**		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 8GB DIMM	1	C; empty	Chnl 1
	2	E; 8GB DIMM	2	G; empty	
	3	I; empty	3	K; empty	
Chnl 2	4	B; 8GB DIMM	4	D; empty	Chnl 2
	5	F; 8GB DIMM	5	H; empty	
	6	J; empty	6	L; empty	
Chnl 3	7	L; empty	7	J; empty	Chnl 3
	8	H; 8GB DIMM	8	F; empty	
	9	D; 8GB DIMM	9	B; empty	
Chnl 4	10	K;	10	I; empty	Chnl 4
	11	G; 8GB DIMM	11	E; empty	
	12	C; 8GB DIMM	12	A; empty	

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

- 768GB, consisting of twenty-four (24) 32GB quad-rank PC3-10600 LRDIMMs DDR3 Registered (LRDIMM) memory, operating at 1333MHz or 1066MHz when populated at 3 DIMMs per Channel in 24 slots.

	CPU1		**CPU2**		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 32GB DIMM	1	A; 32GB DIMM	Chnl 1
	2	E; 32GB DIMM	2	E; 32GB DIMM	
	3	I; 32GB DIMM	3	I; 32GB DIMM	
Chnl 2	4	B; 32GB DIMM	4	B; 32GB DIMM	Chnl 2
	5	F; 32GB DIMM	5	F; 32GB DIMM	
	6	J; 32GB DIMM	6	J; 32GB DIMM	
Chnl 3	7	L; 32GB DIMM	7	L; 32GB DIMM	Chnl 3
	8	H; 32GB DIMM	8	H; 32GB DIMM	
	9	D; 32GB DIMM	9	D; 32GB DIMM	
Chnl 4	10	K; 32GB DIMM	10	K; 32GB DIMM	Chnl 4
	11	G; 32GB DIMM	11	G; 32GB DIMM	
	12	C; 32GB DIMM	12	C; 32GB DIMM	

UDIMM maximum configuration (2 CPU model)

- 128GB, consisting of sixteen (16) 8GB dual-rank PC3-10600E DDR3 Unbuffered (UDIMM) memory operating at 1333MHz when populated at 2 DIMMs per Channel in 16 slots

	CPU1	**CPU2**	

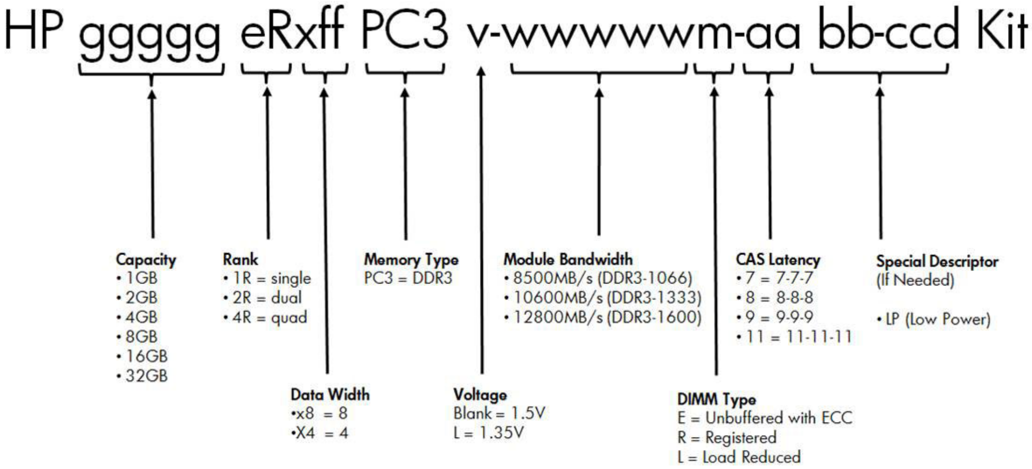
Memory

	slot #	population order	slot #	population order	
Chnl 1	1	A; 8GB DIMM	1	C; 8GB DIMM	Chnl 1
	2	E; 8GB DIMM	2	G; 8GB DIMM	
	3	I; empty	3	K; empty	
Chnl 2	4	B; 8GB DIMM	4	D; 8GB DIMM	Chnl 2
	5	F; 8GB DIMM	5	H; 8GB DIMM	
	6	J; empty	6	L; empty	
Chnl 3	7	L; empty	7	J; empty	Chnl 3
	8	H; 8GB DIMM	8	F; 8GB DIMM	
	9	D; 8GB DIMM	9	B; 8GB DIMM	
Chnl 4	10	K; empty	10	I; empty	Chnl 4
	11	G; 8GB DIMM	11	E; 8GB DIMM	
	12	C; 8GB DIMM	12	A; 8GB DIMM	

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

- 1GB = 1024MB
- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16 GB=16384MB
- 32GB = 32768MB

DDR3 memory options part number decoder


HP ggggg eRxff PC3 v-wwwwwm-aa bb-ccd Kit
Capacity
• 1GB
• 2GB
• 4GB
• 8GB
• 16GB
• 32GB
Rank
• 1R = single
• 2R = dual
• 4R = quad
Memory Type
PC3 = DDR3
Module Bandwidth
• 8500MB/s (DDR3-1066)
• 10600MB/s (DDR3-1333)
• 12800MB/s (DDR3-1600)
CAS Latency
• 7 = 7-7-7
• 8 = 8-8-8
• 9 = 9-9-9
• 11 = 11-11-11
Special Descriptor
(If Needed)
• LP (Low Power)
Data Width
•x8 = 8
•X4 = 4
Voltage
Blank = 1.5V
L = 1.35V
DIMM Type
E = Unbuffered with ECC
R = Registered
L = Load Reduced

Following are memory options available from HP:

HP Memory	**NOTE:** HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at:

Memory

http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.

Registered DIMMs (RDIMMs)	
HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647893-B21
HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647895-B21
HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647897-B21
HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	647899-B21
HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	690802-B21
HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit	647901-B21
HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit	672631-B21
Unbuffered with ECC DIMMs (UDIMMs)	
HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669322-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-B21
Load Reduction DIMMs (LRDIMMs)	
HP 32GB (1x32GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit	647903-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: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at: www.hp.com/go/ddr3memory-configurator.

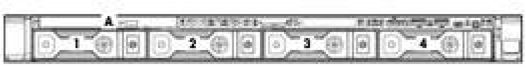
NOTE: For additional memory rules and guidelines, see the "Memory" section later in this document.

NOTE: For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

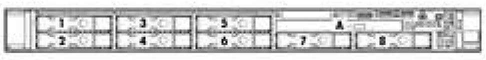
NOTE: PC3L is a low voltage memory.

NOTE: Not all Intel E5 processor series support 1600MHz or 1333MHz speeds. Memory speed is a function of the processor QPI speed.

Storage



1-4	Four LFF Hot-plug SAS/SATA hard drive bays
A	Optional DVD-ROM, or DVD RW



1-8	Eight SFF Hot-plug SATA/SAS hard drive bays
A	Optional DVD-ROM, or DVD RW

Drive Support

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2600 Disk Enclosure	Up to 4	External	HP Smart Array P222/512MB FBWC Controller
	Up to 8	External	HP Smart Array P421/1GB FBWC Controller
			HP Smart Array P421/2GB FBWC Controller
D2700 Disk Enclosure	Up to 2	External	HP Smart Array P222/512MB FBWC Controller
	Up to 4	External	HP Smart Array P421/1GB FBWC Controller
			HP Smart Array P421/2GB FBWC Controller

Technical Specifications

System Unit	**Dimensions** (H x W x D) (with bezel)	4 LFF	1.7" (43.2mm) Height x 17.1" (434.6mm) Width x 29.5" (750mm) Length	
		8 SFF	1.7" (43.2mm) Height x 17.1" (434.6mm) Width x 27.5" (699mm) Length	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	33..00 lb (15.2kg)	
		Minimum (one hard drive, power supply, and processor installed)	31 lb (14.1kg)	
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC, 200 to 240 VAC	
		Rated Input Current	10 A at 100 VAC 5 A at 200 VAC	
		Rated Input Frequency	50 Hz to 60 Hz	
	BTU Rating	Rated Input Power	562 W at 100V AC input 562 W at 200V AC input	
		Maximum	500W	1917 at 100 V AC 1898 at 115 V AC 1856 at 200 V AC 1850 at 230 V AC
			460W	1764 at 100V AC 1736 at 115V AC 1694 at 200V AC 1687 at 230V AC
			750W	2878 at 100 V AC 2834 at 115 V AC 2769 at 200 V AC 2758 at 230 V AC
	Power Specifications	To review typical system power ratings use the 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 - Click on the system of interest. Example: DL160 G8 - Follow the instructions of the next screens.		
	Power Supply Output (per power supply)	Rated Steady-State Power	500 Watts (at 100 VAC), 500 Watts (at 200 VAC)	
		Maximum Peak Power (See Power Specifications Tables)	500Watts (at 100 VAC), 500 Watts (at 200 VAC)	
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed.	

			System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5% to 95% relative humidity (Rh), 38.7° C (101.7° F) maximum wet bulb temperature, non-condensing
	Altitude	Operating	30480 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). **NOTE:** The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.	
		Idle	
		LWAd	5.3 B (1P SKU) 5.3 B (2P SKU)
		LpAm	36 dBA (1P SKU) 36 dBA (2P SKU)
		Operating	
		LWAd	5.3 B (1P SKU) 5.9 B (2P SKU)
		LpAm	37 dBA (1P SKU) 42 dBA (2P SKU)
	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 Ethernet 1Gb 2-port 361i Adapter	**Network Interface Capability**	10Base-T/100Base-TX/1000Base-TX IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX IEEE 1588, IEEE 802.1AS	
	Data Transfer Method	PCI Express v 2.1, 5.0 GT/s and 2.5 GT/s bus speeds and supports for x1, x2,	

		x4 links widths (Lanes)	
	Controller	I350 Powerville	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 20 Mb/s Combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 40 Mb/S Combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 200 Mb/s Combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 400 Mb/s Combined
		1000Base-TX (Half and Full-Duplex)	1000Mb/s per port, 2000 Mb/s Combined
	Connector	RJ-45	
	Cable Support	10Base-T Categories 3, 4 or 5 UTP; up to 328 ft (100 m)	
		10/100/1000Base-TX Category 5 UTP; up to 328 ft (100 m)	
HP Dynamic Smart Array B120i Controller	**Dimensions**	Embedded	
	Disk Drive and Enclosure Interface - Transfer rate	Up to 6Gb/s SATA (Serial ATA)	
	Connectors	6 internal SATA connectors	
	Server Interface	x4 PCIe 2.0	
	SATA Speed	6Gb/s SATA links	
	Cache Memory	Zero Memory RAID has no cache memory	
	Logical Drives Supported	Up to 8 logical volumes (6 physical drives)	
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space	
	Hot Plug Support	Yes	
	RAID Support	RAID 0 (Striping), RAID 1 (Mirroring)	
		RAID 1+0 (Striping & Mirroring)	
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.	

Summary of Changes

Date	Version History	Action	Description of Change:
10-Jun-2014	From Version 24 to 25	Added	762272-B21, 762270-B21, 739898-B21 and 739888-B21 – Added to Hard drives. Gigabit Ethernet Adapters 593722-B21 and 615732-B21. HP PCIe Workload Accelerator Options, HP Tape Storage Systems, HP Disk Storage Systems and HP Remote Monitoring Power Distribution Units (mPDU) – Added to Additional Options.
		Changed	Core Options, Additional Options and Memory were revised.
		Removed	Core Options – Removed 690829-B21, 690825-B21, 653078-B21 and 653082-B21 from Hard drives. H221 Host Bus Adapter. HP Flash Media Kits for USB Drives.
18-Apr-2014	From Version 23 to 24	Changed	Service and Support, Memory, Core Options, and Additional Options were revised.
18-Feb-2014	From Version 22 to 23	Changed	Hard Drives and HP InfiniBand were revised HP secure Encryption was added to Core Options
13-Dec-2013	From Version 21 to 22	Changed	Dual Core Processors were removed from Processors NVIDIA Quadro 4000 2GB PCI-E Adapter were removed from Graphics Options First Generation Accelerators were removed from HP I/O Accelerator Options HP OneView was added to Optional Features Converged Infrastructure Management Software was added HP H221 PCIe 3.0 SAS Host Bus Adapter was added to Storage Controllers HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit was added and HP 4GB SD Enterprise Performance Flash Media Kit was removed from HP Flash Media Kits for USB Drives
11-Oct-2013	From Version 20 to 21	Changed	Changes made: Support for new Value Endurance Solid State Drives and SD Enterprise Mainstream Flash Media Kit
20-Sep-2013	From Version 19 to 20	Changed	HP Dynamic Smart Array B120i Controller in Technical Specifications was revised.
13-Sep-2013	From Version 18 to 19	Changed	High Performance Clusters, Memory, HP Networking, HP Optical Drives, HP InfiniBand, HP Insight software, HP iLO

Summary of Changes

			Advanced License, HP Storage Controllers, HP Tape Backup, HP Disk Backup, HP Storage Options, and HP Rack Options were revised.
15-Jul-2013	From Version 17 to 18	Changed	Additional Options: Updated HP Disk Backup section.
24-May-2013	From Version 16 to 17	Changed	Additional Options: Updated HP Storage Options section.
13-May-2013	From Version 15 to 16	Removed	Additional Options: Removed HP Disk Storage Systems and Modular PDUs 1u/0U sections. Storage: Removed Drive Support section.
		Changed	Overview: Updated What's New with HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive. Standard Features: Updated Maximum Internal Storage section. Configuration Information-Factory Integrated Models: Updated Step 1, Step 2 and Step 3. Core Options: Updated HP Memory, HP Optical Drives and HP Hard Drives sections. Additional Options: Updated HP I/O Accelerator Options, HP Rack Options, HP USB and SD Options and HP Care Pack Services sections. Memory: Updated HP Memory,
29-Apr-2013	From Version 14 to 15	Changed	Technical Specifications: Updated HP Dynamic Smart Array B120i Controller section.
25-Mar-2013	From Version 13 to 14	Removed	Additional Options: Removed 641027-B21, 600279-B21 and 600282-B21 from the HP i/o Accelerator Options section.
25-Feb-2013	From Version 11 to 13	Removed	Removed HP Storage Controllers, Software 582765-B21 and TC203A from HP Insight Software Core Options: Removed SAS Hot Plug SmartDrive SFF (2.5 inch) Enterprise Drives and SAS Hot Plug SmartDrive SFF (2.5 inch) Midline Drive, 6G SAS MLC Hot Plug SFF (2.5 inch) Enterprise Mainstream Solid Stated Drive and Removed p/ns 652503-B21 and 665249-B21 from HP Networking. Additional Options: Removed p/n T9074BAE, 45214B22, TC278AAE, 436222-B21, TC213AAE, TC209A, TC203AAE, TC208A and NOTES from HP Insight Control, Removed HP Backup & Recovery Software section
		Changes	What's New: Updated with Support for HP 1.2TB 6G SAS 10K 2.5in DP ENT SC HDD, Support for HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive, Support for 6G SATA ME 2.5in SC EM SSD and Support new HP iLO Scale-Out license for massive scale out environments.

			Standard Features: Maximum Internal Storage updated storage amounts Optional Features: Updated first link and NOTE in HP Insight Control Pre-Configured Models: Updated NOTES before Entry Models, Updated Hard Drive throughout entire section Confirguration Information - Factory Integrated Models: Updated description in Step 1, updated product description to HP Memory and Updated product description to 652238-B21 Core Options: Updated product descriptions in Unbuffered with ECC DIMMs (UDIMMs) and HP Optical Drives, Updated note in HP Hard Drives Additional Options: Completely updated HP iLO Advanced License, Update product description for TC293B and TC294A, Updated product description for 655915-B21 in HP Graphics Options, Updated NOTES in HP Storage Controllers, Completely updated HP Tape Backup, HP Disk Backup, HP Storage Options, HP Disk Storage Systems, HP Power Distribution Units, HP Intelligent Power Histribution Units (iPDU), HP Rack Series, HP USB and SD Options, and HP Care Pack Services. Storage: Update amounts and Controllers
		Added	Standard Features: HP iLO 4 On System Management Memory to Graphics Optional Features: HP ILO Scale-Out and HP iLO Advanced to HP Insight Management Software and Storage Software section. Pre-Configured Modesl: Added note to Storage Controller throughout Entry Models section Configuration Information - Factory Integrated Models: Added NOTES before Step 1 and added p/n 652241-B21 to HP Insight Software Core Options: Added p/n 697574-B21, 693687-B21, 6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives, 6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives and 6G SATA ME Hot Plug SFF (3.5-inch) Enterprise Mainstream Solid State Drives sections to HP Hard Drive, Added p/ns 656596-B21, 652503-B21, 665249-B21, 665240-B21 and 665243-B21 to HP Networking Additional Options: Added Second Generation Accelerators section to HP I/O Accelerator Options, HP

			Location Discovery Services, HP TFT7600 G2 KVM Console Rackmount Keyboard Monitor, HP Server Console Switch G2 with Virtual Media & CAC to HP Rack Options Storage: Added 6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives
19-Dec-2012	From Version 10 to 11	Changes	Changes made to the description of the Disk Drive Interface - Transfer rate in the Technical Specifications section.
24-Sep-2012	From Version 9 to 10	Changes	Changes made in Optional Features section.
13-Aug-2012	From Version 8 to 9	Changes	Changes made throughout the QuickSpec..
30-Jul-2012	From Version 7 to 8	Changes	Change made in the Configuration Information - Factory Integrated Models section.
15-Jun-2012	From Version 6 to 7	Changes	Revised a Note in the Standard Features, Power Specifications section.
06-Jun-2012	From Version 5 to 6	Changes	Changed "Smart Drive" to "SmartDrive" and Changed a Note in the Power Supplies section.
04-Jun-2012	From Version 4 to 5	Changes	Changes were made throughout.
18-May-2012	From Version 3 to 4	Changed	Changes made in the Processors section of Standard Features.
04-May-2012	From Version 2 to 3	Removed	Removed the Note in the Graphics section of Standard Features.
06-Apr-2012	From Version 1 to 2	Changes	Storage Controller note and Step 1 in Configuration Information - Factory Integrated Models were revised Tape and Disk Backup was removed from Storage and Cache Memory was removed from HP Embedded SATA controller

Summary of Changes

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