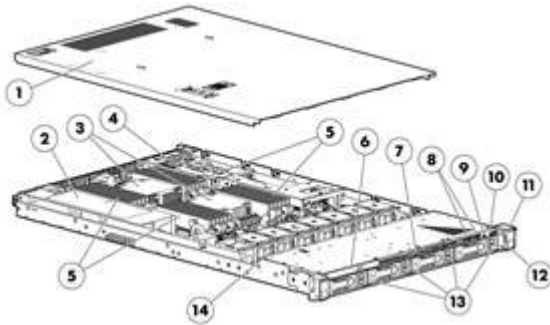


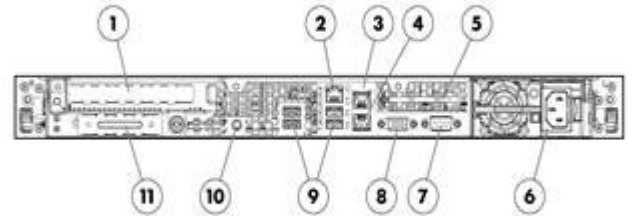
### Overview

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 RDX USB3.0 Disk Backup Systems

### 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)

#### Dual- Core Processors

Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/8.0GT-s QPI/80W, DDR3-1600, HT, Turbo2- 5/5)

**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.

### Standard Features

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

### Standard Features

**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.

### 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.

### Standard Features

<b>Internal Storage Devices</b>	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	Up to 4 Hot plug SAS/SATA 3.5" drives Up to 8 Hot plug SAS/SATA 2.5" drives

<b>Maximum Internal Storage</b> 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

<b>Interfaces</b>	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)
	<b>NOTE:</b> 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. <b>NOTE:</b> Front Video Graphic Adapter Kit (PN 655915-B21) is required for enabling front VGA port.	

<b>Industry Standard Compliance</b>	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

### Standard Features

#### 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 a 110V 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](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://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](http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html)

#### 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](http://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](http://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](http://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](http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html)

### Standard Features

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**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.

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**Required Cabling**

For required cabling information, refer to the Web site at: [www.hp.com/servers/dl160](http://www.hp.com/servers/dl160) Gen8

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**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>.

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**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

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**On System Management****HP iLO Management Engine**

HP iLO Management Engine is a complete set of embedded management 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,
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### Standard Features

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](http://www.hp.com/go/intelligentprovisioning) for additional information and to view usage videos.
    - Use the Service Pack for ProLiant (SPP) at [www.hp.com/go/spp](http://www.hp.com/go/spp) to get firmware and software updates.

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



### Standard Features

#### 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](http://www.hp.com/go/spp/download). More information can be found: [www.hp.com/go/spp](http://www.hp.com/go/spp) and <http://www.hp.com/go/hpsum>

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#### Security

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

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### Standard Features

#### 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](http://www.hp.com/go/insightcontrol).

HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: <http://www.hp.com/services/insight>.

**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/iLOadvance>

### Optional Features

#### High Performance Clusters

HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. <a href="http://www.hp.com/go/clusters">http://www.hp.com/go/clusters</a>
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. <a href="http://www.hp.com/techservers/clusters/ucp/index.html">http://www.hp.com/techservers/clusters/ucp/index.html</a>
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. <a href="http://www.hp.com/go/cmu">http://www.hp.com/go/cmu</a>
HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported option to HP Insight CMU, for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform LSF workload scheduler and Platform Application Center, as well as the HP-MPI parallelization library. <a href="#">HP HPC Linux Value Pack</a>

#### 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**

### Optional Features

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](http://www.hp.com/go/storage/software).

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#### 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](http://www.hp.com/go/insightonline)

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#### Factory Express Portfolio for Servers and Storage

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

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

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

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#### HP Simple Configurator

SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. <http://www.hp.com/products/configurator>

### Service and Support

#### Service and Support

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

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

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

HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. Foundation Care services portfolio consists of scalable, reactive support services for HP industry-standard servers and software. New to this portfolio is HP Collaborative Support. 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.

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#### **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.

### Service and Support

**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>

**3-Year HP 24x7 4 hour Response, Collaborative Support**

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>

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**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.

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**Insight Remote Support**     Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more  
<http://www.hp.com/go/insightremotesupport>

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**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.

### Service and Support

**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.

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**For more information**

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



### Pre-configured Models

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

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

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

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

**NOTE:** 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

<b>HP ProLiant DL160 Gen8 E5-2603 1P 4GB-R SATA 4 LFF 500W PS Entry Server</b> 662082-xx1	<b>Processor(s)</b>	(1) Intel® Xeon® E5-2603 (1.8GHz/4-core/10MB/6.4GT-s QPI/80W)
	<b>Cache Memory</b>	10MB (1 x 10MB) L3 cache
	<b>Memory</b>	4GB (1 x 4GB DDR3-1333MHz RDIMMs) <b>NOTE:</b> Total of 24 DIMM slots
	<b>Network Controller</b>	HP 361i Integrated Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i controller <b>NOTE:</b> Provides data transmission speeds up to 3Gb/s.
	<b>Hard Drive</b>	None ship standard; includes 3 LFF hard drive blanks
	<b>Internal Storage</b>	Up to 4 large form factor drives
	<b>Optical Drive</b>	(1) (Optional: DVD-ROM, DVD-RW)
	<b>Power Supply</b>	500W Platinum FIO Power Supply with Backplane (ships standard)
	<b>Fans</b>	(5) Non hot plug redundant fans
	<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control
	<b>Form Factor</b>	1U <b>NOTE:</b> 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
	<b>Warranty</b>	Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ)

### Base Model

<b>HP ProLiant DL160 Gen8 E5-2620 1P 8GB-R SATA 4 LFF 500W PS Base Server</b> 662083-xx1	<b>Processor(s)</b>	(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
	<b>Cache Memory</b>	15MB (1 x 15MB) L3 cache
	<b>Memory</b>	8GB (2x4GB DDR3-1333MHz RDIMMs) <b>NOTE:</b> Total of 24 DIMM slots

### Pre-configured Models

<b>Network Controller</b>	HP 361i Integrated Dual Port Gigabit Server Adapter
<b>Storage Controller</b>	HP Dynamic Smart Array B120i controller <b>NOTE:</b> Provides data transmission speeds up to 3Gb/s.
<b>Hard Drive</b>	None ship standard; includes 3 LFF hard drive blanks
<b>Internal Storage</b>	Up to 4 large form factor drives
<b>Optical Drive</b>	(1) (Optional: DVD-ROM, DVD-RW)
<b>Power Supply</b>	500W Platinum F10 Power Supply with Backplane (ships standard)
<b>Fans</b>	(5) Non hot plug redundant fans
<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control
<b>Form Factor</b>	1U <b>NOTE:</b> 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
<b>Warranty</b>	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

<b>HP ProLiant DL160 Gen8 E5-2640 2P 16GB-R P420 Hot Plug 8 SFF 500W PS Perf Server</b> 662084-xx1	<b>Processor(s)</b>	(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
	<b>Cache Memory</b>	15MB (1 x 15MB) L3 cache
	<b>Memory</b>	16GB (4x 4GB DDR3-1333MHz RDIMMs) <b>NOTE:</b> Total of 24 DIMM slots
	<b>Network Controller</b>	HP 361i Integrated Dual Port Gigabit Server Adapter
	<b>Storage Controller</b>	HP Smart Array P420/ 1G FBWC controller
	<b>Hard Drive</b>	None ship standard; includes 7 SFF hard drive blanks
	<b>Internal Storage</b>	Up to 8 small form factor drives
	<b>Optical Drive</b>	(1) (Optional: DVD-ROM, DVD-RW)
	<b>Power Supply</b>	500W Platinum F10 Power Supply with Backplane (ships standard)
	<b>Fans</b>	(7) Non hot plug redundant fans
	<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Scale-Out or HP Insight Control
	<b>Form Factor</b>	1U <b>NOTE:</b> 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

### Pre-configured Models

**Warranty**

Server Warranty includes 3 year Next Day Parts replacement, 0-Years Labor, 0-Years Onsite support (3-1-1 warranty in APJ)

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**Country Code Key**

xx=00	U.S.
xx=29	Japan
xx=37	APD
xx=42	Euro
xx=AA	PRC

### Configuration Information - Factory Integrated Models

**NOTE:** This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

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

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

**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 LFF Configure-to-order Server

685622-B21

### Configuration Information - Factory Integrated Models

**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

**Dual-Core Processors**

HP DL160 Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) FIO Processor Kit	662926-L21
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**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#

### Configuration Information - Factory Integrated Models

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

**NOTE:** Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the "Memory"

### Configuration Information - Factory Integrated Models

section later in this document and the Online Memory Configuration Tool for details at [www.hp.com/go/ddr3memory-configurator](http://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](http://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](http://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

656365-B21

**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.

#### 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

656362-B21

**NOTE:** Requires Power Backplane kit (p/n: 662959-B21).

HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit

656363-B21

**NOTE:** Requires Power Backplane kit (p/n: 662959-B21).

#### HP Common Slot -48VDC Power Supplies

HP 750W Common Slot -48VDC Hot Plug Power Supply Kit

636673-B21

**NOTE:** Requires Power Backplane kit (p/n: 662959-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](http://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](http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html)

#### Enablement Kit

### Configuration Information - Factory Integrated Models

HP DL160 Gen8 FIO Power Backplane Kit	662959-B21
<b>NOTE:</b> 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.	
<b>NOTE:</b> Common Slot power supply is mandatory with 10Gigabit FlexibleLOM.	
<b>NOTE:</b> Power Specification and Technical Content for supported power supplies can be found at: <a href="http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html">http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html</a>	

### Step 3: Choose Additional Factory Integratable Options

<b>HP Networking</b>	HP Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter	684218-B21
	HP Ethernet 1Gb 4-port 366FLR FIO Adapter	684217-B21
<b>HP Insight Software</b>	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
<b>HP Optical Drives</b>	HP 9.5mm SATA DVD-ROM JackBlack Optical Drive	652238-B21
	HP 9.5mm SATA DVD-RW JackBlack Optical Drive	652241-B21
<b>HP USB and SD Options</b>	HP Gen8 FIO Internal USB Kit <b>NOTE:</b> Required to enable the internal USB port.	662961-B21
<b>HP Rack Options</b>	HP 1U Friction Gen8 FIO Rail Kit <b>NOTE:</b> 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. <b>NOTE:</b> 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.

<b>HP Unique Options</b>	HP DL160 Gen8 VGA Power Cable Kit <b>NOTE:</b> Required with NVIDIA Quadro 4000 graphic card.	662965-B21
	HP DL360 Gen8 Front Video Adapter Kit <b>NOTE:</b> Required to enable the front video port.	665915-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

#### Dual-Core Processors

HP DL160 Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) Processor Kit	662926-B21
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**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](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)

### Core Options

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
<b>Unbuffered with ECC DIMMs (UDIMMs)</b>	
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
<b>Load Reduction DIMMs (LRDIMMs)</b>	
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](http://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 "Memory" section later in this document and the Online Memory Configuration Tool for details at: [www.hp.com/go/ddr3memory-configurator](http://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](http://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.

### Core Options

<b>HP Optical Drives</b>	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.

#### 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 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](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

### Core Options

HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21
<b>NOTE:</b> Please see QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html">http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html</a> (Worldwide)	
<b>6G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 800GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690829-B21
HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21
HP 200GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690825-B21
<b>6G SAS SLC Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives</b>	
HP 200GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653078-B21
HP 400GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653082-B21
<b>3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 400GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653120-B21
HP 200GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653118-B21
HP 100GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653112-B21
<b>6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
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
<b>6G SATA ME Hot Plug SFF (3.5-inch) Enterprise Mainstream Solid State Drives</b>	
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
<b>3G SATA MLC Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 400GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653126-B21

### Core Options

HP 200GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653124-B21
HP 100GB 3G SATA MLC LFF (3.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653122-B21
<b>6G SATA Non-hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
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
<b>SAS Non-Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives</b>	
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
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html">http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html</a> (Worldwide)	
<b>Hard Drive Kits</b>	
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 Ethernet 1Gb 4-port 331T Adapter	647594-B21
HP Ethernet 1Gb 2-port 332T Adapter	615732-B21
HP Ethernet 1Gb 2-port 361T Adapter	652497-B21
HP NC365T 4-port Ethernet Server Adapter	593722-B21

#### 10 Gigabit Ethernet Adapters

**NOTE:** No more than two 10GbE I/O devices are supported in a single ProLiant server.

**NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

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

HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
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 560SFP+ Adapter	665249-B21

#### FlexibleLOM Adapters

HP Ethernet 1Gb 4-port 331FLR Adapter	629135-B21
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### Core Options

HP Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
HP Ethernet 10Gb 2-port 530FLR-SFP+ Adapter	647581-B21
HP FlexFabric 10Gb 2-port 554FLR-SFP+ Adapter	629142-B21
HP Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-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](http://www.hp.com/go/ProLiantNICs).

### HP InfiniBand

HP InfiniBand 4X QDR ConnectX-2 PCIe G2 Dual Port HCA	592520-B21
HP InfiniBand FDR/EN 10/40Gb Dual Port 544QSFP Adapter	649281-B21
HP InfiniBand FDR/EN 10/40Gb Dual Port 544FLR-QSFP Adapter	649282-B21
HP InfiniBand QDR/EN 10Gb Dual Port 544FLR-QSFP Adapter	649283-B21
QLogic InfiniBand 4X QDR PCI-E G2 Dual Port HCA	583211-B21

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

[http://h18000.www1.hp.com/products/quickspecs/13078\\_div/13078\\_div.html](http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html)

### HP Power Supplies

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

**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
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#### HP Common Slot -48VDC Power Supplies

**NOTE:** The following Power Supplies offer 92% Efficiency

HP 750W Common Slot -48VDC Hot Plug Power Supply Kit	636673-B21
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**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](http://www.hp.com/products/powercords)

### Core Options

**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](http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html)

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### HP Graphics Options

HP DL160 Gen8 VGA Power Cable Kit 662965-B21

**NOTE:** Required with NVIDIA Quadro 4000 graphic card.

HP DL360 Gen8 Front Video Adapter Kit 655915-B21

**NOTE:** Required to enable the front video port.

NVIDIA Quadro 4000 2GB PCI-E Adapter 655933-B21

**NOTE:** Quadro 4000 is FL/FH graphic card and consumes both internal and external PCI-e slots. It is only supported on LFF models since SFF models need HP Smart Array P420 controller in the internal slot.

### 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 C6N28AAE

HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Electronic License C6N36AAE

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 Insight Control server deployment

HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License T9082AAE

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

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

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

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



### Additional Options

<b>HP iLO Advanced License</b>	HP iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates	BD506AAE
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE
	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
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License	BD779A

**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>

### HP High Performance Clusters

#### HP Cluster Management Utility

	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	<b>NOTE:</b> This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License	BD476A
	<b>NOTE:</b> 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.	
	HP Insight Cluster Management Utility Media	BD477A
	<b>NOTE:</b> 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	
	<b>NOTE:</b> For additional license kits please see the QuickSpecs at: <a href="http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html">http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html</a>	
	<b>HP HPC Linux Value Pack</b>	

### Additional Options

HP High Performance Computing Linux Value Pack 1 Processor Flexible License for ProLiant Servers	TC293B
<p><b>NOTE:</b> This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.</p>	
HP High Performance Computing Linux Value Pack Media Kit for ProLiant Servers	TC294A
<p><b>NOTE:</b> This part number can be used to purchase media including software and documentation, which will be delivered to the customer.</p> <p><b>NOTE:</b> For additional license kits please see the QuickSpecs at:  <a href="http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html">http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html</a></p>	

### HP I/O Accelerator Options

#### Second Generation Accelerators

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

#### First Generation Accelerators

HP 160GB Single Level Cell PCIe ioDrive for ProLiant Servers	600278-B21
<p><b>NOTE:</b> A low-profile PCI bracket is included for use in low-profile slots.</p>	
HP 320GB Single Level Cell PCIe ioDrive Duo for ProLiant Servers	600281-B21
<p><b>NOTE:</b> 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</p> <p><b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:  <a href="http://h18004.www1.hp.com/products/quickspecs/13587_div/13587_div.html">http://h18004.www1.hp.com/products/quickspecs/13587_div/13587_div.html</a>          (Worldwide)</p>	

### HP Graphics Options

HP DL160 Gen8 VGA Power Cable Kit	662965-B21
<p><b>NOTE:</b> Required with NVIDIA Quadro 4000 graphic card.</p>	
HP DL360 Gen8 Front Video Adapter Kit	655915-B21
<p><b>NOTE:</b> Required to enable the front video port.</p>	
NVIDIA Quadro 4000 2GB PCI-E Adapter	655933-B21
<p><b>NOTE:</b> Quadro 4000 is FL/FH graphic card and consumes both internal and external PCI-e slots. It is only supported on LFF models since SFF models need HP Smart Array P420 controller in the internal slot.</p>	

### Additional Options

<b>HP Security</b>	<p>HP Trusted Platform Module Option <span style="float: right;">488069-B21</span></p> <p><b>NOTE:</b> 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: <a href="http://www.hp.com/go/TPM">www.hp.com/go/TPM</a>.</p> <p><b>NOTE:</b> ProLiant OS pre-installed units will come with the partition required for TPM deployment.</p> <p><b>NOTE:</b> The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.</p>
	<p>HP 1U Security Gen8 Bezel Kit <span style="float: right;">664918-B21</span></p>

<b>HP Storage Controllers</b>	<p><b>NOTE:</b> 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.</p> <p><b>SAS Controllers</b></p> <p><b>Smart Array P222 Controller</b></p> <p>HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller <span style="float: right;">631667-B21</span></p> <p><b>NOTE:</b> Mini SAS 700mm cable (PN 662963-B21) required with this controller.</p> <p><b>NOTE:</b> HP Smart Array P222 controller can only be installed in the external PCI-e slot.</p> <p><b>NOTE:</b> HP Smart Array P222 controller is supported on LFF models only.</p> <p><b>HP Smart Array P420 Controller</b></p> <p>HP Smart Array P420/2GB FBWC 6Gb 2-ports Int SAS Controller <span style="float: right;">631671-B21</span></p> <p>HP Smart Array P420/1GB FBWC 6Gb 2-ports Int SAS Controller <span style="float: right;">631670-B21</span></p> <p><b>NOTE:</b> HP Smart Array P420 controller can only be installed in the internal PCI-e slot. It is not supported on external PCI-e slot.</p> <p><b>HP Smart Array P421 Controller</b></p> <p>HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller <span style="float: right;">631674-B21</span></p> <p>HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller <span style="float: right;">631673-B21</span></p> <p><b>HP Smart Array P822 Controller</b></p> <p>HP Smart Array P822/2GB FBWC 2-ports Int/4-ports Ext SAS Controller <span style="float: right;">615418-B21</span></p> <p><b>NOTE:</b> Requires two cable kits (P/N: 676895-B21 and P/N: 662963-B21) with 8SFF models.</p> <p><b>Optional upgrades</b></p> <p>HP 2GB P-series Smart Array Flash Backed Write Cache <span style="float: right;">631681-B21</span></p> <p>HP 1GB P-series Smart Array Flash Backed Write Cache <span style="float: right;">631679-B21</span></p> <p>HP 512MB B-series 36 inch Dynamic Smart Array Flash Backed Write Cache for ML/DL <span style="float: right;">631922-B21</span></p> <p><b>NOTE:</b> This upgrade is for HP Dynamic Smart Array B120i controller. It is required for implementing RAID 5.</p>
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### Additional Options

HP Mini SAS 800mm Gen8 Cable Kit	676895-B21
<b>NOTE:</b> This cable option kit is required with HP Smart Array P822/ 2GB FBWC controller.	
HP Mini SAS 700mm Gen8 Cable Kit	662963-B21
<b>NOTE:</b> 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.	
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18000.www1.hp.com/products/quickspecs/14227_div/14227_div.html">http://h18000.www1.hp.com/products/quickspecs/14227_div/14227_div.html</a> (Smart Array P222 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/14228_div/14228_div.html">http://h18000.www1.hp.com/products/quickspecs/14228_div/14228_div.html</a> (Smart Array P420 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html">http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html</a> (Smart Array P421 Controller)	
<a href="http://h18000.www1.hp.com/products/quickspecs/14337_div/14337_div.html">http://h18000.www1.hp.com/products/quickspecs/14337_div/14337_div.html</a> (Smart Array P822 Controller)	
<b>HP Smart Array Advanced Pack</b>	
HP Smart Array Advanced Pack 2.0 No Media 1 Server 1yr 24x7 Support Software	BC377A
HP Smart Array Advanced Pack 2.0 No Media Electronic Lic 1yr 24x7 Support Software	BC390AAE
<a href="http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html">http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html</a> (SAAP)	
<b>Host Bus Adapter</b>	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
<b>NOTE:</b> Supports SCSI Tapes only, no RAID support.	
<b>NOTE:</b> HBA is recommended for SCSI tape drive support.	
HP H220 Host Bus Adapter	650933-B21
HP H221 Host Bus Adapter	650931-B21
<b>NOTE:</b> This is a 2 x4 External Port HBA.	
<b>NOTE:</b> This is only approved for the HP P2000 G3 SAS Modular Smart and tape drives.	
HP H222 Host Bus Adapter	650926-B21
<b>NOTE:</b> Mini SAS 700mm cable (PN 662963-B21) required with this controller	
<b>NOTE:</b> HP H222 Host Bus Adapter is supported on LFF models only.	
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information:	
<a href="http://h18004.www1.hp.com/products/quickspecs/12566_div/12566_div.html">http://h18004.www1.hp.com/products/quickspecs/12566_div/12566_div.html</a> (SC11Xe HBA)	
<a href="http://h18004.www1.hp.com/products/quickspecs/14336_div/14336_div.html">http://h18004.www1.hp.com/products/quickspecs/14336_div/14336_div.html</a> (HBA 220)	
<a href="http://h18004.www1.hp.com/products/quickspecs/14222_div/14222_div.html">http://h18004.www1.hp.com/products/quickspecs/14222_div/14222_div.html</a> (HBA 221)	
<a href="http://h18004.www1.hp.com/products/quickspecs/14337_div/14337_div.html">http://h18004.www1.hp.com/products/quickspecs/14337_div/14337_div.html</a> (HBA 222)	

### Additional Options

#### 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	COL99A
HP StoreEver LTO-6 Ultrium 6650 Internal Tape Drive	EH963A
HP StoreEver LTO-6 Ultrium 6650 External Tape Drive	EH964A
HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive	EH969A
HP StoreEver LTO-6 Ultrium 6250 External Tape Drive	EH970A

#### 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 Systems USB

HP RDX1000 USB3.0 External Disk Backup System	B7B69A
HP RDX1000 USB3.0 Internal Disk Backup System	B7B67A
HP RDX500 USB3.0 Internal Disk Backup System	B7B64A
HP RDX500 USB3.0 External Disk Backup System	B7B66A

##### USB Removable Media RDX Disk Backup Systems

HP RDX320 USB3.0 External Disk Backup System	B7B63A
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##### HP StoreOnce Backup systems

HP StoreOnce 2620 iSCSI Backup	BB852A
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#### 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 SN1000E 16Gb 1-port PCIe Fibre Channel Host Bus Adapter	QR558A
HP SN1000E 16Gb 2-port PCIe Fibre Channel Host Bus Adapter	QR559A

##### 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

### Additional Options

HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter	QW972A
<b>Converged Network Adapter</b>	
HP CN1100E Dual Port Converged Network Adapter	BK835A

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

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

**NOTE:** For additional information on sizing your server, please reference: <http://www.upssizer.com>

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

### Additional Options

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#### HP Power Distribution Units

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

HP 8.6kVA 24A Single Input Three Phase NA/JP Monitored Power Distribution Unit	AF504A
HP 8.3kVA 40A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF506A
HP 11kVA 16A Single Input Three Phase INTL Monitored Power Distribution Unit	AF508A
HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF510A

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

HP 4.9kVA 24A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF914A
HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF915A

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

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

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

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

**NOTE:** Please see the following QuickSpecs for additional options including shorter jumper cables and country specific power cords:  
[http://h18000.www1.hp.com/products/quickspecs/11041\\_div/11041\\_div.html](http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.html)  
(Worldwide)

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

##### iPDU Core Units

HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
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

##### iPDU Extension Bars

HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A

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### Additional Options

#### 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](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](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
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### Additional Options

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:

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

#### **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

### Additional Options

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

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

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

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

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

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

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

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

#### HP 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

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

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

#### Rack Kits

HP Rack Cable Management Velcro Clips	379820-B21
HP 1U Small Form Factor Ball Bearing Gen8 Rail Kit	663201-B21
<b>NOTE:</b> For SFF models.	
HP 1U Gen8 Cable Management Arm	663203-B21
HP 1U Large Form Factor Ball Bearing Gen8 Rail Kit	663202-B21

**NOTE:** For LFF models.

**NOTE:** For additional information regarding Rack Cabinets and Telco Rack support, please see the following URL: [www.hp.com/go/rackandpower](http://www.hp.com/go/rackandpower).

### Additional Options

<b>HP USB and SD Options</b>	<p>HP 4GB SD Enterprise Performance Flash Media Kit <span style="float: right;">580387-B21</span></p> <p><b>NOTE:</b> Blank SD media device is supported for use with VMware and Citrix. SD media must be installed in the internal slot of the ProLiant server. Learn more at <a href="http://www.hp.com/go/proliantvirtualization">http://www.hp.com/go/proliantvirtualization</a>.</p> <p>HP 2GB USB Flash Media Drive Key Kit <span style="float: right;">608447-B21</span></p> <p><b>NOTE:</b> HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.</p> <p>HP 32GB SD Enterprise Mainstream Flash Media Kit <span style="float: right;">700136-B21</span></p>
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### 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
<b>Proactive Care Personalized Support Environmental Option</b> - 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 with Defective 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 with Defective Media Retention ProLiant DL16x Collaborative Support	U1K05E
HP 3 year 6 hour 24x7 Call to Repair with Defective Media Retention BL6xxc Server Blade HW Support	UK121E

### Additional Options

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](http://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](http://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](http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html) (Worldwide)

### Memory

DIMM slot/capacity/populated speed table															
DIMM Type	Registered DIMMS (RDIMMs)								Load Reduced (LRDIMMs)	Unbuffered with ECC DIMMs (UDIMMs)					
	Single Rank (1R)			Dual Rank (2R)					Quad Rank (4R)	Single Rank (1R)	Dual Rank (2R)				
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	
<b>SLOTS THAT CAN BE POPULATED</b>															
24 slot servers	24	24	24	24	24	24	24	24	16	16	16	16	16	16	
<b>MAXIMUM CAPACITY (GB)*</b>															
	96	96	192	192	192	384	384	768	32	32	64	64	128	128	
<b>POPULATED DIMM SPEED (MHz)</b>															
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

E5-2680, E5-2670, E5-2667, E5-2665, E5-2660, E5-2650, E5-2650L, E5-2637

E5-2640, E5-2630, E5-2630L, E5-2620

E5-2609, E5-2603

Supported Memory Speeds

1600/1333/1066MHz

1333/1066MHz

1066MHz



### Memory

<b>Standard and Maximum Memory Capacity (Pre-configured Models)</b>			
<b>Pre Configured Models</b>	<b>Standard Memory</b>	<b>Maximum Memory Plus Optional Memory</b>	<b>Standard Memory Replaced with Optional Memory</b>
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

#### Basic memory slot & population diagram

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

<b>24 DIMM SLOTS (12 per CPU node)</b>					
	<b>CPU1</b>		<b>CPU2</b>		
	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

### Memory

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



### Memory

	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

	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.

### Memory

	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

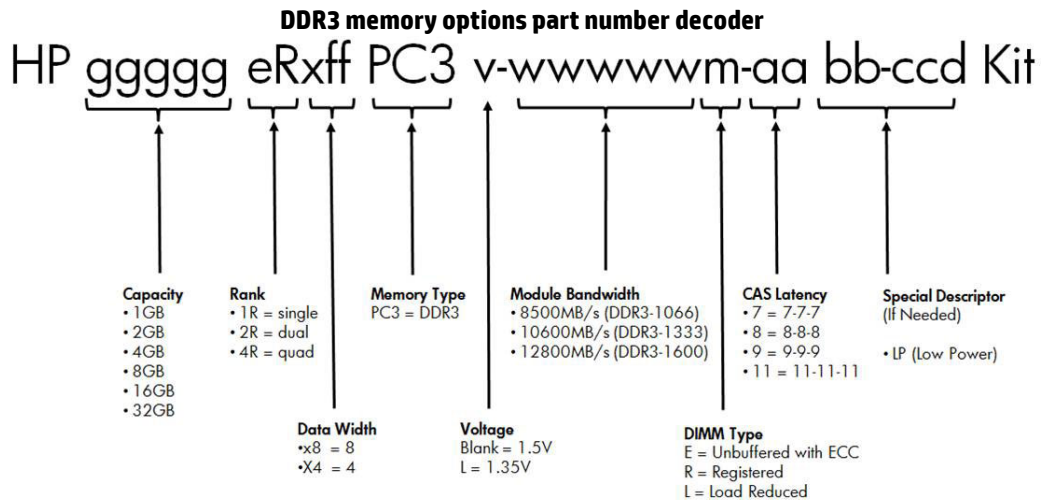
	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 8GB DIMM	1	C; 8GB DIMM	Chnl 1
	2	E; 8GB DIMM	2	G; 8GB DIMM	
	3	I; empty	3	K; empty	
Chnl 2	4	B; 8GB DIMM	4	D; 8GB DIMM	Chnl 2
	5	F; 8GB DIMM	5	H; 8GB DIMM	
	6	J; empty	6	L; empty	
Chnl 3	7	L; empty	7	J; empty	Chnl 3
	8	H; 8GB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

### Memory

- 8GB = 8192MB
- 16 GB=16384MB
- 32GB = 32768MB



### 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: [http://h18000.www1.hp.com/products/quickspecs/14225\\_div/14225\\_div.html](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)

### Memory

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
<b>Load Reduction DIMMs (LRDIMMs)</b>	
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](http://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 "Memory" section later in this document and the Online Memory Configuration Tool for details at: [www.hp.com/go/ddr3memory-configurator](http://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](http://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

<b>System Unit</b>	<b>Dimensions</b> (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			
	<b>Weight</b> (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)			
	<b>Input Requirements</b> (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			
	<b>BTU Rating</b>	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		
		<b>Power Specifications</b>	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: <a href="http://www.hp.com/go/proliant-energy-efficient">www.hp.com/go/proliant-energy-efficient</a> Or <a href="http://www.hp.com/go/hppoweradvisor">www.hp.com/go/hppoweradvisor</a>			
			- Click on the system of interest. Example: DL160 G8 - Follow the instructions of the next screens.			
	<b>Power Supply Output</b> (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)			
	<b>System Inlet Temperature</b>	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			

### Technical Specifications

		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).
<b>Relative Humidity</b> (non-condensing)	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
<b>Altitude</b>	Non-operating	5% to 95% relative humidity (Rh), 38.7° C (101.7° F) maximum wet bulb temperature, non-condensing
	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).
<b>Acoustic Noise</b>	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		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). <b>NOTE:</b> The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.
	<b>Idle</b>	
	LWAd	5.3 B (1P SKU) 5.3 B (2P SKU)
	LpAm	36 dBA (1P SKU) 36 dBA (2P SKU)
	<b>Operating</b>	
	LWAd	5.3 B (1P SKU) 5.9 B (2P SKU)
	LpAm	37 dBA (1P SKU) 42 dBA (2P SKU)
<b>Emissions Classification</b> (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.

### Technical Specifications

<b>HP Ethernet 1Gb 2-port 361i Adapter</b>	<b>Network Interface Capability</b>	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	
	<b>Data Transfer Method</b>	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)	
	<b>Controller</b>	I350 Powerville	
	<b>Network Transfer Rate</b>	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
	<b>Connector</b>	RJ-45	
	<b>Cable Support</b>	10Base-T Categories 3, 4 or 5 UTP; up to 328 ft (100 m)	
10/100/1000Base-TX Category 5 UTP; up to 328 ft (100 m)			

<b>HP Dynamic Smart Array B120i Controller</b>	<b>Dimensions</b>	Embedded
	<b>Disk Drive Interface - Transfer rate</b>	Up to 6Gb/s SATA (Serial ATA)
	<b>SATA Connectors</b>	6 internal connectors w/hot plug support
	<b>Server Interface</b>	PCIe 2.0
	<b>SATA Speed</b>	3Gb/s SATA links
	<b>Logical Drives Supported</b>	Zero Memory, Up to 2 logical volumes (6 physical drives)
	<b>Host Memory Addressing</b>	64-bit, supporting greater than 4GB server memory space
	<b>Hot Plug Support</b>	Yes
	<b>RAID Support</b>	RAID 0 (Striping), RAID 1 (Mirroring)
		RAID 1+0 (Striping & Mirroring)
RAID 5 with optional 512MB FBWC		

**NOTE:** 512 MB cache is required to enable RAID 5 support.  
**NOTE:** NO SAS supported.



### Technical Specifications

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

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

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

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