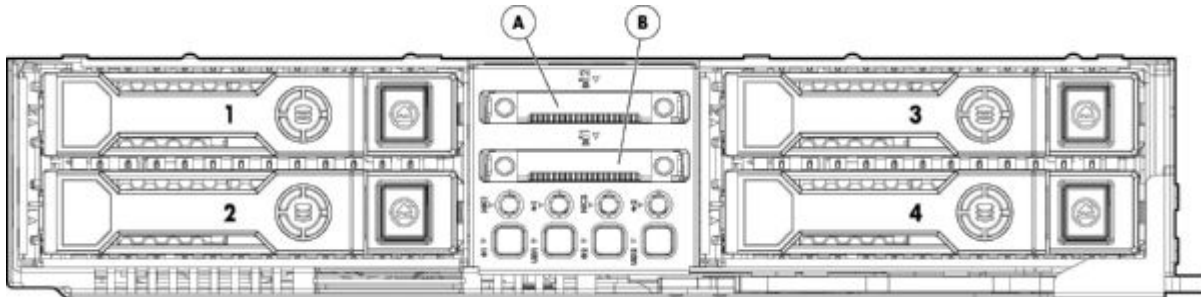


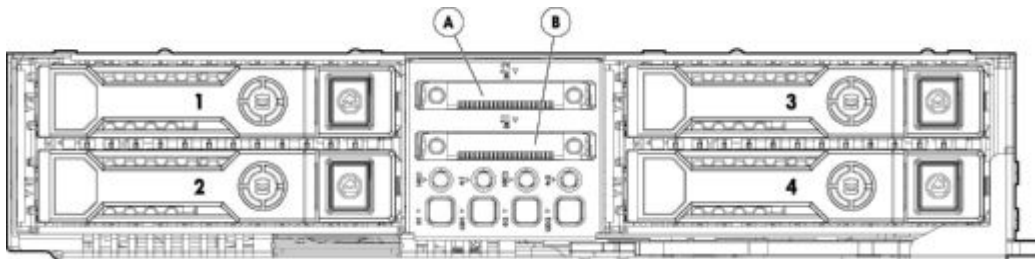
Overview

The HP Apollo 6000 System is designed for air-cooled high-performance computing (HPC), providing more performance, using less energy at a lower cost than a competing blade server. For single threaded workloads, the HP ProLiant XL220a Gen8 v2 Server has two single socket servers in each front accessible server tray. Both of the processors are Intel® Xeon® E3-1200 v3 processors and each one has four dedicated DDR3 memory slots, each capable of holding up to 8GB UDIMMs, two Hot Plug Small Form Factor (SFF) drives, and one Serial/USB/Video (SUV) port dedicated to it



Item Description

1. Node 1 PCIe Riser Board Connector
2. Node 1 DIMM Slots
3. Node 1 Processor (Intel E3-1200v3 series)
4. Node 2 Processors (Intel E3-1200v3 series)
5. Node 2 DIMM Slots
6. Node 2 PCIe Riser Board Connector



1. Node 1 SFF Storage (1 of 2)
 2. Node 1 SFF Storage (2 of 2)
 3. Node 2 SFF Storage (1 of 2)
 4. Node 2 SFF Storage (2 of 2)
- A. Serial/USB/Video (SUV) Connector (Node 1)
B. Serial/USB/Video (SUV) Connector (Node 2)

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

Four-core Processors

Intel® Xeon® Processor E3-1281 v3 (3.7GHz/4-core/8MB/HT/80W)
Intel® Xeon® Processor E3-1271 v3 (3.6GHz/4-core/8MB/HT/80W)
Intel® Xeon® Processor E3-1241 v3 (3.5GHz/4-core/8MB/HT/80W)
Intel® Xeon® Processor E3-1231 v3 (3.4GHz/4-core/8MB/HT/80W)
Intel® Xeon® Processor E3-1280 v3 (3.6GHz/4-core/8MB/HT/82W)
Intel® Xeon® Processor E3-1270 v3 (3.5GHz/4-core/8MB/HT/80W)
Intel® Xeon® Processor E3-1220 v3 (3.1GHz/4-core/8MB/No HT/80W)
Intel® Xeon® Processor E3-1275L v3 (2.7GHz/4-core/8MB/No HT/45W)
Intel® Xeon® Processor E3-1265L v3 (2.5GHz/4-core/8MB/HT/45W)

Cache Memory

8MB (1x8MB) Level 3
NOTE: For Quad-core processors.

Chipset

Intel® C222 Series Chipset
NOTE: For more information regarding Intel® chipsets, please see the following URL:
<http://www.intel.com/products/server/chipsets/>.

On System Management Processor

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

Memory Protection

Advanced ECC (multi-bit error protection)

Memory

Type	HP SmartMemory Unbuffered (UDIMM)
DIMM Slots Available	4 DIMM Slots available per node, 8 DIMM Slots per tray (2 Channels/2 DIMMs per channel)
Maximum (UDIMM) (per server)	32GB (4 x 8GB@1600MHz) Unbuffered memory configurations
Maximum (UDIMM) (per server tray)	64GB (2 nodes x 4 x 8GB@1600MHz) Unbuffered memory configurations

NOTE: HP memory from previous generation servers are not fully compatible with the HP ProLiant XL220a v2 Gen8 Server.
NOTE: 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.

Standard Features

Network Controller

- HP Ethernet 10Gb 2P 561FLR-T FIO Adptr
- HP 10GbE 2P 560FLR-SFP+ Adptr FIO Kit
- HP FlexFabric 10Gb 554FLR-SFP+ FIO Adptr
- HP FlexFabric 10Gb 534FLR-SFP+ FIO Adptr
- HP FlexFabric 10Gb 2P 533FLR-T FIO Adptr
- HP Ethernet 10GbE 530FLR-SFP+ FIO Adptr
- HP FlexFabric 10G2P 526FLR-SFP FIO Adptr
- HP 1GbE 4-port 366FLR Adapter FIO Kit
- HP Ethernet 1GbE 4P 331FLR FIO Adptr
- HP Apollo 6000 Dual 1GbE 364i FIO Kit

Expansion Slots	Expansion Slot #	Technology	Bus Width*	Connector Width	Form Factor
	1	PCIe 3.0	x16	x16	Low profile
	2	PCIe 3.0	x8	N/A	FlexibleLOM

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

HP Server ROM

HP ROM (Read Only Memory) is now digitally signed using the HP 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.

The HP 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 the HP RBSU (ROM based setup utility) user guide: www.hp.com/support/rbsu.

Storage Controller

Smart Array Controller

- HP Smart Array P430/4G Controller
- HP Smart Array P430/2G Controller

Host Bus Adapter

- HP H220 Host Bus Adapter

Storage Controller Cable

- HP a6000 Mini-SAS P430 Cbl
- HP a6000 Mini-SAS H220 Cbl

Standard Features

Internal Storage Devices	Diskette Drives	Via USB through the SUV port, external support only
	Optical Drives	Via USB through the SUV port, external support only
	USB	Via SUV port, external support only
	MicroSD Card	Internal microSD slot

Maximum Internal Storage (per Node)	Hot Plug SFF SAS	2.0TB	2 x 1TB
	Hot Plug SFF SATA	2.0TB	2 x 1TB
	Hot Plug SFF SATA SSD	1.6 TB	2 x 800GB

Interfaces	FlexibleLOM	ProLiant Gen8 servers offer a new networking technology-Flexible Network Technology. The ProLiant XL220a Gen8 v2 Server offers the customer the choice of 1Gigabit, 10Gigabit or FlexibleLOM solutions depending on workload. For further details on the choices, see FlexibleLOM in the Networking Section of this document.
	KVM	Serial USB Video Port (SUV)
	MicroSD	1 (internal)
	USB Ports	1 (internal)
	HP iLO Remote Management Network Port	Aggregated via HP Apollo 6000 Chassis
	Health LED	1 front per server node
	Power	1 front per server node
	UID	1 front per server node

Industry Standard Compliance	ACPI 2.0b Compliant
	PCIe 3.0 Compliant
	WOL Support
	Microsoft® Logo certifications
	PXE Support
	USB 1.1 and 2.0 Compliant
	SMBIOS 2.6.1

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

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

Standard Features

Operating Systems and Virtualization Software Support for ProLiant Servers [Microsoft® Windows® Server](#)
[Canonical® Ubuntu®](#)
[Red Hat Enterprise Linux \(RHEL\)](#)
[SUSE® Linux Enterprise Server \(SLES\)](#)
[VMware®](#)

NOTE: Only 64-bit versions of these operating systems are supported.

NOTE: For more information on the HP Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Site at: <http://www.hp.com/go/ossupport> and our driver download page: <http://www.hp.com/support/XL220aGen8v2>.

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

The ProLiant XL220a Gen8 v2 Server is a single-slot tray for the HP Apollo a6000 Chassis, with two one-processor servers (2x1P) on the same tray.

On System Management

HP iLO Management

HP iLO Management is a comprehensive 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 comes standard on all HP ProLiant Gen8 servers. The HP iLO Management portfolio includes:

- **HP iLO:** The HP iLO (Integrated Lights-Out) management processor is the core foundation for the HP iLO Management.
- **HP Agentless Management:** Provides built in server health monitoring and alerting capability without OS agents, that starts working the moment a power cord and an Ethernet cable are connected.
- **HP Active Health System:** Always on, continuous monitoring for increased stability and shorter downtimes; 100% configuration history; Health and service alerts and easy export and upload to Service and Support.
- **HP Intelligent Provisioning:** Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVD are needed.
 - To start Intelligent Provisioning:
 - Press the F10 key during the ProLiant Gen8 server boot process (also known as power on self-test or POST).
 - Please go to the Intelligent Provisioning website at: www.hp.com/go/intelligentprovisioning for additional information and to view usage videos.
 - Use the Service Pack for ProLiant (SPP) at: www.hp.com/go/spp to get firmware and software updates.
- **HP iLO Mobile App:** Enables the ability to access, deploy, and

Standard Features

manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: www.hp.com/go/ilo/mobileapp

NOTE: For more information, visit: <http://www.hp.com/go/ilo> or HP iLO Management Engine technologies whitepaper

HP Insight management software

HP Service Pack for ProLiant (SPP)

HP Service Pack for ProLiant (SPP) and HP Smart Update Manager (HP SUM) provide a comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new HP server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation, HP SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire HP Apollo 6000 Chassis. Further improving system uptime and stability is the fact that HP provides 12 months of support for each Service Pack for ProLiant release.

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 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 provides a 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 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) can be downloaded from www.hp.com/go/spp/download. More information can be found: <http://www.hp.com/go/SmartUpdate>, www.hp.com/go/spp and <http://www.hp.com/go/hpsum>

Standard Features

Security

- Power-on password
- Keyboard password
- QuickLock, Network Server Mode
- Serial interface control
- Administrator's password
- iLO 4 (Integrated Lights-Out 4) has 12 customizable user accounts and SSL encryption
- iLO 4 can be disabled via a Global Setting
- iLO Advanced supports directory services integration

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty.

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

Optional Features

HP Insight 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, see: <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, see: <http://www.hp.com/services/insight>.

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>.

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 license 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, DL 160 and HP Apollo servers. For more information, see: <http://www.hp.com/go/iLO/scale-out>.

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>.

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. http://www.hp.com/go/clusters
HP HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
HP Insight Cluster Management Utility	HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu

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 any time. www.hp.com/go/insightonline

HP Advanced Power Manager

The HP Advanced Power Manager (HP APM) is an optional rack level solution. HP APM will automatically discover hardware components and enable bay level power on and off, server metering, aggregate dynamic power capping, configurable power-up dependencies and sequencing, consolidated Ethernet access to all resident iLOs, and asset management capabilities.

HP APM features rack level event logging, RADIUS authentication, integrated serial concentrator, up to 11 local user accounts, read only service port, and supports SNMP, SSH, Syslogd, telnet.

Service and Support

Service and Support The XL220a tray is a part of the HP Apollo a6000 chassis. Support for this tray can be purchased at a chassis level. Please refer to HP Apollo a6000 chassis quick spec documentation for details.

HP Technology Services for Industry Standard Servers

HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HP Care Pack Services

HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Get connected to HP to improve your support experience

Connecting products to HP will help prevent problems with 24x7 monitoring, prefailure alerts, automatic call logging, and parts dispatch. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device.

Warranty / Service Coverage

The factory warranty for this product is described earlier in this Quick Spec in the Standard Features section, Warranty. Note the warranty coverage is NBD and requires mandatory Customer Self Service remove and replace activities.

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.

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>

To find the full list of Care Pack SKUs for the Apollo family of products, go to: <http://hp.com/go/lookuptool> and in step 2 select HP ProLiant, then select Apollo Series Servers.

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

NOTE: HP Apollo a6000 Chassis and HP Apollo Power Shelf are required to support the server. If you do not already have them, please refer to their QuickSpecs for additional information.

HP Apollo 6000 Power Shelf

http://h18000.www1.hp.com/products/quickspecs/14976_div/14976_div.html

HP Apollo a6000 Chassis

http://h18000.www1.hp.com/products/quickspecs/14974_div/14974_div.html

Step 1: Base Configuration

HP Server	HP ProLiant XL220a Gen8 v2 Compute Tray 753173-B21 NOTE: This server is a 2x1P system. There are two single-socket servers/nodes in one tray. NOTE: Both nodes must be configured identically. Therefore, most options in step 2, step 3, and step 4 must be selected in pairs of matching part numbers.
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Step 2: Choose Required Options

HP Processors	NOTE: Each processor kit includes two (2) processors. NOTE: Maximum one kit can be selected.
	HP XL220a Gen8 v2 E3-1281v3 FIO Kit 774239-L21 HP XL220a Gen8 v2 E3-1271v3 FIO Kit 774241-L21 HP XL220a Gen8 v2 E3-1241v3 FIO Kit 774243-L21 HP XL220a Gen8 v2 E3-1231v3 FIO Kit 774245-L21 HP XL220a Gen8 v2 E3-1280v3 FIO Kit 738250-L21 HP XL220a Gen8 v2 E3-1270v3 FIO Kit 754546-L21 HP XL220a Gen8 v2 E3-1220v3 FIO Kit 754552-L21 HP XL220a Gen8 v2 E3-1275Lv3 FIO Kit 774247-L21 HP XL220a Gen8 v2 E3-1265Lv3 FIO Kit 754554-L21
HP Memory	NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html NOTE: only UDIMMs are supported. NOTE: A minimum of two DIMMs is required per server; four DIMMs per tray. NOTE: DIMMs must be ordered in pair of matching part numbers.
	Unbuffered with ECC DIMMs (UDIMMs)
	HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669324-B21 HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit 713979-B21 HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647909-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-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit 713977-B21

Configuration Information – Factory Integrated Models

	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
	HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
	HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713975-B21
	HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-B21
HP Storage Controllers	NOTE: Two controllers of the same part numbers are required.	
	HP Smart Array P430/4GB FBWC 12Gb 1-port Int SAS Controller	698530-B21
	HP Smart Array P430/2GB FBWC 12Gb 1-port Int SAS Controller	698529-B21
	HP H220 Host Bus Adapter	650933-B21
	Storage Cables	
	NOTE: Two cables are required of the same part numbers.	
	HP Apollo 6000 Mini-SAS P430 Cable	757406-B21
	NOTE: This cable is required to support P430 controller.	
	HP Apollo 6000 Mini-SAS H220 Cable	757405-B21
	NOTE: This cable is required to support H220 controller.	
HP Networking	NOTE: Must select one of the following Network modules	
	NOTE: If the Dual FlexibleLOM Riser Kit (757401-B21) is selected, a pair of FlexibleLOM Adapters of matching part numbers must be selected as well.	
	HP Apollo 6000 Dual Ethernet 1Gb 1-port 364i FIO Kit	757404-B21
	HP Apollo 6000 Dual FlexibleLOM Riser Kit	757401-B21

Step 3: Choose Additional Factory Integrated Options

HP Networking

FlexibleLOM Adapters

NOTE: The FlexibleLOM Adapters in this section is required if the Dual FlexibleLOM Riser Kit (757401-B21) is selected

NOTE: FlexibleLOM Adapters in this section is Factory Integrated Only (FIO) options.

NOTE: FlexibleLOM Adapters can only be selected in pair of matching part numbers.

HP Ethernet 10Gb 2-port 561FLR-T FIO Adapter	700700-B21
HP Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter	684218-B21
HP FlexFabric 10Gb 2-port 554FLR-SFP+ FIO Adapter	684213-B21
HP FlexFabric 10Gb 2-port 534FLR-SFP+ FIO Adapter	700752-B21
HP FlexFabric 10Gb 2-port 533FLR-T FIO Adapter	700760-B21
HP Ethernet 10Gb 2-port 530FLR-SFP+ FIO Adapter	684210-B21
HP FlexFabric 10Gb 2-port 526FLR-SFP+ FIO Adapter	684219-B21
HP Ethernet 1Gb 4-port 366FLR FIO Adapter	684217-B21
HP Ethernet 1Gb 4-port 331FLR FIO Adapter	684208-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Step 4: Choose Additional Options for Factory Integration

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

Core Options

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

HP Memory	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-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-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
	HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
	HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713975-B21
	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 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21

HP Hard Drives

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

NOTE: Hard drives have either a one year or three year warranty.

NOTE: The hard drive options are not required when configuring a Drive-less Model.

NOTE: Hard drives must be selected in pair of matching part numbers.

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

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 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-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

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

Core Options

HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
6G SATA Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives	
HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739898-B21
HP 300GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739888-B21
6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives	
HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21

HP Networking

HP Ethernet 10Gb 2-port 530FLR-SFP+ Adapter	647581-B21
HP Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-B21
HP Ethernet 10Gb 2-port 561FLR-T Adapter	700699-B21
HP Ethernet 1Gb 4-port 331FLR Adapter	629135-B21
HP Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
HP FlexFabric 10Gb 2-port 526FLR-SFP+ Adapter	629138-B21
HP FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
HP FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
HP FlexFabric 10Gb 2-port 554FLR-SFP+ Adapter	629142-B21
HP Apollo 6000 Dual FlexibleLOM Riser Kit	757401-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: www.hp.com/go/ProLiantNICs

Additional Options

HP Insight Software	HP Insight Control Integrated Lights-Out (iLO) HP iLO Scale Out HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU BD776AAE HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License BD776A 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 Flex Qty E-LTU BD778AAE HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License BD778A HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License BD779A HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU E6U64ABE HP Integrated Lights-Out (iLO) Advanced for ProLiant HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License 512485-B21 HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates BD505A HP iLO Advanced Flexible Qty License with 3yr 24x7 Tech Support and Updates BD506A HP iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates BD506AAE HP iLO Advanced Tracking License with 3yr 24x7 Tech Support and Updates BD507A HP iLO Advanced including 1yr 24x7 Technical Support and Updates Tracking License 512487-B21 HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License TA850AAE
	<p>NOTE: For additional license options please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html</p> <p>NOTE: For more information, visit: http://www.hp.com/go/ilo</p>

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

HP Storage Controllers

SAS Controllers

Smart Array P430 Controller

HP Smart Array P430/2GB FBWC 12Gb 1-port Int SAS Controller 698529-B21

HP Smart Array P430/4GB FBWC 12Gb 1-port Int SAS Controller 698530-B21

Optional Upgrades

HP Apollo 6000 Mini-SAS H220 Cable 757405-B21

HP Apollo 6000 Mini-SAS P430 Cable 757406-B21

Host Bus Adapter

HP H220 Host Bus Adapter 650933-B21

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

http://h18004.www1.hp.com/products/quickspecs/14336_div/14336_div.html
(HBA 220)

HP Advanced Power Manager

HP Advanced Power Manager Kit 741192-B21

NOTE: Each HP APM can connect up to 10 chassis via consolidated chassis management cable.

HP 4M 20 Pin Consolidated Management Cable 762048-B21

NOTE: 1 cable per chassis.

HP 3M MicroDB9 to MicroDB9 Cable 762049-B21

NOTE: This cable is required for connectivity to DC Power shelf.

HP Rack Options

HP USB BFR with PVC Free Keyboard/Mouse Kit

HP USB BFR with PVC Free US Keyboard/Mouse Kit 631341-B21

HP USB BFR with PVC Free UK Keyboard/Mouse Kit 631344-B21

HP USB BFR with PVC Free FR Keyboard/Mouse Kit 631346-B21

HP USB BFR with PVC Free ES Keyboard/Mouse Kit 631348-B21

HP USB BFR with PVC Free DE Keyboard/Mouse Kit 631358-B21

HP USB BFR with PVC Free JP Keyboard/Mouse Kit 631360-B21

HP USB BFR with PVC Free IT Keyboard/Mouse Kit 631362-B21

HP USB BFR with PVC Free CN Keyboard/Mouse Kit 631364-B21

HP USB BFR with PVC Free AE Keyboard/Mouse Kit 638212-B21

HP USB BFR with PVC Free RU Keyboard/Mouse Kit 638214-B21

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

HP USB BFR with PVC Free AP-Intl Keyboard/Mouse Kit 672097-373

HP USB BFR with PVC Free Intl Keyboard/Mouse Kit 672097-B33

HP USB BFR with PVC Free PT Keyboard/Mouse Kit 672097-133

HP USB BFR with PVC Free TR Keyboard/Mouse Kit 672097-143

HP USB BFR with PVC Free CZ Keyboard/Mouse Kit 672097-223

HP USB BFR with PVC Free FI Keyboard/Mouse Kit 672097-353

HP USB BFR with PVC Free SE Keyboard/Mouse Kit 672097-103

HP USB BFR with PVC Free CH Keyboard/Mouse Kit 672097-113

HP USB BFR with PVC Free KR Keyboard/Mouse Kit 672097-KD3

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

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

Additional Options

HP USB and SD Options

HP Flash Media Kits for USB Drives

HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit 737953-B21

NOTE: 36pin SUV Dongle Kit is required.

Other USB and SD Options

HP 36pin Serial/USB/VGA Dongle Cord Kit 676277-B21

HP Enterprise Mainstream Flash Media Kits for Memory Cards

HP 8GB microSD Enterprise Mainstream Flash Media Kit 726116-B21

HP 32GB microSD Enterprise Mainstream Flash Media Kit 700139-B21

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

Memory Subsystem Architecture

Intel Processor socket supports 2 channels and 2 DIMMs per channel. Total max. memory up to 32GB DDR3 PC3-12800E1600MHz.

Standard Memory Plus Optional Memory

Up to 32 GB memory is available with the optional installation of 4 x 8GB PC3-12800E UDIMM ECC DDR3 UDIMM Memory kits, operating at 1600MHz when fully populated at 2 DIMMs per Channel in 4 slots.

NOTE: The below chart does not represent all possible memory configurations.

NOTE: For best performance, it is recommended that customer installs memory in identical pairs

Memory Population Rules and Guidelines:

- 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.
- There are two channels per processor with two DIMM slots per channel.
- Memory channel A consists of the two (2) DIMMs that are closest to the processor.
- Memory channel B consists of the two (2) DIMMs that are furthest from the processor.
- 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
- No support for RDIMMs; Non-ECC UDIMMs
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- 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.
- For memory population rules and additional memory guidelines, please see the HP ProLiant XL220 Gen8 v2 user guide at <http://www.hp.com/support>.

DIMM slot/capacity/populated speed table									
DIMM Type	Unbuffered with ECC DIMMs (UDIMMs)								
DIMM Rank	Single Rank (1R)			Dual Rank (2R)					
DIMM Capacity	2GB	2GB	2GB	4GB	4GB	8GB	8GB	4GB	8GB
DIMM Native Speed (MHz)	1333	1600	1600	1333	1600	1333	1600	1600	1600
Voltage	LV	Std	LV	LV	Std	LV	Std	LV	LV
SLOTS THAT CAN BE POPULATED									
4 slot servers	4	4	4	4	4	4	4	4	4
MAXIMUM CAPACITY (GB)*									
Capacity	8	8	8	16	16	32	32	16	32
POPULATED DIMM SPEED (MHz)									

Memory

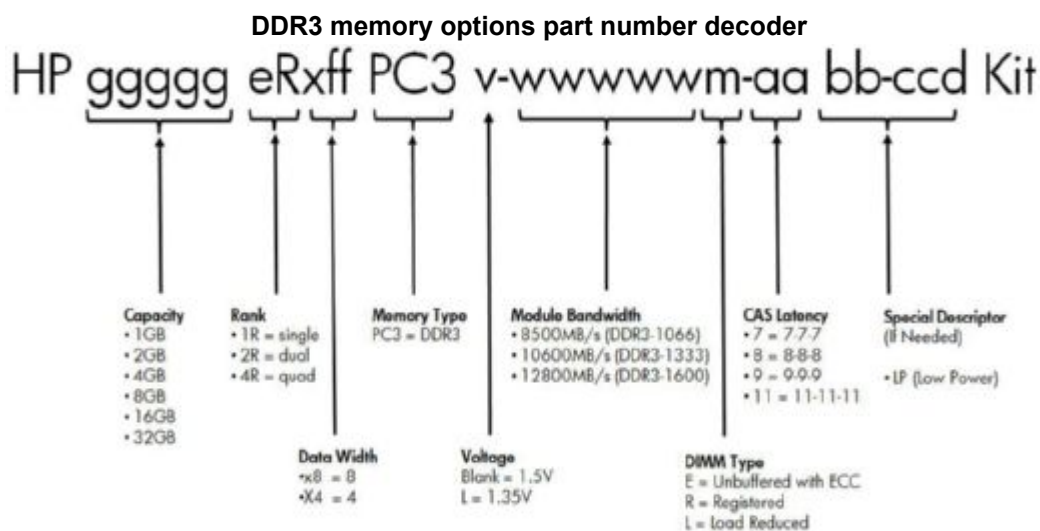
1 DIMM Per Channel	1333	1600	1600	1333	1600	1333	1600	1600	1600
2 DIMM PER Channel	1333**	1600	1600	1333**	1600	1333**	1600	1600	1600

* Maximum capacity will vary based on individual server platform qualification schedule

** For HP SmartMemory, UDIMM is supported at 2DPC@DDR3-1333. Third party memory may only support up to 2DPC@DDR3-1066.

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

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



Following are memory options available from HP:

HP Memory

Unbuffered with ECC DIMMs (UDIMMs)

HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669324-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-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-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit	669320-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713975-B21
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

Memory

HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS- 713979-B21
11 Low Voltage Memory Kit

Technical Specifications

System Unit	Server Dimensions (L x W x D)	1.70 x 8.33 x 27.87 in (4.33 x 21.15 x 70.79 cm)	
	Shipping Dimensions (L x W x D)	37.63 x 15.13 x 9 in (95.5 x 38.4 x 22.8 cm)	
	Weight (approximate)	Maximum (four hard drives and two processors installed)	15.0 lb (6.8 kg)
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 304.8 m) above sea level to a maximum of 10,000 ft (3048 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	-22° to 140° F (-30° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10% to 90% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.
		Non-operating	5% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3048 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
		Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
	Emissions Classification (EMC)	FCC Rating	Class A
		Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

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.

Summary of Changes

Date	Version History	Action	Description of Change:
09-Feb-2014	From version 4 to 5	Changed	Changed one overview image and refreshed the TS Verbiage.
November 1 , 2014	From v3 to v4	Changed	Updated Service and Support
September 3, 2014	From v2 to v3	Changed	Changes were made throughout the QuickSpecs.
June 13, 2014	From v1 to v2	Changed	Changes made to the Standard Features, Memory and Technical Specifications sections.

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