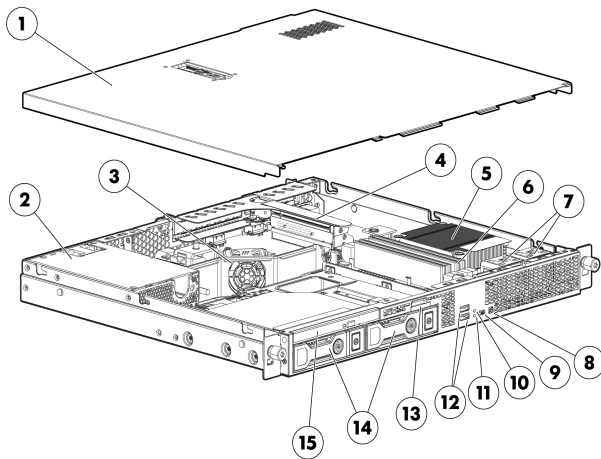# QuickSpecs

Overview

Do you need an entry-level short-depth server utilizing the latest technology to keep you competitive?
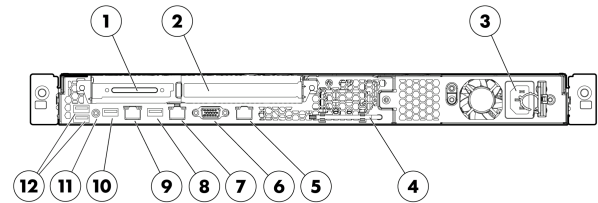
The HP ProLiant DL320e Gen8 v2 Server is an entry-level single processor 1U short depth rack server specifically designed to give you the competitive edge you need. The server supports the latest Intel Xeon E3-1200 v3, PCIe 3.0 slots, DDR3 1600 MHz memory, and up to 8 TB internal storage, plus the state of the art HP iLO Management Engine.

It is ideal for small businesses, chain stores, telecommunications firms, or others that require a low-cost, compact server. The DL320e Gen8 v2 is versatile enough to handle a variety of workloads, including single/dedicated IT services such as networking, security, file/print, and web serving/hosting.

Front View:

1. Access Panel
2. Power Supply
3. Fan Assembly
4. PCI Riser Cage
5. Processor
6. DIMMS
7. Fan Assembly
8. Power On/Standby button and LED
9. UID LED button
10. Health LED
11. NIC status LED
12. 2 USB Connectors
13. Serial number/iLO information pull tab
14. Hard Drive Bays
15. Optical drive

Rear View:

1. Expansion slot 2, PCIe x8
2. Expansion slot 1, PCIe x16
3. Integrated Power Supply
4. T-10/T-15 Torx screwdriver
5. NIC1/shared iLO connector
6. Video Connector
7. NIC Connector 2
8. USB 3.0 Connector
9. iLO4 Connector
10. USB 3.0 Connector
11. NIC link LED
12. USB2.0 Connectors

Overview

What's New

- New affordable processors available - Pentium and Core series
- Compact 15.07-inch 1U chassis depth to meet mobility and space requirements
- Standard 300W 80% power supply for lower power consumption
- NEBS compliance with 750W common slot power supply for telecom environment

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	**Entry Processors** Intel® Pentium® G3220 (3.0GHz/2-core/3MB/54W) Processor **NOTE:** Intel ®Pentium® G3220 processor, performance for 1600MHz memory is clocked down to 1333MHz. Intel® Pentium® G3240 (3.2GHz/2-core/3MB/54W) Processor **NOTE:** Intel® Pentium® G3240 Processor supports up to 1600MHz DDR3 memory speeds. **Base Processors** **NOTE:** All support up to1600MHz DDR3 memory speeds. Intel® Core™ i3-4130 (3.4GHz/2-core/3MB/54W, HT) Processor Intel® Core™ i3-4130T (2.9GHz/2-core/3MB/35W, HT) Processor **Performance Processors** **NOTE:** All support up to 1600MHz DDR3 memory speeds. Intel® Xeon® E3-1220v3 (3.1GHz/4-core/8MB/80W) Intel® Xeon® E3-1230v3 (3.3GHz/4-core/8MB/80W, HT) Intel® Xeon® E3-1230Lv3 (1.8GHz/4-core/8MB/25W, HT) Intel® Xeon® E3-1240v3 (3.4GHz/4-core/8MB/80W, HT) Intel® Xeon® E3-1265Lv3 (2.5GHz/4-core/8MB/45W, HT) Intel® Xeon® E3-1270v3 (3.5GHz/4-core/8MB/80W, HT) Intel® Xeon® E3-1280v3 (3.6GHz/4-core/8MB/82W, HT) **NOTE:** HT indicates that the processor model supports Intel® /Hyper-Threading Technology (depends on the processor). **NOTE:** DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs and CPU installed (options for 1600MHz, 1333MHz).
Cache Memory One of the following depending on Model	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/.
Upgradeability	Up to 4 DIMM slots available for higher Memory capacity Up to 4 bay SFF Hot plug Drive Cage; Or 2 bay LFF Hot plug or Non hot plug Drive Cages 2 PCIe 3.0 expansion slots Optical Drive Bay

Standard Features

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

Memory Protection	ECC

Memory One of the following depending on Model	Type	HP SmartMemory Unbuffered (UDIMM)
	DIMM Slots Available	4 DIMMs (2 Channels/ 2 DIMMs per channel)
	Maximum Capacity (UDIMM)	32GB (4 x 8GB@1600MHz)

NOTE: HP memory from previous generation servers are not fully compatible with the HP ProLiant DL320e Gen8 Servers.
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
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 1600MHz, or 1333MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

Network Controller	HP Ethernet 1Gb 2-port NC332i Adapter **NOTE:** The HP ProLiant DL320e Gen8 v2 server has an embedded dual-port network adapter. The server can be further upgraded with various networking products

Expansion Slots

Expansion Slots #	Technology	Bus Width*	Connector Width	Form Factor	Notes
1	PCIe 3.0	x8	x16	Half-length, full-height slot	
2	PCIe 3.0	x4	x8	Low profile slot	

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

Standard Features

HP Server ROM

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

HP ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HP ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

HP's ProLiant ROM is used to configure the following:

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

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

Storage Controller
One of the following depending on Model

Base Models

HP Dynamic Smart Array B120i Controller
NOTE: B120i has the following performance with regards to drive speed: 6Gb/s - in 2LFF and 4SFF only with port 0 & 1 installed; 3Gb/s - in 4SFF with more than 2 drives installed. For full 6 Gb.0/s speed a stand up card/smart array controller must be used.
NOTE: B120i supports RAID 0/1/10 only. It does not have FBWC support so cannot support advanced RAID (5 onwards). For FBWC, a standup Smart Array Controller card must be configured.

Performance Models

HP Smart Array P222/512MB FBWC controller
NOTE: P222 can support RAID 0/1/10/5/50. More advanced options available with Smart Array Advanced Pack 2.0.

NOTE: The DL320e Gen8 v2 can support other advanced controllers as well, depending on model and configuration
NOTE: For set up instructions for HP Smart Array B120i SATA Controller please refer to the HP ProLiant DL300 series server user guide.
NOTE: For general information about HP Smart Array B120i SATA RAID Controller, please visit: http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/dynamicsmartarray/index.html

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Standard Features

Internal Storage Devices	Diskette Drive	None
	Optical Drive	Optional
		DVD-RW
		NOTE: Slim-type (9.5mm)
	Hard Drives	None ship standard (Base Models and Performance Models)
	Hard Drive Bays	4 SFF drive bays or 2 LFF Non hot plug/Hot plug
		NOTE: HP ProLiant DL320e Series servers offer both SFF, and LFF versions in CTO. The Optical Drive bay is available with both models.
		NOTE: LFF versions are not an upgradeable option from SFF models, or vice versa, also between Non Hot Plug LFF and Hot Plug LFF.
		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. These part numbers for single HDD blanks below are also provided should the customer require replacement HDD blanks for their server.

Maximum Internal Storage	Hot Plug SFF SAS	4.8TB	4 x 1.2TB
	Hot Plug SFF SATA	4.0TB	4 x 1TB
	Hot Plug LFF SAS	8.0TB	2 x 4TB
	Hot Plug LFF SATA	8.0TB	2 x 4TB
	Hot Plug SFF SAS SSD	1.6TB	4 x 400GB
	Hot Plug SFF SATA SSD	3.2TB	4 x 800GB
	Hot Plug LFF SATA SSD	1.6TB	2 x 800GB
	Non-Hot Plug LFF SATA	6TB	2 x 3TB

Interfaces	Video	1 Rear standard video
	HP iLO Remote Management Network Port	1Gb Dedicated
	Micro SD slot	1 Internal
		NOTE: The Micro SD slot is not a hot-pluggable device. Customers should not attempt to plug an Micro SD card into the slot while the server is powered.
	USB 2.0 Ports	5 total: 2 rear, 2 front, 1 internal (Optional)
	USB 3.0 Ports	2 total: 2 rear

Industry Standard Compliance	ACPI 2.0b Compliant
	PCIe 3.0
	PXE Support
	WOL Support
	USB 2.0 Compliant
	USB 3.0 Compliant

QuickSpecs

Standard Features

Server Power Cords	All Pre-configured Models servers ship with a high voltage server to PDU power cord. **NOTE:** HP ProLiant DL servers no longer ship standard with a 12-foot NEMA 5-15P to C13 power cords (227099-001) that allow connection to 110V US wall outlets in a home or office. ProLiant DL servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU 6-foot C-14 to C13 power cord (142258-001). If a user wishes to power a ProLiant DL server using a110V receptacle (NEMA-15), the 12-foot NEMA 5-15 to C13 power cord must be ordered separately. See Power Cords section for Worldwide Power Cord options.
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
Common Slot Power Supply	**NOTE:** The default power supply for DL320e Gen8 server is a 300W Non Hot Plug, Non Redundant (ATX) power supply with 80% efficiency. A Common Slot 48V DC power supply (750W, 94% efficiency) supporting NEBS compliance is available only for the 4 SFF configuration. **NOTE:** Selecting the 750W power supply requires the HP DL320e Gen8 v2 CS FIO Enablement Kit **NOTE:** Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html
System Fans	2 front fan assemblies and 1 center fan assembly ship standard, non-redundant
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Canonical Ubuntu Server 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 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/DL320eGen8v2.

Standard Features

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

1U Rack form factor

4 SFF Drive Bay Version:
1.7" (4.32cm) Height x 17.11" (43.46cm) Width x 15.07" (38.30cm) Length

2 LFF Drive Bay Version:
1.7" (4.32cm) Height x 17.11" (43.46cm) Width x 15.07" (38.30cm) Length

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On System Management   HP iLO Management Engine

HP iLO Management Engine 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 Engine comes standard on all HP ProLiant Gen8 servers. The HP iLO Management Engine portfolio includes:

- **HP iLO:** The HP iLO (Integrated Lights-Out) management processor is the core foundation for the HP iLO Management Engine
- **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 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

Standard Features

Management Engine technologies whitepaper

HP Insight Management	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 interdepencies, when determining the correct updates and order of update deployment.

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

Security	Power-on password	
	Administrator's password	

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 resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

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

http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

QuickSpecs

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. HP Insight Control also supports Location and Power Discovery Services to automate many configuration, asset tracking, and power management tasks to speed implementation and prevent downtime. 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 Essentials	HP iLO Essentials license ideal for small and medium business customers. The specially created HP iLO Essentials (a subset of iLO Advanced functionality) saves SMB customers time and money, by ease of remote server set up through the interactive virtual media, lowering operational costs with remote access via the Integrated Remote Console, and faster time to resolution with email-based proactive notifications. With this newly designed HP iLO Essentials license SMB customers now have the option of a server management package solely design and priced just right for their IT environments. HP iLO Essentials is available on all HP ProLiant Gen8 e-series making this an ideal solution for small business owners. For more information, see: http://www.hp.com/go/iLO/essentials
	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

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**

Optional Features

HP offers array-based and host-based replication software for use in disaster recovery, testing, application development and reporting.

- **Storage Device Management Software**
  Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.
- **HP StoreVirtual VSA**
  With HP StoreVirtual VSA you can use the power of virtualization to turn a set of heterogeneous and disconnected physical disk drives in your servers and storage devices into a single pool of logical storage capacity.

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

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
HP Proactive Insight experience	Prevent problems with innovative, automated monitoring tools and proactive services. The HP Proactive Insight experience consist of using Insight Online, Insight Remote Support, and Proactive Care Support Service as one integrated solution. The Proactive Insight experience provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: www.hp.com/go/proactiveinsightexperience
Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.
HP Simple Configurator	SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support

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. **Protect your business beyond warranty with HP Care Pack Services** HP Care Pack services offer complete care and support expertise with committed response choices designed to meet your IT and business needs. HP Foundation Care services offer scalable reactive support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for your IT and business needs. HP Proactive Care delivers high levels of system availability through proactive service management and advanced technical response.
Optimized Care	**Supports maintaining servers at optimum performance availability** **3-Year HP 24x7 4 hour response, Proactive Care Service*** This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP's vast global resources. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf **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
Standard Care	**Supports maintaining high level of server availability** **3-Year HP Next Business Day, Proactive Care Service*** This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP's vast global resources. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf **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

Service and Support

Basic Care	**Delivers minimum recommended support service level**
	3-Year HP Next Business Day with Collaborative Support This service gives you hardware break/fix plus software diagnosis support with collaborative call management for a broad spectrum of 3rd Party software products including O/S and hypervisors. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8232ENW.pdf
	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
Related Services	**HP Proactive Care Personalized Support - Environmental Option** The Personalized Support option provides an assigned Account Support Manager who can bring best practices from across the industry plus extra technical skills to your IT team. This option is only available as an add-on to HP Proactive Care Support.
	HP Proactive Select Service Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf
	Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc
Insight Online/Insight Remote Support	HP Insight Remote Support provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. This comes at no additional cost with your HP solution*. Learn more about Insight Remote Support http://www.hp.com/go/insightremotesupport and Insight Online http://www.hp.com/go/insightonline
	* Insight Remote Support is a prerequisite for Proactive Care.
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

Parts and Materials HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction.

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: Maximum speed supported depends on the CPU installed. Entry model will support maximum speed of 1600 MHz.

Please see Memory Population Table or the Online Memory Configuration Tool at: www.hp.com/go/ddr3memory-configurator.

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.

Base Models

HP ProLiant DL320e Gen8 v2 G3220 1P 2GB-U NHP 2 LFF 300W PS Server 743490-xx1	**Processor(s)**	(1) Intel® Pentium® G3220 (3.0 GHz/2-core/3MB/54W) Processor
	Cache Memory	8MB (1x8MB) Level3
	Memory	2GB (1 x 4GB) Unbuffered DIMMs PC3-12800E (1600MHz)
	Network Controller	HP Ethernet 1Gb 2-port NC332i Adapter
	Storage Controller	HP Dynamic Smart Array B120i Controller **NOTE:** B120i has the following performance with regards to drive speed: 6Gb/s - in 2LFF and 4SFF only with port 0 & 1 installed; 3Gb/s - in 4SFF with more than 2 drives installed. For full 6 Gb.0/s speed a stand up card/smart array controller must be used. **NOTE:** B120i supports RAID 0/1/10 only. It does not have FBWC support so cannot support advanced RAID (5 onwards). For FBWC, a standup Smart Array Controller card must be configured.
	Hard Drive	None ship standard
	Internal Storage	2 bay LFF Non Hot Plug Drive Cage; includes 2LFF Hard Drive blanks
	Optical Drive Bay	None ships standard
	PCI-Express Slots	1 PCIe3 x16 and 1 PCIe3 x8
	Power Supply	300 Watts Non-Hot Plug, Non redundant Power Supply **NOTE:** The 300 Watts Non-Hot Plug Non redundant Power Supply is rated at 80% efficiency.
	Fans	2 front fan assemblies and 1 center fan assembly ship standard, non-redundant
	Management	HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
	Form Factor	1U
	Warranty	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. **NOTE:** No rail kits are included with the server. They must be ordered separately.
HP ProLiant DL320e Gen8	**Processor(s)**	(1) Intel® Xeon® E3-1220v3 (3.1GHz/4-core/8MB/80W, HT) Processor

Pre-configured Models

v2 E3-1220v3 1P 4GB-U B120i 300W PS Server 717170-xx1	**Cache Memory**	8MB (1x8MB) Level3
	Memory	4GB (1 x 4GB) Unbuffered DIMMs PC3-12800E (1600MHz)
	Network Controller	HP Ethernet 1Gb 2-port NC332i Adapter
	Storage Controller	HP Dynamic Smart Array B120i Controller **NOTE:** B120i has the following performance with regards to drive speed: **6Gb/s** - in 2LFF and 4SFF only with port 0 & 1 installed; **3Gb/s** - in 4SFF with more than 2 drives installed. For full 6 Gb.0/s speed a stand up card/smart array controller must be used. **NOTE:** B120i supports RAID 0/1/10 only. It does not have FBWC support so cannot support advanced RAID (5 onwards). For FBWC, a standup Smart Array Controller card must be configured.
	Hard Drive	None ship standard
	Internal Storage	2 bay LFF Hot Plug Drive Cage; includes 1 LFF hard drive blank
	Optical Drive Bay	None ships standard
	PCI-Express Slots	1 PCIe3 x16 and 1 PCIe3 x8
	Power Supply	300 Watts Non-Hot Plug, Non redundant Power Supply **NOTE:** The 300 Watts Non-Hot Plug Non redundant Power Supply is rated at 80% efficiency.
	Fans	2 front fan assemblies and 1 center fan assembly ship standard, non-redundant
	Management	HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
	Form Factor	1U
	Warranty	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. **NOTE:** No rail kits are included with the server. They must be ordered separately.

Performance Models

HP ProLiant DL320e Gen8 v2 E3-1240v3 1P 8GB-U P222 300W PS Server 722547-xx1	**Processor(s)**	(1) Intel® Xeon® E3-1240v3 (3.4GHz/4-core/8MB/80W, HT) Processor
	Cache Memory	8MB (1x8MB) Level3
	Memory	8GB (1 x 8GB) Unbuffered DIMMs PC3-12800E (1600MHz)
	Network Controller	HP Ethernet 1Gb 2-port NC332i Adapter
	Storage Controller	HP Smart Array P222/512MB FBWC Controller
	Hard Drive	None ship standard
	Internal Storage	4 bay SFF Hot Plug Drive Cage; includes 3 SFF hard drive blanks
	Optical Drive Bay	None ships standard
	PCI-Express Slots	1 PCIe3 x16 and 1 PCIe3 x8
	Power Supply	300 Watts Non-Hot Plug, Non redundant Power Supply **NOTE:** The 300 Watts Non-Hot Plug Non redundant Power Supply is rated at 80% efficiency.

Pre-configured Models

Fans		2 front fan assemblies and 1 center fan assembly ship standard, non-redundant
Management		HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
Form Factor		1U
Warranty		Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. **NOTE:** No rail kits are included with the server. They must be ordered separately.

Country Code Key	xx = 00	U.S.
	xx = 20	Brazil
	xx = 29	Japan
	xx = 37	APD
	xx = 42	Europe
	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: Factory Integrated Models must start with a CTO Server.
NOTE: FIO indicates that this option is only available as a factory installable option.
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 DL320e Gen8 v2 Non-hot Plug 2 LFF Configure-to-order Server	722313-B21

Factory Integrated Model ships with:

1U Chassis with 2 LFF Non-Hot Plug Drive Cage
HP Ethernet 1Gb 2-port NC332i Adapter
HP iLO Management Engine (standard)
HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10)
NOTE: For set up instructions for HP Dynamic Smart Array B120i SATA Controller please refer to the HP ProLiant DL300 series server user guide
NOTE: For general information about HP Dynamic Smart Array B120i SATA Controller, please visit:
http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/smartarrayb120i/index.html

	HP ProLiant DL320e Gen8 v2 Hot Plug 2 LFF Configure-to-order Server	722314-B21

Factory Integrated Model ships with:

1U Chassis with 2 LFF Hot Plug Drive Cage
HP Ethernet 1Gb 2-port NC332i Adapter
HP iLO Management Engine (standard)
HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10)
NOTE: For set up instructions for HP Dynamic Smart Array B120i SATA Controller please refer to the HP ProLiant DL300 series server user guide
NOTE: For general information about HP Dynamic Smart Array B120i SATA Controller, please visit:
http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/smartarrayb120i/index.html

	HP ProLiant DL320e Gen8 v2 Hot Plug 4 SFF Configure-to-order Server	722315-B21

Factory Integrated Model ships with:

1U Chassis with 4 SFF Hot plug Drive Cage
HP Ethernet 1Gb 2-port NC332i Adapter
HP iLO Management Engine (standard)
HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10)
NOTE: For set up instructions for HP Dynamic Smart Array B120i SATA Controller please refer to the HP ProLiant DL300 series server user guide
NOTE: For general information about HP Dynamic Smart Array B120i SATA Controller, please visit:
http://h18004.www1.hp.com/products/servers/proliantstorage/arraycontrollers/smartarrayb120i/index.html

Configuration Information - Factory Integrated Models

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

HP Processors	**Entry Processors**	
	NOTE: G3220 supports up to 1333MHz DDR3 memory speeds. G3420 supports up to 1600MHz DDR3 memory speeds.	
	HP DL320e Gen8 v2 Intel® Pentium® G3220 (3.0GHz/2-core/3MB/54W) FIO Processor Kit	741417-L21
	HP DL320e Gen8 v2 Intel® Pentium® G3420 (3.2GHz/2-core/3MB/54W) FIO Processor Kit	741419-L21
	Base Processors	
	NOTE: All support up to 1600MHz memory speeds.	
	HP DL320e Gen8 v2 Intel® Core™ i3-4130 (3.4GHz/2-core/3MB/54W) FIO Processor Kit	741413-L21
	HP DL320e Gen8 v2 Intel® Core™ i3-4130T (2.9GHz/2-core/3MB/35W) FIO Processor Kit	741415-L21
	Performance Processors	
	NOTE: All support up to 1600MHz DDR3 memory speeds.	
	HP DL320e Gen8 v2 Intel® Xeon® E3-1280v3 (3.6GHz/4-core/8MB/95W) FIO Processor Kit	718249-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1270v3 (3.5GHz/4-core/8MB/80W) FIO Processor Kit	718251-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1240v3 (3.4GHz/4-core/8MB/80W) FIO Processor Kit	718253-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1230Lv3 (1.8GHz/4-core/8MB/25W) FIO Processor Kit	741411-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1230v3 (3.3GHz/4-core/8MB/80W) FIO Processor Kit	718255-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1220v3 (3.1GHz/4-core/8MB/80W) FIO Processor Kit	718257-L21
	HP DL320e Gen8 v2 Intel® Xeon® E3-1265Lv3 (2.5GHz/4-core/8MB/45W) FIO Processor Kit	718261-L21
HP Memory	**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 (Worldwide)	
	NOTE: HP memory from previous generation servers are not fully compatible with new Active Health features on the DL320e Gen8 v2 Server.	
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713975-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-B21
	Unbuffered with ECC DIMMs (UDIMMs)	

Configuration Information - Factory Integrated Models

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

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

NOTE: Depending on the memory configuration and processor model, 1600MHz and 1333MHz memory may operate at a lower speed. Please see the see the "Memory" section later in this document and the Online Memory Configuration Tool for details at www.hp.com/go/ddr3memory-configurator.

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

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

NOTE: PC3L is a low voltage memory.

HP Power Supplies

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

HP 300W FIO Power Supply Kit	718142-B21
HP DL320e Gen8 v2 CS FIO Enablement Kit	718144-B21

NOTE: This is not a power supply. It is an option required if P/N: 636673-B21 is on the order.

HP 750W Common Slot -48VDC Hot Plug Power Supply Kit	636673-B21

NOTE: Selecting the 750W power supply requires the HP DL320e Gen8 v2 CS FIO Enablement Kit

QuickSpecs

Configuration Information - Factory Integrated Models

Step 3: Choose Additional Factory Integratable Options

HP USB Cable Kit	HP Gen8 FIO Internal USB Kit	662961-B21
	NOTE: Required only if USB Flash Media Drive Key is selected.	

HP Rail Kits	HP DL320eGen8 v2 Entry Rack Ear FIO Kit	723903-B21
	NOTE: DL320e Gen8 v2 ships with thumbscrew ear attachments (BTO and CTO) as standard. The Entry Rack Ear FIO Kit is a Quick Release Ear kit, it also needs to be purchased if you want to have a security bezel installed.	
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License.	
	NOTE: For more rail kit options see "Additional Options" section of this QuickSpecs.	

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle FIO Electronic License	C6N36ABE
	NOTE: The Electronic software license is available in EMEA only.	

Converged Infrastructure Management Software	**HP OneView with iLO Advanced - Server hardware required on same purchase order**	
	HP OneView for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic	E5Y43A
	HP OneView incl 3yr 24x7 Supp Bundle 1 Svr E-LTU	E5Y43AAE

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	**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 (Worldwide) **NOTE:** HP memory from previous generation servers are not fully compatible with SmartMemory features in Gen8 Servers.	
	Unbuffered with ECC DIMMs (UDIMMs)	
	HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713975-B21
	HP 4GB (1x4GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713977-B21
	HP 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit	713979-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
	NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: www.hp.com/go/ddr3memory-configurator. **NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient. **NOTE:** PC3L is a low voltage memory.	
HP Optical Drives	HP 9.5mm SATA DVD-RW JackBlack Optical Drive	652241-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; refer to the specific hard drive QuickSpecs for details.	

QuickSpecs

Core Options

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

HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
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) 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 (Worldwide)

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

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

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

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

HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	628065-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21

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

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

Core Options

HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	718171-B21

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

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

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

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

6G SATA ME Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives

HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691860-B21
HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691856-B21
HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691854-B21
HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691852-B21

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

HP 400GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690827-B21
HP 200GB 6G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	690825-B21

6G SAS SLC Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives

HP 400GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653082-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) SC Enterprise Performance 3yr Warranty Solid State Drive	653078-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)

Hard Drive Kits
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.
NOTE: The part numbers for single HDD blanks below are provided should the customer require replacement HDD blanks for their server.
NOTE: The mixing of standard SAS drives with SAS SSD drives is supported within the

Core Options

server, but limits the RAID configuration to two separate RAID 0 volumes. Mixing of other drives types is not supported.

HP LFF Gen8 Hard Drive Blank Kit	666986-B21
HP SFF Gen8 Hard Drive Blank Kit	666987-B21

HP Networking	**Gigabit Ethernet Adapters**	
	HP NC112T PCI Express Gigabit Server Adapter	503746-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP Ethernet 1Gb 2-port 332T Adapter	615732-B21
	HP Ethernet 1Gb 2-port 361T Adapter	652497-B21

10 Gigabit Ethernet Adapters

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

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

HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21
HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21

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

Switches

HP PS1810-24G Switch	J9834A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18004.www1.hp.com/products/quickspecs/14586_div/14586_div.html (Worldwide)

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 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 **NOTE:** The Electronic software license is available in EMEA only.	C6N28ABE
	HP Insight Control Server Provisioning Media Kit	BD883A
	HP Insight Management Media Kit	C6N31A
	HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License	T9082AAE
	HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License	452151-B21

NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.
NOTE: Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.
NOTE: Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.

NOTE: For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html

HP Integrated Lights-Out (iLO)

HP Integrated Lights-Out (iLO) Advanced for ProLiant

	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License **NOTE:** The Electronic software license is available in EMEA only.	E6U59ABE
	HP iLO Advanced including 3yr 24x7 Tech Support and Updates Electronic License **NOTE:** The Electronic software license is available in EMEA only.	E6U64ABE
	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 Essentials

	HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U61ABE
	HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates E-LTU **NOTE:** The Electronic software license is available in EMEA only.	E6U62ABE
	HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates Single Svr License	BD774A
	HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates Single Svr License	BD775A

NOTE: For additional license options please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html
NOTE: For more information, visit: http://www.hp.com/go/ilo.

Additional Options

Converged Infrastructure Management Software	**HP OneView**	
	HP OneView with iLO Advanced	
	HP OneView Media Kit Phys No Lic	E5Y37A
	HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y34A
	HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU	E5Y35AAE
	HP OneView without iLO Advanced	
	HP OneView w/o iLO Adv incl 3yr 24x7 Supp Phys 1 Svr Lic	E5Y38A
	HP OneView w/o iLO Adv inc 3yr 24x7 Supp Flex Qty E-LTU	E5Y39AAE

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14621_div/14621_div.html (Worldwide)

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

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.

	HP Insight Cluster Management Utility Media	BD477A

NOTE: For additional license kits please see the QuickSpecs at http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html.

HP Security	HP Trusted Platform Module Option	488069-B21

NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: www.hp.com/go/TPM.
NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.
NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

	HP 1U Security Gen8 Bezel Kit	664918-B21

NOTE: The Entry Rack Ear FIO Kit (P/N: 723903-B21) needs to be purchased if a security bezel is installed

Additional Options

HP Storage Controllers	**SAS Controllers**	
	Smart Array P222 Controller	
	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller	631667-B21
	Smart Array P421 Controller	
	HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller	631673-B21
	HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller	631674-B21
	Smart Array P431 Controller	
	HP Smart Array P431/2GB FBWC 6Gb 2-ports Ext SAS Controller	698531-B21
	Optional Upgrades	
	HP SmartCache No Media 24x7 Technical Support 1 Svr License	D7S26A
	HP SmartCache No Media 24x7 Technical Support Flexible License	D7S27A
	HP SmartCache No Media 24x7 Technical Support Electronic License	D7S27AAE

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14227_div/14227_div.html (Smart Array P222 Controller)
http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html (Smart Array P421 Controller)
http://h18000.www1.hp.com/products/quickspecs/14625_div/14625_div.html (Smart Array P431 Controller)

	Host Bus Adapter	
	HP H221 Host Bus Adapter	650931-B21

NOTE: This is a 2 x4 External Port HBA.

	HP H221 PCIe 3.0 SAS Host Bus Adapter	729552-B21
	HP H222 Host Bus Adapter	650926-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)
http://h18004.www1.hp.com/products/quickspecs/14222_div/14222_div.html (HBA 221)
http://h18004.www1.hp.com/products/quickspecs/14337_div/14337_div.html (HBA 222)

HP Networking Switches	HP PS1810-24G Switch	J9834A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18004.www1.hp.com/products/quickspecs/14586_div/14586_div.html (Worldwide)

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 www.hp.com/go/ebs. **NOTE:** For Internal drives to be connected to DL servers please make sure that you order rack mount kit as well.	
	HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit	C0L99A
	HP StoreEver LTO-6 Ultrium 6650 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 StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader	C0H19A
HP Tape Storage Systems	**HP StoreEver MSL6480**	
	HP StoreEver MSL6480 Scalable Base Module	QU625A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14604_div/14604_div.html (Worldwide)	
HP Disk Backup	**NOTE:** For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk backup products see: http://www.hp.com/storage/SPOCK.	
	HP RDX Removable Disk Backup System	
	HP RDX320 USB3.0 External Disk Backup System	B7B63A
	HP RDX500 USB3.0 Internal Disk Backup System	B7B64A
	HP RDX500 USB3.0 External Disk Backup System	B7B66A
	HP RDX1000 USB3.0 Internal Disk Backup System	B7B67A
	HP RDX1000 USB3.0 External Disk Backup System	B7B69A
	NOTE: Please see the QuickSpecs for additional part numbers, Technical Specifications, and additional information: http://h18000.www1.hp.com/products/quickspecs/13036_div/13036_div.html (Worldwide)	
HP Disk Storage Systems	**Disk Enclosures**	
	HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle	E7W32A
	HP D2600 Disk Enclosure	AJ940A
	HP D2700 Disk Enclosure	AJ941A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)	

QuickSpecs

Additional Options

HP Uninterruptible Power Systems	HP Tower UPS	
	HP T1000 G3 UPS Models	
	HP T1000 G3 1000VA NA Tower Uninterruptible Power System	AF448A
	HP T1000J JP Uninterruptible Power System	AF457A
	HP T1500 G3 UPS Models	
	HP T1500 G3 1400VA NA Tower Uninterruptible Power System	AF450A
	HP T1500J JP Uninterruptible Power System	AF458A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13160_div/13160_div.html
(Worldwide)

HP Rack-mountable UPS

HP R1500 G3 Uninterruptible Power Supply (UPS)

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

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html
(Worldwide)

HP R/T3000 G2 Uninterruptible Power System (UPS)

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

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

R5000 Uninterruptible Power System (UPS)

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

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

R7000 Uninterruptible Power System (UPS)

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

NOTE: Please see the QuickSpecs for additional information:
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.

NOTE: For additional information on sizing your HP UPS, please reference:
http://www.upssizer.com
NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and

Additional Options

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

HP Basic Power Distribution Units (bPDU)	**HP Basic Power Distribution Unit: 1U/0U Version**	
	HP 1.9kVA 120 Volt 12 Outlet NA/JP Basic Power Distribution Unit	H5M54A
	HP 3.6kVA 200-240 Volt 12 Outlet WW Basic Power Distribution Unit	H5M56A
	HP Basic Power Distribution Unit: Half Height Version	
	HP 2.8kVA 120 Volt 18 Outlet NA/JP Basic Power Distribution Unit	H5M55A
	HP 3.6kVA 200-240 Volt 20 Outlet WW Basic Power Distribution Unit	H5M57A
	HP 4.9kVA 208 Volt 20 Outlet NA/JP Basic Power Distribution Unit	H5M58A
	HP 7.3kVA 230 Volt 20 Outlet INTL Basic Power Distribution Unit	H5M68A
	HP 8.6kVA 208 Volt Three Phase 18 Outlet NA/JP Basic Power Distribution Unit	H5M61A
	HP Basic Power Distribution Unit: Mid Height Version	
	HP 4.9kVA 208 Volt 30 Outlet NA/JP Basic Power Distribution Unit	H5M59A
	HP 7.3kVA 230 Volt 30 Outlet INTL Basic Power Distribution Unit	H5M70A
	HP 8.3kVA 208 Volt 36 Outlet NA/JP Basic Power Distribution Unit	H5M60A
	HP 11kVA 230 Volt 36 Outlet INTL Basic Power Distribution Unit	H5M71A
	HP Hardwired 200-240 Volt 36 Outlet WW Basic Power Distribution Unit	H5M75A
	HP 5.7kVA 208 Volt Three Phase 27 Outlet NA/JP Dual Voltage Basic Power Distribution Unit	H5M63A
	HP 8.6kVA 208 Volt Three Phase 30 Outlet NA/JP Dual Voltage Basic Power Distribution Unit	H5M64A
	HP 8.6kVA 208 Volt Three Phase 30 Outlet NA/JP Basic Power Distribution Unit	H5M62A
	HP 11kVA 400 Volt Three Phase 30 Outlet INTL Basic Power Distribution Unit	H5M72A
	HP Basic Power Distribution Unit: Full Height Version	
	HP 11kVA 400 Volt Three Phase 42 Outlet INTL Basic Power Distribution Unit	H5M73A
	HP 11kVA 400 Volt Three Phase 42 Outlet NA Basic Power Distribution Unit	H5M67A
	HP Basic Power Distribution Unit: 480/277 Volt Version	
	HP 13.2kVA 480 Volt Three Phase 15 Outlet NA Basic Power Distribution Unit	H3X07A
	HP 19.9kVA 480 Volt Three Phase 30 Outlet NA Basic Power Distribution Unit	H3X08A
	HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer	H3X09A

NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14669_div/14669_div.html (Worldwide)

Additional Options

HP Remote Monitoring Power Distribution Units (mPDU)	**HP Remote Monitored Power Distribution Unit: 1U Version**	
	HP 2.8kVA 120 Volt 12 Outlet NA/JP Monitored Power Distribution Unit	D9N43A
	HP 3.6kVA 200-240 Volt 12 Outlet WW Monitored Power Distribution Unit	D9N46A
	HP 4.9kVA 208 Volt 12 Outlet NA/JP Monitored Power Distribution Unit	D9N44A
	HP Remote Monitored Power Distribution Unit: Half Height Version	
	HP 3.6kVA 200-240 Volt 16 Outlet WW Monitored Power Distribution Unit	D9N45A
	HP Remote Monitored Power Distribution Unit: Mid Height Version	
	HP 4.9kVA 208 Volt 24 Outlet NA/JP Monitored Power Distribution Unit	D9N47A
	HP 7.3kVA 230 Volt 24 Outlet INTL Monitored Power Distribution Unit	D9N48A
	HP 8.6kVA 208 Volt Three Phase 21 Outlet NA/JP Monitored Power Distribution Unit	D9N51A
	HP 5.7kVA 208 Volt Three Phase 21 Outlet NA/JP Dual Voltage Monitored Power Distribution Unit	D9N52A
	HP 8.6kVA 208 Volt Three Phase 24 Outlet NA/JP Dual Voltage Monitored Power Distribution Unit	D9N53A
	HP 11kVA 400 Volt Three Phase 21 Outlet INTL Monitored Power Distribution Unit	D9N55A
	HP Remote Monitored Power Distribution Unit: Full Height Version	
	HP 8.3kVA 208 Volt 33 Outlet NA Monitored Power Distribution Unit	D9N49A
	HP 7.3kVA 230 Volt 36 Outlet INTL Monitored Power Distribution Unit	D9N50A
	HP 11kVA 400 Volt Three Phase 33 Outlet INTL Monitored Power Distribution Unit	D9N57A
	HP 14.4kVA 208 Volt Three Phase 24 Outlet NA Monitored Power Distribution Unit	D9N58A
	HP 16.6kVA 400 Volt Three Phase 33 Outlet NA Monitored Power Distribution Unit	D9N61A
	HP 17.3kVA 208 Volt Three Phase 27 Outlet NA/JP Monitored Power Distribution Unit	D9N54A
	HP 17.3kVA 208 Volt Three Phase 24 Outlet NA/JP Monitored Power Distribution Unit	D9N59A
	HP 22kVA 400 Volt Three Phase 24 Outlet INTL Monitored Power Distribution Unit	D9N60A
	HP 22kVA 400 Volt Three Phase 33 Outlet INTL Monitored Power Distribution Unit	D9N56A
	HP 16.6kVA 400 Volt Three Phase 24 Outlet NA Monitored Power Distribution Unit	D9N62A
	HP 19.9kVA 480 Volt Three Phase 30 Outlet NA Monitored Power Distribution Unit	D9N63A
	HP Environmental Sensor for Remote Monitored PDUs	
	HP Environmental Sensor for Remote Monitored PDUs	E2D53A

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/14669_div/14669_div.html (Worldwide)

QuickSpecs

HP ProLiant DL320e Generation 8 (Gen8) v2

Additional Options

HP Intelligent Power Distribution Units (iPDU)		
	iPDU Core Units	
	HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
	HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF521A
	HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
	HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit	AF533A
	HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF523A
	HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
	HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit	AF525A
	HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF526A
	HP 22kVA 32A Three Phase INTL Core Intelligent Modular Power Distribution Unit	AF527A
	HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF535A
	HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit	AF537A
	HP 22kVA 32A 400V Three Phase 12 Outlet Core INTL Intelligent Power Distribution Unit	AF538A
	iPDU Kits with Standard Extension Bars	
	HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit	AF531A
	HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit	AF532A
	HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit	AF534A
	iPDU Extension Bars	
	HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
	HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html (Worldwide)

HP Rack Series		
	HP Intelligent Series Racks	
	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 Technical Specifications such as height, width, depth, weight, and color:
http://h18000.www1.hp.com/products/quickspecs/14223_div/14223_div.html (Worldwide)

HP Rack Options		
	HP TFT7600 G2 KVM Console and Monitor (TFT7600 G2)	
	HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A

Additional Options

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

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

HP USB Keyboard and Mouse

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

Additional Options

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13972_div/13972_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
(Worldwide)

HP Server Console Switch G2 with Virtual Media & CAC

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

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

HP 1x4 USB/PS2 KVM Console Switch

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

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

Rail Kits

HP 1U Small Form Factor Ball Bearing Gen8 Rail Kit	663201-B21
HP 1U Friction Rail Kit	727604-B21

Additional Options

HP USB and SD Options	**HP Flash Media Kits for USB Drives**	
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit	737953-B21
	HP Enterprise Mainstream Flash Media Kits for Memory Cards	
	HP 8GB microSD Enterprise Mainstream Flash Media Kit	726116-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13971_div/13971_div.html (Worldwide)

HP Care Pack Services	**Proactive Care**	

NOTE: Collaborative Support plus Proactive services delivered by the onshore, local language Advanced Solution Center (ASC), 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 4 hour 24x7 ProLiant DL320e Proactive Care Service	U6F03E
HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL320e Proactive Care Service	U6F04E
HP 3 year 6 hour Call to Repair 24x7 ProLiant DL320e Proactive Care Service	U6F09E
HP 3 year 6 hour Call to Repair 24x7 w/Defective Media Retention ProLiant DL320e Proactive Care SVC	U6F10E
HP 3 year Next business day ProLiant DL320e Proactive Care Service	U6E95E
HP 3 year Next business day with Defective Media Retention ProLiant DL320e Proactive Care Service	U6E96E
HP 3 year 4 hour 13x5 ProLiant DL320e Hardware Support	U6E97E
HP 3 year 4 hour 13x5 with Defective Media Retention ProLiant DL320e Hardware Support	U6E98E
HP 3 year 4 hour 24x7 ProLiant DL320e Hardware Support	U6E99E
HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL320e Hardware Support	U6F00E

Collaborative Support

NOTE: Hardware break/fix plus 24x7 software diagnosis support with collaborative call management for a broad spectrum of 3rd Party software products including O/S and hypervisors. Recommended for customers procuring 3rd party SW O/S and hypervisors from the software vendors directly and deploying them on HP ProLiant servers.

HP 3 year 4 hour 24x7 ProLiant DL320e Collaborative Support	U6F01E
HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL320e Collaborative Support	U6F02E
HP 3 year 6 hour Call to Repair 24x7 ProLiant DL320e Collaborative Support	U6F07E
HP 3 year 6 hour Call to Repair 24x7 w/Defective Media Retention ProLiant DL320e Collaborative Sup	U6F08E
HP 3 year Next business day ProLiant DL320e Collaborative Support	U6E93E

Additional Options

HP 3 year Next business day with Defective Media Retention ProLiant DL320e Collaborative Support	U6E94E
HP 3 year Next business day ProLiant DL320e Proactive Care Service	U6E95E
HP 3 year Next business day with Defective Media Retention ProLiant DL320e Proactive Care Service	U6E96E
HP 3 year 4 hour 13x5 ProLiant DL320e Hardware Support	U6E97E
HP 3 year 4 hour 13x5 with Defective Media Retention ProLiant DL320e Hardware Support	U6E98E

Installation Services

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

HP Installation ProLiant DL320e Service	U6F51E
HP Installation non Standard Hours ProLiant DL320e Service	U6F52E
HP Startup ProLiant DL320e Service	U6F53E
HP Startup non Standard Hours Proliant DL320e Service	U6F54E

Other Services

HP 3 year Next business day ProLiant DL320e Hardware Support	U6E91E
HP 3 year Next business day with Defective Media Retention ProLiant DL320e Hardware Support	U6E92E
HP 3 year 4 hour 13x5 ProLiant DL320e Hardware Support	U6E97E
HP 3 year 4 hour 13x5 with Defective Media Retention ProLiant DL320e Hardware Support	U6E98E
HP 3 year 4 hour 24x7 ProLiant DL320e Hardware Support	U6E99E
HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant DL320e Hardware Support	U6F00E
HP 3 year 6 hour Call to Repair 24x7 ProLiant DL320e Hardware Support	U6F05E
HP 3 year 6 hour Call to Repair 24x7 w /Defective Media Retention ProLiant DL320e Hardware Support	U6F06E
HP 3 year 24 hour Call to Repair 24x7 ProLiant DL320e Hardware Support	U6F55E
HP 3 year 24 hour Call to Repair 24x7 w/Defective Media Retention ProLiant DL320e Hardware Support	U6F56E

NOTE: For more information, customer/resellers can contact:
http://www.hp.com/services/carepack

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

General Memory Population Rules and Guidelines:

- The HP ProLiant DL320e Gen8v2Server has four memory slots
- There are two channels per server with two DIMM slot 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
- Different types of processors have different types of memory support.
- Support for single/dual-rank 1333/1600 MT/s ECC UDIMM (unbuffered DIMMS)
- The server supports up to 32 GB (4 x 8-GB) for Unbuffered DIMMs
- No support for RDIMMs; Non-ECC UDIMMs
- Do not install DIMMs if the processor is not installed
- Populate DIMMs from heaviest load (double-rank) to lightest load (single-rank)
- Always use HP qualified DIMM

Farthest DIMM (either CHA or CHB) should always be populated first

Memory

The UDIMM installing sequence:

Memory		Slot			
		DIMM4C	DIMM3A	DIMM2D	DIMM1B
Standard (Base Model)	**4 GB**	Empty	4 GB	Empty	Empty
Standard (Performance Model)	**8 GB**	Empty	8 GB	Empty	Empty
Maximum	**32 GB**	8 GB	8 GB	8 GB	8 GB

Memory Speed by Processor Model	
Processor Models	Supported Memory Speeds
E3-1220v3, E3-1230v3, E3-1230Lv3, E3-1240v3, E3-1270v3, E3-1280v3, E3-1265Lv3, i3-4130, i3-4130T, G3420	1600/1333MHz
G3220	1333MHz

Following are memory options available from HP:

HP Memory

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 (Worldwide)

NOTE: HP memory from previous generation servers are not fully compatible with the DL320e Gen8 Server.

Unbuffered with ECC DIMMs (UDIMMs)

HP 2GB (1x2GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit — 713975-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit — 713977-B21

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

NOTE: All DDR3 memory option kits consist of one DIMM per kit. For detailed memory
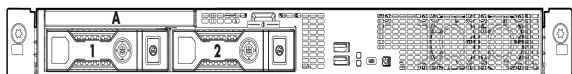
Memory

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

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.
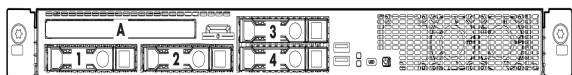
NOTE: PC3L is a low voltage memory.

Storage

1 - 2   2 x 3.5" (LFF) SAS/SATA hard drive bays

A   Optical Drive Bay: Optional DVD-RW drive

1 - 4   4 x 2.5" (SFF) SAS/SATA hard drive bays

A   Optical Drive Bay: Optional DVD-RW drive

Technical Specifications

System Unit	Dimensions (H x W x D)	4 SFF	1.7 x 17.11 x 15.07 inches (4.32 x 43.46 x 38.30 cm)
		2 LFF	1.7 x 17.11 x 15.07 inches (4.32 x 43.46 x 38.30 cm)
	Weight (approximate)	Maximum (Processor,HDD+ Common Slot power supply with 2 PCI cards)	4 SFF - 8.0 kg, 17.64 lb
		Minimum (Processor, one NHP hard drive, ATX power supply, without any Power Supply)	2 LFF NHP - 7.0 kg, 15.43 lb
	Input Requirements (HP ProLiant 300 W power supply)	Rated Input Voltage	100 to 127 VAC 200 to 240VAC
		Rated Input Current	6 Amps (at 100VAC) to 3 Amps (at 200 VAC)
		Rated Input Frequency	50 to 60 Hz
	Power Supply Output (per power supply)	Rated Steady-State Power	300 W (at 100 to 127 VAC), 300 W (at 200 to 240 VAC)
		Maximum Peak Power	350 W (at 100 to 127 VAC), 350 W (at 200 to 240 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise		Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were

Technical Specifications

measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

Idle

	LWAd	4.8 B (Base Model)
		4.9 B (Performance Model)
	LpAm	32 dBA (Base Model)
		33 dBA (Performance Model)

Operating

	LWAd	4.8 B (Base Model)
		5.1 B (Performance Model)
	LpAm	32 dBA (Base Model)
		35 dBA (Performance Model)

NOTE: The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels
NOTE: Values are subject to change without notification and are for reference only.
NOTE: Performance of system, options, and ancillary equipment will vary depending on the system configuration.
NOTE: Levels presented do not account for non-Hewlett-Packard installed hardware.

Emissions Classification (EMC)	FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

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

HP Dynamic Smart Array B120i Controller	**Dimensions**	Embedded
	Disk Drive Interface – Transfer rate	Up to 6Gb/s SATA (Serial ATA)
	SATA Connectors	6 internal SATA connectors
	Server Interface	x4 PCIe 2.0
	SATA Speed	6Gb/s SATA links
	Cache Memory	Zero Memory RAID has no cache memory
	Logical Drives Supported	Up to 8 logical volumes (6 physical drives)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	Hot Plug Support	Yes
	RAID Support	RAID 0 (Striping), RAID 1 (Mirroring)
		RAID 1+0 (Striping & Mirroring)

Technical Specifications

HP Ethernet 1Gb 2-port NC332i Adapter	Compatibility	IEEE 802.3 10Base-T
		IEEE 802.3u 100Base-T
		IEEE 802.3ab 1000Base-T
		IEEE 802.3az 1000Base-T
		NOTE: NC332i is also compliant with the IEEE standard 802.az-2010
	Data Transfer Method	PCI Express, one lanes (x1)
		NOTE: Speed is 5GT/s
	Controller	BCM5720
	Network Transfer Rate	10Base-T (Half and/or Full-Duplex)
		100Base-T (Half and/or Full--Duplex)
		1000Base-T (Half and/or Full-Duplex)
	Connector	RJ-45
	Cable Support	10Base-T
		100Base-TX
		1000BaseTX

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.