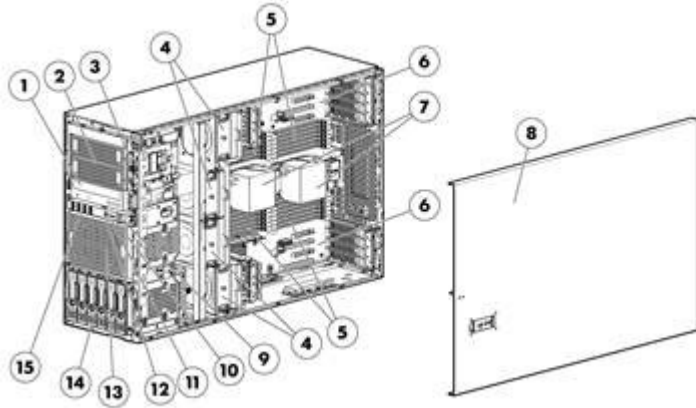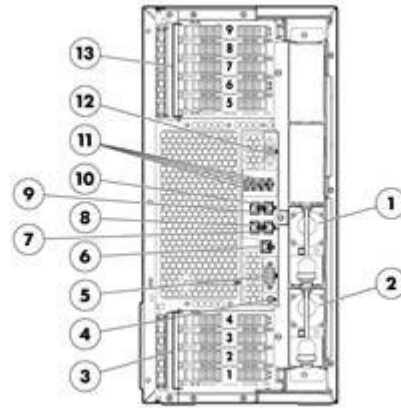# QuickSpecs

Overview

The HP ProLiant ML350p Gen8 is the latest generation of the best-selling ProLiant ML dual-processor Tower server that delivers best-in-class performance and availability with maximum expandability for enterprise datacenters, remote branch offices and growing businesses. It incorporates key HP technologies for the Gen8 ProLiant system architecture and provides innovations in memory, server management, firmware management and server storage. It combines these innovations with the latest Intel Xeon processors for a system with unsurpassed flexibility and performance.

Front View:

1. Half height SATA DVD ROM or DVD RW optical drive
2. Two (2) removable media bays
3. Systems Insight Display (rack and CTO models only)
4. Four (4) system fans
5. Twenty-four (24) DIMM slots: DDR3 Registered (RDIMM) or Unbuffered (UDIMM) memory
6. Nine (9) PCIe expansion slots (8 PCIe 3.0 and 1 PCIe 2.0)
7. Two (2) processor heatsinks
8. Quick removal access panel
9. Power On / Standby button and system power LED button
10. NIC Activity LED
11. Health LED
12. UID LED button
13. Optional drive cage
14. Standard drive cage (6 LFF or 8 SFF)
15. Four (4) USB connectors

Rear View:

1. Power supply 2
2. Power supply 1
3. Four (4) PCIe slots (for processor 1)
4. UID LED button
5. Serial connector
6. iLO connector
7. NIC connector 4
8. NIC connector 3
9. NIC connector 2
10. NIC connector 1
11. Four (4) USB connectors
12. Video connector
13. Five (5) PCIe slots (for processor 2)

Standard Features

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

Processor	Entry Processors
One of the following depending on Model	NOTE: All support up to 1066MHz memory speeds.

Entry Processors

NOTE: All support up to 1066MHz memory speeds.

Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/6.4GT-s QPI/80W)

Intel® Xeon® E5-2603 (1.80GHz/4-core/10MB/6.4GT-s QPI/80W)

Base Processors

NOTE: All support up to1333MHz DDR3 memory speeds.

Intel® Xeon® E5-2640 (2.50GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2-3/3/4/4/5/5)

Intel® Xeon® E5-2630 (2.30GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2-3/3/4/4/5/5)

Intel® Xeon® E5-2620 (2.90GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2-3/3/4/4/5/5)

Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/7.2GT-s QPI/60W, DDR3-1333, HT, Turbo2-3/3/4/4/5/5)

Performance Processors

NOTE: All support up to 1600MHz DDR3 memory speeds.

Intel® Xeon® E5-2690 (2.90GHz/8-core/20MB/8.0GT-s QPI/135W, DDR3-1600, HT, Turbo2-4/4/4/5/5/7/7/9)

Intel® Xeon® E5-2680 (2.70GHz/8-core/20MB/8.0GT-s QPI/130W, DDR3-1600, HT, Turbo2-4/4/5/5/5/7/8/8)

Intel® Xeon® E5-2670 (2.60GHz/8-core/20MB/8.0GT-s QPI/115W, DDR3-1600, HT, Turbo2-4/4/5/5/6/6/7/7)

Intel® Xeon® E5-2667 (2.90GHz/6-core/15MB/8.0GT-s QPI/130W, DDR3-1600, HT, Turbo2-3/3/3/4/5/6)

Intel® Xeon® E5-2665 (2.40GHz/8-core/20MB/8.0GT-s QPI/115W, DDR3-1600, HT, Turbo2-4/4/5/5/6/6/7/7)

Intel® Xeon® E5-2660 (2.20GHz/8-core/20MB/8.0GT-s QPI/95W, DDR3-1600, HT, Turbo2-5/5/6/6/7/7/8/8)

Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/8.0GT-s QPI/95W, DDR3-1600, HT, Turbo2-4/4/5/5/5/7/8/8)

Intel® Xeon® E5-2650L (1.8GHz/8-core/20MB/8.0GT-s QPI/70W, DDR3-1600, HT, Turbo2-4/4/5/5/5/7/8/8)

Intel® Xeon® E5-2643 (3.30GHz/4-core/10MB/8.0GT-s QPI/130W, DDR3-1600, HT, Turbo2-1/1/2/2)

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

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.
NOTE: Turbo 2 indicates the maximum potential bin increments when using Intel® Turbo Boost Technology, with 8, 7, 6, 5, 4, 3, 2, and 1 cores active.
NOTE: DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed (options for 1600, 1333, 1066MHz).
NOTE: Up to 2 processors supported. Mixing different processor models is not supported.
NOTE: For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version

Standard Features

number.

Cache Memory One of the following depending on Model	20MB (1 x 20MB) Level 3 cache NOTE: For Eight-core processors. 15MB (1 x 15MB) Level 3 cache NOTE: For Six-core processors. 10MB (1 x 10MB) Level 3 cache NOTE: For Quad-core processors. 5MB (1 x 5MB) Level 3 cache NOTE: For Dual-Core processors.
Chipset	Intel® C600 Chipset Intel® E5-2600 Processor Family NOTE: For more information regarding Intel® chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/.
Upgradeability	Upgradeable to two processors NOTE: Total 4, 8, 12 or 16 cores Up to 24 DIMM slots available for higher memory capacity Up to 24 SFF Hard Drive Bays; Or 18 LFF Hard Drive Bays 8 PCIe 3.0 and 1 PCIe 2.0 I/O slots for additional communications and storage expansion Redundant Power Supply and Redundant Fans Optical Drive Bay (up to 3)
On System Management Chipset	HP iLO (Firmware: HP iLO4) NOTE: For more information, visit: http://www.hp.com/go/ilo
Memory Protection	Advanced ECC Online Spare Lock-step mode

Standard Features

Memory One of the following depending on model	Type	HP SmartMemory DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
	Standard (Performance Models)	16 GB (4 x 4 GB) RDIMM
	Standard (Base Models)	8 GB (2 x 4 GB) RDIMM
	Standard (Entry Models)	4 GB (1 x 4 GB) RDIMM
	Maximum (RDIMM)	384 GB (24 x 16 GB) RDIMMM
	Maximum (UDIMM)	128 GB (16 x 8 GB)

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

Network Controller	HP 1Gb Ethernet 4-port 331i Adapter

Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
9	PCIe 3.0	x4	x8	32	Full Length/Full Height	For processor 2
8	PCIe 3.0	x16	x16	32	Full Length/Full Height	For processor 2
7	PCIe 3.0	x4	x8	32	Full Length/Full Height	For processor 2
6	PCIe 3.0	x16	x16	32	Full Length/Full Height	For processor 2
5	PCIe 2.0	x4	x8	0	Half Length/Full Height	For processor 2
4	PCIe 3.0	x4	x8	0	Full Length/Full Height	For processor 1

Standard Features

3	PCIe 3.0	x16	x16	0	Full Length/Full Height	For processor 1
2	PCIe 3.0	x4	x8	0	Full Length/Full Height	For processor 1
1	PCIe 3.0	x8	x16	0	Full Length/Full Height	For processor 1

NOTE: Bus number - Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.
NOTE: Nine total expansion slots. Three PCIe 3.0 x16 (x16 speed); One PCIe 3.0 x16 (x8 speed); Four PCIe 3.0 x8 (x4 speed); One PCIe 2.0 x8 (x4 speed).

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

Entry Models	HP Smart Array P420i/Zero Memory Controller
Base Models	HP Smart Array P420i/512M FBWC Controller
	HP Smart Array P420i/1G FBWC Controller
	NOTE: The SA-P420i/512M FBWC is standard on tower model and SA-P420i/1G FBWC is standard on rack model.
Performance Models	HP Smart Array P420i/2G FBWC Controller

QuickSpecs

Standard Features

Internal Storage Devices	Optical Drives	HP Half-Height SATA DVD-ROM Optical Drive **NOTE:** DVD ROM is standard in entry and base tower models.
	Hard Drives	HP Half Height SATA DVD-RW Optical Drive **NOTE:** DVD-RW is standard in performance tower and all rack models. None ship standard

Maximum Internal Storage One of the following depending on model			
	Hot Plug LFF SAS	54TB	18 x 3TB
	Hot Plug LFF SATA	54TB	18 x 3TB
	Hot Plug SFF SAS	24TB	24 x 1TB
	Hot Plug SFF SATA	24TB	24 x 1TB
	Hot Plug SFF SATA SSD	9.6TB	24 x 400GB
	Hot Plug SFF SAS SSD	19.2TB	24 x 800GB
	Hot Plug LFF SATA SSD	7.2TB	18 x 400GB

Interfaces		
	Serial	1
	Video	1 (rear)
	Network RJ-45 (Ethernet)	5 (1 dedicated for HP Integrated Lights-Out)
	iLO remote management network port	1 Gb Dedicated
	SD slot	1 (internal)
	USB	10 (4 front, 4 rear, 2 internal)

Industry Standard Compliance	
	ACPI 2.0b Compliant
	PCIe 3.0 Compliant
	PXE Support
	WOL Support
	Novell Certified
	IPMI 2.0, SMASH CLP, DCMI 1.0 compliant
	Microsoft® Logo certifications
	USB 2.0 Support
	SMBIOS 2.7.1

Server Power Cords   ProLiant ML servers in a rack-mount configuration no longer ship standard with NEMA power cords that allow connection to 110V US wall outlets in a home or office. These servers are primarily connected to PDU's in data center racks so they now ship standard with only a PDU power cord (416151-B21). If a user wishes to power a ProLiant ML rack-mount server using a 110V receptacle (NEMA-15), the NEMA power cord must be ordered separately. The 12' cord (AF556A) or 6' cord (187335-001) can be purchased online at HP.COM. In a tower configuration, the servers ship standard with a 6' country specific NEMA power cord. If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix: http://www.hp.com/go/powercordmatrix.

Standard Features

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

NOTE: Mixing of power supplies in the same server is not supported. All power supplies must be of the same output and efficiency rating. If non-matched power supplies are inserted you will get errors and operation will fail.

HP CS Platinum power supplies are required when enabling HP's Intelligent Power Discovery (IPD) solution. IPD is the first technology to create an automated, energy-aware network between IT systems and facilities. This allows your company to reclaim millions of dollars in wasted power capacity and downtime costs across data centers. For more information on HP's IPD solution, go to www.hp.com/go/ipd.
It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs. HP Power Advisor can be accessed at: www.hp.com/go/hppoweradvisor.
NOTE: The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on 80Plus.org.

Redundant Power: Optional (1 + 1 redundant) power supplies can be purchased through power supply option kits (see Power Supplies for part numbers).

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

System Fans
One of the following depending on Model	(4) hot plug, redundant fans plus louvers
Fan Redundancy is standard in performance model. Four fans, PCIe baffles plus fan louvers are required for fan redundancy.
(3) hot plug, non-redundant fans
For fan redundancy in entry and base models, the HP Hot Plug Redundant Fan Kit (659486-B21) must be purchased. HP Hot Plug Redundant Fan Kit includes 4th fan, PCIe baffles and fan louvers.

Standard Features

Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server 2008 Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Solaris VMware Citrix XenServer NOTE: For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport.

Graphics	Integrated Matrox G200 video standard • 1280 x 1024 (32 bpp) • 1920 x 1200 (16 bpp) NOTE: For more information, visit: http://www.hp.com/go/ilo.

Form Factor	Tower or Rack (5U)

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

• **HP iLO:** The HP iLO management processor is the core foundation for HP iLO Management Engine. HP iLO for HP ProLiant servers simplify server setup, engage health monitoring and power and thermal control, and promote remote administration for HP ProLiant ML, DL, BL and SL servers. Furthermore with the new HP iLO is the ability to access, deploy, and manage your server anytime from anywhere with your Smartphone device.
• **HP Agentless Management:** With HP iLO Management Engine in every HP ProLiant Gen8 server, the base hardware monitoring and alerting capability is built into the system (running on the HP iLO chipset) and starts working the moment that a power cord and an Ethernet cable is connected to the server.
• **HP Active Health System:** HP Active Health System is an essential component of the HP iLO Management Engine. It provides customers with: Diagnostics tools/scanners wrapped into one; Always on, continuous monitoring for increased stability and shorter downtimes; Rich configuration history; Health and service alerts; Easy export and upload to Service and Support.
• **HP Intelligent Provisioning (previously known as SmartStart):** HP Intelligent Provisioning offers the ability for out-of-the box single-server deployment and configuration without the need for media. HP Embedded Remote Support: The new embedded Remote Support functions builds on the already established HP Insight Remote Support

Standard Features

application that can run either on a stand-alone central system, or as a plug-in to HP Systems Insight Manager. Key parts of that technology now are part of the HP iLO Management Engine and are ready to start working for you, after a few keystrokes on a single activation screen.

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

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

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

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

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

QuickSpecs

Standard Features

Security	Power-on password
	Setup password
	Serial interface control
	Power switch security
	Administrator's password

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 3-Year Parts, 3-Year Labor, 3-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

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.

Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol

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

HP Matrix Operating Environment

The HP Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business.

The HP Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HP CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS).

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

HP iLO Advanced License for ProLiant Servers

HP iLO management processors for HP ProLiant Gen8 servers virtualizes system controls to help simplify server setup, engage health monitoring and power and thermal control, and promote remote administration. HP iLO functions out-of-the-box without additional software installation and functions regardless of the servers' state of operation. Basic system board management functions, diagnostics, and essential Lights-Out functionality ships standard across all HP ProLiant Gen8 rack, tower and blade servers. The HP iLO can be accessed from any location via a web browser and works hand-in-hand with HP Systems Insight Manager, Insight Control, and HP Matrix Operating Environment, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service to the business.

Advanced functionality, such as graphical remote console, multi-user collaboration, and video record/playback can be activated with the optional HP iLO Advanced or HP iLO Advanced for BladeSystem licenses. The Advanced licensed features offer sophisticated remote administration of servers in dynamic data center and remote locations and can help significantly reduce cost associated with IT-related travel and unplanned downtime.

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

Optional Features

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

HP Insight Online	HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime. www.hp.com/go/insightonline

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

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

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

Optional Features

HP Enterprise
Configurator

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

QuickSpecs

Service and Support

Service and Support	**HP Technology Services for Industry Standard Servers and BladeSystem** Capitalizing on HP ProLiant server and HP BladeSystem capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best — the experienced professionals at HP Services. **What HP ProLiant and BladeSystem Services can do for you** HP ProLiant and BladeSystem Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. Foundation Care services deliver scalable support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for their business needs. New to this portfolio is HP Collaborative Support. If you are running business critical environments, HP offers Proactive Care or Critical Advantage. These services help deliver high levels of application availability through proactive service management and advanced technical response You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs. HP Technology Services meets business challenges with services offered in three support recommendations – **Optimized Care, Standard Care, and Basic Care** - available for each product group. Such support solutions enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support recommendations for servers, storage, networking and software. All three service recommendations include support services from the broader portfolio of Foundation Care and Proactive Care services.
Optimized Care	## Optimized Care: Supports maintaining servers at optimum performance availability **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf **HP Installation and Startup for Insight Control Software / HP SIM** Provides for the deployment and basic configuration of HP Insight Control or HP SIM (Systems Insight Manager) on HP ProLiant ML and DL series servers or HP BladeSystem servers http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf **3-Year HP 24x7 4 hour Response, Proactive Care or Critical Advantage** Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf Additional Services: Data Center Transformation Services
Standard Care	## Standard Care: Service recommendation that maintains high level of server availability **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

Service and Support

HP Installation and Startup for Insight Control Software / HP SIM
Provides for the deployment and basic configuration of HP Insight Control or HP SIM (Systems Insight Manager) on HP ProLiant ML and DL series servers or HP BladeSystem servers
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf

3-Year HP 24x7 4 hour Response, Collaborative Support
Offers customers a single point of contact for server problem diagnosis, hardware problem resolution, and basic software problem diagnosis, fault isolation, and resolution if available to HP. If the problem is with HP HW, the representative will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware) Installation & Start Up and Software Support; Microsoft or Linux or VMware education courses; +60 Proactive Select Credits

Basic Care

Basic Care: delivers minimum recommended support service level

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service
Provides for the deployment and basic configuration of HP Insight Control on HP ProLiant ML and DL series servers or HP BladeSystem servers
http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA0-9972ENW.pdf

Additional Services -Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware) Installation & Start Up and Software Support; +30 Proactive Select Credits, Factory Express.

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

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

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

*HP Support Center Mobile App is subject to local availability

Warranty / Service Coverage
For ProLiant servers and storage systems, the services cover HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that

Service and Support

have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

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

Pre-configured Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.
NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
NOTE: HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.
NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

Entry Models

HP ProLiant ML350p Gen8 E5-2609 1P 4GB-R P420i Hot Plug 6 LFF 460W PS Entry Svr 646675-xx1	Processor	(1) Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/6.4GT-s QPI/80W) Processor
	Cache Memory	10MB (1 x 10MB) L3 cache
	Memory	4GB (1x4GB) DDR3 RDIMM NOTE: 11 DIMM slots available (23 if second processor is purchased).
	Network Controller	HP 1Gb Ethernet 4-port 331i Adapter
	Storage Controller	HP Smart Array P420i/Zero Memory Controller
	Hard Drive	None ship standard
	Internal Storage	(6) Hot plug LFF SAS/SATA HDD bays; upgradable to (18)
	Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
	Power Supply	(1) HP 460W Common Slot Gold Hot Plug Power Supply
	Fans	3 hot plug, non-redundant fans
	Accessories	USB Keyboard and Mouse ship standard
	Management	iLO Management Engine Standard Optional: HP Insight Control
	Form Factor	Tower (5U)
	Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

QuickSpecs

Pre-configured Models

Base Models

HP ProLiant ML350p Gen8 E5-2620 1P 8GB-R P420i Hot Plug 8 SFF 460W PS Base Svr 646676-xx1		
Processor	(1) Intel® Xeon® E5-2620 (2.90GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) Processor
Cache Memory	15MB (1 x 15MB) L3 cache
Memory	8GB (2x4GB) DDR3 RDIMM NOTE: 10 DIMM slots available (22 if second processor is purchased).
Network Controller	HP 1Gb Ethernet 4-port 331i Adapter
Storage Controller	HP Smart Array P420i/512M FBWC Controller
Hard Drive	None ship standard
Internal Storage	(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (24)
Optical Drive	HP Half-Height SATA DVD-ROM Optical Drive
Power Supply	(1) HP 460W Common Slot Gold Hot Plug Power Supply
Fans	3 hot plug, non-redundant fans
Accessories	USB Keyboard and Mouse ship standard
Management	iLO Management Engine Standard Optional: HP Insight Control
Form Factor	Tower (5U)
Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

HP ProLiant ML350p Gen8 E5-2630 1P 8GB-R P420i Hot Plug 8 SFF 750W PS Base Svr 646677-xx1		
Processor	(1) Intel® Xeon® E5-2630 (2.30GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) Processor
Cache Memory	15MB (1 x 15MB) L3 cache
Memory	8GB (2x4GB) DDR3 RDIMM NOTE: 10 DIMM slots available (22 if second processor is purchased).
Network Controller	HP 1Gb Ethernet 4-port 331i Adapter
Storage Controller	HP Smart Array P420i/1G FBWC Controller
Hard Drive	None ship standard
Internal Storage	(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (24)
Optical Drive	HP Half-Height SATA DVD-RW Optical Drive
Power Supply	(1) HP 750W Common Slot Platinum Plus Hot Plug Power Supply
Management	iLO Management Engine Standard Optional: HP Insight Control
Fans	3 hot plug, non-redundant fans
Form Factor	Rack (5U)
Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response

Pre-configured Models

Performance Models

HP ProLiant ML350p Gen8 E5-2650 2P 16GB-R P420i Hot Plug SFF 750W PS ES Server 678237-xx1		
Processor	(2) Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/8GT-s QPI/95W, DDR3-1600, HT, Turbo2- 4/4/5/5/5/7/8/8) Processors	
Cache Memory	20MB (1 x 20MB) L3 cache	
Memory	16GB (4x4GB) DDR3 RDIMM NOTE: 20 DIMM slots available.	
Network Controller	HP 1Gb Ethernet 4-port 331i Adapter	
Storage Controller	HP Smart Array P420i/2G FBWC Controller	
Hard Drive	None ship standard	
Internal Storage	(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (24)	
Optical Drive	HP Half-Height SATA DVD-RW Optical Drive	
Power Supply	(2) HP 750W Common Slot Platinum Plus Hot Plug Power Supply	
Fans	4 hot plug, redundant fans plus louvers	
Accessories	USB Keyboard and Mouse ship standard	
Management	iLO Management Engine Standard Optional: HP Insight Control	
Form Factor	Tower (5U)	
Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response	

HP ProLiant ML350p Gen8 E5-2640 2P 16GB-R P420i Hot Plug 8 SFF 750W PS Perf Svr 646678-xx1		
Processor	(2) Intel® Xeon® E5-2640 (2.50GHz/6-core/15MB/7.2GT-s QPI/95W, DDR3-1333, HT, Turbo2- 3/3/4/4/5/5) Processors	
Cache Memory	15MB (1 x 15MB) L3 cache	
Memory	16GB (4x4GB) DDR3 RDIMM NOTE: 20 DIMM slots available.	
Network Controller	HP 1Gb Ethernet 4-port 331i Adapter	
Storage Controller	HP Smart Array P420i/2G FBWC Controller	
Hard Drive	None ship standard	
Internal Storage	(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (24)	
Optical Drive	HP Half-Height SATA DVD-RW Optical Drive	
Power Supply	(2) HP 750W Common Slot Platinum Plus Hot Plug Power Supplies	
Fans	4 hot plug, redundant fans plus louvers	
Management	iLO Management Engine Standard Optional: HP Insight Control	
Form Factor	Rack (5U)	
Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response	

Pre-configured Models

Country Code Key		Tower Code Key	Rack Code Key
	xx=00	US	US
	xx=01	Australia	N/A
	xx=03	UK	N/A
	xx=04	Germany	N/A
	xx=05	France	N/A
	xx=20	Brazil	N/A
	xx=29	Japan	Japan
	xx=37	APD	APD
	xx=42	Europe (Excludes USB Keyboard)	Europe
	xx=AA	PRC	PRC

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: Configure-to-order (CTO) servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is only available as a factory installable option.

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

HP Models   **ML350p Gen8 Tower Models**

HP ProLiant ML350p Gen8 Hot Plug 8 SFF Configure-to-order Tower Server   652065-B21

Includes:

HP 1Gb Ethernet 4-port 331i Adapter
HP Smart Array P420i Controller
Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays
Seven (7) HDD blanks
Ten (10) USB ports
Eight (8) PCIe 3.0 slots (3x16, 1x8, 4x4), One (1) PCIe 2.0 slot (1x4)
USB Keyboard & Mouse (optional)
Tower (5U) form factor
SID Module (optional)

HP ProLiant ML350p Gen8 Hot Plug 6 LFF Configure-to-order Tower Server   652066-B21

Includes:

HP 1Gb Ethernet 4-port 331i Adapter
HP Smart Array P420i Controller
Six (6) Hot-Plug (LFF) SAS/SATA Drive Bays
Five (5) HDD blanks
Ten (10) USB ports
Eight (8) PCIe 3.0 slots (3x16, 1x8, 4x4), One (1) PCIe 2.0 slot (1x4)
USB Keyboard & Mouse (optional)
Tower (5U) form factor
SID Module (optional)

ML350p Gen8 Rack Models

HP ProLiant ML350p Gen8 Hot Plug 8 SFF Configure-to-order Rack Server   652063-B21

Includes:

HP 1Gb Ethernet 4-port 331i Adapter
HP Smart Array P420i Controller
Eight (8) Hot-Plug (SFF) SAS/SATA Drive Bays
Seven (7) HDD blanks
Ten (10) USB ports
Eight (8) PCIe 3.0 slots (3x16, 1x8, 4x4), One (1) PCIe .2.0 slot (1x4)
Rack (5U) form factor
Sliding Rail Kit
SID module (standard)

HP ProLiant ML350p Gen8 Hot Plug 6 LFF Configure-to-order Rack Server   652064-B21

Includes:

HP Embedded 1 Gb Ethernet 4-port 331i Adapter
Embedded HP Smart Array P420i Controller
Six(6) Hot-Plug (LFF) SAS/SATA Drive Bays
Five(5) HDD blanks

Configuration Information - Factory Integrated Models

Ten (10) USB ports
Eight (8) PCIe 3.0 slots (3x16, 1x8, 4x4), One (1) PCIe 2.0 slot (1x4)
Rack (5U) form factor
Sliding Rail Kit
SID module (standard)

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

HP Processors

Entry Processors
NOTE: All support up to 1066MHz memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/80W) FIO Processor Kit	660597-L21
HP ML350p Gen8 Intel® Xeon® E5-2603 (1.80GHz/4-core/10MB/80W) FIO Processor Kit	660595-L21

Base Processors
NOTE: All support up to1333MHz DDR3 memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2640 (2.50GHz/6-core/15MB/95W) FIO Processor Kit	660600-L21
HP ML350p Gen8 Intel® Xeon® E5-2630 (2.30GHz/6-core/15MB/95W) FIO Processor Kit	660599-L21
HP ML350p Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) FIO Processor Kit	660598-L21
HP ML350p Gen8 Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/60W) FIO Processor Kit	660607-L21

Performance Processors
NOTE: All support up to 1600MHz DDR3 memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2690 (2.90GHz/8-core/20MB/135W) FIO Processor Kit	660605-L21
HP ML350p Gen8 Intel® Xeon® E5-2680 (2.70GHz/8-core/20MB/130W) FIO Processor Kit	660604-L21
HP ML350p Gen8 Intel® Xeon® E5-2670 (2.60GHz/8-core/20MB/115W) FIO Processor Kit	660603-L21
HP ML350p Gen8 Intel® Xeon® E5-2667 (2.90GHz/6-core/15MB/130W) FIO Processor Kit	660608-L21
HP ML350p Gen8 Intel® Xeon® E5-2665 (2.40GHz/8-core/20MB/115W) FIO Processor Kit	660596-L21
HP ML350p Gen8 Intel® Xeon® E5-2660 (2.20GHz/8-core/20MB/95W) FIO Processor Kit	660602-L21
HP ML350p Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) FIO Processor Kit	660601-L21
HP ML350p Gen8 Intel® Xeon® E5-2650L (1.80GHz/8-core/20MB/70W) FIO Processor Kit	660606-L21
HP ML350p Gen8 Intel® Xeon® E5-2643 (3.30GHz/4-core/10MB/130W) FIO Processor Kit	678242-L21
HP ML350p Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) FIO Processor Kit	678244-L21

Configuration Information - Factory Integrated Models

HP Memory	**NOTE:** HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html	
	NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.	

Registered DIMMs (RDIMMs)

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

Unbuffered with ECC DIMMs (UDIMMs)

HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647905-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: http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

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	

Primary Power Supplies

NOTE: Primary Power Supplies offer 94% Efficiency with Intelligent Power Discovery.

HP 460W Common Slot Platinum Plus Hot Plug Power Supply Kit	656362-B21
HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
HP 1200W Common Slot Platinum Plus Hot Plug Power Supply Kit	656364-B21

Optional Power Supplies

NOTE: Optional Power Supplies offer 92% Efficiency.

HP 460W Common Slot Gold Hot Plug Power Supply Kit	503296-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21

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

SID Module	Systems Insight Display FIO Kit NOTE: Provides health status for key components (for CTO Tower Models only, standard in Rack Models)	660583-B21

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	582765-B21
	HP Insight Control for Linux including 1yr 24x7 Support ML/DL Bundle 1 Server FIO License	TC203A

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. Contact your local sales representative for additional information.

HP Unique Options		
	HP Hot Plug Redundant Fan Kit	659486-B21
	HP Tower to Rack Conversion Tray Kit	659488-B21
	HP Security Bezel Kit	660584-B21

NOTE: For restricting access to a rack model

HP Graphic Card Support Kit   660582-B21
NOTE: An option kit will be required per Graphic Card)
NOTE: The ML350p Gen8 supports up to 3 graphic cards. Three single-slot or two dual-slot and one single-slot cards are supported. Three dual-slot cards are not supported at this time.
NOTE: Please see the HP Power Advisor for estimated power consumption of your individual system configuration prior to installing GPUs. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor.

HP Processors

Entry Processors
NOTE: All support up to 1066MHz memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2609 (2.40GHz/4-core/10MB/80W) Processor Kit	660597-B21
HP ML350p Gen8 Intel® Xeon® E5-2603 (1.80GHz/4-core/10MB/80W) Processor Kit	660595-B21

Base Processors
NOTE: All support up to1333MHz DDR3 memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2640 (2.50GHz/6-core/15MB/95W) Processor Kit	660600-B21
HP ML350p Gen8 Intel® Xeon® E5-2630 (2.30GHz/6-core/15MB/95W) Processor Kit	660599-B21
HP ML350p Gen8 Intel® Xeon® E5-2620 (2.0GHz/6-core/15MB/95W) Processor Kit	660598-B21
HP ML350p Gen8 Intel® Xeon® E5-2630L (2.0GHz/6-core/15MB/60W) Processor Kit	660607-B21

Performance Processors
NOTE: All support up to 1600MHz DDR3 memory speeds.

HP ML350p Gen8 Intel® Xeon® E5-2690 (2.90GHz/8-core/20MB/135W) Processor Kit	660605-B21
HP ML350p Gen8 Intel® Xeon® E5-2680 (2.70GHz/8-core/20MB/130W) Processor Kit	660604-B21
HP ML350p Gen8 Intel® Xeon® E5-2670 (2.60GHz/8-core/20MB/115W) Processor Kit	660603-B21
HP ML350p Gen8 Intel® Xeon® E5-2667 (2.90GHz/6-core/15MB/130W) Processor Kit	660608-B21
HP ML350p Gen8 Intel® Xeon® E5-2665 (2.40GHz/8-core/20MB/115W) Processor Kit	660596-B21
HP ML350p Gen8 Intel® Xeon® E5-2660 (2.20GHz/8-core/20MB/95W) Processor Kit	660602-B21

Core Options

	HP ML350p Gen8 Intel® Xeon® E5-2650 (2.0GHz/8-core/20MB/95W) Processor Kit	660601-B21
	HP ML350p Gen8 Intel® Xeon® E5-2650L (1.80GHz/8-core/20MB/70W) Processor Kit	660606-B21
	HP ML350p Gen8 Intel® Xeon® E5-2643 (3.30GHz/4-core/10MB/130W) Processor Kit	678242-B21
	HP ML350p Gen8 Intel® Xeon® E5-2637 (3.0GHz/2-core/5MB/80W) Processor Kit	678244-B21

HP Memory

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.

Registered RDIMMs

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

Unbuffered with ECC DIMMs (UDIMMs)

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

HP Drive Cage Options

HP 2nd Media Bay Cage Kit		661618-B21
HP 5U 6LFF Hot Plug Drive Cage Kit		659485-B21
HP 5U 8SFF Hot Plug Drive Cage Kit		659484-B21

NOTE: Additional Hot Plug Drive Cages require a separate Smart Array controller for each drive cage.

Core Options

HP Optical Drives	HP Half-Height SATA DVD ROM JackBlack Optical Drive	624189-B21
	HP Half-Height SATA DVD RW JackBlack Optical Drive	624192-B21

NOTE: A total of two optical drives can be added. A second and third optical drive requires the HP 2nd Media Bay Cage Kit (Part Number 661618-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.

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

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HP 300GB 6G SAS 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
HP 72GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652597-B21

SAS Hot Plug Smart Drive 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 Smart Drive LFF (3.5-inch) Enterprise Drives

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

SAS Hot Plug Smart Drive LFF (3.5-inch) Midline Drives

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 Smart Drive 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 Smart Drive LFF (3.5-inch) Midline (MDL) Drives

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

Core Options

NOTE: SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

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

HP 800GB 6G SAS MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653109-B21
HP 400GB 6G SAS MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653105-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	658478-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

3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

HP 400GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653120-B21
HP 200GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653118-B21
HP 100GB 3G SATA MLC SFF (2.5-inch) SC Enterprise Mainstream 3yr Warranty Solid State Drive	653112-B21

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 Blank Kits

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 4-port 331T Adapter	647594-B21

10 Gigabit Ethernet adapters

HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21

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

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QuickSpecs

Core Options

HP InfiniBand	QLogic InfiniBand 4X QDR PCI-E G2 Dual Port HCA	583211-B21
	HP InfiniBand 4X QDR ConnectX-2 PCIe G2 Dual Port HCA	592520-B21

NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html

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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.

Primary Power Supplies
NOTE: Primary Power Supplies offer 94% Efficiency with Intelligent Power Discovery.

HP 460W Common Slot Platinum Plus Hot Plug Power Supply Kit	656362-B21
HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
HP 1200W Common Slot Platinum Plus Hot Plug Power Supply Kit	656364-B21

Optional Power Supplies
NOTE: Optional Power Supplies offer 92% Efficiency.

HP 460W Common Slot Gold Hot Plug Power Supply Kit	503296-B21
HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21

NOTE: Option Kits contain optional power supply, an IEC power cable and PDU IEC cables.

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

QuickSpecs

Additional Options

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

HP Insight Software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	T9074BAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Management Media Kit	436222-B21

NOTE: HP Insight Management Media Kit contains DVDs without licenses. Contains HP Systems Insight Manager, HP Insight Control, HP Matrix Operating Environment, and Virtual Connect Enterprise Manager software. Uses an integrated installer to perform quick and accurate software installation and updates.

HP Insight Control server deployment

HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License	T9082AAE
HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License	452151-B21

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

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

HP Insight Control for Linux

HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
HP Insight Control for Linux Media Kit	TC208A

NOTE: Media pack DVD contains the ISO image for HP Insight Control for Linux, HP Systems Insight Manager, HP Insight Control power management, HP Insight Control virtual machine management, and an integrated installer. Servers must be acquired separately.

NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).
NOTE: Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent.
NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.
NOTE: For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html

Additional Options

HP iLO Advanced License	HP iLO Advanced Pack Electronic License with 3yr 24x7 Tech Support and Updates	BD506AAE
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21

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

High Performance Clusters	**HP Insight 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 (Worldwide)

HP HPC Linux Value Pack

HP High Performance Computing Linux Value Pack 1 Processor Flexible License	TC293B

NOTE: This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.

HP High Performance Computing Linux Value Pack Media Kit	TC294A

NOTE: This part number can be used to purchase media including software and documentation, which will be delivered to the customer.
NOTE: For additional license kits please see the QuickSpecs at http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html.

HP I/O Accelerator Options	HP 160GB Single Level Cell PCIe ioDrive for ProLiant Servers	600278-B21
	NOTE: A low-profile PCI bracket is included for use in low-profile slots.	
	HP 320GB Multi Level Cell PCIe ioDrive for ProLiant Servers	600279-B21
	NOTE: A low-profile PCI bracket is included for use in low-profile slots.	
	HP 320GB Single Level Cell PCIe ioDrive Duo for ProLiant Servers	600281-B21
	HP 640GB Multi Level Cell PCIe ioDrive Duo for ProLiant Servers	600282-B21
	HP 1.28TB Multi Level Cell PCIe IO Accelerator	641027-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13587_div/13587_div.html (Worldwide)

Additional Options

HP Graphics Options	HP Graphic Card Support Kit	660582-B21
	NOTE: An option kit will be required per Graphic Card.	
	NOTE: The ML350p Gen8 supports up to 3 graphic cards. Three single-slot or two dual-slot and one single-slot cards are supported. Three dual-slot cards are not supported at this time.	
	NOTE: Please see the HP Power Advisor for estimated power consumption of your individual system configuration prior to installing GPUs. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor.	
	NVIDIA Quadro 4000 2GB PCI-E Adapter	655933-B21
	NVIDIA Quadro 6000 6GB PCI-E Adapter	655935-B21

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 Security Bezel Kit	660584-B21

HP Storage Controllers	SAS Controllers	
	HP Smart Array P222 Controller	
	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller	631667-B21
	HP Smart Array P420 Controller	
	HP Smart Array P420/2GB FBWC 6Gb 2-ports Int SAS Controller	631671-B21
	HP Smart Array P420/1GB FBWC 6Gb 2-ports Int SAS Controller	631670-B21
	HP Smart Array P421 Controller	
	HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller	631674-B21
	HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller	631673-B21
	Optional Upgrades	
	HP 1GB P-series Smart Array Flash Backed Write Cache	631679-B21
	HP 2GB P-series Smart Array Flash Backed Write Cache	631681-B21
	HP 512MB P-series Smart Array Flash Backed Write Cache	661069-B21
	HP Smart Array Advanced Pack 2.0 No Media 1 Server 1yr 24x7 Support Software	BC377A
	HP Smart Array Advanced Pack 2.0 No Media Electronic Lic 1yr 24x7 Support Software	BC390AAE
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	

Additional Options

http://h18000.www1.hp.com/products/quickspecs/14227_div/14227_div.html
(Smart Array P222 Controller)
http://h18000.www1.hp.com/products/quickspecs/14228_div/14228_div.html
(Smart Array P420 Controller)
http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html
(Smart Array P421 Controller)
http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html
(Smart Array Advanced Pack)

HP Host Bus Adapters

HP H221 Host Bus Adapter	650931-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18004.www1.hp.com/products/quickspecs/14222_div/14222_div.html

SCSI HBA

HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21

NOTE: Supports external drive attach.

NOTE: Please see the following QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/12566_div/12566_div.html

HP Backup & Recovery Software	HP Basic Upgrade to Data Protector Express V6 for 1 Server E-LTU	TC333BAE
	HP Data Protector Express V6.0 for 1 Server E-LTU	TC330BAE
	HP Data Protector Express V6.0 for 10 Server E-LTU	TC332BAE
	HP Data Protector Express V6.0 for 3 Server E-LTU	TC331BAE

NOTE: One of these Data Protector Express base products is required. To see available options: http://www.hp.com/go/dataprotectorexpress

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.	

NOTE: Installation of tape drive requires ordering of 2nd Media Bay Cage, Part Number 661618-B21.

HP LTO-4 Ultrium 1760 SAS Internal WW Tape Drive	EH919A
HP LTO-4 Ultrium 1840 SAS Internal Tape Drive	EH860A
HP Ultrium 920 SAS Internal Tape Drive	EH847A
HP LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957A
HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A

NOTE: Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation.

HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A

Additional Options

HP Disk Backup	NOTE: For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. 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 D2D Backup Systems with Backup Data Deduplication	
	HP D2D2502i Backup System	EJ001B
	HP D2D2502i Backup System	EJ001C
	HP D2D2504i Backup System	EJ002B
	HP D2D2504i Backup System	EJ002C
	HP D2D4112 Backup System	EH993B
	HP D2D4112 Backup System	EH993C
	HP RDX Removable Disk Backup Systems USB	
	HP RDX320 Internal Removable Disk Backup System	AJ767A
	NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 320GB of disk capacity per data cartridge.	
	HP RDX500 Internal Removable Disk Backup System	AJ934A
	NOTE: For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.	
	HP RDX1000 Internal Removable Disk Backup System	BV847A
	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 Storage Options	NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html	
	Emulex Fibre Channel HBAs	
	HP 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter	AJ762A
	HP 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ763A
	QLogic Fibre Channel HBAs	
	HP 81Q PCI-e Fibre Channel Host Bus Adapter	AK344A
	HP 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ764A
	SAN Switches	
	HP 8/20q FC 16-ports Active Switch	AK242A
	HP 8Gb Simple SAN Connection Kit	AK241A
	Converged Network Adapter	
	HP CN1000Q Dual Port Converged Network Adapter	BS668A
	HP CN1100E Dual Port Converged Network Adapter	BK835A

Additional Options

HP Uninterruptible Power Systems	HP Tower UPS	
	HP T1500 G3 UPS Models	
	HP T1500 G3 1400VA INTL Tower Uninterruptible Power System	AF451A
	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 T1000 G3 UPS Models

HP T1000 G3 1000VA INTL Tower Uninterruptible Power System		AF449A
HP T1000 G3 1000VA NA Tower Uninterruptible Power System		AF448A
HP T1000J JP Uninterruptible Power System		AF457A

HP R/T3000 G2 Uninterruptible Power System (UPS)

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

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

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

HP Power Distribution Units	Monitored PDUs	
	HP Monitored Power Distribution Unit: Half Rack Version	
	HP 4.9kVA 24A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF914A
	HP 17.3kVA 48A Single Input Three Phase NA/JP Monitored Power Distribution Unit	AF916A
	HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF915A
	HP 22kVA 32A Single Input Three Phase INTL Monitored Power Distribution Unit	AF917A
	HP Monitored Power Distribution Unit: Full Rack Version	
	HP 17.3kVA 24A Dual Three Phase NA/JP Monitored Power Distribution Unit	AF503A
	HP 8.6kVA 24A Single Input Three Phase NA/JP Monitored Power Distribution Unit	AF504A
	HP 16.6kVA 40A Dual Input Single Phase NA/JP Monitored Power Distribution Unit	AF505A
	HP 8.3kVA 40A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF506A
	HP 11kVA 16A Single Input Three Phase INTL Monitored Power Distribution Unit	AF508A
	HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF510A

NOTE: Please see the following QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html (Worldwide)

Additional Options

Modular Power Distribution Units 1U/0U (Up to 32 outlets)
NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).

HP 2.8kVA 24A Low Voltage NA/JP Modular Power Distribution Unit	252663-D71
HP 3.6kVA 16A High Voltage INTL Modular Power Distribution Unit	252663-B24

NOTE: This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.

HP 4.9kVA 24A High Voltage NA/JP Modular Power Distribution Unit	252663-D72
HP 8.3kVA 40A High Voltage INTL Modular Power Distribution Unit	252663-B21
HP 7.3kVA 32A High Voltage INTL Modular Power Distribution Unit	252663-B31
HP 8.3kVA 40A High Voltage NA/JP Modular Power Distribution Unit	252663-D73
HP 8.3kVA 40A High Voltage NA/JP Core Modular Power Distribution Unit	252663-D75
HP 4.9kVA 24A High Voltage NA/JP Core Modular Power Distribution Unit	252663-D74
HP 9.2kVA 40A High Voltage INTL Core Modular Power Distribution Unit	252663-B34
HP 7.3kVA 32A High Voltage INTL Core Modular Power Distribution Unit	252663-B33
HP 22kVA 32A Three Phase INTL Core Modular Power Distribution Unit	AF518A

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

NOTE: For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu.

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

HP Intelligent Power Distribution Units (iPDU)

iPDU Core Units
NOTE: Each iPDU Core has 6 or 12 IEC C19 outlets and includes the LED display unit.
NOTE: 6 outlet iPDU cores can be mounted in 1U or 0U locations. 12 outlets iPDU cores require 2U of rack space.

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 11.4kVA 16A 415V Three Phase L22-20 NA Core Intelligent Power Distribution Unit	AF900A
HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
HP 17.3kVA 24A 415V Three Phase IEC309 NA Core Intelligent Power Distribution Unit	AF901A
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

Additional Options

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 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A

NOTE: iPDU Kits include one Core Unit, LED Display, and 4 Standard (non-intelligent) Extension Bars. Total outlets would be 20 IEC C13 and 2 IEC C19 per kit. Additional Standard or Intelligent Extension bars can be added for a maximum of 30 IEC C13 outlets.
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 Options

HP TFT7600 G2 KVM Console and Monitor

HP TFT7600 G2 KVM Console Rackmount Keyboard BE Monitor	AZ881A
HP TFT7600 G2 KVM Console Rackmount Keyboard DK Monitor	AZ876A
HP TFT7600 G2 KVM Console Rackmount Keyboard FR Monitor	AZ873A
HP TFT7600 G2 KVM Console Rackmount Keyboard DE Monitor	AZ872A
HP TFT7600 G2 KVM Console Rackmount Keyboard Intl Monitor	AZ884A
HP TFT7600 G2 KVM Console Rackmount Keyboard IT Monitor	AZ874A
HP TFT7600 G2 KVM Console Rackmount Keyboard JP Monitor	AZ882A
HP TFT7600 G2 KVM Console Rackmount Keyboard NO Monitor	AZ877A
HP TFT7600 G2 KVM Console Rackmount Keyboard PT Monitor	AZ880A
HP TFT7600 G2 KVM Console Rackmount Keyboard RU Monitor	AZ883A
HP TFT7600 G2 KVM Console Rackmount Keyboard SE/FI Monitor	AZ878A
HP TFT7600 G2 KVM Console Rackmount Keyboard ES Monitor	AZ875A
HP TFT7600 G2 KVM Console Rackmount Keyboard CH Monitor	AZ879A
HP TFT7600 G2 KVM Console Rackmount Keyboard UK Monitor	AZ871A
HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
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 1U Rackmount Keyboard with USB

Additional Options

HP 1U IT Rackmount Keyboard with USB	AG076A
HP 1U US Rackmount Keyboard with USB	AG072A
HP 1U BE Rackmount Keyboard with USB	AG083A
HP 1U DK Rackmount Keyboard with USB	AG078A
HP 1U FR Rackmount Keyboard with USB	AG075A
HP 1U DE Rackmount Keyboard with USB	AG074A
HP 1U INT Rackmount Keyboard with USB	AG086A
HP 1U NO Rackmount Keyboard with USB	AG079A
HP 1U PT Rackmount Keyboard with USB	AG082A
HP 1U RU Rackmount Keyboard with USB	AG085A
HP 1U ES Rackmount Keyboard with USB	AG077A
HP 1U SE/FI Rackmount Keyboard with USB	AG080A
HP 1U Rackmount Keyboard with USB	AG081A
HP 1U UK Rackmount Keyboard with USB	AG073A
HP 1U JP Rackmount Keyboard with USB	AG084A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12465_div/12465_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/13792_div/13792_div.html
(Worldwide)

HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch	AF616A
HP Server Console 0x2x16 Port Analog Switch	AF617A

Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html
(Worldwide)

HP Server Console Switch G2 with Virtual Media & CAC

HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
HP KVM Console USB Virtual Media CAC Interface Adapter	AF623A

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

HP IP Console Switch G2 with Virtual Media & CAC

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)

Rack Kits

HP Tower to Rack Conversion Tray Kit	659488-B21

HP USB and SD Options	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	NOTE: HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.	
	HP 4GB Secure Digital High Capacity Flash Media Kit	580387-B21
	NOTE: Blank SD media device is supported for use with VMware and Citrix. SD media must be installed in the internal slot of the ProLiant server. Learn more at http://www.hp.com/go/proliantvirtualization.	

QuickSpecs

Additional Options

HP Care Pack Services		
	HP 3 year 4 hour 13x5 ProLiant ML350 p Hardware Support	U4512E
	HP 3 year 4 hour 24x7 ProLiant ML350 p Hardware Support	U4513E
	HP 3y 6h 24x7 CTR ProLiant ML350 HW Supp	U4514E
	HP Install ProLiant ML350 Service	U4522E
	HP Startup ProLiant ML350 Service	U4523E
	HP 3y SupportPlus24 MS ProLiantML350 SVC	U4525E
	HP 3ySupportPlus24 SuSEProLiantML350 SVC	U6308E
	HP 3y Nbd ProCare Service	U3A72E
	HP 3y 4h 24x7 ProCare Service	U3A78E
	HP 3y Nbd Collab Support	U1K52E
	HP 3y 4h 24x7 Collab Support	U1K58E
	HP 3y Nbd ProCare with IC Service	U3N71E
	HP 3y 4h 24x7 ProCare with IC Service	U3N77E
	HP 3y SupportPlus 24 Service	UR307E

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

Memory

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

DDR3 memory population guidelines

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

General Guidelines:

- White DIMM slots denote the first slot of a channel. For 1 DPC (DIMM per channel) populate white slots only.
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- To maximize performance, balance the total memory capacity between all installed processors
  - Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
  - Heaviest load (DIMM with most ranks) within a channel goes furthest from the processor
- Do not mix UDIMMs, RDIMMs or LRDIMMs
- Quad rank LR DIMMs are supported at 3 DIMMs per channel.
- DIMMs of different voltages (1.35V & 1.5V) may be mixed in any order
  - The system will power them at the higher voltage
- DIMMs of different speed grades may be mixed in any order
  - The system will select a common optimal speed
- Memory speed is a function of the processor QPI bus speed.

Population Guidelines:

- There are four (4) channels per processor; eight (8) channels per server
- There are three (3) DIMM slots for each memory channel; twenty-four (24) total slots
- Memory channels1 and 3 consists of the three (3) DIMMs that are furthest from the processor
- Memory channel 2 and 4 consists of the three (3) DIMMs that are closest to the processor

DIMM slot/capacity/populated speed table									
DIMM Type ->	Registered DIMMS (RDIMMs)						Unbuffered with ECC DIMMs (UDIMMs)		
DIMM Rank ->	Single Rank (1R)			Dual Rank (2R)			Single Rank (1R)	Dual Rank (2R)	
DIMM Capacity ->	4GB	4GB	8GB	8GB	16GB	16GB	2GB	4GB	8GB
DIMM Native Speed (MHz) ->	1333	1600	1600	1333	1333	1600	1333	1333	1333
Voltage	LV	Std	Std	LV	LV	Std	LV	LV	LV
SLOTS THAT CAN BE POPULATED									
24 slot servers	24	24	24	24	24	24	16	16	16
MAXIMUM CAPACITY (GB)*									
24 slot servers	96	96	192	192	384	384	32	64	128
POPULATED DIMM SPEED (MHz)									

Memory

1 DIMM Per Channel	1333	1600	1600	1333	1333	1600	1333	1333	1333
2 DIMM Per Channel	1333	1600	1600	1333	1333	1600	1333***	1333***	1333***
3 DIMM Per Channel	1066**	1066	1066	1066**	1066**	1066	n/a	n/a	n/a

* Maximum capacity will vary based on individual server platform qualification schedule
** RDIMM supports 1.35V 3DPC@1066. Third party memory supports 1.5V 3DPC@1066
*** UDIMM is supported at 2DPC at 1333 using HP SmartMemory only. Third party memory supports up to 2DPC at 1066.

DIMM slot and configuration diagrams

Basic memory slot & population diagram

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

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

Standard memory configuration (1 CPU model)

- 8GB, consisting of two (2) 4GB dual-rank PC3L-10600R-9 RDIMMs (Base Model)

Memory

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

Standard memory plus optional memory (1 CPU model)

- 48GB, consisting of two (2) 4GB RDIMMs plus ten (10) 4GB RDIMMs (Base Model)
  - 12x 4GB dual-rank PC3L-10600R-9 RDIMMs

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

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

- 192GB, consisting of twelve (12) 16GB dual-rank PC3L-10600R-9 RDIMMs

Memory

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

UDIMM maximum configuration (1 CPU model)

- 64GB, consisting of eight (8) 8GB dual-rank PC3L-10600E-9 UDIMMs

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

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

- 384GB, consisting of twenty four (24) 16GB dual-rank PC3L-10600R-9 RDIMMs

Memory

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

UDIMM maximum configuration (2 CPU model)

- 128GB, consisting of sixteen (16) 8GB dual-rank PC3L-10600E-9 UDIMMs

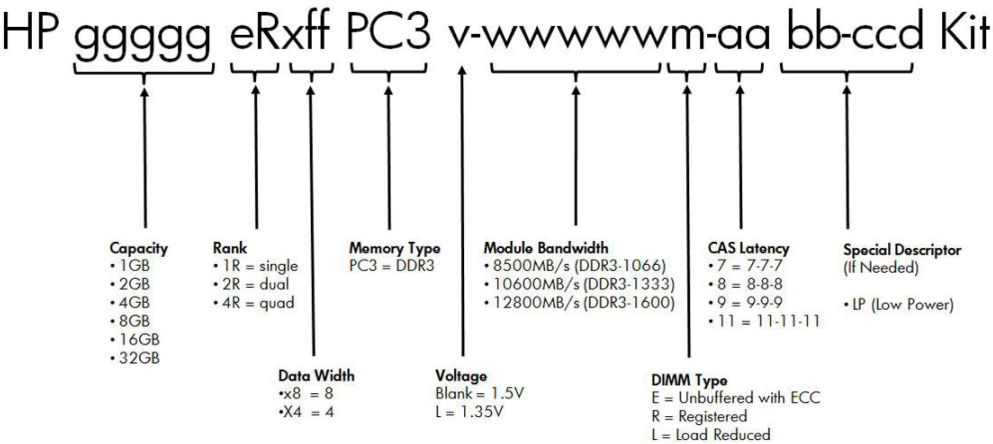|	CPU1		CPU2		
	slot #	population order	slot #	population order	
Chnl 1	1	A; 8GB UDIMM	1	A; 8GB UDIMM	Chnl 1
	2	E; 8GB UDIMM	2	E; 8GB UDIMM	
	3	I; empty	3	I; empty	
Chnl 2	4	B; 8GB UDIMM	4	B; 8GB UDIMM	Chnl 2
	5	F; 8GB UDIMM	5	F; 8GB UDIMM	
	6	J; empty	6	J; empty	
	Processor 1		Processor 2		
Chnl 4	7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

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

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

DDR3 memory options part number decoder

Memory

HP ggggg eRxff PC3 v-wwwwwm-aa bb-ccd Kit

Capacity	**Rank**	**Memory Type**	**Module Bandwidth**	**CAS Latency**	**Special Descriptor**	
• 1GB	• 1R = single	PC3 = DDR3	• 8500MB/s (DDR3-1066)	• 7 = 7-7-7	(If Needed)	
• 2GB	• 2R = dual		• 10600MB/s (DDR3-1333)	• 8 = 8-8-8		
• 4GB	• 4R = quad		• 12800MB/s (DDR3-1600)	• 9 = 9-9-9	• LP (Low Power)	
• 8GB				• 11 = 11-11-11		
• 16GB						
• 32GB						

Data Width
•x8 = 8
•X4 = 4

Voltage
Blank = 1.5V
L = 1.35V

DIMM Type
E = Unbuffered with ECC
R = Registered
L = Load Reduced

Following are memory options available from HP:

HP Memory

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: LRDIMM, RDIMM and UDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen8 servers support RDIMM, UDIMM and LRDIMM.

Registered DIMMs (RDIMMs)

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

Unbuffered with ECC DIMMs (UDIMMs)

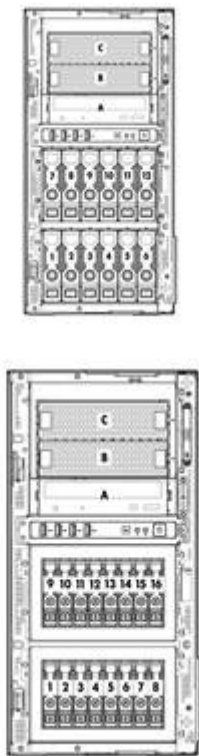|	
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647909-B21
HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit	647907-B21
HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit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

Memory

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:
http://h18004.www1.hp.com/products/servers/platforms/energyefficient/

Storage

1 - 12	12 x 3.5" (LFF) Hot-Plug SAS/SATA hard drive bays NOTE: Optional 2nd hard drive cage shown in configuration.
A	Optical Drive
B-C	Available half height media bays, for up to two half height optical/tape drives or a single full height tape drive, or both can be populated with a third hard drive cage
1-16	16 x 2.5" (SFF) Hot-Plug SAS/SATA hard drive bays NOTE: Optional 2nd hard drive cage shown in configuration
A	Optical Drive
B-C	Available half height media bays, for up to two half height optical/tape drives or a single, full height tape drives, or both can be populated with a third hard drive cage

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
HP Half-Height SATA DVD-ROM Optical Drive	Up to 3	A-C	Embedded SATA Controller
HP Half-Height SATA DVD RW Optical Drive	Up to 3	A-C	Embedded SATA Controller

Hard Drives
NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.
NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

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

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr
600GB 6G SAS 10K			HP Smart Array P420i/512MB FBWC Ctrlr
450GB 6G SAS 10K			HP Smart Array P420i/1GB FBWC Ctrlr
300GB 6G SAS 10K			HP Smart Array P420i/2GB FBWC Ctrlr
300GB 6G SAS 15K			HP Smart Array P420/1GB FBWC Ctrlr

Storage

| 146GB 6G SAS 15K | HP Smart Array P420/2GB FBWC Ctrlr |
| 72GB 6G SAS 15K | |

SAS Hot Plug Smart Drive SFF (2.5-inch) Midline Drives

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr
500GB 6G SAS 7.2K			HP Smart Array P420i/512MB FBWC Ctrlr
			HP Smart Array P420i/1GB FBWC Ctrlr
			HP Smart Array P420i/2GB FBWC Ctrlr
			HP Smart Array P420/1GB FBWC Ctrlr
			HP Smart Array P420/2GB FBWC Ctrlr

SAS Hot Plug Smart Drive LFF (3.5-inch) Enterprise Drives

	Quantity Supported	Position Supported	Controller
600GB 6G SAS 15K	Up to 18	1-12 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr
450GB 6G SAS 15K			HP Smart Array P420i/512MB FBWC Ctrlr
			HP Smart Array P420i/1GB FBWC Ctrlr
			HP Smart Array P420i/2GB FBWC Ctrlr
			HP Smart Array P420/1GB FBWC Ctrlr
			HP Smart Array P420/2GB FBWC Ctrlr

SAS Hot Plug Smart Drive LFF (3.5-inch) Enterprise Drives

	Quantity Supported	Position Supported	Controller
3TB 6G SAS 7.2K	Up to 18	1-12 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr
2TB 6G SAS 7.2K			HP Smart Array P420i/512MB FBWC Ctrlr
1TB 6G SAS 7.2K			HP Smart Array P420i/1GB FBWC Ctrlr
			HP Smart Array P420i/2GB FBWC Ctrlr
			HP Smart Array P420/1GB FBWC Ctrlr
			HP Smart Array P420/2GB FBWC Ctrlr

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

	Quantity Supported	Position Supported	Controller
1TB 6G SAS 7.2K	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr
500GB 6G SAS 7.2K			HP Smart Array P420i/512MB FBWC Ctrlr
			HP Smart Array P420i/1GB FBWC Ctrlr
			HP Smart Array P420i/2GB FBWC Ctrlr
			HP Smart Array P420/1GB FBWC Ctrlr
			HP Smart Array P420/2GB FBWC Ctrlr

3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

Storage

	Quantity Supported	Position Supported	Controller
400GB 3G SATA MLC 200GB 3G SATA MLC 100GB 3G SATA MLC	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr HP Smart Array P420i/512MB FBWC Ctrlr HP Smart Array P420i/1GB FBWC Ctrlr HP Smart Array P420i/2GB FBWC Ctrlr HP Smart Array P420/1GB FBWC Ctrlr HP Smart Array P420/2GB FBWC Ctrlr

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

	Quantity Supported	Position Supported	Controller
3TB 6G SATA 7.2K 2TB 6G SATA 7.2K 1TB 6G SATA 7.2K 500GB 6G SATA	Up to 18	1-12 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr HP Smart Array P420i/512MB FBWC Ctrlr HP Smart Array P420i/1GB FBWC Ctrlr HP Smart Array P420i/2GB FBWC Ctrlr HP Smart Array P420/1GB FBWC Ctrlr HP Smart Array P420/2GB FBWC Ctrlr

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

	Quantity Supported	Position Supported	Controller
800GB 6G SAS MLC 400GB 6G SAS MLC 200GB 6G SAS MLC	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr HP Smart Array P420i/512MB FBWC Ctrlr HP Smart Array P420i/1GB FBWC Ctrlr HP Smart Array P420i/2GB FBWC Ctrlr HP Smart Array P420/1GB FBWC Ctrlr HP Smart Array P420/2GB FBWC Ctrlr

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

	Quantity Supported	Position Supported	Controller
400GB 6G SAS SLC 200GB 6G SAS SLC	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr HP Smart Array P420i/512MB FBWC Ctrlr HP Smart Array P420i/1GB FBWC Ctrlr HP Smart Array P420i/2GB FBWC Ctrlr HP Smart Array P420/1GB FBWC Ctrlr HP Smart Array P420/2GB FBWC Ctrlr

3G SATA MLC Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller

Storage

400GB 3G SATA MLC 200GB 3G SATA MLC 100GB 3G SATA MLC	Up to 24	1-16 and B+C	HP Smart Array P420i/ZM FBWC Ctrlr HP Smart Array P420i/512MB FBWC Ctrlr HP Smart Array P420i/1GB FBWC Ctrlr HP Smart Array P420i/2GB FBWC Ctrlr HP Smart Array P420/1GB FBWC Ctrlr HP Smart Array P420/2GB FBWC Ctrlr

Tape and Disk-Based Backup

NOTE: For the complete range of tape drives, autoloaders, libraries and media, including the internal fitting models, see: http://www.hp.com/go/tape. For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk and tape backup products see: http://www.hp.com/storage/SPOCK.

	Position Supported	Controller	Controller/HBA Option Kit Part Number
HP SCSI Tape Drives LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO4 Ultrium 1760 LTO-4 Ultrium 1840 DAT 72 DAT 160	Internal (B+C) or External	HP SC11Xe Host Bus Adapter HP U320e SCSI Dual Channel Controller NOTE: Please check the full compatibility information at: http://www.hp.com/storage/SPOCK	412911-B21 AH627A
HP SCSI Rack Mount Kits 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter	412911-B21
HP USB Tape Drives DAT 72 DAT 160	Internal (B+C) or External	USB 2.0 Port	N/A
HP USB Rack Mount Kits 1U USB Rack-Mount Kit	External	USB 2.0 Port	
HP SAS Tape Drives DAT 160 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000 LTO-5 Ultrium 3280	Internal (B+C) or External	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller NOTE: Please check the full compatibility information at: http://www.hp.com/storage/SPOCK	631667-B21
HP SAS Rack Mount Kits 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller NOTE: Please check the full compatibility information at: http://www.hp.com/storage/SPOCK	631667-B21

Storage

HP SCSI Tape Autoloaders 1/8 G2 Autoloader	External	HP SC11Xe Host Bus Adapter	412911-B21
HP SCSI Tape Libraries MSL2024 MSL4048 MSL8096	External	HP SC11Xe Host Bus Adapter **NOTE:** Please check the full compatibility information at: http://www.hp.com/storage/SPOCK	412911-B21
HP SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P222/512 FBWC 6Gb 1-port Int/1-port Ext SAS Controller **NOTE:** Please check the full compatibility information at: http://www.hp.com/storage/SPOCK	631667-B21
HP Fibre Channel Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	Please consult the EBS connectivity matrix at: http://www.hp.com/go/ebs for connectivity information and the supported Fibre Channel HBAs shown in this QuickSpec.	
HP USB RDX Removable Disk Backup System RDX160 RDX320 RDX500 RDX1TB	Internal (B+C) or External	USB 2.0 port	N/A
HP D2D Backup Systems, iSCSI D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	
HP D2D Backup Systems, Fibre Channel D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/storage/SPOCK	

QuickSpecs

Technical Specifications

System Unit	Tower Dimensions (H x W x D) (with feet/bezel)		18.19 x 8.58 x 29.13 in (46.2 x 21.8 x 74.0 cm)
	Rack Dimensions (H x W x D) (with feet/bezel)		8.58 x 19.0 x 28.83 in. (21.8 x 48.26 x 73.22cm)
	Tower Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	114.84 lb (52.09 kg)
		Minimum (one hard drive, power supply, and processor installed)	70.33 lb (31.9 kg)
	Rack Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	110.36 lb (50.06 kg)
		Minimum (one hard drive, power supply, and processor installed)	60.91 lb (27.63 kg)
	Input Requirements (per power supply)	Rated Line Voltage	100 to 240 VAC
		Rated Input Current	7.1 Amps (at 120VAC) to 3.5 Amps (at 240 VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	852 W
	BTU Rating	Maximum	460W - 1773 BTU / hr (at 120 VAC), 1715 (at 240 VAC) 750W - 2892 BTU / hr (at 120 VAC), 2797 (at 240 VAC) 1200W - 3530 BTU / hr (at 120 VAC), 4600 (at 240 VAC)
	Power Supply Output (per power supply)	Rated Steady-State Power	460(750) W (at 100 VAC), 460(750) W (at 200 VAC)
		Maximum Peak Power	460(750) W (at 100 VAC), 460(750) W (at 200 VAC)
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).

Technical Specifications

		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	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

Idle

	L WAd	3.9 Bels (1P Non-Redundant) 4.2 Bels (2P Redundant)
	L pAm	22 dBA (1P Non-Redundant) 24 dBA (2P Redundant)

Operating

	L WAd	4.0 Bels (1P Non-Redundant) 4.8 Bels (2P Redundant)
	L pAm	22 dBA (1P Non-Redundant) 30 dBA (2P Redundant)

NOTE: The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.

Emissions Classification (EMC)	FCC Rating	Class B
	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 iLO 4 On System Management Processor	Architecture	PCI Express based health and remote management ASIC
	Processor	Embedded ARM processor core operating at 400MHz
	Upgradeability	Firmware upgradeable via Flash ROM
	Video Support	1920 x 1200 (16 bpp) DVR max resolution

Technical Specifications

Interfaces	One Ethernet Sideband connection (10/100/1000 Mb/s)
	One Ethernet network LAN connection (1 Gbps) for rack, towers and SL systems
	One Ethernet network LAN connection (10/100 Mb/s) for Blade Systems
Memory	16 MB Flash 256 MB DDR 3 with ECC (112 MB after ECC and video)
Operating System Support	Microsoft Windows 2008 R2
	Microsoft Windows 2008 (32 bit and 64 bit)
	Microsoft Windows Server 2008 Standard Edition (32 bit and 64 bit)
	Microsoft Windows Server 2008 Enterprise Edition (32 bit and 64 bit)
	Red Hat Enterprise Linux 5.7 (32 bit and 64 bit)
	Red Hat Enterprise Linux 6.0 (32 bit and 64 bit)
	SUSE LINUX Enterprise Server 11 (32 bit and 64 bit)
	SUSE LINUX Enterprise Server 10 (32 bit and 64 bit)
	VMware ESX 4.1
	VMware ESXi 5.0
Client System Support	Red Hat Enterprise Desktop 5.00
	SUSE Linux Enterprise Desktop 11
	SUSE Linux Enterprise Desktop 10
	Windows 7
	Microsoft Windows XP Professional Edition
	Microsoft Windows Vista Business and Ultimate Editions
Client Browser Support	Microsoft Internet Explorer 9 NOTE: For customers using Protected Mode, please use the Java based version of Integrated Remote Console.
	Microsoft Internet Explorer 8 NOTE: For customers using Protected Mode, please use the Java based version of Integrated Remote Console.
	Microsoft Internet Explorer 7
	Firefox Extended Support Release (ESR) 10 (on supported Windows and Linux systems
	Firefox 3.6 (on supported Windows and Linux systems)
Command Line Support	Secure Shell and serial port access
	Secure Socket Layer
	Secure Shell version 2
Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface
	AES encryption of video
	RC4 encryption of video
Directory Support Services	Active Directory v1.0 (Windows 2003)
Driver Support	HP ProLiant iLO 4 Management Controller Driver Package
Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML

Technical Specifications

HP Smart Array P420i Controller	Dimensions	Embedded
	Disk Drive and Enclosure Interface - Transfer rate	6Gb/s SAS (Serial Attached SCSI) 3Gb/s SATA (Serial ATA)
	SAS Connectors	2 internal 4X connectors
	Cache Memory Speed	DDR3-1333MHz with 40 or 72-bit wide bus
	Server Interface	x8 PCIe 3.0 provides 32.0GB/s maximum bandwidth
	SAS Speed	8 6Gb/s SAS links provide 4.8GB/s maximum bandwidth
	Cache Memory	Zero Memory RAID has no cache memory 40-bit 512MB ECC protected Flash Backed Write Cache (FBWC) 72-bit 1GB and 2GB ECC protected FBWC
	Logical Drives Supported	Zero Memory, Up to 2 logical volumes (8 physical drives) Up to 64 logical drives with cache
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space

RAID Support

RAID 6, 6+0 (Advanced Data Guarding)
NOTE: RAID 6, 6+0 can be enabled with one of the following combinations:

- 512 MB, 1GB or 2GB FBWC and Smart Array Advanced Pack 2.0 License key option upgrades

RAID 5, 5+0 (Distributed Data Guarding)
NOTE: A minimum or 512 MB cache is required to enable RAID 5, 5+0 support

RAID 1+0 (Striping & Mirroring)

RAID 0 (Striping), RAID 1 (Mirroring)

HP Ethernet 1Gb 4-port 331i Adapter	Network Interface	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
	Data Transfer Method	PCI Express, two lanes (x2)	
	Controller	BCM5719	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 40 Mb/s Combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 80 Mb/s Combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 400 Mb/s Combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 800 Mb/s Combined
		1000Base-TX (Half-Duplex)	1000Mb/s per port, 4000 Mb/s Combined
		1000 Base-TX (Full-Duplex)	2000Mb/s per port, 8000 Mb/s Combined
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 or better; up to 328 ft (100 m)

Technical Specifications

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
		The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.