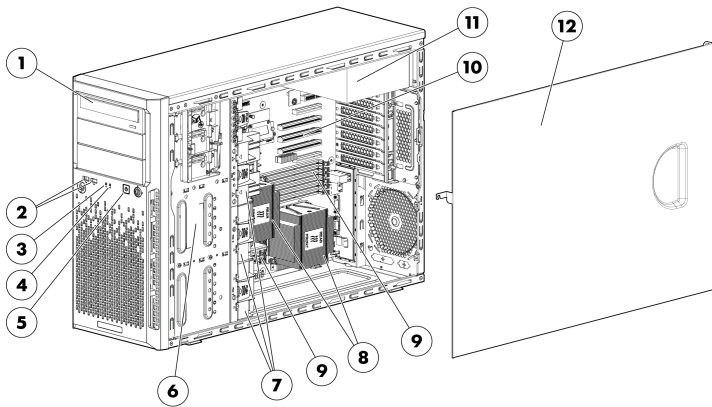


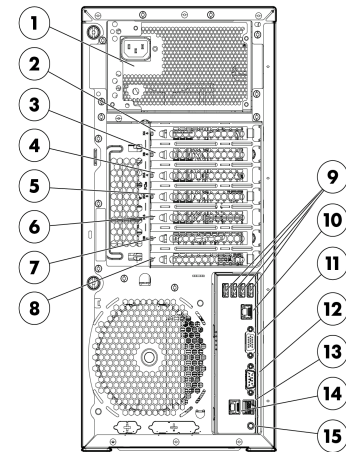
### Overview

The HP ProLiant ML350e Gen8 v2 is a dual processor tower platform, which is built on the latest Intel® Xeon® E5-2400 processors to create a unique system architecture. This unique architecture, as well as flexible deployment options, allows businesses to scale as needed so they can optimize their IT spending dollars. The HP ProLiant ML350e Gen8 v2 delivers the industry's most powerful embedded management technology, HP integrated Lights-Out 4 (iLO4), enabling businesses to manage the servers anytime and from anywhere.



#### Front View:

1. Optical Drive
2. USB2.0 Connectors (2)
3. Health LED
4. NIC Status LED
5. Power On/Standby Button and System Power LED
6. Drive Bays
7. Fans
8. Heat Sink
9. DIMM Slots
10. PCIe Slots
11. Non-hot-plug Power Supply
12. Access Panel



#### Rear View:

1. Non-hot-plug Power Supply
2. PCIe Slot 6 (for processor 1)
3. PCIe Slot 5 (for processor 1)
4. PCIe Slot 4 (for processor 2)
5. PCIe Slot 3 (for processor 2)
6. PCIe Slot 2 (for processor 1)
7. PCIe Slot 1 (for processor 1)
8. Slot Cover
9. USB 2.0 Connectors (4)
10. iLO Connector
11. Video Connector
12. Serial Connector
13. NIC Connector 1
14. NIC Connector 2
15. UID/LED button

### What's New

- Support for 12G SAS High Endurance Hot Plug SFF (2.5-inch) Enterprise Performance and Enterprise Mainstream Solid State Drives
- Up to 25% performance increase with the new Intel® Xeon® E5-2400 v2 processors
- New low voltage DIMMs running at 1600 MHz to reduce energy bills
- Latest HP Smart Array Controllers designed to maximize data availability, performance and capacity
- Simplify user experience with the new configuration and management tool, Smart Storage Administrator

### Overview

- First controller-based encryption solution to provide an extra level of data protection
- New dedicated GPU support for graphics-intensive applications

### Standard Features

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

#### Processor

One of the following depending on Model

#### E5-2400 v2 Series Processors

##### Ten-Core Processors

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

Intel® Xeon® E5-2470 v2 (2.4GHz/10-core/95W/25MB) Processor

##### Eight-Core Processors

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

Intel® Xeon® E5-2450 v2 (2.5GHz/8-core/95W/20MB) Processor

Intel® Xeon® E5-2440 v2 (1.9GHz/8-core/95W/20MB) Processor

##### Six-Core Processors

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

Intel® Xeon® E5-2430 v2 (2.5GHz/6-core/80W/15MB) Processor

Intel® Xeon® E5-2420 v2 (2.2GHz/6-core/80W/15MB) Processor

##### Quad-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

Intel® Xeon® E5-2407 v2 (2.4GHz/4-core/80W/10MB) Processor

Intel® Xeon® E5-2403 v2 (1.8GHz/4-core/80W/10MB) Processor

#### E5-2400 Series Processors

##### Eight-Core Processors

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

Intel® Xeon® E5-2470 (2.3GHz/8-core/95W/20MB) Processor

Intel® Xeon® E5-2450 (2.1GHz/8-core/95W/20MB) Processor

Intel® Xeon® E5-2450L (1.8GHz/8-core/70W/20MB) Processor

##### Six-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

Intel® Xeon® E5-2440 (2.4GHz/6-core/95W/15MB) Processor

Intel® Xeon® E5-2430 (2.2GHz/6-core/95W/15MB) Processor

Intel® Xeon® E5-2430L (2.0GHz/6-core/60W/15MB) Processor

Intel® Xeon® E5-2420 (1.9GHz/6-core/95W/15MB) Processor

##### Quad-Core Processors

**NOTE:** All support up to 1066MHz DDR3 memory speeds.

Intel® Xeon® E5-2407 (2.2GHz/4-core/80W/10MB) Processor

Intel® Xeon® E5-2403 (1.8GHz/4-core/80W/10MB) Processor

**NOTE:** DDR3 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

**NOTE:** Up to 2 processors supported. Mixing different processor models is not supported.

**NOTE:** For the Intel® C600 Chipset E5-2400 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2400x v#, 2 = number of CPUs in a Node, 4 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v# (not yet designated) = version number.

### Standard Features

**Cache Memory**

One of the following depending on Model

25MB (1 x 25MB) Level 3

**NOTE:** For Ten-core processors.

20MB (1 x 20MB) Level 3

**NOTE:** For Eight-core processors.

15MB (1 x 15MB) Level 3

**NOTE:** For Six-core processors.

10MB (1 x 10MB) Level 3

**NOTE:** For Quad-core processors.

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**Chipset**

Intel® C600 Chipset

Intel® E5-2400 v2 Processor Family

**NOTE:** For more information regarding Intel® chipsets, please see the following URL:

<http://www.intel.com/products/server/chipsets/>.

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**Upgradeability**

Upgradeable to two processors

**NOTE:** Total 8, 12, 16 or 20 cores

**NOTE:** Processor upgrade available from Intel® Xeon® Processors E5-2400 to E5-2400 v2. Please contact HP Technology Sales (<http://www.hp.com/support>), your local HP Re-seller, or reference the following Customer Advisory: [ProLiant Servers-Instructions for Upgrading an HP ProLiant Gen8 Server from an Intel Xeon Processor E5-2400 to an Intel Xeon Processor E5-2400v2](#), regarding critical details before upgrading. An explanation of requirements and limitations are provided.

Up to 12 DIMM slots available for higher memory capacity

Up to 16 SFF hard drives or 8 LFF hard drives for expanded storage

4 PCIe 3.0 and 2 PCIe 2.0 I/O slots for additional communications and storage expansion

Redundant Power Supplies (92% and 94% efficiency)

Tower to rack conversion

Optical drive bays (up to 2)

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**On System Management**

HP iLO (Firmware: HP iLO4)

**Chipset**

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

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**Memory Protection**

Advanced ECC

Online Spare

Lock-step mode

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### Standard Features

#### Memory

One of the following depending on model

Type	HP SmartMemory DDR3 Registered (RDIMM) or Unbuffered (UDIMM)
DIMM Slots Available	12 DIMM slots (6 DIMM slots per CPU)
Maximum (RDIMM)	192 GB (12 x 16 GB) RDIMMM
Maximum (UDIMM)	96 GB (12 x 8 GB) UDIMM

**NOTE:** HP memory from previous generation servers are not fully compatible with the HP ProLiant ML350e Gen8 v2 Server.

**NOTE:** To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

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

**NOTE:** If one processor is installed, only 6 DIMM slots are available. When populating with two processors 12 DIMM slots are available.

**NOTE:** Depending on the memory configuration and processor model, the memory speed may run up to 1600MHz or at 1333MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: [www.hp.com/go/ddr3memory-configurator](http://www.hp.com/go/ddr3memory-configurator).

**NOTE:** Redundant PSU Kit (PN 738661-B21) is required for RDIMMs.

#### Network Controller

HP Ethernet 1Gb 2-port 361i Adapter

#### Expansion Slots

Expansion Slot #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
6	PCIe 2.0	x1	X4	0	Half Length/Full Height	Activated when installed with Processor 1
5	PCIe 2.0	x4	x8	0	Full-length/Full Height	Activated when installed with Processor 1
4	PCIe 3.0	X8	X16	32	Full Length/Full Height	Activated when installed with Processor 2
3	PCIe 3.0	x16	x16	32	Full Length/Full Height	Activated when installed with Processor 2
2	PCIe 3.0	X16	X16	0	Full Length/Full Height	Activated when installed with Processor 1

### Standard Features

1	PCIe 3.0	X4	X8	0	Full Length/Full Height	Activated when installed with Processor 1
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**NOTE:** Bus number - Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.

### 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](http://www.hp.com/support/rbsu).

### Storage Controller One of the following depending on model

HP Dynamic Smart Array B120i/512MB FBWC SATA Controller (RAID 0,1, 5, 10)

### Standard Features

<b>Internal Storage Devices</b>	<b>Optical Drives</b>	HP Half-Height SATA DVD-ROM/RW Optical Drive <b>NOTE:</b> DVD ROM is standard in base tower models.
	<b>Hard Drives</b>	None ship standard
	<b>Hard Drive Bays</b>	(4) Non-hot plug LFF SATA HDD bays
	<b>One of the following depending on model</b>	(4) Hot plug LFF SAS/SATA HDD bays; upgradable to (8)
		(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (16)
		<b>NOTE:</b> All Pre-configured Models come populated with some hard drive blanks installed. Should the customer need additional hard drive blanks, they can order more using either P/N 666987-B21: HP SFF Gen8 Hard Drive Blank Kit or P/N 666986-B21: HP LFF Gen8 Hard Drive Blank Kit. These part numbers for single HDD blanks below are also provided should the customer require replacement HDD blanks for their server.

<b>Maximum Internal Storage</b> <b>One of the following depending on model</b>	Hot Plug LFF SAS	32TB	8 x 4TB
	Hot Plug LFF SATA	32TB	8 x 4TB
	Hot Plug SFF SAS	19.2TB	16 x 1.2TB
	Hot Plug SFF SATA	16TB	16 x 1TB
	Non-Hot Plug LFF SATA	16TB	4 x 4TB
	Hot Plug SFF SAS SSD	1.6TB	16 x 100GB
	Hot Plug LFF SATA SSD	1TB	8 x 100GB

<b>Interfaces</b>	Serial	1
	Video	1 (rear)
	Network RJ-45 (Ethernet)	3 (1 dedicated for HP Integrated Lights-Out)
	HP iLO Remote Management Network Port	1 Gb Dedicated
	SD slot	1 (internal) <b>NOTE:</b> The SD slot is not a hot-pluggable device. Customers should not attempt to plug an SD card into the SD slot while the server is powered.
	USB 2.0	8 (2 front, 4 rear, 2 internal)

<b>Industry Standard Compliance</b>	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

### Standard Features

#### 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>.

#### 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](http://www.hp.com/go/proliant-energy-efficient) or [www.hp.com/go/hppoweradvisor](http://www.hp.com/go/hppoweradvisor).

**NOTE:** Power Specification and Technical Content for supported power supplies can be found at: [http://h18000.www1.hp.com/products/quickspecs/14209\\_na/14209\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14209_na/14209_na.html)

#### Common Slot Power Supplies

**NOTE:** The ML350e Gen8 v2 supports three power supply models, a 460W Multi-Output Power Supply, and a 460W and 750W Common Slot Platinum Plus Power Supplies. The 460W Multi-Output Power Supply is a non-redundant power supply.

**NOTE:** Mixing of power supplies in the same server is not supported. All power supplies inside a server must be exactly the same model. Mixing Gold, Platinum, and Platinum Plus certified power supplies is not supported.

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 power output options - 460W, 750W - 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](http://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](http://www.hp.com/go/hppoweradvisor).

**NOTE:** The 80 PLUS program is a unique forum that unites electric utilities, the computer industry, and consumers in an effort to bring energy efficient technology solutions to the marketplace. 80 Plus independently tests power supply efficiency and publicly posts the results on [80Plus.org](http://80Plus.org).

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



### Standard Features

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**NOTE:** Power Specification and Technical Content for supported power supplies can be found at: [http://h18000.www1.hp.com/products/quickspecs/14209\\_na/14209\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14209_na/14209_na.html)

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#### System Fans

Two (2) Non-hot plug, non-redundant fans ship standard (support up to 3 fans).

**NOTE:** Third fan is shipped with 2nd CPU Kit. Third fan is only required in 2P configurations.

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#### Operating Systems and Virtualization Software Support for ProLiant Servers

[Microsoft Windows Server](#)

[Red Hat Enterprise Linux \(RHEL\)](#)

[SUSE Linux Enterprise Server \(SLES\)](#)

[Canonical Ubuntu](#)

[VMware](#)

**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: <http://www.hp.com/go/ossupport> and our driver download page <http://www.hp.com/support/ML350eGen8v2>

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#### Graphics

Integrated Matrox G200 video standard

- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

HP iLO 4 On System Management Memory

- 16 MB Flash
  - 256 MB DDR 3 with ECC (112 MB after ECC and video)
- 

#### Form Factor

Tower 5U

Rackable with the purchase of tower to rack conversion tray kit

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### Standard Features

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

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

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

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

### Standard Features

#### HP Insight Management HP Service Pack for ProLiant

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

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

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

**NOTE:** The Service Pack for ProLiant (which includes HP SUM) can be downloaded from [www.hp.com/go/spp/download](http://www.hp.com/go/spp/download). More information can be found: <http://www.hp.com/go/SmartUpdate>, [www.hp.com/go/spp](http://www.hp.com/go/spp) and <http://www.hp.com/go/hpsum>

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#### Security

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

### Standard Features

#### Warranty

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

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

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

### Optional Features

<b>HP Insight Management</b>	HP Insight Control	<p>HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. HP Insight Control also supports Location and Power Discovery Services to automate many configuration, asset tracking, and power management tasks to speed implementation and prevent downtime. For more information, see <a href="http://www.hp.com/go/insightcontrol">http://www.hp.com/go/insightcontrol</a>.</p> <p>HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, see: <a href="http://www.hp.com/services/insight">http://www.hp.com/services/insight</a>.</p>
	HP iLO Essentials	<p>HP iLO Essentials license ideal for small and medium business customers. The specially created HP iLO Essentials (a subset of iLO Advanced functionality) saves SMB customers time and money, by ease of remote server set up through the interactive virtual media, lowering operational costs with remote access via the Integrated Remote Console, and faster time to resolution with email-based proactive notifications. With this newly designed HP iLO Essentials license SMB customers now have the option of a server management package solely design and priced just right for their IT environments. HP iLO Essentials is available on all HP ProLiant Gen8 e-series making this an ideal solution for small business owners. For more information, see: <a href="http://www.hp.com/go/iLO/essentials">http://www.hp.com/go/iLO/essentials</a></p>
	HP iLO Advanced	<p>HP Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HP ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: <a href="http://www.hp.com/go/iloadvanced">http://www.hp.com/go/iloadvanced</a></p>
	HP Matrix Operating Environment	<p>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.</p> <p>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).</p>

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

### Optional Features

#### Storage Software

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

Storage software that gets the job done:

- **Data Protection and Recovery Software**

Whether you're a large enterprise or a smaller business, HP data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.

- **Data Archive and Migration Software**

HP's storage software enables you to comply with data retention and retrieval requirements, improve application performance, and reduce costs by efficiently migrating infrequently accessed or less valuable data to lower cost storage.

- **Storage Resource Management Software (SRM)**

HP's storage resource management software reduces operational costs and provides the command and control foundation you need to efficiently manage and visualize your physical and virtual environments.

- **Data Replication Software**

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

- **Storage Device Management Software**

Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.

- **HP StoreVirtual VSA**

With HP StoreVirtual VSA you can use the power of virtualization to turn a set of heterogeneous and disconnected physical disk drives in your servers and storage devices into a single pool of logical storage capacity.

**NOTE:** For more information available Storage Software including QuickSpecs, please see: [www.hp.com/go/storage/software](http://www.hp.com/go/storage/software).

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#### HP Insight Online

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

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

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#### HP Proactive Insight experience

Prevent problems with innovative, automated monitoring tools and proactive services. The HP Proactive Insight experience consist of using Insight Online, Insight Remote Support, and Proactive Care Support Service as one integrated solution. The Proactive Insight experience provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: [www.hp.com/go/proactiveinsightexperience](http://www.hp.com/go/proactiveinsightexperience)

### Optional Features

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

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

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

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

### Service and Support

#### Service and Support

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

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

##### **Protect your business beyond warranty with HP Care Pack Services**

HP Care Pack services offer complete care and support expertise with committed response choices designed to meet your IT and business needs.

HP Foundation Care services offer scalable reactive support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for your IT and business needs. HP Proactive Care delivers high levels of system availability through proactive service management and advanced technical response.

#### Optimized Care

##### **Supports maintaining servers at optimum performance availability**

##### **3-Year HP 24x7 4 hour response, Proactive Care Service\***

This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP's vast global resources.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

##### **HP ProLiant Server Hardware Installation**

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>

#### Standard Care

##### **Supports maintaining high level of server availability**

##### **3-Year HP Next Business Day, Proactive Care Service\***

This service gives you combined reactive and proactive support including rapid access to our Advanced Solution Center to manage and prevent problems and a Technical Support Specialist with a broad level of technical knowledge that will engage with additional technical expertise as needed from HP's vast global resources.

<http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855EEE.pdf>

##### **HP ProLiant Server Hardware Installation**

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>

#### Foundation Care

##### **Delivers minimum recommended support service level**

##### **3-Year HP Next Business Day with Collaborative Support**

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>



### Service and Support

#### 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>

#### Insight Online/Insight Remote Support

HP Insight Remote Support provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. This comes at no additional cost with your HP solution\*. Learn more about Insight Remote Support <http://www.hp.com/go/insightremotesupport> and Insight Online <http://www.hp.com/go/insightonline>

\* Insight Remote Support is a prerequisite for Proactive Care.

#### HP Support Center

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

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

\*\* HP Support Center Mobile App is subject to local availability

#### Parts and Materials

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

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

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

#### For more information

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

### Pre-configured Models

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

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

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

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

**NOTE:** All Pre-configured Models come populated with some hard drive blanks installed. Should the customer need additional hard drive blanks, they can order more using either P/N 666987-B21: HP SFF Gen8 Hard Drive Blank Kit or P/N 666986-B21: HP LFF Gen8 Hard Drive Blank Kit.

### Entry Models

<b>HP ProLiant ML350e Gen8 v2 E5-2403v2 1P 2GB-U B120i 460W PS Entry Server</b> 740898-001	<b>Processor</b>	(1) Intel® Xeon® E5-2403 v2 (1.8GHz/4-core/80W/10MB) Processor
	<b>Cache Memory</b>	10MB (1 x 10MB) Level 3
	<b>Memory</b>	2GB (1 x 2GB) Unbuffered DIMMs
	<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i/ZM FBWC SATA Controller (RAID 0,1, 5, 10)
	<b>Hard Drive</b>	None ships standard
	<b>Internal Storage</b>	4 LFF Non-Hot Plug SATA HDD Bays only
	<b>Optical Drive</b>	None ships standard
	<b>Power Supply</b>	(1) 460 Watt Power Supply (non-hot plug, non-redundant)
	<b>Fans</b>	2 Non-Hot Plug, Non Redundant Fans
	<b>Accessories</b>	USB Keyboard and Mouse (None ship standard)
	<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

### Pre-configured Models

#### Base Models

<b>HP ProLiant ML350e Gen8 v2 E5-2407v2 1P 4GB-U 460W PS Base Server</b> 748953-001	<b>Processor</b>	(1) Intel® Xeon® E5-2407 v2 (2.4GHz/4-core/80W/10MB) Processor
	<b>Cache Memory</b>	10MB (1 x 10MB) Level 3
	<b>Memory</b>	4GB (1 x 4GB) Unbuffered DIMMs
	<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i/512MB FBWC SATA Controller (RAID 0,1, 5, 10)
	<b>Hard Drive</b>	None ships standard
	<b>Internal Storage</b>	4 LFF Hot Plug SATA HDD Bays only
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 460 Watt Power Supply (non-hot plug, non-redundant)
	<b>Fans</b>	2 Non-Hot Plug, Non Redundant Fans
	<b>Accessories</b>	USB Keyboard and Mouse ship standard
	<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

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<b>HP ProLiant ML350e Gen8 v2 E5-2407 1P 4GB-U B120i 460W PS Base Server</b> 740899-001	<b>Processor</b>	(1) Intel® Xeon® E5-2407 (2.2GHz/4-core/80W/10MB) Processor
	<b>Cache Memory</b>	10MB (1 x 10MB) Level 3
	<b>Memory</b>	4GB (1 x 4GB) Unbuffered DIMMs
	<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i/512MB FBWC SATA Controller (RAID 0,1, 5, 10)
	<b>Hard Drive</b>	None ships standard
	<b>Internal Storage</b>	4 LFF Hot Plug SATA HDD Bays only
	<b>Optical Drive</b>	HP Half-Height SATA DVD-ROM Optical Drive
	<b>Power Supply</b>	(1) 460 Watt Power Supply (non-hot plug, non-redundant)
	<b>Fans</b>	2 Non-Hot Plug, Non Redundant Fans
	<b>Accessories</b>	USB Keyboard and Mouse ship standard
	<b>Management</b>	HP iLO Management Engine (standard) Optional: HP iLO Essentials or HP Insight Control
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

### Smart Buys

<b>HP ProLiant ML350eGen8v2 E5-2403v2 8GB-U B120i 460W PS US Svr/S-Buy</b> 749355-S01	<b>Processor</b>	(1) Intel® Xeon® E5-2403 v2 (1.8GHz/4-core/80W/10MB) Processor
	<b>Cache Memory</b>	10MB (1 x 10MB) Level 3
	<b>Memory</b>	8GB (2 x 4GB) Unbuffered DIMMs
	<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i/ZM FBWC SATA Controller (RAID 0,1, 5, 10)
	<b>Hard Drive</b>	None ships standard
	<b>Internal Storage</b>	4LFF Hot Plug HDD Bays
	<b>Optical Drive</b>	HP Half Height SATA DVD/RW Optical Drive
	<b>Power Supply</b>	(1) 460 Watt ATX Power Supply (non-hot plug, non-redundant)
	<b>Fans</b>	2 Non-Hot Plug, Non Redundant Fans
	<b>Accessories</b>	USB Keyboard and Mouse
	<b>Management</b>	HP iLO Management Engine (standard)
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

<b>HP ProLiant ML350eGen8v2 E5-2420v2 8GB-U B120i 460W PS US Svr/S-Buy</b> 749356-S01	<b>Processor</b>	(1) Intel® Xeon® E5-2420 v2 (2.2GHz/6-core/80W/15MB) Processor
	<b>Cache Memory</b>	15MB (1 x 15MB) Level 3
	<b>Memory</b>	8GB (2 x 4GB) Unbuffered DIMMs
	<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
	<b>Storage Controller</b>	HP Dynamic Smart Array B120i/512MB FBWC SATA Controller (RAID 0,1, 5, 10)
	<b>Hard Drive</b>	None ships standard
	<b>Internal Storage</b>	4LFF Hot Plug HDD Bays
	<b>Optical Drive</b>	HP Half Height SATA DVD/RW Optical Drive
	<b>Power Supply</b>	(1) 460 Watt ATX Power Supply (non-hot plug, non-redundant)
	<b>Fans</b>	2 Non-Hot Plug, Non Redundant Fans
	<b>Accessories</b>	USB Keyboard and Mouse
	<b>Management</b>	HP iLO Management Engine (standard)
	<b>Form Factor</b>	Tower (5U)
	<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

### Smart Buys

**HP ProLiant  
ML350eGen8v2 E5-  
2440v2 2P 16GB-R  
P430/2GB 750W PS US  
Svr/S-Buy  
749357-S01**

<b>Processor</b>	(2) Intel® Xeon® E5-2440 v2 (1.9GHz/8-core/95W/20MB) Processor
<b>Cache Memory</b>	20MB (1 x 20MB) Level 3
<b>Memory</b>	16GB (2 x 8GB) 1600 RDIMMs
<b>Network Controller</b>	HP Ethernet 1Gb 2-port 361i Adapter
<b>Storage Controller</b>	HP Smart Array P430/2GB FBWC 6Gb 1-Port SAS Controller
<b>Hard Drive</b>	None ships standard
<b>Internal Storage</b>	(8) Hot plug SFF SAS/SATA HDD bays
<b>Optical Drive</b>	HP Half Height SATA DVD/RW Optical Drive
<b>Power Supply</b>	(1) 750 Watt Common Slot Platinum Plus Power Supply (Hot Plug, Redundant)
<b>Fans</b>	3 Non-Hot Plug, Non Redundant Fans
<b>Accessories</b>	USB Keyboard and Mouse
<b>Management</b>	HP iLO Management Engine (standard)
<b>Form Factor</b>	Tower (5U)
<b>Warranty</b>	Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response

### Configuration Information - Factory Integrated Models

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

**NOTE:** Factory Integrated Models must start with a CTO Server.

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

**NOTE:** All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.

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

#### HP Models

#### ML350e Gen8 v2 Tower Models

HP ProLiant ML350e Gen8 v2 Non-hot Plug 4 LFF Configure-to-order Server

740895-B21

**Includes:**

HP Ethernet 1Gb 2-port 361i Adapter  
HP Dynamic Smart Array B120i/ZM SATA Controller (RAID 0/1/10)  
Four (4) Non-Hot-Plug (LFF) SATA Drive Bays  
Eight (8) USB ports  
Six (6) PCIe slots  
Two (2) Non-hot plug, non-redundant fans  
HP iLO Management Engine (standard)  
Tower (5U) form factor

HP ProLiant ML350e Gen8 v2 Hot Plug 4 LFF Configure-to-order Server

740896-B21

**Includes:**

HP Ethernet 1Gb 2-port 361i Adapter  
HP Dynamic Smart Array B120i/ZM SATA Controller (RAID 0/1/10)  
Four (4) Hot-Plug (LFF) SATA Drive Bays  
Eight (8) USB ports  
Six (6) PCIe slots  
Two (2) Non-hot plug, non-redundant fans  
HP iLO Management Engine (standard)  
Tower (5U) form factor

HP ProLiant ML350e Gen8 v2 Hot Plug 8 SFF Configure-to-order Server

740897-B21

**Includes:**

HP Ethernet 1Gb 2-port 361i Adapter  
HP Dynamic Smart Array B120i/ZM SATA Controller (RAID 0/1/10)  
Eight (8) Hot-Plug (SFF) SATA Drive Bays  
**NOTE:** A SAS controller is required to support 8 SFF drives.  
Eight (8) USB ports  
Six (6) PCIe slots  
Two (2) Non-hot plug, non-redundant fans  
HP iLO Management Engine (standard)  
Tower (5U) form factor

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

#### HP Processors

#### E5-2400 v2 Series Processors

### Configuration Information - Factory Integrated Models

#### Ten-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2470v2 (2.4GHz/10-core/25MB/95W) FIO Processor Kit 701849-L21

#### Eight-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2450v2 (2.5GHz/8-core/20MB/95W) FIO Processor Kit 701847-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2440v2 (1.9GHz/8-core/20MB/95W) FIO Processor Kit 701845-L21

#### Six-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2430v2 (2.5GHz/6-core/15MB/80W) FIO Processor Kit 701843-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2420v2 (2.2GHz/6-core/15MB/80W) FIO Processor Kit 701841-L21

#### Quad-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

HP ML350e Gen8 v2 Intel® Xeon® E5-2407v2 (2.4GHz/4-core/10MB/80W) FIO Processor Kit 701839-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2403v2 (1.8GHz/4-core/10MB/80W) FIO Processor Kit 701837-L21

#### E5-2400 Series Processors

#### Eight-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2470 (2.3GHz/8-core/20MB/95W) FIO Processor Kit 741277-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2450 (2.1GHz/8-core/20MB/95W) FIO Processor Kit 741275-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2450L (1.8GHz/8-core/20MB/70W) FIO Processor Kit 741253-L21

#### Six-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

HP ML350e Gen8 v2 Intel® Xeon® E5-2440 (2.4GHz/6-core/15MB/95W) FIO Processor Kit 741259-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2430 (2.2GHz/6-core/15MB/95W) FIO Processor Kit 741257-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2430L (2.0GHz/6-core/15MB/60W) FIO Processor Kit 741251-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2420 (1.9GHz/6-core/15MB/95W) FIO Processor Kit 741255-L21

#### Quad-Core Processors

**NOTE:** All support up to 1066MHz DDR3 memory speeds.

### Configuration Information - Factory Integrated Models

HP ML350e Gen8 v2 Intel® Xeon® E5-2407 (2.2GHz/4-core/10MB/80W) FIO Processor Kit 740887-L21

HP ML350e Gen8 v2 Intel® Xeon® E5-2403 (1.8GHz/4-core/10MB/80W) FIO Processor Kit 740885-L21

#### HP Memory

**NOTE:** To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

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

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for RDIMMs.

#### Registered DIMMs (RDIMMs)

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713981-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713983-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713985-B21

#### Registered DIMMs (RDIMMs)

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647893-B21

HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647895-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647897-B21

HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647899-B21

HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 690802-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647901-B21

HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 672631-B21

#### Unbuffered with ECC DIMMs (UDIMMs)

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

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

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

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

#### Unbuffered with ECC DIMMs (UDIMMs)

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669320-B21



### Configuration Information - Factory Integrated Models

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

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool: [www.hp.com/go/ddr3memory-configurator](http://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:** Mixing of power supplies in the same server is not supported. All power supplies inside a server must be exactly the same model. Mixing Gold, Platinum, and Platinum Plus certified power supplies is not supported.

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

#### Primary Power Supplies

HP 460W Factory Integrated Power Supply Kit	667559-B21
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**NOTE:** This power supply is non-redundant and is factory integrated only.

#### HP Common Slot Platinum Plus Power Supply Kits

**NOTE:** The following Power Supplies offer 94% Efficiency with support for 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 Common Slot Gold Power Supplies

**NOTE:** The following Power Supplies offer up to 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

#### Enablement Kit

HP ML350e v2 Redundant Power Supply	738661-B21
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**NOTE:** ML350e v2 Redundant Power Supply (PN: 738661-B21) is required for any common slot power supply.

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for any 2P configuration.

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for RDIMMs

**NOTE:** Power Specification and Technical Content for supported power supplies can be found at:

[http://h18000.www1.hp.com/products/quickspecs/14209\\_na/14209\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14209_na/14209_na.html)

### Configuration Information - Factory Integrated Models

#### Step 3: Choose Additional Factory Integratable Options

<b>HP Insight Software</b>	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
<b>HP Storage Controller</b>	<b>Optional Upgrades</b> HP 4GB Flash Backed Write Cache FIO Kit for P-series Smart Array Controllers	698537-B21

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#### 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 Processors

##### E5-2400 v2 Series Processors

###### Ten-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2470v2 (2.4GHz/10-core/25MB/95W) Processor Kit 701849-B21

###### Eight-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2450v2 (2.5GHz/8-core/20MB/95W) Processor Kit 701847-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2440v2 (1.9GHz/8-core/20MB/95W) Processor Kit 701845-B21

###### Six-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2430v2 (2.5GHz/6-core/15MB/80W) Processor Kit 701843-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2420v2 (2.2GHz/6-core/15MB/80W) Processor Kit 701841-B21

###### Quad-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

HP ML350e Gen8 v2 Intel® Xeon® E5-2407v2 (2.4GHz/4-core/10MB/80W) Processor Kit 701839-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2403v2 (1.8GHz/4-core/10MB/80W) Processor Kit 701837-B21

##### E5-2400 Series Processors

###### Eight-Core Processors

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

HP ML350e Gen8 v2 Intel® Xeon® E5-2470 (2.3GHz/8-core/20MB/95W) Processor Kit 741277-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2450 (2.1GHz/8-core/20MB/95W) Processor Kit 741275-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2450L (1.8GHz/8-core/20MB/70W) Processor Kit 741253-B21

###### Six-Core Processors

**NOTE:** All support up to 1333MHz DDR3 memory speeds.

HP ML350e Gen8 v2 Intel® Xeon® E5-2440 (2.4GHz/6-core/15MB/95W) Processor Kit 741259-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2430 (2.2GHz/6-core/15MB/95W) Processor Kit 741257-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2430L (2.0GHz/6-core/15MB/60W) Processor Kit 741251-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2420 (1.9GHz/6-core/15MB/95W) Processor Kit 741255-B21

###### Quad-Core Processors

**NOTE:** All support up to 1066MHz DDR3 memory speeds.

HP ML350e Gen8 v2 Intel® Xeon® E5-2407 (2.2GHz/4-core/10MB/80W) Processor Kit 740887-B21

HP ML350e Gen8 v2 Intel® Xeon® E5-2403 (1.8GHz/4-core/10MB/80W) Processor Kit 740885-B21

#### HP Memory

**NOTE:** To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

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

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for RDIMMs.

### Core Options

#### Registered DIMMs (RDIMMs)

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713981-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713983-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713985-B21

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647893-B21

HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647895-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647897-B21

HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647899-B21

HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 690802-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647901-B21

HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 672631-B21

#### Unbuffered with ECC DIMMs (UDIMMs)

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

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

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

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

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669320-B21

HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647905-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669322-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647907-B21

HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669324-B21

HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647909-B21

**NOTE:** All DDR3 memory option kits consist of one DIMM per kit. For detailed memory configuration rules and guidelines, please use the [Online DDR3 Memory Configuration](#)

### Core Options

Tool: [www.hp.com/go/ddr3memory-configurator](http://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 Optical Drives

HP Half-Height SATA DVD ROM JackBlack Optical Drive	624189-B21
HP Half-Height SATA DVD RW JackBlack Optical Drive	624192-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 SmartDrive SFF (2.5-inch) Enterprise Drives

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

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

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

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

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

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

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

##### SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

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

[http://h18000.www1.hp.com/products/quickspecs/12244\\_na/12244\\_na.html](http://h18000.www1.hp.com/products/quickspecs/12244_na/12244_na.html)

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

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

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

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

### Core Options

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
<b>6G SATA Non-Hot Plug LFF (3.5-inch) Midline (MDL) Drives</b>	
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21
<b>NOTE:</b> SATA hard drives have a 1-year warranty. Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html">http://h18000.www1.hp.com/products/quickspecs/13021_na/13021_na.html</a>	
<b>12G SAS High Endurance Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives</b>	
HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741159-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741155-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
HP 200GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741151-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
<b>12G SAS Mainstream Endurance Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741146-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741142-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	741138-B21
<b>NOTE:</b> This drive supports Gen8 servers only.	
<b>6G SATA ME Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HP 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
HP 200GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691864-B21
HP 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21
<b>6G SATA ME Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives</b>	

### Core Options

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

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

[http://h18000.www1.hp.com/products/quickspecs/14038\\_na/14038\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14038_na/14038_na.html)

#### Hard Drive Kits

**NOTE:** All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.

**NOTE:** Mixing of SFF and LFF drive cages is not allowed.

**NOTE:** A second SFF Hot Plug Drive Cage requires a separate Smart Array controller. A second LFF Hot Plug Drive cage can be supported with a P222, or both LFF drive cages can be supported with a single P430.

HP ML350e Gen8 v2 4 Large Form Factor (LFF) Hot Plug Hard Drive Cage Kit	741741-B21
HP ML350e Gen8 v2 8 Small Form Factor (SFF) Hot Plug Hard Drive Cage Kit	741744-B21
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
HP Ethernet 1Gb 2-port 332T Adapter	615732-B21
HP Ethernet 1Gb 2-port 361T Adapter	652497-B21

#### 10 Gigabit Ethernet Adapters

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

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

HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21
HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
HP Ethernet 10Gb 2-port 530SFP Adapter	652503-B21
HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: [www.hp.com/go/ProLiantNICs](http://www.hp.com/go/ProLiantNICs)

#### Optional Upgrades



### Core Options

HP PCI Baffle Kit	738655-B21
<b>NOTE:</b> The PCI Baffle Kit is required whenever a PCI option card (NIC, Smart Array Controller, etc.) is installed in a PCIe slot.	

### HP Power Supplies

**NOTE:** Mixing of power supplies in the same server is not supported. All power supplies inside a server must be exactly the same model. Mixing Gold, Platinum, and Platinum Plus certified power supplies is not supported.

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

#### HP Common Slot Platinum Plus Power Supply Kits

**NOTE:** The following Power Supplies offer 94% Efficiency with support for Intelligent Power Discovery.

HP 460W Common Slot Platinum Plus Hot Plug Power Supply Kit	656362-B21
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HP 750W Common Slot Platinum Plus Hot Plug Power Supply Kit	656363-B21
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#### HP Common Slot Gold Power Supplies

**NOTE:** The following Power Supplies offer up to 92% efficiency.

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

HP ML350e v2 Redundant Power Supply	738661-B21
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**NOTE:** Redundant Enablement Kit (PN: 738661-B21) is required for any common slot power supply.

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for any 2P configuration

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for RDIMMs

**NOTE:** Power Specification and Technical Content for supported power supplies can be found at:

[http://h18000.www1.hp.com/products/quickspecs/14209\\_na/14209\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14209_na/14209_na.html)

### HP Computation and Graphics Accelerators

NVIDIA Quadro K2000 PCIe Graphics Adapter	753959-B21
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### Additional Options

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

#### HP Insight Software

#### HP Insight Control

HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License C6N27A

HP Insight Control Server Provisioning Media Kit BD883A

HP Insight Management Media Kit C6N31A

**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

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

**NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: <http://www.hp.com/go/insightupdates>.

**NOTE:** For additional license options please see the QuickSpecs at:

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

#### HP Integrated Lights-Out (iLO)

#### HP Integrated Lights-Out (iLO) Advanced for ProLiant

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License TA850AAE

HP iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates BD506AAE

HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License 512485-B21

#### HP iLO Essentials

HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates BD505A

**NOTE:** For additional license options please see the QuickSpecs at:

[http://h18004.www1.hp.com/products/quickspecs/14276\\_na/14276\\_na.html](http://h18004.www1.hp.com/products/quickspecs/14276_na/14276_na.html)

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

#### 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 P430 Controller

HP Smart Array P430/4GB FBWC 6Gb 1-port Int SAS Controller 698530-B21

HP Smart Array P430/2GB FBWC 6Gb 1-port Int SAS Controller 698529-B21

#### HP Smart Array P431 Controller

HP Smart Array P431/4GB FBWC 6Gb 2-ports Ext SAS Controller 698532-B21

HP Smart Array P431/2GB FBWC 6Gb 2-ports Ext SAS Controller 698531-B21

#### HP Smart Array P830 Controller

HP Smart Array P830/4GB FBWC 6Gb 2-ports Int SAS Controller 698533-B21

#### Optional Upgrades

### Additional Options

HP 512MB B-series 36 inch Dynamic Smart Array Flash Backed Write Cache for ML/DL <b>NOTE:</b> This cache option provides RAID 5 for the integrated Dynamic Smart Array B120i.	631922-B21
HP Tower to Rack Conversion Tray Universal Kit	417705-B21
HP ML350e Gen8 v2 Smart Array Cable Kit <b>NOTE:</b> This Cable kit is required when ordering a Smart Array P430 Controller.	725895-B21
HP PCI Baffle Kit <b>NOTE:</b> The PCI Baffle Kit is required whenever a PCI option card (NIC, Smart Array Controller, etc.) is installed in a PCIe slot.	738655-B21
HP SmartCache No Media 24x7 Technical Support 1 Svr License	D7S26A
HP SmartCache No Media 24x7 Technical Support Flexible License	D7S27A
HP SmartCache No Media 24x7 Technical Support Electronic License <b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/14227_na/14227_na.html">http://h18000.www1.hp.com/products/quickspecs/14227_na/14227_na.html</a> (Smart Array P222 Controller) <a href="http://h18000.www1.hp.com/products/quickspecs/14624_na/14624_na.html">http://h18000.www1.hp.com/products/quickspecs/14624_na/14624_na.html</a> (Smart Array P430 Controller) <a href="http://h18000.www1.hp.com/products/quickspecs/14625_na/14625_na.html">http://h18000.www1.hp.com/products/quickspecs/14625_na/14625_na.html</a> (Smart Array P431 Controller) <a href="http://h18000.www1.hp.com/products/quickspecs/14744_na/14744_na.html">http://h18000.www1.hp.com/products/quickspecs/14744_na/14744_na.html</a> (Smart Array P830 Controller)	D7S27AAE
<b>HP Host Bus Adapters</b>	
HP H220 Host Bus Adapter	650933-B21
HP H221 PCIe 3.0 SAS Host Bus Adapter	729552-B21
HP H222 Host Bus Adapter	650926-B21
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18004.www1.hp.com/products/quickspecs/14336_na/14336_na.html">http://h18004.www1.hp.com/products/quickspecs/14336_na/14336_na.html</a> (HBA 221) <a href="http://h18004.www1.hp.com/products/quickspecs/14222_na/14222_na.html">http://h18004.www1.hp.com/products/quickspecs/14222_na/14222_na.html</a> (HBA 221) <a href="http://h18004.www1.hp.com/products/quickspecs/14337_na/14337_na.html">http://h18004.www1.hp.com/products/quickspecs/14337_na/14337_na.html</a> (HBA 222)	
<b>SCSI HBA</b>	
HP SC11Xe Ultra320 Single Channel/ PCIe x4 SCSI Host Bus Adapter <b>NOTE:</b> Please see the following QuickSpecs for additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html">http://h18000.www1.hp.com/products/quickspecs/12566_na/12566_na.html</a> (SC11Xe HBA)	412911-B21

### Additional Options

<b>HP Secure Encryption</b>	HP Secure Encryption No Media E-LTU per Drive	D8S85AAE
	HP Secure Encryption No Media Flexible License per Drive	D8S84A
	<b>NOTE:</b> HP Secure Encryption is supported on the HP Smart Array P731m and the P230i as an option. HP Secure Encryption licensing is based on the number of physical drives requiring encryption.	
	<b>NOTE:</b> For more information about HP Secure Encryption, go to <a href="http://www.hp.com/go/hpsecureencryption">www.hp.com/go/hpsecureencryption</a> .	

### HP Tape Backup

**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: <http://www.hp.com/go/tape>. For hardware and software compatibility of HP tape backup products see: <http://www.hp.com/storage/SPOCK> and [www.hp.com/go/ebs](http://www.hp.com/go/ebs).  
**NOTE:** All internal tape drives listed are only supported with the non-hot plug, non-redundant ATX power supply. The internal drives not are supported in any hot-plug, redundant power supply configuration.

HP StoreEver DAT 160 USB Internal Tape Drive	Q1580B
HP StoreEver LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847B
HP StoreEver LTO-4 Ultrium 1760 SAS Internal WW Tape Drive	EH919B
HP StoreEver LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957B
HP StoreEver LTO-5 Ultrium 3000 SAS External Tape Drive	EH958B
HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit	COL99A
HP StoreEver LTO-6 Ultrium 6650 SAS Internal Tape Drive	EH963A
HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive	EH964A
HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive	EH969A
HP StoreEver LTO-6 Ultrium 6250 External Tape Drive	EH970A
HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader	COH19A

### HP Tape Storage Systems **HP StoreEver MSL6480**

HP StoreEver MSL6480 Scalable Base Module	QU625A
<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/14604_na/14604_na.html">http://h18000.www1.hp.com/products/quickspecs/14604_na/14604_na.html</a>	

### Additional Options

#### HP Disk Storage Systems **Disk Enclosures**

HP D3600 Enclosure QW968A

**NOTE:** See the D3000 Disk Enclosure QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/14866\\_na/14866\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14866_na/14866_na.html)

HP D3700 Enclosure QW967A

**NOTE:** See the D3000 Disk Enclosure QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/14866\\_na/14866\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14866_na/14866_na.html)

HP D2600 Disk Enclosure AJ940A

**NOTE:** See the D2000 Disk Enclosure QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/13404\\_na/13404\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13404_na/13404_na.html)

HP D2700 Disk Enclosure AJ941A

**NOTE:** See the D2000 Disk Enclosure QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/13404\\_na/13404\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13404_na/13404_na.html)

HP D6000 Dual I/O Module Disk Enclosure QQ695A

**NOTE:** See the D6000 Disk Enclosure QuickSpecs for additional information including configuration steps and additional options needed for a complete solution at: [http://h18000.www1.hp.com/products/quickspecs/14419\\_na/14419\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14419_na/14419_na.html)

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#### HP Storage Options

##### QLogic Fibre Channel HBAs

HP StoreFabric SN1000Q 16GB 1-port PCIe Fibre Channel Host Bus Adapter QW971A

HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter QW972A

##### Converged Network Adapter

HP CN1100E Dual Port Converged Network Adapter BK835A

HP CN1000Q Dual Port Converged Network Adapter BS668A

HP StoreFabric CN1100R Dual Port Converged Network Adapter QW990A

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### Additional Options

#### HP Uninterruptible Power Systems

##### HP Tower UPS

##### HP T1500 G3 UPS Models

HP T1500 G3 1400VA NA Tower Uninterruptible Power System

AF450A

##### HP T1000 G3 UPS Models

HP T1000 G3 1000VA NA Tower Uninterruptible Power System

AF448A

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

[http://h18000.www1.hp.com/products/quickspecs/13160\\_na/13160\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13160_na/13160_na.html)

##### HP Rack-mountable UPS

##### HP R1500 G3 Uninterruptible Power Supply (UPS)

HP R1.5kVA G3 1U NA Uninterruptible Power System

AF469A

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

[http://h18000.www1.hp.com/products/quickspecs/14059\\_na/14059\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14059_na/14059_na.html)

##### HP R/T3000 G2 Uninterruptible Power System (UPS)

HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System

AF466A

HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System

AF467A

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

[http://h18000.www1.hp.com/products/quickspecs/14058\\_na/14058\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14058_na/14058_na.html)

##### R5000 Uninterruptible Power System (UPS)

HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System

AF460A

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

[http://h18000.www1.hp.com/products/quickspecs/14109\\_na/14109\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14109_na/14109_na.html)

##### R7000 Uninterruptible Power System (UPS)

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System

AF462A

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

[http://h18000.www1.hp.com/products/quickspecs/14110\\_na/14110\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14110_na/14110_na.html)

**NOTE:** For additional information on HP Uninterruptible Power Systems please go to:

[www.hp.com/servers/rackups](http://www.hp.com/servers/rackups).

**NOTE:** For additional information on sizing your server, please reference:

<http://www.upssizer.com>.

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

### Additional Options

<b>HP Basic Power Distribution Units (bPDU)</b>	<b>HP Basic Power Distribution Unit: 1U/0U Version</b>	
	HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU	H5M54A
	HP 3.6kVA 200-240 Volt Detachable C20 Input ( 12xC13) WW Basic PDU	H5M56A
	<b>HP Basic Power Distribution Unit: Half Height Version</b>	
	HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU	H5M55A
	HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU	H5M57A
	HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU	H5M58A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU	H5M61A
	<b>HP Basic Power Distribution Unit: Mid Height Version</b>	
	HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU	H5M59A
	HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU	H5M60A
	HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU	H5M75A
	HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU	H5M63A
	HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU	H5M64A
	HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU	H5M62A
	<b>HP Basic Power Distribution Unit: Full Height Version</b>	
	HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU	H5M67A
	<b>HP Basic Power Distribution Unit: 480/277 Volt Version</b>	
	HP 13.2kVA 480 Volt IEC309 30A 3-Phase Input (15 Outlet) NA Basic PDU	H3X07A
	HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU	H3X08A
	HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer	H3X09A

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

[http://h18000.www1.hp.com/products/quickspecs/14557\\_na/14557\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14557_na/14557_na.html)

**NOTE:** Additional HP Power Distribution Units are available. For a complete list of all HP PDUs and additional information please visit [www.hp.com/go/rackandpower](http://www.hp.com/go/rackandpower).

### Additional Options

**HP Remote Monitoring Power Distribution Units (mPDU)**

**HP Remote Monitored Power Distribution Unit: 1U Version**

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

**HP Remote Monitored Power Distribution Unit: Half Height Version**

HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU	D9N45A
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**HP Remote Monitored Power Distribution Unit: Mid Height Version**

HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU	D9N47A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU	D9N51A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU	D9N52A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU	D9N53A

**HP Remote Monitored Power Distribution Unit: Full Height Version**

HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU	D9N49A
HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU	D9N58A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU	D9N61A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU	D9N54A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU	D9N59A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU	D9N62A
HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU	D9N63A

**HP Environmental Sensor for Remote Monitored PDUs**

HP Environmental Sensor for Remote Monitored PDUs	E2D53A
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**HP Remote Monitored Power Distribution Unit: 1U Version**

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

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

[http://h18000.www1.hp.com/products/quickspecs/14669\\_na/14669\\_na.html](http://h18000.www1.hp.com/products/quickspecs/14669_na/14669_na.html)

### Additional Options

<b>HP Intelligent Power Distribution Units (iPDU)</b>	<b>iPDU Core Units</b>	
	HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF520A
	HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF521A
	HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF522A
	HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit	AF533A
	HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit	AF523A
	HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit	AF902A
	HP 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
	<b>iPDU Kits with Standard Extension Bars</b>	
	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
	<b>iPDU Extension Bars</b>	
	HP 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A
	HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A
	<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications and additional information: <a href="http://h18000.www1.hp.com/products/quickspecs/13650_na/13650_na.html">http://h18000.www1.hp.com/products/quickspecs/13650_na/13650_na.html</a>	

<b>HP Rack Series</b>	<b>HP Intelligent Series Rack</b>	
	HP 636 1075mm Pallet Intelligent Series Rack	BW895A
	HP 636 1075mm Shock Intelligent Series Rack	BW896A
	HP 642 1075mm Pallet Intelligent Series Rack	BW903A
	HP 642 1075mm Shock Intelligent Series Rack	BW904A
	HP 642 1200mm Pallet Intelligent Series Rack	BW907A
	HP 642 1200mm Shock Intelligent Series Rack	BW908A
	HP 647 1075mm Pallet Intelligent Series Rack	BW911A
	HP 647 1075mm Shock Intelligent Series Rack	BW912A
	HP 647 1200mm Pallet Intelligent Series Rack	BW913A
	HP 647 1200mm Shock Intelligent Series Rack	BW914A
	<b>NOTE:</b> Please see the QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: <a href="http://h18000.www1.hp.com/products/quickspecs/14223_na/14223_na.html">http://h18000.www1.hp.com/products/quickspecs/14223_na/14223_na.html</a>	
	<b>NOTE:</b> For additional information regarding Rack Cabinets, please see the following URL: <a href="http://www.hp.com/go/rackandpower">http://www.hp.com/go/rackandpower</a> .	



### Additional Options

#### HP Rack Options

##### HP TFT7600 G2 KVM Console and Monitor (TFT7600 G2)

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\\_na/13731\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13731_na/13731_na.html)

##### HP USB Keyboard and Mouse

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

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

[http://h18000.www1.hp.com/products/quickspecs/13792\\_na/13792\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13792_na/13792_na.html)

##### HP Server Console Switches

HP Server Console 0x2x8 Port Analog Switch AF616A

HP Server Console 0x2x16 Port Analog Switch AF617A

HP TAA 0x2x16xKVM Server Console G2 Switch AF626A

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

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

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

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

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

HP KVM CAT5 1-pack USB Interface Adapter 336047-B21

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

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

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

HP 1x4 USB/PS2 KVM Console Switch AF611A

HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software AF620A

HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software AF621A

HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software AF622A

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

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

### Additional Options

#### HP USB and SD Options

#### HP Flash Media Kits for USB Drives

**NOTE:** HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software. 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 8GB USB Enterprise Mainstream Flash Media Drive Key Kit 737953-B21

#### HP Enterprise Mainstream Flash Media Kits for Memory Cards

HP 8GB SD Enterprise Mainstream Flash Media Kit 726113-B21

HP 32GB SD Enterprise Mainstream Flash Media Kit 700136-B21

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

[http://h18000.www1.hp.com/products/quickspecs/13971\\_na/13971\\_na.html](http://h18000.www1.hp.com/products/quickspecs/13971_na/13971_na.html)

#### HP Care Pack Services

#### Proactive Care

**NOTE:** Collaborative Support plus Proactive services delivered by the onshore, local language Advanced Solution Center (ASC), end-to-end case ownership from a Technical Solution Specialists and Technical Account Manager who remotely delivers firmware/software revision management, proactive scans and incident trend reports. Recommended for customers running a virtualized infrastructure and/or customers who desire an enhanced call support experience.

HP 3 year 4 hour 24x7 ProLiant ML350e Proactive Care Service U6C93E

HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant ML350e Proactive Care Service U6C94E

HP 3 year 6 hour Call to Repair 24x7 ProLiant ML350e Proactive Care Service U6C99E

HP 3 year 6 hour Call to Repair 24x7 w/Defective Media Retention ProLiant ML350e Proactive Care SVC U6D00E

HP 3 year ISS ProactiveCare Personalized Support U6W98E

#### Foundation Care

HP 3 year 4 hour 24x7 ProLiant ML350e Collaborative Support U6C91E

HP 3 year 4 hour 24x7 with Defective Media Retention ProLiant ML350e Collaborative Support U6C92E

HP 3 year 6 hour Call to Repair 24x7 ProLiant ML350e Collaborative Support U6C97E

HP 3 year 6 hour Call to Repair 24x7 w/Defective Media Retention ProLiant ML350e Collaborative Support U6C98E

#### Installation Services

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

HP Install ProLiant ML350e Service U6D41E

HP Startup ProLiant ML350e Service U6D43E

**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](http://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 or RDIMMs
- 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 three (3) channels per processor; six (6) channels per server
- There are two (2) DIMM slots for each memory channel; twelve (12) total slots
- Memory channel 1 consists of the two (2) DIMMs that are furthest from the processor
- Memory channel 3 consists of the two (2) DIMMs that are closest to the processor

DIMM slot/capacity/populated speed table																			
DIMM Type ->	Registered DIMMS (RDIMMs)										Unbuffered with ECC DIMMs (UDIMMs)								
	Single Rank (1R)					Dual Rank (2R)					Single Rank (1R)			Dual Rank (2R)					
DIMM Rank ->	4GB	4GB	4GB	8GB	8GB	8GB	8GB	16GB	16GB	16GB	2GB	2GB	2GB	4GB	4GB	4GB	8GB	8GB	8GB
DIMM Capacity ->	4GB	4GB	4GB	8GB	8GB	8GB	8GB	16GB	16GB	16GB	2GB	2GB	2GB	4GB	4GB	4GB	8GB	8GB	8GB
DIMM Native Speed (MHz) ->	1333	1600	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600
Voltage	LV	Std	LV	Std	LV	Std	LV	LV	Std	LV	LV	Std	LV	LV	Std	LV	LV	Std	LV
<b>SLOTS THAT CAN BE POPULATED</b>																			
12 slot servers	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
<b>MAXIMUM CAPACITY (GB)*</b>																			
12 slot servers	48	48	48	96	96	96	96	192	192	192	24	24	24	48	48	48	96	96	96

### Memory

POPULATED DIMM SPEED (MHz)																			
1 DIMM Per Channel	1333	1600	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600	1333	1600	1600
2 DIMM Per Channel	1333	1600	1600	1600	1333	1600	1600	1333	1600	1600	1333**	1600	1600	1333**	1600	1600	1333**	1600	1600

Please note:

Memory speed is a function of the processor QPI bus speed.

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

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

### DIMM slot and configuration diagrams

#### Basic memory slot & population diagram

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

12 DIMM SLOTS (6 per CPU node)					
	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A	1	A	Chnl 1
	5	D	2	D	
Chnl 2	4	B	3	B	Chnl 2
	3	E	4	E	
Chnl 3	2	C	5	C	Chnl 3
	1	F	6	F	

#### Standard memory configuration (1 CPU model) - Entry models

- 2GB, consisting of one (1) 2GB single-rank PC3L-10600E-9 UDIMM

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 2GB UDIMM	1	A; empty	Chnl 1
	5	D; empty	2	D; empty	
Chnl 2	4	B; empty	3	B; empty	Chnl 2
	3	E; empty	4	E; empty	
Chnl 3	2	C; empty	5	C; empty	Chnl 3
	1	F; empty	6	F; empty	

#### Standard memory configuration (1 CPU model) - Base models

- 4GB, consisting of one (1) 4GB dual-rank PC3L-10600E-9 UDIMM

### Memory

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 4GB UDIMM	1	A; empty	Chnl 1
	5	D; empty	2	D; empty	
Chnl 2	4	B; empty	3	B; empty	Chnl 2
	3	E; empty	4	E; empty	
Chnl 3	2	C; empty	5	C; empty	Chnl 3
	1	F; empty	6	F; empty	

#### Standard memory configuration (1 CPU model) - Performance models

- 8GB, consisting of two (2) 4GB dual-rank PC3L-10600E-9 UDIMMs

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 4GB UDIMM	1	A; empty	Chnl 1
	5	D; empty	2	D; empty	
Chnl 2	4	B; 4GB UDIMM	3	B; empty	Chnl 2
	3	E; empty	4	E; empty	
Chnl 3	2	C; empty	5	C; empty	Chnl 3
	1	F; empty	6	F; empty	

#### RDIMM maximum configuration (1 CPU model)

- 96GB, consisting of six (6) 16GB dual-rank PC3L-10600R-9 RDIMMs

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 16GB RDIMM	1	A; empty	Chnl 1
	5	D; 16GB RDIMM	2	D; empty	
Chnl 2	4	B; 16GB RDIMM	3	B; empty	Chnl 2
	3	E; 16GB RDIMM	4	E; empty	
Chnl 3	2	C; 16GB RDIMM	5	C; empty	Chnl 3
	1	F; 16GB RDIMM	6	F; empty	

#### UDIMM maximum configuration (1 CPU model)

- 48GB, consisting of six (6) 8GB dual-rank PC3L-10600E-9 UDIMMs

### Memory

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 8GB RDIMM	1	A; empty	Chnl 1
	5	D; 8GB RDIMM	2	D; empty	
Chnl 2	4	B; 8GB RDIMM	3	B; empty	Chnl 2
	3	E; 8GB RDIMM	4	E; empty	
Chnl 3	2	C; 8GB RDIMM	5	C; empty	Chnl 3
	1	F; 8GB RDIMM	6	F; empty	

### RDIMM maximum configuration (2 CPU model)

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

	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 16GB RDIMM	1	A; 16GB RDIMM	Chnl 1
	5	D; 16GB RDIMM	2	D; 16GB RDIMM	
Chnl 2	4	B; 16GB RDIMM	3	B; 16GB RDIMM	Chnl 2
	3	E; 16GB RDIMM	4	E; 16GB RDIMM	
Chnl 3	2	C; 16GB RDIMM	5	C; 16GB RDIMM	Chnl 3
	1	F; 16GB RDIMM	6	F; 16GB RDIMM	

### UDIMM maximum configuration (2 CPU model)

- 96GB, consisting of twelve (12) 8GB dual-rank PC3L-10600E-9 UDIMMs

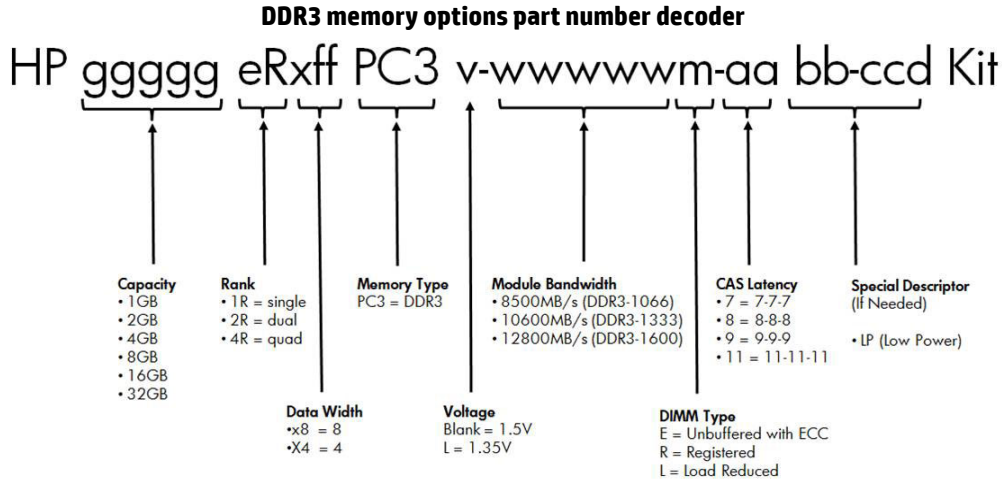
	Processor 1		Processor 2		
	slot #	population order	slot #	population order	
Chnl 1	6	A; 8GB RDIMM	1	A; 8GB RDIMM	Chnl 1
	5	D; 8GB RDIMM	2	D; 8GB RDIMM	
Chnl 2	4	B; 8GB RDIMM	3	B; 8GB RDIMM	Chnl 2
	3	E; 8GB RDIMM	4	E; 8GB RDIMM	
Chnl 3	2	C; 8GB RDIMM	5	C; 8GB RDIMM	Chnl 3
	1	F; 8GB RDIMM	6	F; 8GB RDIMM	

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

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

### Memory

- 16GB = 16384MB



**Following are memory options available from HP:**

**HP Memory**

**NOTE:** To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:

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

**NOTE:** Redundant PSU Kit (PN: 738661-B21) is required for RDIMMs.

**Registered DIMMs (RDIMMs)**

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713981-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713983-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit 713985-B21

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 4GB (1x4GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647893-B21

HP 4GB (1x4GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647895-B21

HP 8GB (1x8GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647897-B21

HP 8GB (1x8GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 647899-B21

HP 8GB (1x8GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 690802-B21

HP 16GB (1x16GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit 647901-B21

HP 16GB (1x16GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit 672631-B21

### Memory

#### Unbuffered with ECC DIMMs (UDIMMs)

**NOTE:** The following memory is supported by the E5-2400 v2 series Processors.

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

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

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

**NOTE:** The following memory is supported by the E5-2400 series Processors.

HP 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669320-B21

HP 2GB (1x2GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647905-B21

HP 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669322-B21

HP 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647907-B21

HP 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669324-B21

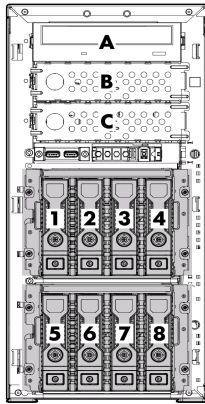
HP 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647909-B21

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

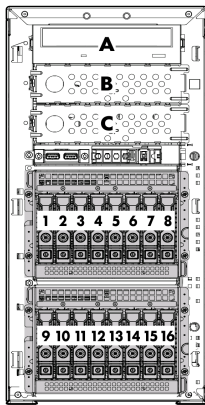
**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: <http://h18004.www1.hp.com/products/servers/platforms/energyefficient/>



### Storage



- A Optical Drive (standard with BTO, optional with CTO)
- B Optional Media Bay
- C Optional Media Bay
- 1-4 Standard LFF Drive Cage
- 5-8 Optional LFF Drive Cage



- A Optical Drive
- B Optional Media Bay
- C Optional Media Bay
- 1-8 Standard SFF Drive Cage
- 9-16 Optional SFF Drive Cage

### Technical Specifications

<b>System Unit</b>	<b>Dimensions</b> (H x W x D) (with feet/bezel)	16.93 x 7.87 x 24.8 in (43 x 20 x 63 cm)	
	<b>Weight</b> (approximate)	Maximum (all hard drives, power supplies, and processors installed)	72.34 lb (27 kg)
		Minimum (one hard drive, power supply, and processor installed)	53.58lb (20 kg)
<b>Input Requirements</b> (per power supply)	<b>Input Requirements</b> (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
<b>BTU Rating</b>	<b>BTU Rating</b>	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)
<b>Power Supply Output</b> (per power supply)	<b>Power Supply Output</b> (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)
<b>System Inlet Temperature</b>	<b>System Inlet Temperature</b>	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 304.8 m (1.8°F per every 1000 ft) above sea level to a maximum of 3048 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
<b>Relative Humidity</b> (non-condensing)	<b>Relative Humidity</b> (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.
<b>Altitude</b>	<b>Altitude</b>	Operating	3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

### Technical Specifications

	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
<b>Acoustic Noise</b>	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	4.1 B
	L pAm	25 dB
	Operating	
L WAd	4.1 B	
L pAm	26 dB	
<b>Emissions Classification (EMC)</b>	<b>NOTE:</b> Configurations tested for Entry models included Windows 2008 Enterprise 64-bit.	
	<b>NOTE:</b> Configurations tested for Base models included one (1) 1TB non-hot plug LFF SATA HDD and Windows 2008 Enterprise 64-bit.	
	<b>NOTE:</b> The Listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.	
<b>FCC Rating</b>	Class A	
<b>Normative Standards</b>	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	
<b>NOTE:</b> 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.		

<b>HP Dynamic Smart Array B120i Controller</b>	<b>Dimensions</b>	Embedded
	<b>Disk Drive Interface - Transfer rate</b>	Up to 6Gb/s SATA (Serial ATA)
	<b>Connectors</b>	6 internal SATA connectors
	<b>Server Interface</b>	x4 PCIe 2.0
	<b>SATA Speed</b>	6Gb/s SATA links
	<b>Cache Memory</b>	Zero Memory RAID has no cache memory optional 40-bit 512MB ECC protected Flash Backed Write Cache (FBWC)
	<b>Logical Drives Supported</b>	Up to 8 logical volumes (6 physical drives)
	<b>Host Memory Addressing</b>	64-bit, supporting greater than 4GB server memory space

### Technical Specifications

<b>RAID Support</b>	RAID 0 (Striping), RAID 1 (Mirroring) RAID 1+0 (Striping & Mirroring) RAID 5 with optional 512MB FBWC <b>NOTE:</b> 512 MB cache is required to enable RAID 5 support <b>NOTE:</b> NO SAS supported.
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<b>HP Ethernet 1Gb 2-port 361i Adapter</b>	<b>Network Interface Compatibility</b>	10Base-T/100Base-TX/1000Base-TX IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX IEEE 1588, IEEE 802.1AS IEEE 802.3az - Energy Efficient Ethernet (EEE)	
	<b>Data Transfer Method Controller</b>	PCI Express V2.0, 5.0 GT/s with x2 link (fixed) Intel I350 Powerville	
	<b>Network Transfer Rate</b>	10Base-T (Half-Duplex)	10 Mb/s per port, 20 Mb/s Combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 40 Mb/s Combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 200 Mb/s Combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 400 Mb/s Combined
		1000Base-TX (Half-Duplex)	1000Mb/s per port, 2000 Mb/s Combined
		1000 Base-TX (Full-Duplex)	2000Mb/s per port, 4000 Mb/s Combined
	<b>Connector</b>	RJ-45	
	<b>Cable Support</b>	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
10/100/1000Base-TX		Category 5E or better; up to 328 ft (100 m)	

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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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.

### Technical Specifications

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