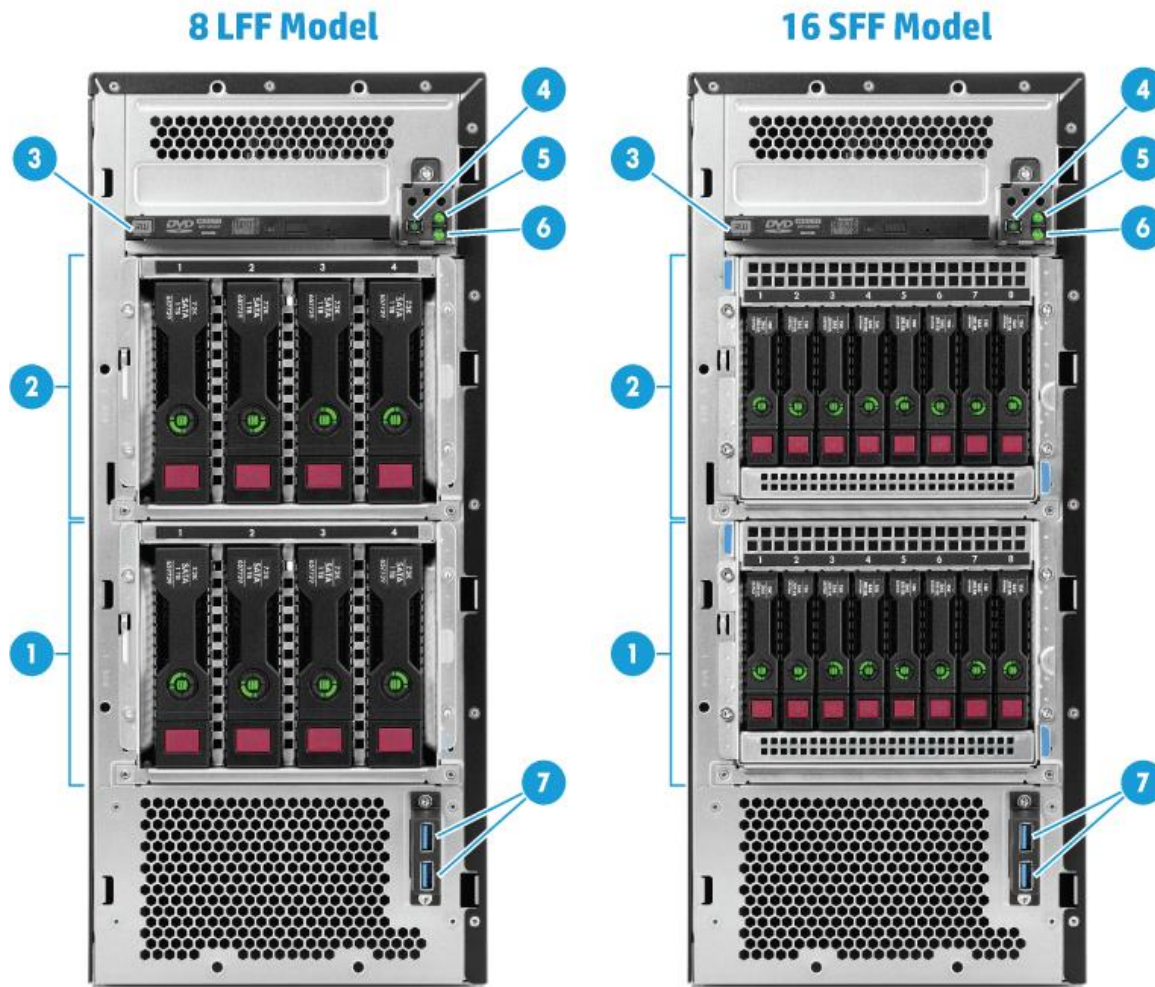


### Overview

### HP ProLiant ML110 Generation9 (Gen9)

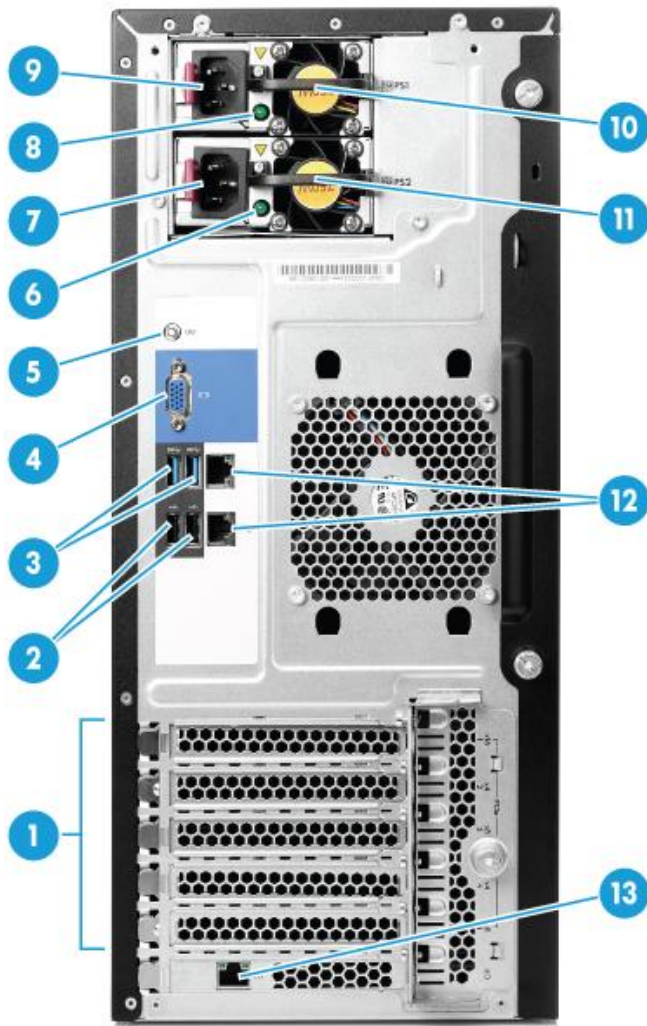
The HP ProLiant ML110 Gen9 Server is a 1P/ 4.5U affordable single-socket tower server featuring better performance, expansion, and growth than previous 1P single-socket tower models. Designed to meet small and mid-sized businesses' performance compute demands the ML110 Gen9 delivers exceptional value at an affordable price.



#### Front View (details for 8LFF and 16SFF)

1. Drive cage
2. Drive cage
3. Optical drive (optional)
4. Power button/LED
5. Health LED
6. NIC status LED
7. USB 3.0 (2) connectors

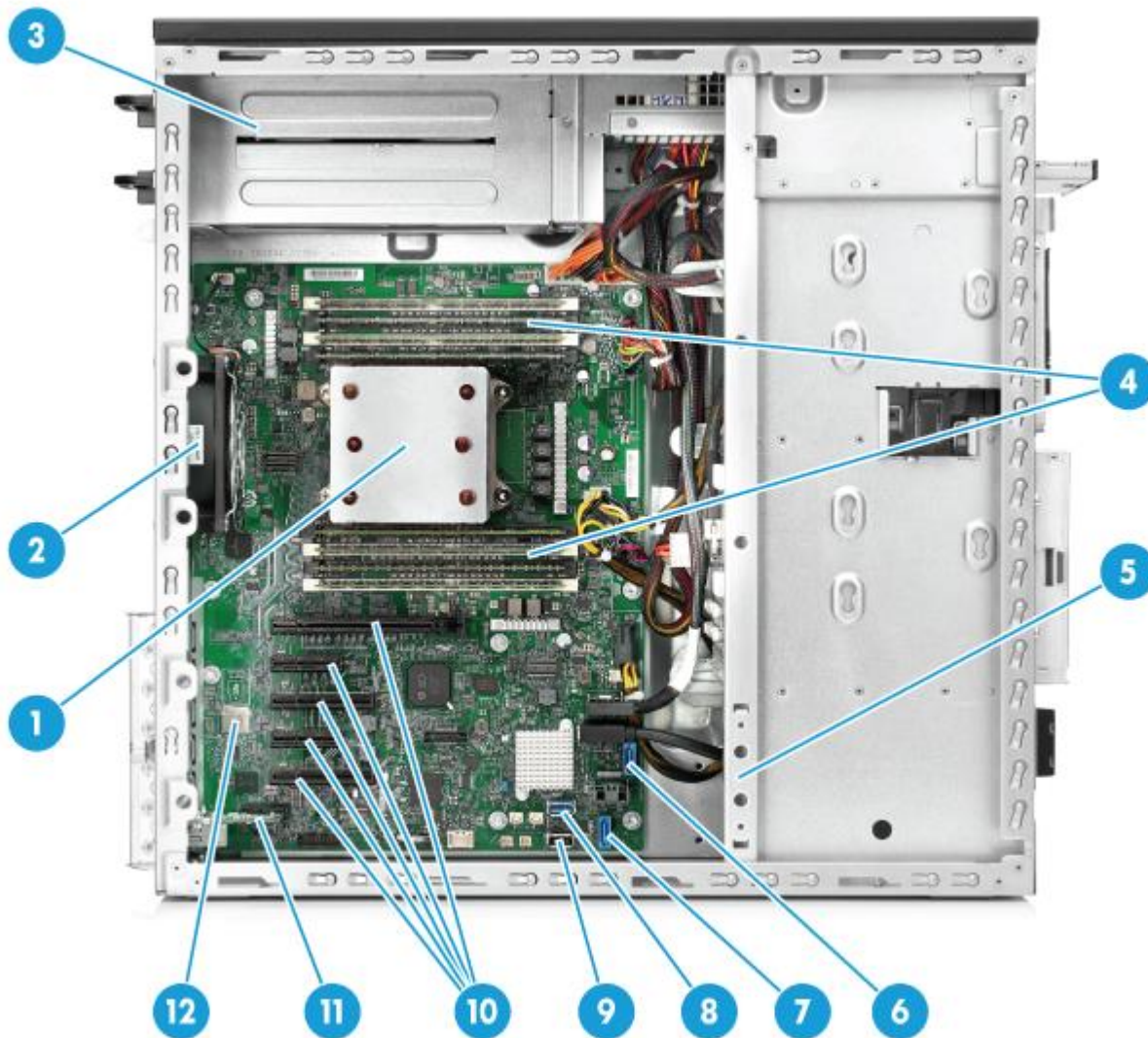
### Overview



### Rear View

1. PCIe3 Slots (Slots 1-5)
2. USB 2.0 (2) connectors
3. USB 3.0 (2) connectors
4. Video connector
5. UID button/LED
6. Power supply 2 LED
7. Power supply 2 power connection
8. Power supply 1 LED
9. Power supply 1 power connection
10. Power Supply 1 bay
11. Power Supply 2 bay
12. Network RJ-45 ports (2)
13. HP ML Gen9 dedicated iLO port kit (optional)

### Overview



### Internal View

1. One (1) processor and heatsink with HP Smart Socket Guide
2. System Fan (92x32mm default), upgrade system fan(92x38mm) is required for 140W E5-1600v3 Processor and SAS SSD
3. Power Supply backplane cage
4. Eight (8) DDR4 DIMM slots
5. PCIe fan (option required to support PCIe expansion cards)
6. Front USB 3.0 connector
7. SATA connector 1
8. Internal USB 3.0 connector
9. Internal USB 2.0 connector
10. Five (5) PCIe3 expansion slots
11. Dedicated iLO module slot (optional)
12. MicroSD slot

### Standard Features

**NOTE:** For more information regarding Intel Xeon processors, please see the following <http://www.intel.com/xeon>.

Intel® Xeon® processor E5-2600 v3 product family is designed to deliver the best combination of performance, built-in capabilities, and cost-effectiveness. One (or two) of the following Intel® Xeon® E5-2600 v3 processors based on the model.

Processor	Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
One of the following depending on model	E5-2660v3	2.6GHz	10	25MB	105W	9.6GT/s	2133
	E5-2640v3	2.6GHz	8	20MB	90W	8.0GT/s	1866
	E5-2630Lv3	1.8GHz	8	20MB	55W	8.0GT/s	1866
	E5-2623v3	3.0GHz	4	10MB	105W	8.0GT/s	1866
	E5-2620v3	2.4GHz	6	15MB	85W	8.0GT/s	1866
	E5-2609v3	1.9GHz	6	15MB	85W	6.4GT/s	1600
	E5-2603v3	1.6GHz	6	15MB	85W	6.4GT/s	1600
	E5-1650v3	3.5GHz	6	15MB	140W	0.0GT/s	2133
	E5-1620v3	3.5GHz	4	10MB	140W	0.0GT/s	2133
	E5-1603v3	2.8GHz	4	10MB	140W	0.0GT/s	1866

**NOTE:** Up to 1 processor supported. Mixing different processor models is not supported.

### Cache Memory

One of the following depending on model

10MB (1 x 10MB) Level 3

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

15MB (1 x 15MB) Level 3

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

20MB (1 x 20MB) Level 3

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

30MB (1 x 30MB) Level 3

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

### Chipset

Intel® C610 Series Chipset

Intel® E5-2600v3 Processor Family

Intel® E5-1600v3 Processor

**NOTE:** This is a 140W processor which need to order with the ML110 Gen9 System fan upgrade kit - 789654-B21.

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

### On System Management Chipset

HP iLO (Firmware HP iLO4 2.1) 2GB NAND

**NOTE:** 1GB USB user space configurable via UEFI and accessible via iLO. Read and learn more in the iLO QuickSpecs.

### Memory

Type:

HP SmartMemory

DDR4 Registered (RDIMM) or Load Reduced (LRDIMM)

DIMM Slots Available 8 (8 DIMM slots per processor, 4 channels per processor, 2 DIMMs per channel)

Maximum Capacity (LRDIMM) 128GB (8 x 16GB LRDIMM @2133MHz)

Maximum Capacity (RDIMM) 256GB (8 x 32GB RDIMM @2133MHz)

**NOTE:** This server does not support mixing LRDIMMs or RDIMMs. Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS installation.

### Memory Protection

Advanced ECC

Advanced ECC uses single device data correction to detect and correct single and all multi-bit error that occurs within a single DRAM chip.

Online spare

Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.

### Network Controller

Broadcom 5717C0 Dual-port 1Gb

### Standard Features

#### Expansion Slots

Expansion Slots #	Technology	Bus Width	Connector Width	Bus Number	Form Factor	Notes
5	PCIe 3.0	x8	x8		Full-height, half-length slot	For processor 1
4	PCIe 3.0	x4	x4		Full-height, half-length slot	For processor 1
3	PCIe 3.0	x8	x8		Full-height, half-length slot	For processor 1
2	PCIe 3.0	x4	x4		Full-height, half-length slot	For processor 1
1	PCIe 3.0	x16	x16		Full-height, <sup>3</sup> / <sub>4</sub> length (up to 9.5") Slot	For processor 1

**NOTE:** Bus number - Default bus assignment (in decimal). Inserting cards with PCI bridges may alter the actual bus assignment number.

**NOTE:** Five total expansion PCIe 3.0 slots. One PCIe 3.0 x16 (x16 speed); Two PCIe 3.0 x 8 (x8 speed); Two PCIe 3.0 x 4 (x4 speed).

Expansion Slots #	Technology	Bus Width	Connector Width	Bus Number	Device Number	Form Factor	Notes
6	HP ML Gen9 Dedicated iLO Port Kit	x1	x1			Dedicate for ML Series	

#### Storage Controller

One of the following depending on model

Entry Models HP Dynamic Smart Array B140i Controller

**NOTE:** B140i can't mix with any standup internal controller.

Base Models HP Dynamic Smart Array B140i Controller

**NOTE:** B140i can't mix with any standup internal controller.

#### Internal Storage Devices

One of the following depending on model

Optical Drive Optional SATA 9.5mm DVD-ROM Optical Drive

Optional SATA 9.5mm DVD RW Optical Drive

**NOTE:** Optical is optional in pre-configured models.

Hard Drives None ship standard

Hard Drive Bays Up to 4 Non-hot plug SATA 3.5" drives

**NOTE:** Mixing drive cage types is not allowed.

**NOTE:** All Pre-configured Models come populated with hard drive blanks installed. The 4LFF configurations includes 1 blanks and 8SFF includes 7 blanks. Additional hard drive blanks can be ordered using either P/N 666986-B21 for the HP LFF HDD Blank Kit or P/N 666987-B21 for the HP SFF HDD Blank Kit. These part numbers for single HDD blanks below are also provided should you require replacement HDD blanks for your server.

**NOTE:** NHP SATA is limited to B140i controller.

(4) Hot plug LFF SAS/SATA HDD bays; upgradable to (8)

(8) Hot plug SFF SAS/SATA HDD bays; upgradable to (16)

#### Maximum Internal Storage

One of the following depending on model

	CAPACITY	CONFIGURATION
Hot Plug LFF SAS	48TB	8x6TB
Hot Plug LFF SATA	48TB	8x6TB
Hot Plug SFF SAS	19.2TB	16x1.2TB
Hot Plug SFF SATA	16TB	16x1TB
Non-Hot Plug LFF SATA	24TB	8x3TB
Hot Plug LFF SAS SSD	12.8TB	8x1.6TB
Hot Plug LFF SATA SSD	12.8TB	8x1.6TB
Hot Plug SFF SAS SSD	25.6TB	16x1.6TB
Hot Plug SFF SATA SSD	25.6TB	16x1.6TB

### Standard Features

#### Power Supply

One of the following depending on model

HP 350W ATX-Gen9 Power Supply FIO Kit

HP 550W ATX-Gen9 Power Supply Kit

HP 750W CS Gold Ht Plg Pwr Supply Kit

**NOTE:** The first 750W CS Gold Ht Plg Pwr Supply Kit requires the RPS Enablement Kit.

**NOTE:** The RPS Enablement kit will support two power supplies.

HP Entry-Level Power Supplies provide lower-cost options for customers trying to balance their need for enterprise class efficiency and reliability while maintaining lowest possible hardware costs. All Entry-Level power supply options have been designed specifically for HP ProLiant Gen9 Essential Series servers.

The HP 550W FIO Power Supply is the standard, non-redundant AC power supply option for most HP ProLiant Gen9 Essential servers. It features Silver-level (89%) certified power efficiency with a set of features optimized for the Gen9 Essential-series rack and tower servers.

All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (A0K02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the [ProLiant Power Cables](#) web page.

To review the power requirements for your selected system, please use the HP Power Advisor Tool located at <http://www.hp.com/go/hppoweradvisor>.

Power specifications and technical content for all HP Server power supplies can be found at <http://www.hp.com/go/proliant/powersupply>.

#### System Fans

One of the following depending on model

1P model

#### Non-redundant

2 fans

#### Redundant

NA

**NOTE:** One (1) Non-hot plug, non-redundant fans ship as standard.

#### Interfaces

Video

1 (rear)

Network RJ-45 (Ethernet)

2

HP iLO Remote Management Network Port

1Gb Dedicated

Micro SD Slot

1 (internal)

**NOTE:** The Micro-SD slot is not a hot-pluggable device. Customers should not attempt to plug a Micro-SD card into the Micro-SD slot while the server is powered.

USB 3.0

5 (2 rear, 1 internal, 2 front)

USB 2.0

3 (2 rear, 1 internal)

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

[Microsoft Windows Server](#)

[Canonical Ubuntu](#)

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

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

[VMware](#)

**NOTE:** 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/ML10Gen9>.

#### Upgradeability

Up to 16 SFF Hard Drive Bays, Or 8 LFF Hard Drive Bays

Up to 8 DIMM slots

Redundant Power Supply

Optional optical drive (up to 1)

#### Industry Standard Compliance

ACPI 2.0b Compliant

PCIe 3.0 Compliant

PXE Support

WOL Support

### Standard Features

Novell Certified  
 IPMI 2.0, SMASH CLP, DCMI 1.0 compliant  
 Microsoft® Logo certifications  
 USB 3.0 Support  
 SMBIOS 2.7.1  
 ASHRAE A3

#### Graphics

HP NVIDIA Quadro K2200 GPU Module  
 HP NVIDIA Quadro K4200 GPU Module  
**NOTE:** If this SKU is selected, then customer must select HP 750W CS Gold Ht Plg Pwr Supply Kit OR HP 550W ATX-GEN9 Pwr Supply Kit in order.  
**NOTE:** This option kit cannot be selected with 350W power supplies due to power consumption.  
**NOTE:** The supporting holder kit - 787006-B21 must be selected when K4200 GPU Module kit is ordered.

#### HP Server UEFI/Legacy ROM

**HP Server UEFI /Legacy ROM**  
 Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better manageability and more secured configuration while interacting with your server at boot time. HP ProLiant Gen9 platform defaults to UEFI and can be factory or field configured for Legacy BIOS Boot Mode.  
**NOTE:** The UEFI System Utilities function is analogous to the HP ROM-Based Setup Utility (RBSU) of legacy BIOS. For more information, please visit <http://www.hp.com/go/proliantuefi/docs>.

UEFI enables numerous new capabilities specific to HP ProLiant servers such as:

- Secure Boot
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.0 Stack
- Embedded UEFI Shell
- Mass Configuration Deployment Tool using HP RESTful API.
- PXE boot support for IPv6 networks
- Boot support for option cards that only support a UEFI option ROM

For more information please visit <http://www.hp.com/go/proliant/uefi>.

**NOTE:** For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.

**NOTE:** HP Legacy F10 Mode Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory.

#### Form Factor

Tower (4.5U)

#### Embedded Management

**HP Integrated Lights-Out (HP iLO)** Monitor your servers for ongoing management, service alerting, reporting and remote management with HP iLO. Learn more at <http://www.hp.com/go/iLO>.

**UEFI** Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at <http://www.hp.com/go/ProLiant/uefi>.

**HP RESTful API** RESTful API is an application programming interface. RESTful Web Service API served by iLO's web server: Learn more at <http://www.hp.com/go/restfulapi>.

**Intelligent Provisioning** Provision servers by discovering and deploying 1 to few servers with Intelligent Provisioning. Learn more at <http://www.hp.com/go/intelligentprovisioning>.

**Embedded Remote Support** HP's embedded remote support, when used with Insight Online direct connect or HP Insight Remote Support, allows HP ProLiant servers to transmit hardware events directly to HP or an HP Authorized Partner for automated phone home support. Learn more at <http://www.hp.com/go/insightonline/info>.

### Standard Features

<b>Server utilities</b>	<b>HP Smart Update</b>	Optimize firmware and driver updates with HP Smart Update solutions. Learn more at <a href="http://www.hp.com/go/smartupdate">http://www.hp.com/go/smartupdate</a> .
	<b>HP Systems Insight Manager (HP SIM)</b>	HP SIM allows you to monitor the health of your HP ProLiant Servers and HP Integrity Servers, and also provides you with basic support for non-HP servers. HP SIM also integrates with HP SUM to provide quick and seamless firmware updates. Learn more at <a href="http://www.hp.com/go/sim">http://www.hp.com/go/sim</a> .
	<b>Scripting Tool Kit and Windows PowerShell</b>	Provision 1 to many servers using your own scripts to discover and deploy them with HP Scripting Tool Kit for Windows and Linux or HP Scripting Tools for Windows PowerShell. Learn more at <a href="http://www.hp.com/go/ProLiantSTK">http://www.hp.com/go/ProLiantSTK</a> or <a href="http://www.hp.com/go/powershell">http://www.hp.com/go/powershell</a> .
	<b>HP RESTful Interface Tool</b>	HP RESTful Interface tool is a scripting tool to provision servers using RESTful API Interface to discover and deploy servers at scale. Learn more at <a href="http://www.hp.com/go/restfulapi">http://www.hp.com/go/restfulapi</a> .
	<b>HP iLO Mobile Application</b>	Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: <a href="http://www.hp.com/go/ilo/mobileapp">http://www.hp.com/go/ilo/mobileapp</a> .
	<b>HP Insight Online</b>	HP Insight Online, available at no additional cost as part of your HP warranty, Care Pack or contractual support agreement with HP, is a personalized dashboard for simplified tracking of IT operations and support information from anywhere, anytime. Learn more at <a href="http://www.hp.com/go/insightonline/info">http://www.hp.com/go/insightonline/info</a> . <b>NOTE:</b> The Service Pack for ProLiant (which includes HP SUM) can be downloaded from <a href="http://www.hp.com/go/spp/download">http://www.hp.com/go/spp/download</a> . More information can be found: <a href="http://www.hp.com/go/SmartUpdate">http://www.hp.com/go/SmartUpdate</a> , <a href="http://www.hp.com/go/spp">http://www.hp.com/go/spp</a> and <a href="http://www.hp.com/go/hpsum">http://www.hp.com/go/hpsum</a> .

<b>Security</b>	<ul style="list-style-type: none"> <li>Power-on password</li> <li>Setup password</li> <li>Serial interface control</li> <li>Power switch security</li> <li>Administrator's password</li> <li>TPM 1.2</li> <li>UEFI</li> </ul>
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<b>Warranty</b>	<p>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.</p> <p><b>NOTE:</b> Server Warranty includes 3-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: <a href="http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html">http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html</a>.</p>
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### Optional Features

#### Embedded Management

- iLO Essentials** HP iLO Essentials is the preferred license for small and medium business that offers full remote server management capabilities for small and medium business via the Integrated Remote Console (IRC), virtual media, and e-mail based alerts. Learn more about HP iLO Essentials at <http://www.hp.com/go/iLO/essentials>.
- iLO Scale-Out** HP iLO Scale-Out is the preferred license built for web hosting, cloud service providers, and high performance computing data centers, managing massive scale out environments. This license offers sophisticated scripting tools that provides remote access through Text Console via SSH, Dynamic power capping, Email-based Alerting and proactive notifications. For more information, visit <http://www.hp.com/go/iLO/scale-out>.
- iLO Advanced** HP iLO Advanced licenses offer smart remote functionality without compromise, for all HP ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality. Learn more about HP iLO Advanced at <http://www.hp.com/go/iloadvanced>.

#### Server Management

- HP Insight Control** HP Insight Control, lets you deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see <http://www.hp.com/go/insightcontrol>.  
**NOTE:** HP OneView support for HP ProLiant Gen9 rack (DL) and blade (BL) servers will be available with a future version of HP OneView to be released Early 2015. Customers may purchase HP OneView licenses now, and will be granted rights to use HP Insight Control software and transition to HP OneView with a free upgrade, when available. Customers also have the option to purchase HP Insight Control.

#### High Performance Clusters

HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. <http://www.hp.com/go/cmu>.

HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. <http://www.hp.com/go/clusters>.

#### HPC Interconnects

**NOTE:** High Performance Computing (HPC) interconnect technologies are available for this server under the HP Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand Interconnects: <http://www.hp.com/techservers/clusters/ucp/index.html>.

#### 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.

### Optional Features

- **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 create a virtual array within your host server. Manage it as a single pool of shared storage capacity, and scale it to match your evolving needs. HP ProLiant Gen9 servers include a 3-year limited license for HP StoreVirtual VSA software with 1TB of capacity at no extra cost. Simply select to install HP StoreVirtual VSA software during server setup within Intelligent Provisioning. More information, instructional videos, and free console management software are available at <http://www.hp.com/go/vsa1TB>.

**NOTE:** For more information about Storage Software including QuickSpecs, please see: <http://www.hp.com/go/storage/software>.

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#### One Config Simple (SCE)

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**

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

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

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

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

##### **HP Proactive Care with 24x7 coverage, three year Care Pack Service**

HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP. This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server. <http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf>

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#### Standard Care Package **Supports maintaining high level of server availability**

##### **Foundation Care 24x7, three-year Care Pack Service**

HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours if needed; collaborative software included in this Care Pack service provides troubleshooting assistance on industry leading software running on your HP server. Simplify your support experience and make HP your first call for hardware or software questions. <http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

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#### Related Services **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>

##### **Factory Express 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. 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>.

##### **Data Privacy Services**

Protect your data through better media management. HP Data privacy services help manage and protect sensitive data to reduce the risk of unauthorized access to private information and help meet compliance requirements. Our retention services allow you to keep drives and other devices upon failure, our removal services provide convenient data sanitization and our recovery services allow you to safely retire IT assets and capture any remaining value from the hardware. <http://www.hp.com/services/dataprivacy>

Additional HP Care Pack services can be found at: <http://www.hp.com/go/cpc>.

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#### **Get connected to HP to improve your support experience**

Prevent problems with innovative, automated monitoring tools and proactive services. Combining Proactive Care Services with our remote support technology such as Insight Online 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: <http://www.hp.com/go/proactiveinsightexperience>

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#### **HP Support Center**

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

HP's Support Center Mobile App\*\* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

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

### Service and Support

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**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.

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**For more information** To learn more on 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

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

1. Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
2. HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
3. 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 Hard Drive Blank Kit or P/N 666986-B21: HP LFF Hard Drive Blank Kit.

**NOTE:** All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (AOK02A). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the [ProLiant Power Cables](#) web page.

**Caution:** HP recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation.

	Entry Models	Base Models
<b>[SKU Number]</b>	777160-001	777161-001
<b>Model Name</b>	HP ProLiant ML110 Gen9 E5-2603v3 4GB-R B140i 4LFF NHP 350W PS Entry Server	HP ProLiant ML110 Gen9 E5-2620v3 8GB-R B140i 4LFF 350W PS Base Server
<b>Processor</b>	Intel® Xeon® E5-2603v3	Intel® Xeon® E5-2620v3
<b>Number of Processors</b>	One	
<b>Memory</b>	4GB (1x4GB Registered DIMMs, 2133 MHz)	8GB (1x8GB Registered DIMMs, 1600 MHz)
<b>Network Controller</b>	Broadcom 5717 Dual-port 1GbE	
<b>Storage Controller</b>	HP Dynamic Smart Array B140i	
<b>Hard Drive</b>	None ship standard	
<b>Internal Storage</b>	4 LFF HDD Bays (Non Hot Plug)	4 LFF HDD Bays (Hot Plug)
<b>Optical Drive Bay</b>	Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive)	
<b>Optical Drive</b>	Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive)	
<b>PCI-Express Slots</b>	5 PCIe 3.0 slots (without risers)	
<b>Power Supply</b>	(1) HP 350W ATX Power Supply	(1) HP 550W ATX Power Supply
<b>Fans</b>	1 non hot plug, non-redundant	
<b>Management</b>	iLO Management (standard), Intelligent Provisioning (standard), iLO Essentials (optional)	
<b>Form Factor</b>	Tower (4.5U)	
<b>Warranty</b>	Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response.	

### Smart Buy Models

[SKU Number]	799111-S01	807879-S01	807880-S01
<b>Model Name</b>	HP ProLiant ML110 Gen9 E5-2603v3 1.6GHz 6-core 8GB-R B140i 8SFF 1x1TB 550W PS US Server/S-Buy	HP ProLiant ML110 Gen9 E5-1603v3 2.8GHz 4-core 4GB-R B140i 4LFF 1x1TB 350W PS US Server/S-Buy	HP ProLiant ML110 Gen9 E5-1620v3 3.6GHz 4-core 8GB-R B140i 4LFF 1x1TB 550W PS US Server/S-Buy
<b>Processor</b>	Intel® Xeon® E5-2603v3	Intel® Xeon® E5-1603v3	Intel® Xeon® E5-1620v3
<b>Number of Processors</b>	One	One	One
<b>Memory</b>	8GB RD 2133MHz (2x4GB)	4GB RD 2133MHz (1x4GB)	8GB RD 2133MHz (1x8GB)
<b>Network Controller</b>	Broadcom 5717 Dual-port 1GbE		
<b>Storage Controller</b>	HP Dynamic Smart Array B140i		
<b>Hard Drive</b>	1TB SATA		
<b>Internal Storage</b>	(8) SFF 6G HP SATA		(4) LFF 6G NHP SATA
<b>Optical Drive</b>	Optional SATA 9.5mm DVD RW Optical Drive		
<b>PCI-Express Slots</b>	5xPCI-E		
<b>Power Supply</b>	(1) HP 550W ATX-Gen9 Power Supply Kit	(1) HP 350W ATX-Gen9 Power Supply F10 Kit	(1) HP 550W ATX-Gen9 Power Supply Kit
<b>Fans</b>	(1) Non-hot plug, non-redundant fan		
<b>Management</b>	iLO Management (Standard)		
<b>Form Factor</b>	Tower (4.5U)		
<b>Warranty</b>	Server Warranty includes Next Business Day Foundations Care 3X3X3		

### Configuration Information - Factory Integrated Models

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.

1. Factory Integrated Models must start with a CTO Server.
2. FIO indicates that this option is only available as a factory installable option.
3. All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.
4. Some options may not be integrated at the factory. Contact your local sales representative for additional information.

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

CTO Server	HP ProLiant ML110 Gen9 Non Hot Plug 4LFF Configure-to-order Server	HP ProLiant ML110 Gen9 Hot Plug 4LFF Configure-to-order Server	HP ProLiant ML110 Gen9 Hot Plug 8SFF Configure-to-order Server
SKU Number	776933-B21	776934-B21	776935-B21
Processor	1	1	1
DIMM Slots	8 DIMM slots for RDIMM, LRDIMM DDR4 Memory		
Storage Controller	HP Dynamic Smart Array B140i		
PCIe	5 PCIe 3.0 Slots		
Drive Cage	4LFF Non Hot Plug	4LFF Hot Plug	8SFF Hot Plug
Network Controller	Broadcom 5717 Dual-port 1GbE		
Fans	1 non hot plug, non-redundant		
Management	iLO Management (standard), Intelligent Provisioning (standard), iLO Essentials (optional)		
USB	2 front, 2 internal, 4 rear		

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

#### HP Processors

##### Entry Processors - E5-2600v3 series Processors

HP ML110 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit	773167-L21
HP ML110 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	773169-L21

##### Base Processors - E5-2600v3 series Processors

HP ML110 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	773158-L21
HP ML110 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	773162-L21
HP ML110 Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) FIO Processor Kit	773173-L21
HP ML110 Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W) FIO Processor Kit	780075-L21

##### Performance Processors - E5-2600v3 series Processors

HP ML110 Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit	773156-L21
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##### Entry Processors - E5-1600v3 series Processors

HP ML110 Gen9 Intel® Xeon® E5-1603v3 (2.8GHz/4-core/10MB/140W) FIO Processor Kit	783017-L21
HP ML110 Gen9 Intel® Xeon® E5-1620v3 (3.5GHz/4-core/10MB/140W) FIO Processor Kit	783021-L21
HP ML110 Gen9 Intel® Xeon® E5-1650v3 (3.5GHz/6-core/15MB/140W) FIO Processor Kit	783023-L21

**NOTE:** DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

**NOTE:** For the Intel® C600 Chipset E5-2600 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x v#, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for Low power SKUs and v# (not yet designated) = version number.

#### HP Memory

##### Registered DIMMs (RDIMMs) for E5-2600v3 Series

HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	738629-B21
HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit	803026-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit	803028-B21

### Configuration Information - Factory Integrated Models

#### Load Reduced DIMMs (LRDIMMs) for E5-2600v3 Series

HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit 726720-B21

**NOTE:** Select one or more memory options above. Up to 8 memory dimms are supported.

**NOTE:** LRDIMM, RDIMM are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen9 servers support LRDIMM and RDIMM.

**NOTE:** HP memory from previous generation servers are not qualified or warranted on this ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9.

**NOTE:** Depending on the memory configuration and processor model, the memory speed may run at 2133MHz, 1866MHz, 1600MHz, or 1333MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: <http://www.hp.com/go/ddrconfig>.

#### Power Supplies

**NOTE:** Select quantity one or two HP Entry-Level Power Supplies below. Mixing of power supplies is not supported in the same server.

**NOTE:** Prior to selecting a power supply option, it is highly recommended that you review your server configuration in the HP Power Advisor tool to determine the right size power supply for your server configuration. The HP Power Advisor is located at: <http://www.hp.com/go/hppoweradvisor>.

**NOTE:** Check power advisor for power consumption for the customer usage case. Power specifications and technical content for all HP Server power supplies can be found at <http://www.hp.com/go/proliant/powersupply>.

#### HP Entry-Level Power Supplies

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

HP ML110 Gen9 350W ATX Gen9 Power Supply FIO Kit 776442-B21

HP 550W ATX Gen9 Power Supply Kit 776444-B21

#### Accessories

HP ML110 Gen9 Redundant Power Supply Enablement Kit 784582-B21

**NOTE:** This kit must be selected when 750W CS Gold Ht Plg Pwr Supply Kit (P/N 512327-B21) is ordered.

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

**HP Storage Controllers** **NOTE:** Select one controller listed below if ordering SAS Hard drives in Step 4.

#### SAS Controller

HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller 761872-B21

**NOTE:** Smart Storage Battery included.

**NOTE:** Must select battery holder P/N: 786710-B21 when purchase P440.

**NOTE:** B140i can't mix with any standup internal controller.

**NOTE:** Must also select one of HP ML110 Gen9 Mini SAS P440/P840 Cable Kit (P/N 789651-B21)

HP Smart Array P840/4GB FBWC 12Gb 2-ports Int FIO SAS Controller 761874-B21

**NOTE:** Smart Storage Battery included.

**NOTE:** B140i can't mix with any standup internal controller.

**NOTE:** Must select P840/4G Controller when apply 16SFF.

**NOTE:** Must also select two of HP ML110 Gen9 Mini SAS P440/P840 Cable Kit (P/N 789651-B21)

#### HP Host Bus Adapter

HP H240 12Gb 2-ports Int FIO Smart Host Bus Adapter 761873-B21

**NOTE:** Must select for H240 controller.

1 HP ML110 Gen9 Mini SAS H240 cable kit (P/N 789648-B21) is required for Hot Plug 4LFF Model.

2 HP ML110 Gen9 Mini SAS H240 cable kit (P/N 789648-B21) are required for below:

- Hot Plug 4 Model+4 LFF (with additional drive cage)

- 8SFF Model

#### HP Unique Options

HP AHCI-Enable FIO Setting 801845-B21

**NOTE:** This needs to be selected when Advanced Host Controller Interface mode is required on B140i controller.

### Step 4: Choose Additional Options for Factory Integration for Core and Additional Options sections below.



### Core Options

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

<b>HP Unique Options</b>	<p>HP ML110 Gen9 Mini SAS H240 Cable Kit <span style="float: right;">789648-B21</span>  <b>NOTE:</b> Must be selected for H240 controller.            1 cable kit is required for Hot Plug 4LFF            2 cable kits are required for below:            - Hot Plug 4+4 LFF (with additional drive cage)            - 8SFF</p> <p>HP ML110 Gen9 Mini SAS P440/P840 Cable Kit <span style="float: right;">789651-B21</span>  <b>NOTE:</b> Must be selected for P440/P840 controller.            1 cable kit is required for P440x1            2 cable kits are required for P840x1</p> <p>HP ML110 Gen9 System Fan Upgrade Kit <span style="float: right;">789654-B21</span>  <b>NOTE:</b> When any E5-1600 processor kit or SAS SSD is selected, then this option kit must be ordered.</p> <p>HP ML110 Gen9 PCI Fan and Baffle Kit <span style="float: right;">784580-B21</span>  <b>NOTE:</b> If any PCIe card is selected, then this option kit must be selected. This option kit cannot be selected if no PCIe card is ordered.</p> <p>HP ML110 Gen9 Redundant Power Supply Enablement Kit <span style="float: right;">784582-B21</span>  <b>NOTE:</b> This kit must be selected when 750W CS Gold Ht Plg Pwr Supply Kit is ordered.</p>
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<b>HP Memory</b>	<p><b>Registered DIMMs (RDIMMs) for E5-2600v3 Series</b></p> <p>HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit <span style="float: right;">726717-B21</span>            HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit <span style="float: right;">726718-B21</span>            HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit <span style="float: right;">759934-B21</span>            HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit <span style="float: right;">726719-B21</span>            HP 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit <span style="float: right;">728629-B21</span>            HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit <span style="float: right;">803026-B21</span>            HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit <span style="float: right;">803028-B21</span></p> <p><b>Load Reduced DIMMs (LRDIMMs) for E5-2600v3 Series</b></p> <p>HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit <span style="float: right;">726720-B21</span></p>
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<b>HP Optical Drives</b>	<p>HP 9.5mm SATA DVD-ROM JackBlack Gen9 Optical Drive <span style="float: right;">726536-B21</span>            HP 9.5mm SATA DVD-RW JackBlack G9 Optical Drive <span style="float: right;">726537-B21</span></p>
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<b>HP Drives</b>	<p><b>NOTE:</b> User may select any combination of SAS or SATA Hard Drives.            However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set.  <b>NOTE:</b> If B140i is the primary controller, user can only select SATA drives.  <b>NOTE:</b> SAS drives require the selection of a SAS controller. See card lists in Controllers section.</p> <p><b>SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives</b></p> <p>HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive <span style="float: right;">718162-B21</span>            HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">652589-B21</span>            HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">759212-B21</span>            HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">652583-B21</span>            HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">759210-B21</span>            HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">652572-B21</span>            HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">759208-B21</span>            HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">652564-B21</span>            HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive <span style="float: right;">652605-B21</span></p> <p><b>SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives</b></p> <p>HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive <span style="float: right;">652749-B21</span>            HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive <span style="float: right;">652745-B21</span></p>
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### Core Options

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

HP 600GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	765424-B21
HP 450GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	737394-B21
HP 300GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive	737261-B21

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

HP 6TB 12G SAS 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive	765259-B21
HP 6TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	761477-B21
HP 4TB 12G SAS 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive	765257-B21
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

#### SATA Hot Plug 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

#### SATA Hot Plug LFF (3.5-inch) Midline (MDL) Drives

HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive	765255-B21
HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	753874-B21
HP 4TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive	765253-B21
HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	693687-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	628061-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658079-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	657750-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive	658071-B21

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

HP 4TB 6G SATA 7.2K rpm LFF (3.5in) Non-hot Plug Standard 1yr Warranty Hard Drive	801888-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	628065-B21
HP 3TB 6G SATA 7.2K rpm LFF (3.5in) Non-hot Plug Standard 1yr Warranty Hard Drive	801886-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5in) Non-hot Plug Standard 1yr Warranty Hard Drive	801884-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659337-B21
HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659339-B21
HP 1TB 6G SATA 7.2K rpm LFF (3.5in) Non-hot Plug Standard 1yr Warranty Hard Drive	801882-B21
HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive	659341-B21

#### 12G SAS Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives

HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741155-B21
HP 200GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive	741151-B21

#### 6G SATA Hot Plug LFF (3.5-inch) Enterprise Light G1 Solid State Drives

HP 960GB 6G SATA Light Endurance LFF 3.5-in SC Converter ENT Light 3yr Wty G1 Solid State Drive	756604-B21
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#### 6G SATA Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives

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

#### 6G SATA Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives

### Core Options

HP 1.6TB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	757339-B21
HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717973-B21
HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739898-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717971-B21
HP 300GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739888-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	717969-B21
<b>6G SATA Hot Plug SFF Value Endurance (2.5-inch) Enterprise Value G1 Solid State Drives</b>	
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756657-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756636-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756621-B21
<b>6G SATA Hot Plug SFF (2.5-inch) Enterprise Light G1 Solid State Drives</b>	
HP 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive	756601-B21
<b>6G SATA Hot Plug SFF Value Endurance (2.5-inch) Enterprise Value M1 Solid State Drives</b>	
HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764929-B21
HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764927-B21
HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764925-B21
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive	764923-B21
<b>6G SATA Hot Plug SFF (2.5-inch) Enterprise Boot Solid State Drives</b>	
HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	717965-B21
HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734360-B21
<b>6G SATA Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives</b>	
HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691860-B21
HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691856-B21
HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691854-B21
HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691852-B21
<b>6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value G1 Solid State Drives</b>	
HP 1.6TB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive	757342-B21
HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756660-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756639-B21
HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive	756624-B21

### Core Options

#### 6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value M1 Solid State Drives

HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive	764943-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive	764941-B21
HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive	764939-B21

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

HP 800GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718189-B21
HP 600GB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive	739900-B21
HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718183-B21
HP 300GB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive	739890-B21
HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive	718177-B21

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

HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	718171-B21
HP 80GB 6G SATA Value Endurance LFF 3.5-in SC Enterprise Boot 3yr Wty Solid State Drive	734362-B21

#### Hard Drive Blank Kits

HP Large Form Factor Hard Drive Blank Kit	666986-B21
HP Small Form Factor Hard Drive Blank Kit	666987-B21

#### Hard Drive Kits

HP ML110 Gen9 4LFF Hot Plug Drv Cage Kit	784584-B21
HP ML110 Gen9 8SFF Hot Plug Drv Cage Kit	784586-B21

### HP Networking

#### 1 Gigabit Ethernet adapters

HP Ethernet 1Gb 4-port 331T Adapter	647594-B21
HP Ethernet 1Gb 2-port 361T Adapter	652497-B21
HP Ethernet 1Gb 2-port 332T Adapter	615732-B21

#### 10 Gigabit Ethernet adapters

HP Ethernet 10Gb 2-port 560SFP+ Adapter	665249-B21
HP Ethernet 10Gb 2-port 561T Adapter	716591-B21
HP Ethernet 10Gb 2-port 546SFP+ Adapter	779793-B21

### HP Power Supplies

#### HP Entry-Level Power Supplies

HP 750W Common Slot Gold Hot Plug Power Supply Kit	512327-B21
HP 550W ATX Gen9 Power Supply Kit	776444-B21
HP ML110 Gen9 Redundant Power Supply Enablement Kit	784582-B21

**NOTE:** If this kit must be selected when 750W CS Gold Ht Plg Pwr Supply Kit is ordered.  
**NOTE:** Check power advisor for power consumption for the customer usage case. Power specifications and technical content for all HP Server power supplies can be found at <http://www.hp.com/go/proliant/powersupply>.

### HP Computation and Graphics Accelerators

HP NVIDIA Quadro K2200 Graphics Accelerator	J0G89A
HP NVIDIA Quadro K4200 Graphics Accelerator	J0G90A

**NOTE:** If this SKU is selected, then customer must select HP 750W CS Gold Ht Plg Pwr Supply Kit OR HP 550W ATX-GEN9 Pwr Supply Kit in order.  
**NOTE:** this option kit cannot be selected with 350W power supplies due to power consumption.

### Core Options

**NOTE:** HP ML110 Gen9 GPU Supporting Holder Kit must be selected.

HP ML110 Gen9 GPU Supporting Holder Kit

787006-B21

**NOTE:** Only the above listed Graphics cards are HP standard supported options in this server.

**NOTE:** The NVIDIA Quadro modules are supported only on 64-bit versions of Linux and Windows operating systems as well as on Virtual Machine client operating systems. The supported bare metal operating systems are RHEL6, SLES 11 and Windows Server 2012 R2.

**NOTE:** Please see the HP Power Advisor for estimated power consumption of your individual system configuration prior to installing GPUs. The HP Power Advisor is located at: <http://www.hp.com/go/hppoweradvisor>.

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### HP Cooling Options

HP ML110 Gen9 PCI Fan and Baffle Kit

784580-B21

**NOTE:** If any PCIe card is selected, then this option kit must be selected. This option kit cannot be selected if no PCIe card is ordered.

HP ML110 Gen9 System Fan Upgrade Kit

789654-B21

**NOTE:** When any 140W processor kit or SAS SSD is selected, then this option kit must be ordered.

### 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 Storage Controllers

##### SAS Controller

HP Smart Array P440/4GB FBWC 12Gb 1-port Int SAS Controller 726821-B21

HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller 726825-B21

HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller 726897-B21

**NOTE:** When additional 8SFF Drive cage is ordered and also P840 is selected, then Must select one separate HP ML110 Gen9 Mini SAS P440/P840 Cbl Kit.

HP Smart Array P841/4GB FBWC 12Gb 4-ports Ext SAS Controller 726903-B21

HP ML110 Gen9 Mini SAS H240 Cable Kit 789648-B21

**NOTE:** Must be selected for H240 controller.

1 cable kit is required for Hot Plug 4LFF

2 cable kits are required for below:

- Hot Plug 4+4 LFF (with additional drive cage)

- 8SFF

HP ML110 Gen9 Mini SAS P440/P840 Cable Kit 789651-B21

**NOTE:** Must be selected for P440/P840 controller.

1 cable kit is required for P440x1

2 cable kits are required for P840x1

**NOTE:** Must select battery holder kit when P series FIO controller is selected.

##### SAS Controller Options

HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Servers 727258-B21

##### HP Host Bus Adapter

HP H240 12Gb 2-ports Int Smart Host Bus Adapter 726907-B21

HP H241 12Gb 2-ports Ext Smart Host Bus Adapter 726911-B21

##### Battery Holder

HP ML150 Gen9 Smart Storage Battery Holder Kit 786710-B21

**NOTE:** Only support P series controllers.

#### HP Tape Backup

**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: <http://www.hp.com/go/tape>. For hardware and software compatibility of HP tape backup products see: <http://www.hp.com/storage/SPOCK> and <http://www.hp.com/go/ebs>.

**NOTE:** Must select SAS controller to support internal SAS tape drives.

**NOTE:** Tape drive and HDD total amount can't exceed SAS controller support qty.

**NOTE:** Limited to H240 when select Tape Drive.

##### Tape Drives

HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader COH19A

HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit COL99A

HP StoreEver LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit EH946C

HP StoreEver LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rack-mount EJ014B

HP StoreEver LTO-5 Ultrium 3280 SAS Tape Drive in 3U Rack-mount EJ013B

HP StoreEver 1U SAS Rack-mount Kit AE459B

HP StoreEver LTO-3 Ultrium 920 SAS External Tape Drive EH848B

HP StoreEver LTO-5 Ultrium 3280 SAS External Tape Drive EH900B

HP StoreEver LTO-4 Ultrium 1760 SAS External Tape Drive EH920B

HP StoreEver LTO-4 Ultrium 1760 SCSI External Tape Drive EH922B

HP StoreEver LTO-5 Ultrium 3000 SAS External Tape Drive EH958B

HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive EH964A

HP StoreEver LTO-6 Ultrium 6250 External Tape Drive EH970A

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

HP StoreEver MSL6480 Scaleable Expansion Module QU626A

HP StoreEver MSL6480 Scalable Base Module QU625A

HP MSL2024 0-Drive Tape Library AK379A

### Additional Options

	HP MSL4048 0-Drive Tape Library	AK381A
<b>HP Disk Backup</b>	<b>HP RDX Removable Disk Backup System</b>	
	HP RDX320 USB3.0 External Disk Backup System	B7B63A
	HP RDX500 USB3.0 External Disk Backup System	B7B66A
	HP RDX1000 USB3.0 External Disk Backup System	B7B69A
	HP RDX 2TB USB3.0 External Disk Backup System	E7X53A
<b>HP Disk Storage Systems</b>	<b>Disk Enclosures</b>	
	HP D6000 w/35 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 140TB Bundle	E7W30A
	HP D6000 w/70 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 280TB Bundle	E7W31A
	HP D6000 Dual I/O Module Disk Enclosure	QQ695A
	HP D6000 w/35 2TB 6G SAS 7.2K LFF Dual port MDL HDD 70TB Bundle	QQ697A
	HP D6000 w/70 2TB 6G SAS 7.2K LFF Dual port MDL HDD 140TB Bundle	QQ698A
	HP D6000 w/35 3TB 6G SAS 7.2K LFF Dual port MDL HDD 105TB Bundle	QQ699A
	HP D6000 w/70 3TB 6G SAS 7.2K LFF Dual port MDL HDD 210TB Bundle	QQ700A
	HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle	E7W32A
<b>HP Rack Mount Consoles, KVM Switches, and Keyboards</b>	<b>HP Location Discovery Services</b>	
	HP Location Discovery Services LCD8500 Kit	TL052A
	<b>HP Rack Mount Consoles</b>	
	HP LCD8500 1U US Rackmount Console Kit	AF630A
	HP LCD8500 1U US TAA Rackmount Console Kit	AF645A
	HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
	HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor	AZ885A
	<b>NOTE:</b> Please see the <a href="#">HP Rack Console QuickSpecs</a> for information on additional options and product specifications.	
	<b>HP KVM Switches</b>	
	HP Server Console 0x2x8 Port Analog Switch	AF616A
	HP Server Console 0x2x16 Port Analog Switch	AF617A
	HP TAA 0x2x16xKVM Server Console G2 Switch	AF626A
	HP USB Remote Access Key for G3 KVM Console Switches	AF650A
	HP 0x1x8 G3 KVM Console Switch	AF651A
	HP 0x2x16 G3 KVM Console Switch	AF652A
	HP TAA 0x2x16 G3 KVM Console Switch	AF653A
	HP KVM Console USB Interface Adapter	AF628A
	HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
	HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
	HP KVM Console USB 2.0 Virtual Media CAC Interface Adapter	AF629A
	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
	<b>HP USB Keyboard and Mouse</b>	
	HP USB BFR with PVC Free US Keyboard/Mouse Kit	631341-B21
	HP 1U US Rackmount Keyboard with USB	AG072A
	<b>NOTE:</b> Please see the <a href="#">HP USB Keyboard and Mouse QuickSpecs</a> for information on additional options and product specifications.	
	<b>HP Other Options</b>	

### Additional Options

HP Rack LED Light Kit	BW939A
HP Kit LCD 1.83m Latch Display Port Cable	G7T29A
HP Advanced Power Manager Kit	741192-B21

#### HP Uninterruptible Power Systems (UPS)

##### HP DirectFlow Three Phase UPS Power Unit (1U UPS)

HP R12000 DirectFlow - 1U Rackmount Uninterruptible Power System	G9Y75A
HP R12000 DirectFlow - POD 1U Rackmount Uninterruptible Power System	AF478A

##### Input/Output Module Options for 1U UPS

HP 30A 400-415 Volt Three Phase NA R10000 DirectFlow UPS IEC309 Input/Output Module	AF489A
HP 30A 480 Volt Three Phase NA R12000 DirectFlow UPS L22-30 Input/Output Module	AF491A
HP 30A 480 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	AF492A
HP 30A 400-415 Volt Three Phase NA R12000 DirectFlow UPS IEC309 Input/Output Module	G9Y76A

##### Power Unit (2U UPS)

HP R18000 DirectFlow - 2U Rackmount Uninterruptible Power System	AF479A
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##### Input/Output Module Options for 2U UPS

HP 30A 480 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	AF486A
HP 30A 480 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	AF487A
HP 30A 400 Volt Three Phase NA R18000 DirectFlow UPS IEC309 Input/Output Module	D9Q02A
HP 30A 400-415V Three Phase NA R18000 DirectFlow UPS 1:1 IEC309 Input/Output Module	AF484A

**NOTE:** All Input/Output Modules support dual output outlets except the AF484A.

##### Battery Pack Options

HP DirectFlow UPS - 1U Rackmount Lithium-ion Battery Pack	AF480A
HP DirectFlow UPS - 3U Rackmount VRLA Battery Pack	AF482A
HP WW DirectFlow Secondary Battery Cable	AF497A

**NOTE:** Please see the [HP DirectFlow Three Phase Uninterruptible Power System QuickSpecs](#) for information on additional options and product specifications.

##### HP Tower UPS

###### HP T750 G4 UPS Models

HP T750 G4 NA/JP Uninterruptible Power System	J2P85A
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###### HP T1000 G4 UPS Models

HP T1000 G4 NA/JP Uninterruptible Power System	J2P86A
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###### HP T1500 G4 UPS Models

HP T1500 G4 NA/JP Uninterruptible Power System	J2P87A
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###### HP T750 G2 UPS Models

HP T750 G2 750VA NA Tower Uninterruptible Power System	AF446A
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###### HP T1500 G3 UPS Models

HP T1500 G3 1400VA NA Tower Uninterruptible Power System	AF450A
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##### HP Rack/Tower UPS

###### HP R/T2200 G4 UPS Models

HP R/T2200 G4 NA/JP Uninterruptible Power System	J2R00A
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###### HP R/T3000 G4 UPS Models

HP R/T3000 G4 Low Voltage NA/JP Uninterruptible Power System	J2R01A
HP R/T3000 G4 High Voltage NA/JP Uninterruptible Power System	J2R02A

###### 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

###### R1500 G4 Models

HP R1500 G4 NA Uninterruptible Power System	J2Q99A
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###### R1.5kVA G3 Models



### Additional Options

HP R1.5kVA G3 1U NA Uninterruptible Power System AF469A

**R7000 Uninterruptible Power System (UPS)**

HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System AF462A

**R5000 Uninterruptible Power System (UPS)**

HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System AF460A

**HP UPS Options**

HP R/T2200 G4 Extended Runtime Module J2R09A

HP R/T3000 G4 Extended Runtime Module J2R10A

HP 2U Rack/Tower UPS Shipping Kit L4Q11A

**NOTE:** Please see the [HP Line Interactive Single Phase UPS QuickSpecs](#) for information on additional options and product specifications.

**NOTE:** To learn more, please visit the [HP Uninterruptible Power Systems \(UPS\) web page](#).

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### HP USB and SD Options

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

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

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

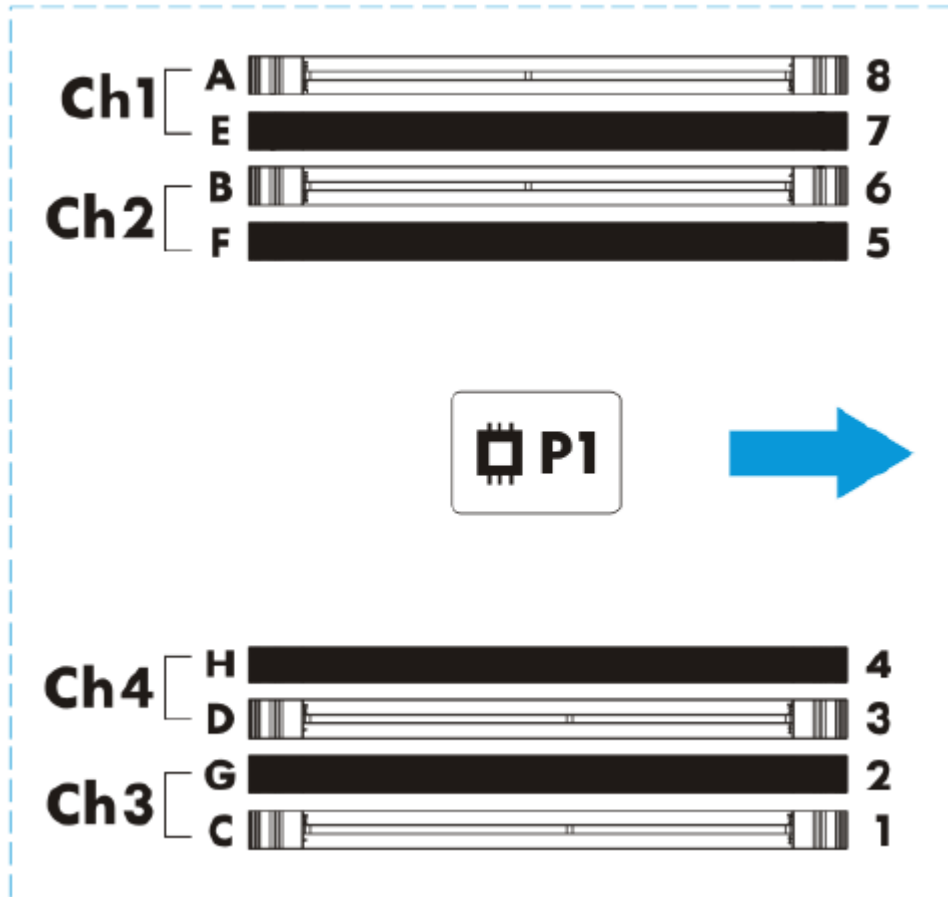
HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit 737953-B21

HP Dual 8GB microSD Enterprise Midline USB Kit 741279-B21

### Memory

**Memory Subsystem Architecture** Each Intel® Xeon® E5-2600v3 family processor socket contains four memory channels per installed processor with one DIMM per channel for a total of four (4) DIMMs or a grand total of eight (8) DIMMs for the server.

### Memory Population guidelines



DIMM population order								
1st slot of channel				2nd slot of channel				
	A	B	C	D	E	F	G	H
Number of DIMMs to install	1							
2		■						
4		■	■					
8		■	■	■	■	■	■	■

#### General Memory Population Rules and Guidelines:

- Install DIMMs only if the corresponding processor is installed.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.
- White DIMM slots denote the first slot to be populated in a channel.
- Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.
- Do not mix RDIMMs or LRDIMMs.
- Quad rank RDIMMs are not supported in HP ProLiant ML110 Gen9 servers.

### Memory

- Quad rank LRDIMMs are capable of up to three DIMMs per channel.
  - RDIMMs operating at 1.2V.
  - DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
  - The maximum memory speed is a function of the memory type, memory configuration, and processor model.
  - The maximum memory capacity is a function of the memory type and number of installed processors.
  - To realize the performance memory capabilities listed in this document, HP SmartMemory is required.
- There are four (4) channels per processor  
 There are two (2) DIMM slots for each memory channel; eight (8) total slots.
- Memory channels 1 and 3 consists of the two (2) DIMMs that are furthest from the processor.  
 Memory channel 2 and 4 consists of the two (2) DIMMs that are closest to the processor.

#### Intel Gen9 Supported Memory Bandwidth for HP ProLiant Gen9 Intel® Xeon®E5-2600v3 Series Processor Family

##### Memory Bandwidth and Capacity

[DIMM Type]	Registered Dimms (RDIMMs)				Load Reduced (LRDIMMs)
DIMM Rank	Single Rank		Dual Rank		Dual Rack
DIMM Capacity	4GB	8GB	16GB	32GB	16GB
DIMM Native Speed (MT/s)					
Voltage	Std Voltage 1.2V			Std	

##### SLOTS THAT CAN BE POPULATED

8 slot servers	8	8	8	8	8	16
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##### MAXIMUM CAPACITY (GB)

	32	64	128	256
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1 DIMM Per Channel	2133				
2 DIMM Per Channel	2133				

##### DIMM slot and configuration diagram

##### DIMM slot and configuration diagrams

- Population order; start with "A" first, "B" second, "C" third, etc.
- When one processor is installed, install DIMMs in sequential alphabetic order: A, B, C, D, E, F ...
- alphabetic order: CPU1-A, CPU2-A, CPU1-B, CPU2-B, CPU1-C, CP2-C

		CPU 1			
		Slot #	population order		
Chnl 3	1	C		C	Chnl 1
	2	G		G	
		CPU 1			

### Memory

	Slot #	population order		
Chnl 4	3	D		B
	4	H		F
<b>CPU 1</b>				
	Slot #	population order		
Chnl 2	5	F		H
	6	B		D
<b>CPU 1</b>				
	Slot #	population order		
Chnl 1	7	E		G
	8	A		C

### Memory Speed by Processor Model

Processor Models	Supported Memory Speeds
E5-2609v3, E5-2603v3,	1600MHz
E5-2640v3, E5-2620v3, E5-2630Lv3, E5-2623v3, E5-1603v3,	1866MHz
E5-2660v3, E5-1620v3, E5-1650v3,	2133MHz

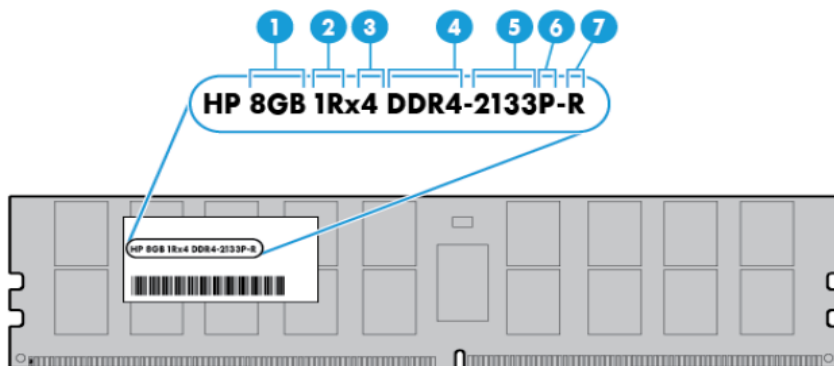
### Standard and Maximum Memory Capacity (Pre-configured Models)

Pre-Configured Models	Standard Memory	Maximum Memory Plus Optional Memory	Standard Memory Replaced with Optional Memory
E5-2603v3,	4GB (1x4GB)	228GB (7x32GB, 1x4GB)	128GB (8x16GB)
E5-2620v3,	8GB (1x8GB)	232GB (7x32GB, 1x8GB)	128GB (8x16GB)

### DDR4 memory options part number decoder

**NOTE:** Capacity references are rounded to the common gigabyte (GB) values.

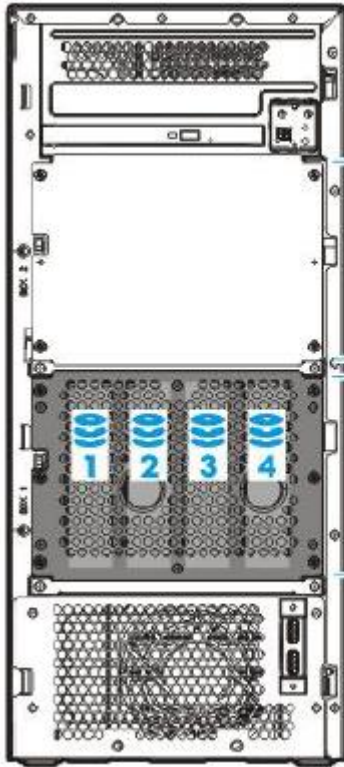
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB



1. Capacity: 4GB/8GB/16GB/32GB
2. Rank: 1R = Single-rank; 2R = Dual-rank; 4R = Quad-rank
3. Data width: x4 = 4-bit; x8 = 8-bit
4. Memory generation: DDR4
5. Maximum memory speed: 2133 MT/s
6. CAS latency: P = 15
7. DIMM type: R = RDIMM (registered); L = LRDIMM (load reduced)

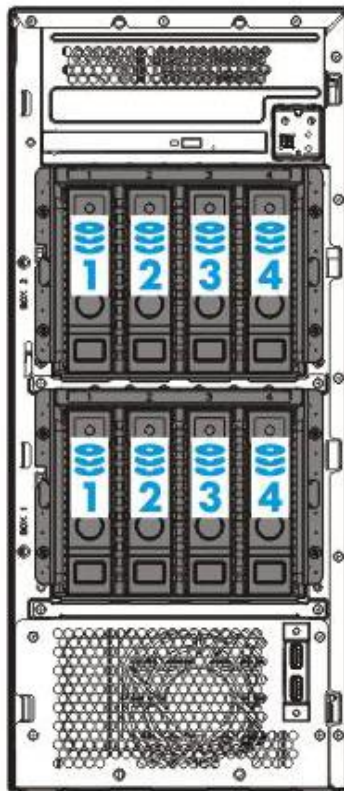
### Storage

#### 4-bay LFF non-hot-plug drive model



1-4      4 x LFF SATA/SSD Non-hot-plug Hard Drive Bays

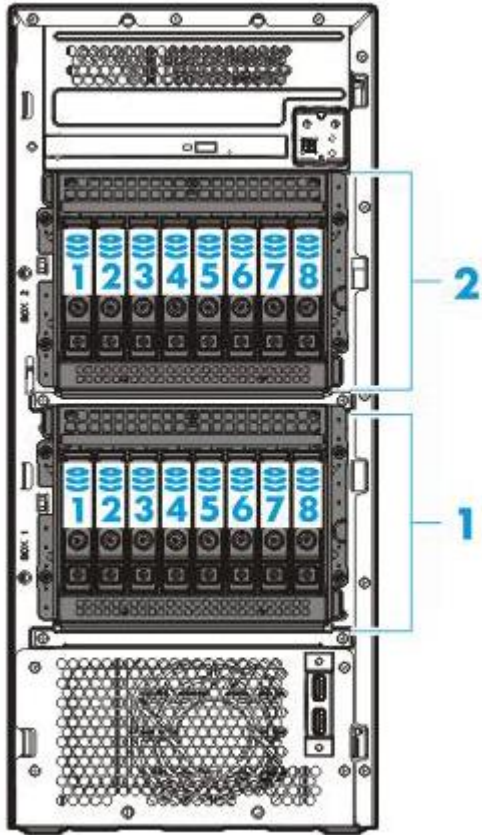
#### 4-bay LFF hot-plug drive model



1-4      4 x LFF SAS/SSD Hot Pluggable Hard Drive Bays

### Storage

8-bay SFF hot-plug drive model



1 x 1-8      8 x SFF SATA/SSD Hot Pluggable Hard Drive Bays

1 x 2-8      8 x SFF SATA/SSD Hot Pluggable Hard Drive Bays

#### Maximum Storage Capacity -

Total (8 LFF Drive)	48TB
Total (16 SFF Drive)	25.6TB

### Technical Specifications

<b>System Unit</b>	<b>Tower Dimensions</b>	17.32(H) x 7.68(W) x 18.92(D) in (44 x 19.5 x 48.05 cm)
	<b>Tower Weight</b>	Minimum: 27.56lb (12.5kg) Maximum: 55lb (24.9g)
	<b>Input Requirements</b>	Range Line Voltage 100 to 240 VAC Rated Input Current For 350W & 550W Power Supply:8A (at 100~240 VAC) Rated Input Frequency 50 to 60 Hz Rated Input Power For 550 W Power Supply:< 639 W (at 100 VAC),< 605 W (at 200 VAC) For 350 W Power Supply:< 427 W (at 100 VAC),< 427 W (at 200 VAC)
	<b>BTU Rating</b>	Maximum For 550 W Power Supply:2204 BTU/hr (at 100 VAC),2113 BTU/hr (at 200 VAC) For 350 W Power Supply:1452 BTU/hr (at 100 VAC),1544 BTU/hr (at 200 VAC)
	<b>Power Specifications</b>	To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: <a href="http://www.hp.com/go/proliant-energy-efficient">http://www.hp.com/go/proliant-energy-efficient</a> or <a href="http://www.hp.com/go/hppoweradvisor">http://www.hp.com/go/hppoweradvisor</a> - Click on the system of interest.
	<b>Power Supply Output</b>	Rated Steady-State Power For 550 W Power Supply:550 W (at 100 VAC),550 W (at 200 VAC), Maximum Peak Power For 350 W Power Supply:350 W (at 100 VAC),350 W (at 200 VAC),
	<b>System Inlet Temperature</b>	Standard Operating Support 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 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C(86°F). Extended Ambient Operating Support For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: <a href="http://www.hp.com/servers/ashrae">http://www.hp.com/servers/ashrae</a> .  For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: <a href="http://www.hp.com/servers/ashrae">http://www.hp.com/servers/ashrae</a> .  System performance may be reduced if operating in the extended ambient operating range or with a fan fault. <b>NOTE: Supports A3 extended ambient.</b>
	<b>Relative Humidity</b>	Non-operating -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr(36°F/hr). Operating Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of 24°C (75.2°F) dew point or 90% relative humidity. Non-operating 5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	<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 457m/min (1500 ft/min). Non-operating 9144 m (30,000 ft). Maximum allowable altitude change rate is 457m/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

### Technical Specifications

in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

#### Idle

L WAd	3.6 Bels (LFF Non Hot-Plug Base)
	3.6 Bels (LFF Hot-plug Base)
	4.1 Bels (LFF Hot-plug Performance)
L pAm	21 dBA (LFF Non Hot-Plug Base)
	21 dBA (LFF Hot-plug Base)
	27 dBA (LFF Hot-plug Performance)

#### Operating

L WAd	3.6 Bels (LFF Non Hot-Plug Base)
	3.7 Bels (LFF Hot-plug Base)
	4.2 Bels (LFF Hot-plug Performance)
L pAm	21 dBA (LFF Non Hot-Plug Base)
	21 dBA (LFF Hot-plug Base)
	25 dBA (LFF Hot-plug Performance)

**NOTE:** Configurations tested for LFF non hot-plug based models included one (1) 1TB LFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.

**NOTE:** Configurations tested for LFF hot-plug base models included one (1) 1TB LFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.

**NOTE:** Configurations tested for LFF hot-plug performance models included four (4) 2TB LFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.

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

#### Emissions Classification

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

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

<b>HP Dynamic Smart Array B140i Controller</b>	<b>Number of PCI links</b>	Four
	<b>PCI link rate</b>	4Gb/s
	<b>Storage protocol support</b>	SATA
	<b>SAS/SATA peak data transfer rate</b>	6Gb/s
	<b>Number of SAS/SATA links</b>	10 links
	<b>SAS/SATA connectivity</b>	2x4 connectors; 2x1 connectors
	<b>Expander support</b>	No
	<b>Drives supported (max)</b>	Up to 10 Internal Drives
	<b>RAID support</b>	0, 1, 10, 5 SATA
	<b>Software management</b>	HP SSA, SMH, SIM
	<b>Warranty</b>	Server warranty
	<b>HP Secure Encryption license</b>	Not Supported
	<b>HP SmartCache License</b>	Not Supported
	<b>HP Smart Storage Administrator</b>	Supported



### Technical Specifications

<b>HP Ethernet 1Gb 2-port 330i Adapter</b>	<b>Network Interface</b>	10Base-T/100Base-TX/1000Base-TX	
	<b>Compatibility</b>	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX	
	<b>Data Transfer Method</b>	PCI Express, two lanes (x2)	
	<b>Controller</b>	BCM5717	
	<b>Network Transfer Rate</b>	10Base-T (Half-Duplex)	10 Mb/s per port, 40 Mb/s combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 80 Mb/s combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 400 Mb/s combined
		100Base-TX (Full-Duplex)	200 Mb/s per port, 800 Mb/s combined
		100Base-TX (Half-Duplex)	1000Mb/s per port, 4000 Mb/s combined
		100Base-TX (Full-Duplex)	2000Mb/s per port, 8000 Mb/s combined
<b>Connector</b>	RJ-45		
<b>Cable Support</b>	10 Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)	
	10/100/1000 Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)	

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

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

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



[hp.com/qref/ml110gen9](http://hp.com/qref/ml110gen9)

### Summary of Changes

Date	Version History	Action	Description of Change
04/24/2015	From Version 1 to 2	Added	Smart Buy models added to the NA version only.

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