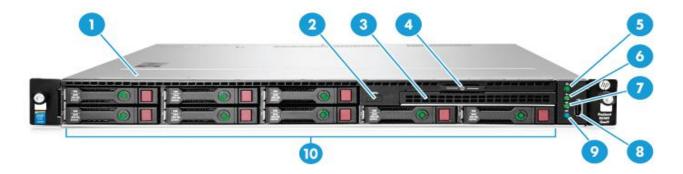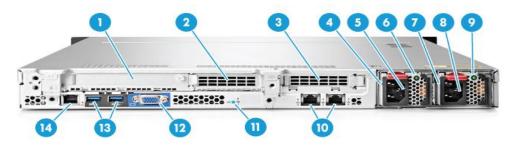Overview

## HP ProLiant DL160 Generation9 (Gen9)

The HP ProLiant DL160 Gen9 is the next generation 2P 1U value server replacing DL360e Gen8. It delivers the right balance of performance, storage, reliability, manageability and efficiency in a dense and compact chassis, to meet the needs of a diverse set of customers- from SMBs and service providers with a wide range of workloads - from general purpose IT to the New Style of IT, such as, Big Data and Cloud.

Front View

1.  Access Panel
2.  Optional USB3.0 (optional with 8SFF only)
3.  Optical disk drive bay
4.  Serial label pull tab
5.  Power On/Standby button and system power LED
6.  Health LED
7.  NIC status LED
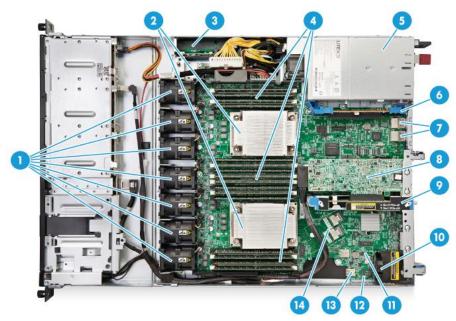8.  USB 2.0 connector
9.  UID button/LED
10. 8SFF drive cage

Rear view

1.  PCIe3 slot 1 (primary, associated with processor 1)
2.  PCIe3 slot 2 (primary, associated with processor 1)
3.  PCIe3 slot 3 (secondary, associated with processor 2)
4.  Power supply 1 bay
5.  Power supply 1 Power Connector (Optional)
6.  Power supply 1 LED (Optional)
7.  Power supply 2 bay
8.  Power supply 2 power connector
9.  Power Supply 2 LED
10. Embedded 2x1GbE network adapter
11.  Unit ID LED
12. Video Connector

## Overview

13. USB3.0 connectors
14. Dedicated iLO connector (optional)



Internal View

1. Hot Swappable fans (up to 7)
2. Processor heat sinks (processors with HP Smart Sockets placed below heat sinks)
3. HP Smart Storage Battery (optional)
4. DDR4 DIMM slots (up to 16)
5. Entry level power supply bay (1x900W shown)
6. Connector for secondary PCIe riser ( associated with CPU2)
7. Embedded 2x1GbE network adapter
8. HP Smart Array P440 controller (optional)
9. Primary PCIe riser (2 PCIe3 slots associated with CPU1)
10. Dedicated iLO module connector (optional)
11. MicroSD card slot
12. Internal SATA ports (one for ODD and another one reserved)
13. Internal USB 3.0 connector
14. Embedded B140i SATA controller (2x SATA ports for up to eight drives)

## Standard Features

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**
One of the following depending on model

| Model | CPU frequency | Cores | L3 Cache | Power | QPI | DDR4 Hz |
|---|---|---|---|---|---|---|
| E5-2660v3 | 2.6GHz | 10 | 25MB | 105W | 9.6GT/s | 2133 |
| E5-2650v3 | 2.3GHz | 10 | 25MB | 105W | 9.6GT/s | 2133 |
| E5-2650Lv3 | 1.8GHz | 12 | 30MB | 65W | 9.6GT/s | 2133 |
| E5-2640v3 | 2.6GHz | 8 | 20MB | 90W | 8.0GT/s | 1866 |
| E5-2630v3 | 2.4Ghz | 8 | 20MB | 85W | 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 |

**Chipset**
One of the following depending on model

Intel® C610 Series Chipset
Intel® E5-2600v3 Processor Family
**NOTE:** For more information regarding Intel chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/.

**On System Management Chipset**
One of the following depending on model

HP iLO (Firmware HP iLO4 2.0) 2GB NAND
**NOTE:** For more information, visit: http://www.hp.com/go/ilo.

**Memory**
One of the following depending on model

Type:
HP SmartMemory
DDR4 Registered (RDIMM) or Load Reduced (LRDIMM)

| | | |
|---|---|---|
| DIMM Slots Available | 16 | (8 DIMM slots per processor, 4 channels per processor, 2 DIMMs per channel) |
| Maximum Capacity (LRDIMM) | 512GB | (16 x 32GB LRDIMM @2133MHz) |
| Maximum Capacity (RDIMM) | 256GB | (16 x 16GB RDIMM @2133MHz) |

**Memory Protection**
One of the following depending on model

| | |
|---|---|
| Advanced ECC | Advanced ECC uses single device data correction to detect and correct single and all multibit 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. |

**Expansion Slots**
CPU1 PCIe riser slots

| Expansion Slots # | Technology | Bus Width | Connector Width | Bus Number | Form Factor | Notes |
|---|---|---|---|---|---|---|
| 1 | PCIe 3.0 | x16 | x16 | | Full-height, half-length slot | Processor 1 |
| 2 | PCIe 3.0 | x8 | x8 | | Low profile slot | Processor 1 |

**NOTE:** Bus Width data indicates the number of physical electrical lanes running to the connector.

CPU 1 FlexibleLOM riser slots

| Expansion Slots # | Technology | Bus Width | Connector Width | Bus Number | Device Number | Form Factor | Notes |
|---|---|---|---|---|---|---|---|
| 1 | Flexible LOM | x8 | x8 | | | Flexible LOM | Processor 1 (can only be used for flexibleLOMs) |
| 2 | PCIe 3.0 | x8 | x8 | | | Low profile slot | Processor 1 |

**NOTE:** This riser is mandatory for installing flexibleLOMs.

## Standard Features

| CPU2 riser PCIe slots | Expansion Slots # | Technology | Bus Width | Connector Width | Bus Number | Device Number | Form Factor | Notes |
|---|---|---|---|---|---|---|---|---|
| | 3 | PCIe 3.0 | x16 | x16 | | | Low profile slot | Processor 2 |

**NOTE:** When populating slots on CPU2 riser, second processor must be installed.
**NOTE:** Only one of the CPU1 PCIe risers can be selected in any given configuration.
**NOTE:** One of the CPU 1 risers is mandatory for all configurations.

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

| | |
|---|---|
| Entry Models | HP Dynamic Smart Array B140i Controller |
| | HP H240 FIO Smart Host Bus Adapter |
| Base Models | HP H240 FIO Smart Host Bus Adapter |
| Performance Models | HP Smart Array P440/4G Controller |

**NOTE:** B140i provides support for up to 8 SATA drives, data transmission speeds up to 6Gb/s and supports RAID 0, 1 & 5.
**NOTE:** H240 provides support for up to 8 SAS/SATA drives, data transmission speeds up to 12Gb/s and supports RAID 0, 1 & 5.
**NOTE:** P440 provides support for up to 8 SAS/SATA drives, data transmission speeds up to 12Gb/s.

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**Internal Storage Devices**
One of the following depending on model

| | |
|---|---|
| Optical Drives | Optional: DVD-ROM, DVD-RW |
| Hard Drives | None ship standard |
| Hard Drive Bays | 8 SFF drive bays total with Optical Bay |
| | 4 LFF drive bays total with Optical bay |

**NOTE:** HP ProLiant DL160 Gen9 server offers both SFF and LFF models. The Optical Drive bay is available with both models.
**NOTE:** Drive cage changes are not supported.
**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 Gen9 Hard Drive Blank Kit or P/N 666986-B21: HP LFF Gen9 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.

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**Maximum Internal Storage**
One of the following depending on model

| | CAPACITY | CONFIGURATION |
|---|---|---|
| Hot Plug SFF SAS | 9.6TB | 8 x 1.2TB |
| Hot Plug SFF SATA | 8.0TB | 8 x 1TB |
| Hot Plug LFF SAS | 24.0TB | 4 x 6TB |
| Hot Plug LFF SATA | 24.0TB | 4 x 6TB |
| Hot Plug SFF SAS SSD | 12.8TB | 8 x 1.6TB |
| Hot Plug SFF SATA SSD | 12.8TB | 8 x 1.6TB |
| Hot Plug LFF SATA SSD | 6.4TB | 4 x 1.6TB |

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**Power Supply**
One of the following depending on model

HP 550W FIO Power Supply
HP 800W/900W Gold AC Power Input Module

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.

The HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module with Power Backplane can be configured to support power redundancy in ProLiant servers that offer only a single power supply bay, providing additional protection against power loss. With an 80 Plus Gold power efficiency rating (up to 92%), this power option helps to reduce operating expenses while protecting against trapped power capacity in the data center. Each power backplane option can support up to two (2) hot-plug AC power input modules.

## Standard Features

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**<br>One of the following depending on model | | **Non-redundant** | **Redundant** |
|---|---|---|---|
| | 1P model | 3 fans | 4 fans |
| | | **Non-redundant** | **Redundant** |
| | 2P model | 6 fans | 7 fans |

**NOTE:** Redundant fan option kit (PN: 725587-B21) can be bought separately if redundancy is required with 1P or 2P configurations.
**NOTE:** Additional fans required with 2P configurations are included in "-B21" processor option kits.

| **Interfaces** | | |
|---|---|---|
| | Video | 1 (Vaux Support) |
| | HP iLO Remote Management Network Port | 1 GbE (Optional) |
| | USB | 4 USB ports (standard); 1 (optional)<br>Front: 1xUSB 2.0 std; 1xUSB3.0 optional (with 8SFF models only)<br>Rear: 2xUSB 3.0<br>Internal: 1xUSB 3.0 |
| | Micro SD Slot | 1 Micro SD |

**NOTE:** 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.

| | LOM Network Ports | 2x1GbE network ports |
|---|---|---|

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

Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Oracle Solaris
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/DL160Gen9.

**Upgradeability**
One of the following depending on model

Upgradeable to two processors (24 cores)
Up to 16 DIMM slots available
**NOTE:** To take advantage of all 16 DIMMs, second processor must be installed.
FlexibleLOM slot for 1Gigabit or 10 Gigabit Ethernet or QDR/FDR InfiniBand networking options
Optional 2nd CPU riser slot (x16, low profile)
**NOTE:** 2nd CPU must be installed if this riser is configured.
Up to 8 SFF Hard Drive Bays; or 4 LFF Hard Drive Bays
Redundant Power Supply
Redundant Fan
Optical Drive Bay (8 SFF/4 LFF)

**Industry Standard Compliance**

ACPI 2.0b Compliant
PCIe 3.0 Compliant
PXE Support
WOL Support
Microsoft® Logo certifications
USB 3.0 Support
ASHRAE A3/A4

## Standard Features

**NOTE:** Supports A3/A4 extended ambient temperature.
**NOTE:** Refer to technical specifications section for more details.

| | |
|---|---|
| **Graphics** | Integrated Matrox G200eH2 video standard |

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

| | |
|---|---|
| **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 UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory.

| | |
|---|---|
| **Form Factor** <br> One of the following depending on model | 1U Rack form factor <br> 8SFF and 4LFF version: <br> 1.7" (4.4cm) Height x 17.1" (43.5cm) Width x 23.9" (60.8cm) Length |

| | | |
|---|---|---|
| **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. |

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

## Standard Features

| | | |
|---|---|---|
| **Server utilities** | **HP Smart Update** | Optimize firmware and driver updates with HP Smart Update solutions. Learn more at http://www.hp.com/go/smartupdate. |
| | **HP Systems Insight Manager (HP SIM)** | 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.<br>HP SIM also integrates with HP SUM to provide quick and seamless firmware updates. Learn more at http://www.hp.com/go/sim. |
| | **HP OneView Standard** | HP OneView Standard can inventory, monitor, alert, and report on your G6, G7, Gen8, and Gen9 servers, while using the HP OneView user interface. Annual support is optionally available. Learn more at http://www.hp.com/go/oneview. |
| | **Scripting Tool Kit and Windows PowerShell** | 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 http://www.hp.com/go/ProLiantSTK or http://www.hp.com/go/powershell. |
| | **HP RESTful Interface Tool** | 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 http://www.hp.com/go/restfulapi. |
| | **HP iLO Mobile Application** | Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: http://www.hp.com/go/ilo/mobileapp. |
| | **HP Insight Online** | 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 http://www.hp.com/go/insightonline/info. |
| **Security** | Power-on password<br>Serial interface control<br>Administrator's password<br>TPM 1.2<br>UEFI | |
| **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.<br>**NOTE:** 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: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html. | |

## 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. |
| | **HP OneView Advanced** | HP OneView Advanced is converged management that eliminates infrastructure complexity with automation simplicity. This modern architecture is designed to accelerate your IT operations across servers, storage, and network resources using software-defined approaches and automation, see http://www.hp.com/go/oneview. |
| **Rack and Power Infrastructure** | | HP Rack and Power Infrastructure products and services create highly efficient and intelligent solutions for existing or new IT data centers. HP Rack and Power infrastructure solutions – rack infrastructure, power protection and management, performance optimized data centers (PODs) – are the foundation you are looking for to help secure your long-term IT success. These products are designed to help you react to changes in the industry. They deliver efficient, easy-to-use capabilities to manage, monitor, deploy and provision infrastructure from entry to enterprise. As an industry leader, HP is uniquely positioned to address the key concerns of power, cooling, cable management and system access. Learn more at HP Rack and Power Infrastructure. |
| **High Performance Clusters** | | 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

## Optional Features

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 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.

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## Service and Support

| | |
|---|---|
| **HP Technology Services** | 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. |
| **Optimized Support recommendation** | **HP Proactive Care – 24x7 coverage, four hour response, three year Care Pack Service**<br>Prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP.  Includes enhanced escalation management. Provides collaborative software call management with two hour call back to reduce troubleshooting on industry leading software.<br><br>As a leading global support provider for Microsoft, Red Hat, VMware, SUSE and other operating systems, HP is able to simplify and shorten your time to resolution with one call for hardware or software questions.  http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf<br><br>**HP ProLiant Server Hardware Installation**<br>Help ensure your new HP ProLiant hardware is installed smoothly, efficiently and with minimal disruption to your IT and business operations. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf |
| **Standard Support recommendation** | **HP Foundation Care - 24x7 coverage, three year Care Pack Service**<br>Connect to HP for faster problem resolution. Foundation Care provides hardware onsite response within four hours if needed and collaborative software call management with two hour callback for industry leading third party software. Simplify your support experience and make HP your first call for hardware or software questions.<br>http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en<br><br>**HP ProLiant Hardware Installation**<br>Help ensure your new HP ProLiant hardware is installed smoothly, efficiently and with minimal disruption to your IT and business operations. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf |
| **Related Services** | **Data Center Platform Consulting Services**<br>These services help modernize key systems and leverage new technology to support a changing business climate and   prepare you for the new style of IT. HP understands the needs of the data center of the future and will serve as your guide for the journey. http://www.hp.com/services/consulting<br><br>**Data Privacy Services**<br>Protect your data through better media management.  HP Data privacy services help manage and protect sensitive data. http://www.hp.com/services/dataprivacy<br><br>**Factory Express for Servers and storage**<br>HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Choose how your factory solutions are built, tested, integrated, shipped and deployed.  http://www.hp.com/go/factory-express<br><br>Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc |
| **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. |

## 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 (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.

**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 | |
|---|---|---|---|---|
| **[SKU Number]** | 769503-B21 | 769504-B21 | 769505-B21 | 769506-B21 |
| **Model Name** | HP ProLiant DL160 Gen9 E5-2603v3 1P 8GB-R B140i 4LFF 550W PS Entry Server | HP ProLiant DL160 Gen9 E5-2603v3 1P 8GB-R H240 8SFF 550W PS Entry Server | HP ProLiant DL160 Gen9 E5-2609v3 1P 16GB-R H240 8SFF 550W PS Base Server | HP ProLiant DL160 Gen9 E5-2630v3 2P 32GB-R P440/4G 8SFF 800W RPS Perf Server |
| **Processor** | Intel® Xeon® E5-2603v3 | | Intel® Xeon® E5-2609v3 | Intel® Xeon® E5-2630v3 |
| **Number of Processors** | One | | | |
| **Memory** | 8GB (1x8GB Registered DIMMs, 2133 MHz) **NOTE:** Due to processor limitation, these DDR4 DIMMs will operate at 1600 MHz in this model. | | 16GB (2x8GB Registered DIMMs, 2133 MHz) **NOTE:** Due to processor limitation, these DDR4 DIMMs will operate at 1600 MHz in this model. | 32GB (2x16GB Registered DIMMs, 2133 MHz) |
| **Network Controller** | HP Embedded Dual Port 361i Adapter Network Interface | | | |
| **Storage Controller** | HP Dynamic Smart Array B140i | HP H240 FIO Smart Host Bus Adapter | | HP Flexible Smart Array P440/4G FIO Controller |
| **Hard Drive** | None ship standard | | | |
| **Internal Storage** | 4 LFF HDD Bays | 8 SFF HDD Bays | | |
| **Optical Drive Bay** | 1; (Optional: DVD-ROM, DVD-RW) | | | |
| **Optical Drive** | Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive) | | | |
| **PCI-Express Slots** | 2 Standard (1-FH/HL, 1-LP) PCIe 3.0 | | | 3 Standard (1-FH/HL, 2-LP) PCIe 3.0 |
| **Power Supply** | (1) HP 550W FIO Power Supply | | | HP 800W Redundant Power Supply |
| **Fans** | 3 hot swap fans, non redundant | | 4 hot swap fans, redundant | 7 hot swap fans, redundant |
| **Management** | iLO Management (standard), Intelligent Provisioning (standard), iLO Essentials (optional) | | | |
| **Energy Star** | | | | Meets Energy Star requirements |
| **Form Factor** | Rack (1U), HP Easy Install Rails | | | |
| **Warranty** | Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. | | | |

## 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)

| [Chassis] | HP ProLiant DL160 Gen9 Hot Plug 8SFF Configure-to-order Server | HP ProLiant DL160 Gen9 Hot Plug 4LFF Configure-to-order Server | HP ProLiant DL160 Gen9 Non Hot-Plug 4LFF Configure-to-order Server |
|---|---|---|---|
| SKU Number | 754520-B21 | 754521-B21 | 754522-B21 |
| Processor | 2 (optional) x HP Smart Socket Guides | | |
| DIMMSlots | 16 DIMM slots for RDIMM, LRDIMM DDR4 Memory | | |
| Storage Controller | HP Dynamic Smart Array B140i | | |
| PCIe | Optional (None ship standard) | | |
| Drive Cage | 8SFF Hot Plug | 4LFF Hot Plug | 4LFF Non Hot Plug |
| Network Controller | HP Ethernet 1Gb 2-port i350 Adapter | | |
| Fans | 3 hot swap fans, non redundant | | |
| Management | iLO Management (standard), Intelligent Provisioning (standard),  iLO Essentials (optional) | | |
| USB | 1 front, 1 internal, 2 rear | | |
| Ears | HP Thumbscrew Ears | | |

## 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 DL160 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit | 733943-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit | 763235-L21 |
| | **Base Processors - E5-2600v3 series Processors** | |
| | HP DL160 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit | 733935-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit | 733937-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit | 733939-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) FIO Processor Kit | 763241-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W) FIO Processor Kit | 779386-L21 |
| | **Performance Processors - E5-2600v3 series Processors** | |
| | HP DL160 Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit | 733931-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) FIO Processor Kit | 733933-L21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit | 763237-L21 |

**NOTE:** If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

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

**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**    **NOTE:** Select one or more memory from section below. A minimum of two memory kits are required if server is configured with two processors.

## Configuration Information - Factory Integrated Models

**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 with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9.

**NOTE:** If only one processor is installed, only half of the total DIMM slots are available. When populating with two processors, all DIMM slots are available.

**NOTE:** Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: http://www.hp.com/go/proliant-energy-efficient.

**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/ddr4config.

**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 |

**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 |
| HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit | 726722-B21 |

**HP I/O Expansion Options**

| | |
|---|---|
| HP DL160 Gen9 CPU1 Riser FIO Kit | 725585-B21 |

**NOTE:** This riser enables two PCIe3 slots.

**HP Power Supplies**

**NOTE:** Mixing of power supplies in the same server is not supported. All power supplies must be of the same input voltage, output rating, and efficiency rating. If non-matching power supplies are installed, you may receive an error message and/or experience operational issues with your 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.

**HP Entry-Level Power Supplies**

| | |
|---|---|
| HP 550W FIO Power Supply Kit | 730941-B21 |
| HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module | 744689-B21 |

**NOTE:** Up to two may be selected but one HP Server RPS Backplane Kit (P/N: 745813-B21) is required.

| | |
|---|---|
| HP Server Redundant Power Supply Backplane Kit | 745813-B21 |

**NOTE:** Required to be bought when 900W/800W power supply (P/N: 744689-B21) is selected.

## Step 3: Choose Additional Factory Integratable Options

**HP Storage Controllers**

**NOTE:** One of the cable options below is required to be selected depending on combination of CTO Server and Storage Controller. If not using the embedded B140i controller, must select one of the following HP Storage Controllers and Cable Options noted below.

**NOTE:** HP ProLiant DL160 Gen9 NHP 4LFF CTO Server (PN: 754522-B21) includes SATA Cables required to support the embedded B140i controller and no cable option is required.

**HP Smart Array Controllers**

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

**NOTE:** Includes the HP Smart Storage Battery

**NOTE:** If HP ProLiant DL160 Gen9 8SFF CTO Server (PN: 754520-B21) or HP ProLiant DL160 Gen9 4LFF CTO Server (PN: 754521-B21) is selected in Step 1 above.

**HP Smart Host Bus Adapters**

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

**NOTE:** If HP ProLiant DL160 Gen9 8SFF CTO Server (PN: 754520-B21) or HP ProLiant DL160 Gen9 4LFF CTO Server (PN: 754521-B21) is selected in Step 1 above.

**HP Cable Options**

| | |
|---|---|
| HP DL160 Gen9 4LFF Smart Array B140i SATA Cable FIO Kit | 768775-B21 |

## Configuration Information - Factory Integrated Models

| | | |
|---|---|---|
| | **NOTE:** Required if using the embedded B140i as the primary controller with the HP ProLiant DL160 Gen9 4LFF CTO Server (PN: 754521-B21) | |
| | HP DL160 Gen9 8SFF Smart Array B140i SATA Cable FIO Kit | 774611-B21 |
| | **NOTE:** Required if using the embedded B140i as the primary controller with the HP ProLiant DL160 Gen9 8SFF CTO Server (PN: 754520-B21) | |
| | HP DL160 Gen9 4LFF Smart Array P440 SAS Cable Kit | 725593-B21 |
| | **NOTE:** Required with the HP ProLiant DL160 Gen9 4LFF CTO Server (PN: 754521-B21) if HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller (PN: 761872-B21) is selected. | |
| | HP DL160 Gen9 8SFF Smart Array P440 SAS Cable Kit | 774619-B21 |
| | **NOTE:** Required with the HP ProLiant DL160 Gen9 8SFF CTO Server (PN: 754520-B21) if HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller (PN: 761872-B21) is selected. | |
| | HP DL160 Gen9 4LFF Smart Array H240 SAS Cable Kit | 725590-B21 |
| | **NOTE:** Required with the HP ProLiant DL160 Gen9 4LFF CTO Server (PN: 754521-B21) if HP H240 12Gb 1-port Int FIO Smart HBA (PN: 761873-B21) is selected. | |
| | HP DL160 Gen9 8SFF Smart Array H240 SAS Cable Kit | 774621-B21 |
| | **NOTE:** Required with the HP ProLiant DL160 Gen9 8SFF CTO Server (PN: 754520-B21) if HP H240 12Gb 1-port Int FIO Smart HBA (PN: 761873-B21) is selected. | |
| **HP Insight Software** | **HP Insight Control** | |
| | HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License | C6N36A |
| **HP Converged Infrastructure Management Software** | **HP OneView Advanced (with HP iLO Advanced)** | |
| | HP OneView for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic | E5Y43A |
| **HP Security** | HP DL160 Gen9 Quick Release Ear FIO Kit | 774609-B21 |
| | **NOTE:** This option kit is required for Security Bezel. | |
| **BIOS Mode** | HP Legacy FIO Mode Setting | 758959-B22 |
| | **NOTE:** If B140i is the only primary controller, then this option cannot be selected. | |
| | **NOTE:** Selecting this option will change the default UEFI BIOS setting into Legacy BIOS setting. | |
| **Controller State** | HP Mfg FIO Enable HBA Mode Setting | 792962-B21 |
| | **NOTE:** Can only be selected with H240 FIO Smart Host Bus Adapter | |
| | **NOTE:** If H240 is the primary controller then RAID is not allowed with this selection. | |
| | HP AHCI-Enable FIO Setting | 801845-B21 |
| | **NOTE:** If B140i is the primary controller then RAID is not allowed with this selection | |

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

**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.

## Core Options

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

| | | |
|---|---|---|
| **HP Unique Options** | HP DL180 Gen9 Dedicated iLO Management Port Kit | 725581-B21 |
| | HP DL160 Gen9 Low Profile PCIe CPU2 Riser Kit | 725586-B21 |
| | **NOTE:** CPU 2 is required if this riser is to be installed, enables one PCIe3 slot. | |
| | HP DL160 Gen9 Front USB 3.0 Enablement Kit | 725594-B21 |
| | **NOTE:** This kit is required to enable a front USB3.0 port on SFF models only. | |
| | HP DL160 Gen9 FlexibleLOM Enablement Kit | 781844-B21 |
| | **NOTE:** This riser kit is required when flexibleLOM is selected. | |

| | | |
|---|---|---|
| **HP Processors** | **Entry Processors - E5-2600v3 series Processors** | |
| | HP DL160 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit | 733943-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit | 763235-B21 |
| | **Base Processors - E5-2600v3 series Processors** | |
| | HP DL160 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit | 733935-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit | 733937-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit | 733939-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor Kit | 763241-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2623v3 (3GHz/4-core/10MB/105W) Processor Kit | 779836-B21 |
| | **Performance Processors - E5-2600v3 series Processors** | |
| | HP DL160 Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit | 733931-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) Processor Kit | 733933-B21 |
| | HP DL160 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit | 763237-B21 |

| | | |
|---|---|---|
| **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 |
| | **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 |
| | HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit | 726722-B21 |

| | | |
|---|---|---|
| **HP Optical Drives** | HP 9.5mm SATA DVD-ROM JackBlack Gen9 Optical Drive | 726536-B21 |
| | HP 9.5mm SATA DVD-RW JackBlack G9 Optical Drive | 726537-B21 |

| | | |
|---|---|---|
| **HP Drives** | **SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives** | |
| | HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive | 718162-B21 |
| | HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652589-B21 |
| | HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759212-B21 |
| | HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652583-B21 |
| | HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759210-B21 |
| | HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652572-B21 |
| | HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759208-B21 |
| | HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652564-B21 |
| | HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652605-B21 |
| | **SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives** | |
| | HP 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive | 652745-B21 |
| | HP 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive | 652749-B21 |
| | **SAS Hot Plug LFF (3.5-inch) Enterprise (ENT) Drives** | |

## Core Options

| | |
|---|---|
| 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 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 761477-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 1yr Warranty Hard Drive | 753874-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 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive | 628065-B21 |
| HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive | 659339-B21 |
| HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive | 659337-B21 |
| HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) Non-hot plug Midline 1yr Warranty Hard Drive | 659341-B21 |
| **12G SAS Hot Plug SFF (2.5-inch) Enterprise Performance Solid State Drives** | |
| HP 800GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive | 741159-B21 |
| 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 |
| **12G SAS Hot Plug SFF (2.5-inch) Enterprise Mainstream Solid State Drives** | |
| HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 741146-B21 |
| HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 741142-B21 |
| HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 741138-B21 |
| **12G SAS Hot Plug SFF (2.5-inch) Enterprise Value Solid State Drives** | |
| HP 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762263-B21 |
| HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762261-B21 |
| HP 1.6TB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762272-B21 |
| **12G SAS Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives** | |
| HP 800GB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762270-B21 |
| **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 |

## Core Options

| | |
|---|---|
| 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** | |
| 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 |
| HP 1.6TB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 757339-B21 |
| HP 1.6TB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive | 757342-B21 |
| **6G SATA Hot Plug SFF Value Endurance (2.5-inch) Enterprise Value G1 Solid State Drives** | |
| 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 |
| **6G SATA Hot Plug SFF (2.5-inch) Enterprise Light G1 Solid State Drives** | |
| HP 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive | 756601-B21 |
| **6G SATA Hot Plug SFF (2.5-inch) Enterprise Boot Solid State Drives** | |
| 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 |
| **6G SATA Hot Plug LFF (3.5-inch) Enterprise Mainstream Solid State Drives** | |
| HP 800GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 691860-B21 |
| HP 400GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 691856-B21 |
| HP 200GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 691854-B21 |
| HP 100GB 6G SATA Mainstream Endurance LFF 3.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive | 691852-B21 |
| **6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value G1 Solid State Drives** | |
| 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 |
| **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 |

## Core Options

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|---|---|---|
| | 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 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 |
| | **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 |

| | | |
|---|---|---|
| **HP Networking** | **1 Gigabit Ethernet adapters** | |
| | HP Ethernet 1Gb 2-port 361T Adapter | 652497-B21 |
| | HP Ethernet 1Gb 4-port 331T Adapter | 647594-B21 |
| | HP Ethernet 1Gb 2-port 332T Adapter | 615732-B21 |
| | **10 Gigabit Ethernet adapters** | |
| | 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 |
| | HP Ethernet 10Gb 2-port 561T Adapter | 716591-B21 |
| | **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. | |
| | **FlexibleLOM Adapters** | |
| | HP Ethernet 1Gb 4-port 331FLR Adapter | 629135-B22 |
| | HP Ethernet 1Gb 4-port 366FLR Adapter | 665240-B21 |
| | HP Ethernet 10Gb 2-port 561FLR-T Adapter | 700699-B21 |
| | HP FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter | 700751-B21 |
| | HP FlexFabric 10Gb 2-port 533FLR-T Adapter | 700759-B21 |
| | **NOTE:** FlexibleLOM riser kit (P/N: 781844-B21) is required when any flexibleLOM is selected. | |
| | **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://www.hp.com/go/ProLiantNICs. | |

| | | |
|---|---|---|
| **HP InfiniBand** | HP InfiniBand FDR 2-port 545QSFP Adapter | 702211-B21 |
| | HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+QSFP Adapter | 764284-B21 |
| | **NOTE:** Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html | |

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|---|---|---|
| **HP I/O Expansion Options** | HP DL160 Gen9 Low Profile PCIe CPU2 Riser Kit | 725586-B21 |
| | **NOTE:** CPU 2 is required if this riser is to be installed, enables one PCIe3 slot. | |
| | HP DL160 Gen9 FlexibleLOM Enablement Kit | 781844-B21 |
| | **NOTE:** This enablement kit is required when flexibleLOM is selected. | |

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|---|---|---|
| **HP Power Supplies** | **HP Entry-Level Power Supplies** | |
| | HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module | 744689-B21 |
| | HP Server Redundant Power Supply Backplane Kit | 745813-B21 |

## Core Options

**NOTE:** Backplane kit is required when 800W/ 900W power supply is selected.
**NOTE:** Mixing of power supplies in the same server is not supported. All power supplies must be of the same input voltage, output rating, and efficiency rating. If non-matching power supplies are installed, you may receive an error message and/or experience operational issues with your 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.

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| **HP Cooling Options** | HP DL160 Gen9 Redundant Fan Kit<br>**NOTE:** This kit includes one fan and is required for enabling fan redundancy with 1P and 2P configurations. | 725587-B21 |

## 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 including 1yr 24x7 Technical Support and Updates Electronic License | C6N28ABE |
| | 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.

| Embedded Management | **HP iLO Advanced** | |
|---|---|---|
| | HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License | 512485-B21 |
| | HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates | BD505A |
| | HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU | E6U59ABE |
| | HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU | E6U64ABE |
| | **HP iLO Essentials** | |
| | HP Integrated Lights-Out Essentials including 3yr 24x7 Technical Support and Updates E-LTU | E6U61ABE |
| | HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates Single Svr License | BD774A |
| | HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates Single Svr License | BD775A |
| | HP Integrated Lights-Out Essentials including 1yr 24x7 Technical Support and Updates E-LTU | E6U62ABE |
| | **HP iLO Scale-out** | |
| | HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License | BD776A |
| | HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License | BD777A |
| | HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU | BD776AAE |
| | HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License | BD778A |
| | HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU | BD778AAE |
| | HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License | BD779A |

| HP Converged Infrastructure Management Software | **HP OneView Advanced (with HP iLO Advanced)** | |
|---|---|---|
| | HP OneView incl 3yr 24x7 Supp Phys 1 Svr Lic | E5Y34A |
| | HP OneView incl 3yr 24x7 Supp Flex Qty E-LTU | E5Y35AAE |
| | HP OneView incl 3yr 24x7 Supp Bundle 1 Svr E-LTU | E5Y43AAE |
| | **HP OneView Advanced (without HP iLO Advanced)** | |
| | HP OneView w/o iLO Adv incl 3yr 24x7 Supp Phys 1 Svr Lic | E5Y38A |
| | HP OneView w/o iLO Adv inc 3yr 24x7 Supp Flex Qty E-LTU | E5Y39AAE |
| | HP OneView Media Kit Phys No Lic | E5Y37A |

## Additional Options

**NOTE:** Full licenses of HP OneView Advanced also provide the right-to-use HP Insight Control without additional charge.
**NOTE:** Server provisioning (via 'HP Insight Control server provisioning') is licensed as part of HP OneView Advanced and provides multi-server OS and driver provisioning. Media kit #BD883A can be ordered for a physical copy of this software (USB flash drive).
**NOTE:** Licenses ship without media. The HP OneView Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/oneview
**NOTE:** Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.

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

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| **HP PCIe Workload Accelerator Options** | **Value Endurance (VE) PCIe Workload Accelerators** | |
| | HP 6.4TB FH/HL Value Endurance (VE) PCIe Workload Accelerator | 763840-B21 |
| | HP 3.2TB HH/HL Value Endurance (VE) PCIe Workload Accelerator | 763838-B21 |
| | HP 1.6TB HH/HL Value Endurance (VE) PCIe Workload Accelerator | 763836-B21 |
| | HP 1.3TB HH/HL Value Endurance (VE) PCIe Workload Accelerator | 763834-B21 |
| | **Light Endurance (LE) PCIe Workload Accelerators** | |
| | HP 5.2TB FH/HL Light Endurance (LE) PCIe Workload Accelerator | 775672-B21 |
| | HP 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator | 775670-B21 |
| | HP 1.3TB HH/HL Light Endurance (LE) PCIe Workload Accelerator | 775668-B21 |
| | HP 1.0TB HH/HL Light Endurance (LE) PCIe Workload Accelerator | 775666-B21 |
| | **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14528_na/14528_na.html | |

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|---|---|---|
| **HP Security** | HP 1U Security Bezel Kit | 664918-B21 |
| | **NOTE:** Quick Release Ear option kit (P/N 774609-B21) is required for installing security bezel. | |
| | HP Trusted Platform Module Option | 488069-B21 |
| | **NOTE:** The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: http://www.hp.com/go/TPM. **NOTE:** ProLiant OS pre-installed units will come with the partition required for TPM deployment. **NOTE:** The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss. | |

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

# QuickSpecs

## Additional Options

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|---|---|
| HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller | 726825-B21 |
| **HP Smart Host Bus Adapters** | |
| HP H240 12Gb 2-ports Int Smart Host Bus Adapter | 726907-B21 |
| HP H241 12Gb 2-ports Ext Smart Host Bus Adapter | 726911-B21 |
| **HP Cable Options** | |
| HP DL160 Gen9 4LFF Smart Array H240 SAS Cable Kit | 725590-B21 |
| HP DL160 Gen9 8SFF Smart Array H240 SAS Cable Kit | 774621-B21 |
| HP DL160 Gen9 4LFF Smart Array P440 SAS Cable Kit | 725593-B21 |
| HP DL160 Gen9 8SFF Smart Array P440 SAS Cable Kit | 774619-B21 |

**NOTE:** One of the above cables is required to be selected depending on the combination of chassis and storage controller. Cable option kit descriptions include the right chassis and storage controller names.
**NOTE:** NHP CTO Server includes SATA cables required to connect drives to embedded B140i SATA controller.

**Optional Upgrades**

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

**NOTE:** This option is mandatorily required with HP Smart Array controllers. One server can accommodate only 1 Smart Storage Battery that would suffice the requirement of all HP Smart Array controllers.

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**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:** For Internal drives to be connected to DL servers please make sure that you order rack mount kit as well.

**Tape Drives**

**SAS Rack-Mount Tape Solutions**

| | |
|---|---|
| HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit | C0L99A |
| 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 LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit | EH946C |
| HP StoreEver 1U SAS Rack-mount Kit | AE459B |
| HP MSL Library Extender Kit | AQ746A |

**HP DAT Autoloader**

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|---|---|
| HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader | C0H19A |

**HP MSL2024 Tape Library**

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|---|---|
| HP MSL2024 0-Drive Tape Library | AK379A |

**HP MSL4048 Tape Library**

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|---|---|
| HP MSL4048 0-Drive Tape Library | AK381A |

**HP StoreEver MSL6480**

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| HP StoreEver MSL6480 Scaleable Expansion Module | QU626A |
| HP StoreEver MSL6480 Scalable Base Module | QU625A |

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**HP Disk Storage Systems**

**Disk Enclosures**

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|---|---|
| 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 |

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**HP Data Center Racks**   **HP 11000 G2 Series Racks**

## Additional Options

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|---|---|
| HP 11648 1075mm Pallet Universal Rack | H6J87A |
| HP 11648 1075mm Shock Universal Rack | H6J88A |
| HP 11642 1075mm Pallet Universal Rack | H6J65A |
| HP 11642 1075mm Shock Universal Rack | H6J66A |
| HP 11642 1200mm Pallet Universal Rack | H6J67A |
| HP 11642 1200mm Shock Universal Rack | H6J68A |
| HP 11636 1075mm Pallet Universal Rack | H6J77A |
| HP 11636 1075mm Shock Universal Rack | H6J78A |
| HP 11622 G2 1075mm Shock Universal Rack | H6J83A |
| HP 11622 G2 1075mm Shock Universal Rack | H6J84A |
| HP 11614 1075mm Shock Universal Rack | H6J82A |

**NOTE:** Please see the HP 11000 G2 Series Racks QuickSpecs for information on additional racks options and rack specifications.

**HP Intelligent Series Rack**

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|---|---|
| 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 |
| 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 636 1075mm Pallet Intelligent Series Rack | BW895A |
| HP 636 1075mm Shock Intelligent Series Rack | BW896A |
| HP 842 1075mm Pallet Intelligent Series Rack | BW917A |
| HP 842 1075mm Shock Intelligent Series Rack | BW918A |

**NOTE:** Please see the HP Intelligent Series Racks QuickSpecs for information on additional racks options and rack specifications.

**HP Value Series Rack**

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|---|---|
| HP V142 1075mm deep Pallet 100 series Rack | AF046A |

**NOTE:** Please see the HP Value Series Rack QuickSpecs for information on additional racks options and rack specifications.

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|---|---|---|
| **HP Power Distribution Units (PDUs)** | **HP Basic Power Distribution Unit (bPDU)** | |
| | HP 4.9kVA 24A High Voltage NA/JP Core Modular Power Distribution Unit | 252663-D74 |
| | HP 8.3kVA 40A High Voltage NA/JP Core Modular Power Distribution Unit | 252663-D75 |
| | HP 17.3kVA 48A Three Phase NA/JP Modular Power Distribution Unit | AF511A |
| | HP 3.6kVA 200-240 Volt Detachable C20 Input ( 12xC13) WW Basic PDU | H5M56A |
| | HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU | H5M58A |

**NOTE:** To learn more about HP Basic Power Distribution Units (bPDU), please visit the HP website at http://www.hp.com/go/pdu.

**HP Monitored Power Distribution Units (mPDU)**

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|---|---|
| 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 (16xC13) WW Monitored PDU | D9N45A |
| HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU | D9N47A |
| HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU | D9N59A |

**NOTE:** Please see the HP Monitored Power Distribution Units QuickSpecs for information on additional options and product specifications.

**HP Intelligent Power Distribution Units (iPDU)**

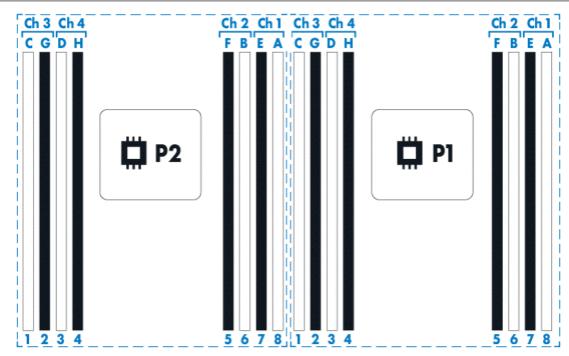| | |
|---|---|
| HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF520A |
| HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF521A |

## Additional Options

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|---|---|---|
| | HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF522A |
| | HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF523A |
| | HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit | AF535A |
| | 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 |

**NOTE:** Please see the HP Intelligent Power Distribution Units QuickSpecs for information on additional options and product specifications.

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|---|---|---|
| **HP Rack Mount Consoles, KVM Switches, and Keyboards** | **Rail Kits** | |
| | **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13972_na/13972_na.html | |
| | HP 1U Small Form Factor Easy Install Rail Kit | 734807-B21 |
| | HP 1U Cable Management Arm for Easy Install Rail Kit | 734811-B21 |
| | **HP Rack Mount Consoles** | |
| | HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor | AZ870A |
| | **NOTE:** Please see the HP Rack Console QuickSpecs for information on additional options and product specifications. | |
| | **HP KVM Switches** | |
| | 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 Server Console 0x2x8 Port Analog Switch | AF616A |
| | HP Server Console 0x2x16 Port Analog Switch | AF617A |
| | HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software | AF618A |
| | HP 1x4 USB/PS2 KVM Console Switch | AF611A |
| | **NOTE:** To learn more, please visit the HP KVM Switches web page. | |
| | **HP USB Keyboard and Mouse** | |
| | HP USB BFR with PVC Free US Keyboard/Mouse Kit | 631341-B21 |
| | **NOTE:** Please see the HP USB Keyboard and Mouse QuickSpecs for information on additional options and product specifications. | |

| | | |
|---|---|---|
| **HP Uninterruptible Power Systems (UPS)** | **HP Rack-mountable UPS** | |
| | HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System | AF466A |
| | **NOTE:** To learn more, please visit the HP Uninterruptible Power Systems (UPS) web page. | |

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|---|---|---|
| **HP USB and SD Options** | HP 8GB microSD Enterprise Mainstream Flash Media Kit | 726116-B21 |
| | HP DL160 Gen9 Front USB 3.0 Enablement Kit | 725594-B21 |
| | **NOTE:** This enablement kit is required to enable front 1xUSB3.0 port with 8SFF models. | |

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|---|---|---|
| **HP Care Pack Services** | **Foundation Care** | |
| | HP 3 year 24x7 DL160 Gen9 Foundation Care Service | U7AZ7E |
| | HP 3 year 24x7 with Defective Media Retention DL160 Gen9 Foundation Care Service | U7AZ8E |
| | HP 3 year 24x7 with Comprehensive Defective Material Retention DL160 Gen9 Foundation Care Service | U7AZ9E |
| | **Proactive Care** | |
| | HP 3 year 24x7 DL160 Gen9 Proactive Care Service | U7BA0E |
| | HP 3 year 24x7 with Defective Media Retention DL160 Gen9 Proactive Care Service | U7BA1E |
| | HP 3 year 24x7 with Comprehensive Defective Material Retention DL160 Gen9 Proactive Care Service | U7BA2E |
| | **Installation & Start-up Services** | |
| | HP Installation ProLiant DL160/DL360e Service | U6E11E |
| | HP Startup ProLiant DL160/DL360e Service | U6E13E |

## Memory

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|---|---|
| **Memory Subsystem Architecture** | Each Intel® Xeon® E5-2600v3 family processor socket contains four memory channels per installed processor with two DIMMs per channel for a total of eight (8) DIMMs or a grand total of sixteen (16) DIMMs for the server. |

**Memory Population guidelines**



**General Memory Population Rules and Guidelines**:

. 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, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.

. When two processors are installed, balance the DIMMs across the two processors.

. 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 DL160 Gen9 servers.

. Quad rank LRDIMMs are capable of up to two DIMMs per channel.

. 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.

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)** | **Unbuffered with ECC DIMMs (UDIMMs)** |
|---|---|---|---|---|---|
| **DIMM Rank** | **Single Rank** | **Dual Rank** | | | **Quad Rank** |
| **DIMM Capacity** | 4GB | 8GB | 16GB | | 32GB |
| **Voltage** | Std Voltage 1.2V | | | | |
| **SLOTS THAT CAN BE POPULATED** | | | | | |

## Memory

| 16 slot servers | 16 | | | |
|---|---|---|---|---|
| **MAXIMUM CAPACITY (GB)** | | | | |
| | 64 | 128 | 256 | 512 |
| **1 DIMM Per Channel** | 2133 | | | |
| **2 DIMM Per Channel** | 2133 | | | |

**DIMM slot and configuration diagram**

DIMM slot and configuration diagrams

**Basic memory slot & population diagram**

• 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 ...

• When two processors are installed, install DIMMs in sequential

• alphabetic order: CPU1-A, CPU2-A,CPU1-B,CPU2-B,CPU1-C, CP2-C

CPU #1 IS PROCESSOR ON RIGHT - LOOKING FROM FRONT OF SERVER

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

| | | CPU 1 | | CPU 2 | |
|---|---|---|---|---|---|
| | Slot # | population order | Slot # | population order | |
| Chnl 4 | 3 | D | 3 | D | |
| | 4 | H | 4 | H | |

| | | CPU 1 | | CPU 2 | |
|---|---|---|---|---|---|
| | Slot # | population order | Slot # | population order | |
| Chnl 2 | 5 | F | 5 | F | |
| | 6 | B | 6 | B | |

| | | CPU 1 | | CPU 2 | |
|---|---|---|---|---|---|
| | Slot # | population order | Slot # | population order | |
| Chnl 1 | 7 | E | 7 | E | |
| | 8 | A | 8 | A | |

**Memory Speed by Processor Model**

| Processor Models | Supported Memory Speeds |
|---|---|
| E5-2609v3, E5-2603v3, | 1600MHz |
| E5-2640v3, E5-2630v3, E5-2620v3, E5-2630Lv3, E5-2623v3, | 1866MHz |
| E5-2660v3, E5-2650v3, E5-2650Lv3, | 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, | 8GB (1x8GB) | 248GB (15x16GB, 1x8GB) | 512GB (16x32GB) |
| E5-2609v3, | 16GB (2x8GB) | 240GB (14x16GB, 2x8GB) | 512GB (16x32GB) |
| E5-2630v3, | 32GB (2x16GB) | 256GB (14x16GB, 2x16GB) | 512GB (16x32GB) |

## Memory

DDR4 memory options part number decoder

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

- 2GB = 2,048MB
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB
- 64GB = 65,536MB

HP ggggg eRxff DDR4 wwwwm a bb-ccd Kit

**Capacity**
- 4GB
- 8GB
- 16GB
- 32GB
- 64GB

**Rank**
- 1R = single
- 2R = dual
- 4R = quad

Data Width
- x8 = 8
- x4 = 4

**Memory Type**

**Module Bandwidth**
- 17000MT/s (DDR4-2133)

**DIMM Type**
R = Registered
L = Load Reduced

**CAS Latency**
- P = 15-15-15

**Special Descriptor**
(If Needed)
HS = Heat spreader

## Storage

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

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

## Technical Specifications

| System Unit | Dimensions (H x W x D) | 8 SFF – 1.69 x 17.11 x 23.92 inches (4.29 x 43.46 x 60.76 cm)<br>4 LFF – 1.7 x 17.1 x 23.9 inches (4.29 x 43.46 x 60.76 cm) | |
|---|---|---|---|
| | Weight (approximate) | Maximum: (all hard drives, power supplies, and processors installed) | 33.04 lb (15kg) |
| | | Minimum: (one hard drive, power supply, and processor installed) | 22.03 lb (10kg) |
| | Input Requirements for Standard 460W PSU, see power specifications tables for detail on 460W, 750W and 1200W power supplies) | Rated Line Voltage | 100 to 240 VAC |
| | | Rated Input Current | For 550W Power Supply:<br>6.7 A (at 100 VAC)<br>3.3 A (at 100 VAC) |
| | | Rated Input Frequency | 47 to 63 Hz |
| | | Rated Input Power | For 550 W Power Supply:<br>< 670 W (at 100 VAC),<br>< 660 W (at 200 VAC), |
| | BTU Rating | Maximum | For 550 W Power Supply:<br>2201 BTU/hr (at 100 VAC),<br>2153 BTU/hr (at 200 VAC) |
| | Power Specifications | To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: http://www.hp.com/go/proliant-energy-efficient or http://www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: DL160 Gen9- Follow the instructions of the next screens. | |
| | Power Supply Output | Rated Steady-State Power | For 550 W Power Supply:<br>550 W (at 100 VAC),<br>550 W (at 200 VAC), |
| | | Maximum Peak Power | For 550 W Power Supply:<br>550 W (at 100 VAC),<br>550 W (at 200 VAC), |
| | System Inlet Temperature | Standard Operating Support | 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 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 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae.<br><br>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 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae.<br><br>System performance may be reduced if operating in the extended ambient operating range or with a fan fault. |

## Technical Specifications

|  |  |  |
|---|---|---|
|  |  | **NOTE:** Supports A3 and A4 extended ambient. |
|  | Non-operating | -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr). |
| **Relative Humidity** | 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-condensing) | Non-operating | 5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing. |
| **Altitude** | Operating | 3048 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min). |
|  | Non-operating | 9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min). |

**Acoustic Noise**

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

**Idle**

| L WAd | Entry 5.1 B |
|---|---|
|  | Base 5.2 B |
|  | Performance 5.0 B |
| L pAm | Entry 34.2 dBA |
|  | Base 35.9 dBA |
|  | Performance 34.9 dBA |

**Operating**

| L WAd | Entry 5.3 B |
|---|---|
|  | Base 5.3 B |
|  | Performance 5.6 B |
| L pAm | Entry 36.3 dBA |
|  | Base 36.2 dBA |
|  | Performance 39.7 dBA |

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

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

| HP Dynamic Smart Array B140i Controller | Number of PCI links | Four |
|---|---|---|
|  | PCI link rate | 4 Gb/s |
|  | Storage protocol support | SATA |
|  | SAS/SATA peak data tranfer rate | 6 Gb/s |
|  | Number of SAS/SATA links | 10 links |
|  | SAS/SATA connectivity | 2x4 connectors; 2x1 connectors |
|  | Expander support | No |
|  | Drives supported (max) | Up to 10 Internal Drives |
|  | RAID support | 0, 1, 10, 5 SATA |

## Technical Specifications

| | | |
|---|---|---|
| **Software management** | HP SSA, SMH, SIM | |
| **Warranty** | Server warranty | |
| **HP Secure Encryption license** | Not Supported | |
| **HP SmartCache License** | Not Supported | |
| **HP Smart Storage Administrator** | Supported | |

| | | | |
|---|---|---|---|
| **HP Embedded Dual Port 361i Adapter** | **Network Interface** | 10Base-T/100Base-TX/1000Base-TX | |
| | **Compatibility** | IEEE 802.3 10Base-T<br>IEEE 802.3ab 1000Base-T<br>IEEE 802.3u 100Base-TX<br>IEEE 1588, IEEE 802.1AS<br>IEEE 802.3az - Energy Efficient Ethernet (EEE) | |
| | **Ports** | | |
| | **Data Transfer Method** | PCI Express v 2.0, 5.0 GT/s, two lanes (x2) | |
| | **Controller** | Intel I350 Powerville | |
| | **Network Transfer Rate** | 10Base-T (Half-Duplex) | 10 Mb/s per port, 40 Mb/s combined |
| | | 10Base-T (Full-Duplex) | 20 Mb/s per port, 80 Mb/s combined |
| | | 100Base-TX (Half-Duplex) | 100 Mb/s per port, 400 Mb/s combined |
| | | 100Base-TX (Full-Duplex) | 200 Mb/s per port, 800 Mb/s combined |
| | | 1000Base-TX (Half and Full-Duplex) | 1000Mb/s per port, 4000 Mb/s combined |
| | **Connector** | Two RJ-45 | |
| | **Cable Support** | 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.<br><br>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/dl160gen9

## Summary of Changes

| Date | Version History | Action | Description of Change |
|---|---|---|---|
| 12/01/2014 | From Version 3 to 4 | Changed | Changes made throughout the entire QuickSpecs. |
| 10/13/2014 | From Version 2 to 3 | Added | 6G SATA Enterprise Value G1 Solid State Drives were added to the Core Option section.<br><br>HP PCIe Workload Accelerator Options and HP USB and SD options were added to the Additional Options section. |
| | | Changed | Standard Features and Optional Features sections were revised. |
| 9/19/2014 | From Version 1 to 2 | Changed | Changes made throughout the entire QuickSpecs. |