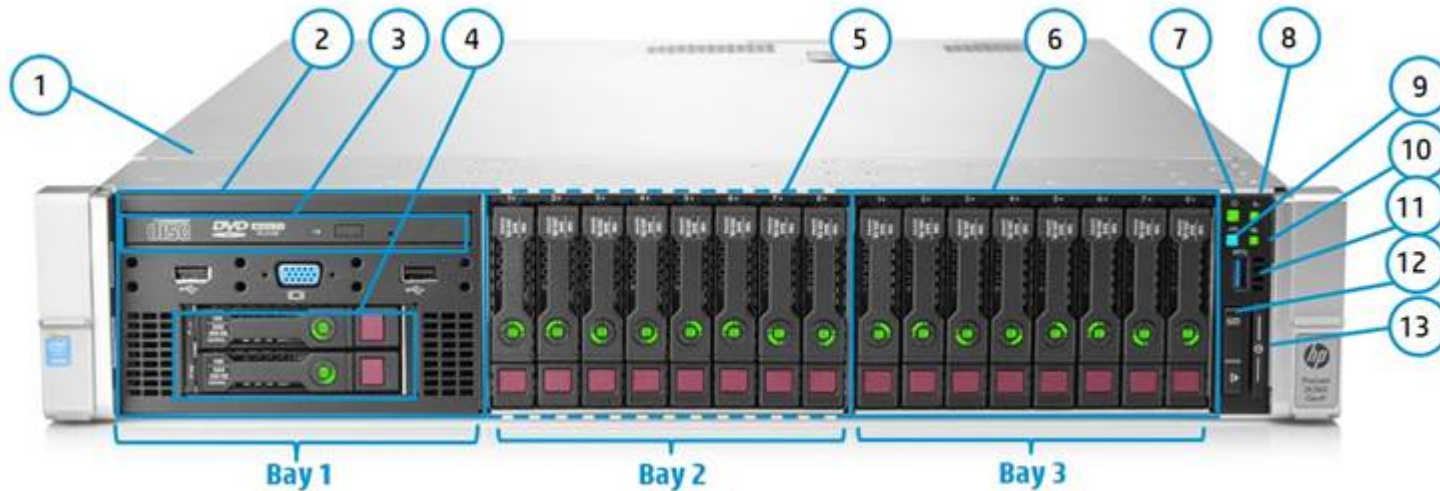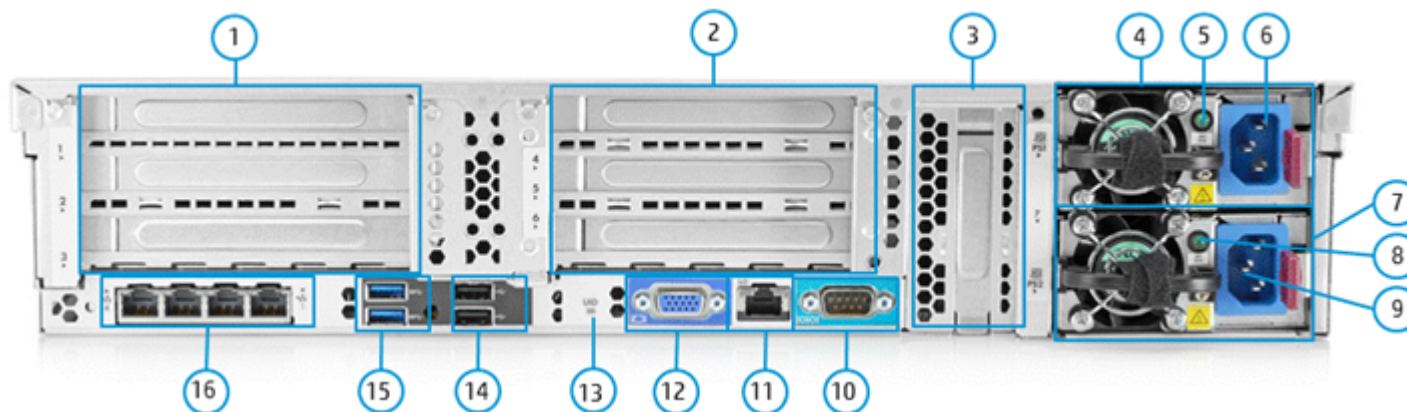Overview

## HP ProLiant DL560 Generation9 (Gen9)

Business-critical workloads and virtualized environments require compact and powerful computing capacity. The HP ProLiant DL560 Gen9 Server is designed for exactly that. To deliver performance, scalability, and expandability in a dense 2U footprint. Deploy the ideal high-density four-socket server for multi-workload compute with the latest technology. It's designed to help you achieve greater performance at the right price.



**Front View**

1.  Quick removal access panel
2.  Bay 1 - Optional 8 SFF Drive Bay or Universal Media Bay
3.  Optional Optical drive. Requires Universal Media Bay
4.  Optional 2 SFF HDDs. Requires Universal Media bay.
5.  Bay 2 - Optional 8 SFF Drive Bay
6.  Bay 3 - fixed 8 SFF Drive Bay
7.  Power On/Standby button and system power LED button
8.  Health Status LED
9.  UID button
10. NIC Status LED
11. USB 3.0 connector
12. Systems Insight Display (SID) (optional)
13. Serial label pull tag



**Rear View**

## Overview

1.  PCIe Slots (Slots 1-3 top to bottom)
2.  PCIe Slots (Slots 4-6 top to bottom)
3.  PCIe Slot  (Slot 7)
4.  HP Common Slot Power Supply bay 1
5.  Power supply power LED
6.  Power supply power connection
7.  HP Common Slot Power Supply bay 2
8.  Power supply power LED
9.  Power supply power connection
10. Serial connector
11. Dedicated iLO connector
12. VGA (video) connector
13. Unit ID LED
14. USB 2.0 connectors (2)
15. USB 3.0 connectors (3)
16. HP FlexibleLOM ports
    (Shown:4x1GbE/Optional:2x10GbE);port1 on right side

## Standard Features

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

**Processor**
Up to four of the following depending on model

| Model | CPU frequency | Cores | L3 Cache | Power | QPI | DDR4 Hz |
|-------|---------------|-------|----------|-------|-----|---------|
| E5-4669v3 | 2.1GHz | 18 | 45MB | 135W | 9.6GT/s | 2133 |
| E5-4667v3 | 2.0GHz | 16 | 40MB | 135W | 9.6GT/s | 2133 |
| E5-4660v3 | 2.1GHz | 14 | 35MB | 120W | 9.6GT/s | 2133 |
| E5-4655v3 | 2.9GHz | 6 | 30MB | 135W | 9.6GT/s | 2133 |
| E5-4650v3 | 2.1GHz | 12 | 30MB | 105W | 9.6GT/s | 2133 |
| E5-4640v3 | 1.9GHz | 12 | 30MB | 105W | 8.0GT/s | 1866 |
| E5-4627v3 | 2.6GHz | 10 | 25MB | 135W | 8.0GT/s | 2133 |
| E5-4620v3 | 2.0GHz | 10 | 25MB | 105W | 8.0GT/s | 1866 |
| E5-4610v3 | 1.7GHz | 10 | 25MB | 105W | 6.4GT/s | 1600 |

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

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

45MB (1 x 45MB) Level 3 cache (E5-4669 v3)
40MB (1 x 40MB) Level 3 cache (E5-4667 v3)
35MB (1 x 35MB) Level 3 cache (E5-4660 v3)
30MB (1 x 30MB) Level 3 cache (E5-4650 v3, E5-4640 v3, E5-4655 v3)
25MB (1 x 25MB) Level 3 cache (E5-4620 v3, E5-4627 v3, E5-4610 v3)

**Chipset**

Intel® C610 Series Chipset
Intel® Xeon® E5-4600v3 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**

HP iLO (Firmware HP iLO4 2.0) 4GB NAND

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

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

| | | |
|---|---|---|
| DIMM Slots Available | 48 | (12 DIMM slots per processor, 4 channels per processor, 3 DIMMs per channel) |
| Maximum Capacity (LRDIMM) | 3.0TB | (48 x 64GB LRDIMM @2133MHz) |
| Maximum Capacity (RDIMM) | 1.5TB | (48 x 32GB RDIMM @2133MHz) |

**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. For additional information, please see the HP SmartMemory QuickSpecs.
**NOTE:** LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.
**NOTE:** Depending on the memory configuration and processor model, the memory speed may run at 2133, 1866MHz, 1600MHz. Please see Memory Population Table below or the Online Memory Configuration Tool.
**NOTE:** 64GB LRDIMM to be available in second half of 2015.

## Standard Features

| **Memory Protection** | 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. |
| | Mirroring mode | Memory mirroring inter-socket stores a copy of memory with dynamic failover in case of failure. Once a DIMM in a mirrored set is detected as failed, the mirror failover uses its mirrored DIMM. |
| | Demand and Patrol Scrubbing | Memory demand and patrol scrubbing prevent accumulation of correctable errors and reduces the likelihood of unplanned downtime. |
| | Failed DIMM Isolation | Failed DIMM isolation improves the service time thus improving the overall system availability. |
| | Data Bus ECC Protection | Data Bus ECC protection provides automatic correction from a single data bit error and detection of double data error bits. Often called single error correction/double error detection (SEC/DED). |
| | Memory Thermal Control | Memory thermal control is used to prevent DIMMs from overheating. Achieved by slowing down the memory access rate per the temperature monitored by DIMM sensor. |
| | Memory Mirroring Inter-Socket | Memory mirroring inter-socket stores a copy of memory with dynamic failover in case of failure. Once a DIMM in a mirrored set is detected as failed, the mirror failover uses its mirrored DIMM. |

**Network Controller** The HP ProLiant DL560 Gen9 servers offer a flexible network technology - FlexibleLOM, which offers customers a choice of 1Gb, 10Gb, or 10Gb base-T Ethernet or converged networking in their embedded adapter. A range of NIC cards are also available to enhance networking capabilities.

**NOTE:** For additional details see the Networking Section of this document.

| Model | Adapter |
|---|---|
| Entry Model | HP Ethernet 1Gb 4-port 331FLR Adapter |
| Base Model | HP FlexFabric 10Gb 2P 533FLR-T Adapter |
| Performance Model | HP FlexFabric 10Gb 2P 533FLR-T Adapter |

**Expansion Slots**

**Primary Riser (Standard)**

| Expansion Slots # | Technology | Bus Width | Connector Width | Form Factor | Notes |
|---|---|---|---|---|---|
| 1 | PCIe 3.0 | x8 | x16 | Half Length/Full Height | Proc 1 |
| 2 | PCIe 3.0 | x8 | x16 | Half Length/Full Height | Proc 1 |
| 3 | PCIe 3.0 | x8 | x8 | Half Length/Full Height | Proc 1 |

**Slot 1 Primary Riser (Optional 2 slot)**

| Expansion Slots # | Technology | Bus Width | Connector Width | Form Factor | Notes |
|---|---|---|---|---|---|
| 2 | PCIe 3.0 | X16 | X16 | Half Length/Full Height | Proc 1 |
| 3 | PCIe 3.0 | x8 | X8 | Half Length/Full Height | Proc 1 |

**Secondary Riser (Optional)**

| Expansion Slots # | Technology | Bus Width | Connector Width | Form Factor | Notes |
|---|---|---|---|---|---|
| 4 | PCIe 3.0 | x16 | x16 | Half Length/Full Height | Proc 2 |
| 5 | PCIe 3.0 | x8 | x16 | Half Length/Full Height | Proc 2 |
| 6 | PCIe 3.0 | x8 | x8 | Half Length/Full Height | Proc 2 |

**Expansion Slot 7**

| Expansion Slots # | Technology | Bus Width | Connector Width | Form Factor | Notes |
|---|---|---|---|---|---|
| 7 | PCIe 3.0 | x8 | x16 | Low Profile | Proc 2 |

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

| Entry Models | HP Dynamic Smart Array B140i Controller |
|---|---|
| Base Models | HP Flexible Smart Array P440ar/2GB controller |

The P440ar Flexible Smart Array controller is in its own dedicated slot, enables SAS drives and has 2GB Flash Backed Write Cache for data retention.

Performance Models HP Smart Array P840/4GB Controller
The P840 Flexible Smart Array controller enables SAS drives and has 4GB Flash Backed Write Cache for enhanced data retention.

## Standard Features

| | | |
|---|---|---|
| **Internal Storage Devices**<br>One of the following depending on model | Hard Drives | None ship standard |
| | Hard Drive Bays | (8) Hot plug SFF SAS/SATA HDD bays in Entry and Base Models, (16) in Performance Models; upgradable to a maximum of (24)<br>For drives: Bay3 (8SFF) is standard; Bay 2 (8SFF) is populated next, followed by Bay 1(8SFF)<br>If one of the two Optional Universal Media Bay Kits is chosen, a maximum of (18) SFF drives are available as versus (24). Universal Media Bay Kits occupy Bay1 and can include an optional Optical Disk Drive; a version has an optional 2SFF drive bay as well. |
| | Optional Optical Drive | Available via Universal Media Bay kit; with and without (2)SFF drive bay<br>An optional optical drive can be added to either the Universal Media Bay Kit with 2SFF drive bay (793479-B21) or the Universal Media Bay Kit without 2SFF drive bay (795090-B21). |

| **Maximum Internal Storage** | CAPACITY | CONFIGURATION |
|---|---|---|
| Hot Plug SFF SATA | 48 TB | 24 x 2 TB |
| Hot Plug SFF SAS | 48 TB | 24 x 2 TB |
| Hot Plug SFF SATA SSD | 38 TB | 24 x 1.6TB |
| Hot Plug SFF SAS SSD | 46 TB | 24 x 1.92TB |

| | |
|---|---|
| **Power Supply**<br>One of the following depending on model | (1) HP 1200W Common Slot Platinum Hot Plug Power Supply<br>**NOTE:** Entry Models have a single HP 1200W Common Slot Platinum Hot Plug Power Supply.<br>(2) HP 1200W Common Slot Platinum Plus Hot Plug Power Supplies<br>**NOTE:** Base and Performance Models have redundant HP 1200W Common Slot Platinum Plus Hot Plug Power Supplies. |

| | |
|---|---|
| **Common Slot Power Supplies** | One of the following depending on power requirements:<br><br>HP 1500W Common Slot Platinum Plus Hot Plug Power Supply<br>HP 1500W Common Slot 48VDC Hot Plug Power Supply<br>HP 1200W Common Slot Platinum Plus Hot Plug Power Supply<br>HP 1200W Common Slot Platinum Hot Plug Power Supply<br><br>**NOTE: HP** 1500W Common Slot Platinum Plus Hot Plug Power Supply supports high line voltage only.<br><br>Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor.<br><br>HP's Common Slot (CS) power supplies allow for commonality of power supplies across a wide range of ProLiant and Integrity servers, as well as HP Storage solutions, and are designed to provide the highest power supply efficiency without degrading system performance. HP CS power supplies are tested by the Electric Power Research Institute (EPRI) and certified through the ECOS 80 Plus power supply program. HP CS power supply options provide efficiency ratings of up to 94% (80 Plus Platinum) and are available in several power output options including - 1200W, 1500W - allowing the customer to "right-size" a power supply for their specific server configuration. All HP Common Slot power sources are UL, CE Mark Compliant, hot-plug and support redundant configurations.<br><br>HP CS Platinum Plus power supplies are required when enabling HP's Intelligent Power Discovery (IPD) solution. IPD is the first technology to create an automated, energy-aware network between IT systems and facilities. This allows your company to reclaim millions of dollars in wasted power capacity and downtime costs across data centers. For more information on HP's IPD solution, go to http://www.hp.com/go/ipd.<br><br>**NOTE:** Mixing of power supplies in the same server is not supported. All power supplies must be of the same output and efficiency rating. If non-matched power supplies are inserted you will get errors and operation will fail.<br><br>**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 |

## Standard Features

required, please check the ProLiant Power Cables web page.

| | |
|---|---|
| **System Fans** | 6 Hot Plug Fans with N+1 redundancy |

| **Interfaces** | | |
|---|---|---|
| | Serial | 1 rear |
| | Video | 1 front (optional with Universal Media Bay kit); 1 rear |
| | iLO 4 Remote Management | 1 |
| | Micro SD dual Slot | 1 |
| | USB 2.0 Ports | 5 total: 2 front (optional); 2 rear; 1 internal |
| | USB 3.0 Ports | 4 total: 1 front; 2 rear, 1 internal |

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

Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
VMware
**NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page http://www.hp.com/support/DL560Gen9.

**Upgradeability**

Upgradeable to four (4) processors
Up to 48 DIMM slots
7 PCIe 3.0 I/O slots for additional communications and storage expansion
**NOTE:** PCIe slot availability is dependent on the number of processors installed. Please refer to the "Expansion Slots" section for more details.
**NOTE:** The HP ProLiant DL560 Gen9 server has a dedicated FlexibleLOM slot and a slot for either a HP Flexible Smart Array or a Smart SAS HBA controller in addition to the 7 PCI 3.0 I/O expansion slots.
Embedded 10-Port SATA, B140i as standard
HP Flexible Smart Array, Smart Array or Smart HBA Controllers
FlexibleLOM slot for 1Gigabit or 10 Gigabit Ethernet or QDR/FDR InfiniBand networking options
Up to 24 SFF Drives; or 18 SFF Drives with optional Universal Media Bay
Optional System Insight Display
Redundant Power Supplies

**Industry Standard Compliance**

PCIe 3.0 Compliant
PCIe 2.0 Compliant
ACPI 2.0. Compliant
PXE Support
WOL Support
Microsoft® Logo certifications
USB 2.0 Support
USB 3.0 Support
Energy Star
ASHRAE A3/A4
**NOTE:** For additional technical thermal details regarding ambient temperatures, humidity and features support please visit: http://www.hp.com/servers/ASHRAE.

**Graphics**

Integrated Matrox G200 video standard
- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

HP iLO 4 On System Management Memory
- 16 MB Flash
- 256 MB DDR 3 with ECC (112 MB after ECC and video)

## Standard Features

| | |
|---|---|
| **HP Server UEFI/Legacy ROM** | **Legacy Mode or Unified Extensible Firmware Interface (UEFI) Mode** |

HP's ProLiant System BIOS is an EDK2 UEFI solution, and adheres to the latest revisions of UEFI Class 2 specifications which supports both legacy boot and UEFI boot operation. The HP ProLiant DL560 Gen9 defaults to UEFI boot operation and can be factory or field configured for legacy boot operation.

**NOTE:** For UEFI boot operation, boot environment and OS image installations should be configured properly to support UEFI.
**NOTE:** For more information on HP's ProLiant System BIOS and UEFI, see the UEFI Information Library: http://www.hp.com/go/uefi/docs.
**NOTE:** HP Legacy FIO Mode Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory.

To modify the server configuration ROM default settings, press F9 in the HP ProLiant POST screen to enter the UEFI System Utilities screen. By default, the System Utilities menus are in the English language.

UEFI enables numerous new capabilities, including both industry standard functionality and features specific to HP ProLiant servers. Following are some of the features that UEFI enables and that the HP ProLiant DL560 Gen9 can support when configured for UEFI boot operation:

- Secure Boot - A new feature in which the system firmware, option card firmware, operating systems, and software collaborate to greatly enhance platform security.
- Operating system specific functionality - Microsoft Windows 2012 supports several features only when installed in UEFI mode.
- Support for > 2.2 TB (using GPT) boot drives - Such drives could previously only be used for boot drives when using RAID solutions such as HP Smart Array.
- UEFI Shell - Provides a pre-boot environment for running scripts and tools. The HP ProLiant UEFI Shell provides both standard capabilities as well as numerous enhancements.
- PXE boot support for IPv6 networks.
- PXE Multicast Boot allowing for faster PXE deployments for large numbers of servers.
- Boot support for option cards that only support a UEFI option ROM.

**NOTE:** When the server is configured for UEFI Boot Mode, PXE servers must be configured with a UEFI boot image.
When the server boots in UEFI mode, it does not boot media with a legacy OS installation. This includes DOS targets and Windows or Linux systems installed in Legacy mode. The reverse is also true for servers that boot in Legacy mode.

| | |
|---|---|
| **Form Factor** | 2U Rack Form Factor |

Entry, Base and Performance pre-configured models ship with Gen9 Easy Install Rail Kits and Cable Management Arm kit

3.44" (8.74 cm) Height x 17.54" (44.55 cm) Width x 29.5" (74.94 cm) Length

## Standard Features

| | | |
|---|---|---|
| **Embedded Management** | **HP Integrated Lights-Out (HP iLO)**<br>Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at http://www.hp.com/go/ilo. | |
| | **UEFI**<br>Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at<br>http://www.hp.com/go/ProLiant/uefi. | |
| | **HP RESTful API**<br>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**<br>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**<br>HP's embedded remote support, 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. | |

| | | |
|---|---|---|
| **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 thru Gen9 servers, with use of the REST API and 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 orhttp://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 |

## Standard Features

**Warranty**

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

**NOTE:** Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:

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

## Optional Features

| | | |
|---|---|---|
| **Embedded Management** | **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 reduces infrastructure complexity with automation simplicity. This modern architecture accelerates your IT operations across servers, storage, and network resources using software-defined approaches and automation. Learn more at http://www.hp.com/go/oneview. |
| | **HP Insight Cluster Management Utility (CMU)** | HP Insight Cluster Management Utility is a hyperscale-optimized management framework that includes software for the provisioning, control, performance management and monitoring of groups of nodes and infrastructure. Learn more at http://www.hp.com/go/cmu. |

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

**HP HPC Interconnects**
High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html

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

## Optional Features

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

Storage software that gets the job done:

- **Data Protection and Recovery Software**
  Whether you're a large enterprise or a smaller business, HP data protection and recovery software will cost-effectively protect you against disaster and ensure business continuity.
- **Data Archive and Migration Software**
  HP's storage software enables you to comply with data retention and retrieval requirements, improve application performance, and reduce costs by efficiently migrating infrequently accessed or less valuable data to lower cost storage.
- **Storage Resource Management Software (SRM)**
  HP's storage resource management software reduces operational costs and provides the command and control foundation you need to efficiently manage and visualize your physical and virtual environments.
- **Data Replication Software**
  HP offers array-based and host-based replication software for use in disaster recovery, testing, application development and reporting.
- **Storage Device Management Software**
  Maximize your investment in HP storage and networking with software that enables hardware-specific configuration, performance tuning and connectivity management.
- **HP StoreVirtual VSA**
  With HP StoreVirtual VSA you can use the power of virtualization to turn a set of heterogeneous and disconnected physical disk drives in your servers and storage devices into a single pool of logical storage capacity.

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

**Solutions**    **Factory Express  Portfolio for Servers and Storage**

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

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

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

**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**<br>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.<br><br>**Protect your business beyond warranty with HP Care Pack Services**<br>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 Care** | **Supports maintaining servers at optimum performance availability**<br><br>**HP Proactive Care with 24x7 coverage, three year Care Pack Service**<br>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 highest level reactive coverage and enhanced escalation management, HP's 24x7, six hour call-to-repair hardware commitment. HP is the only leading manufacturer who makes this level of coverage available as a standard service offering for your most valuable servers. Service includes 24x7 collaborative software support for leading industry standard software running on your HP ProLiant server.<br>http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf |
| **Standard Care Package** | **Supports maintaining high level of server availability**<br><br>**Foundation Care 24x7, three-year Care Pack Service**<br>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.<br>http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf |
| **Related Services** | **HP ProLiant Server Hardware Installation**<br>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.<br>http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf<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. 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:<br>http://www.hp.com/go/factory-express.<br><br>**Data Privacy Services**<br>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.<br>http://www.hp.com/services/dataprivacy<br>Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc |
| **Connect your devices to HP** | Unlock all of the benefits of your technology investment by connecting your products to HP. Achieve up to 77% reduction in down time, near 100% diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HP Proactive Care Service and HP Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to HP support. |
| **HP Support Center** | Personalized online support portal with access to information, tools and experts to support HP |

## Service and Support

business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc

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

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

**Parts and Materials**

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

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

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

## 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.
4. Not all models are available in all regions. Check with your local country HP offices for availability.

**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.
**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.

| | Performance Models | Base Models |
|---|---|---|
| **[SKU Number]** | 741066-B21 | 741065-B21 |
| **Model Name** | HP ProLiant DL560 Gen9 E5-4640v3 4P 128GB-R P840/4GB 16SFF 2x1200W RPS Perf Server | HP ProLiant DL560 Gen9 E5-4620v3 2P 64GB-R P440ar/2GB 8SFF 2x1200W RPS Base Server |
| **Processor** | Intel® Xeon® E5-4640v3 | Intel® Xeon® E5-4620v3 |
| **Number of Processors** | Four | Two |
| **Memory** | 128GB (8x16GB Registered DIMMs, 2133 MHz) **NOTE:** 48 DIMM slots available with Performance Model. Includes HP ProLiant DL560 Gen9 CPU Mezzanine Board. | 64GB (4x16GB Registered DIMMs, 2133 MHz) **NOTE:** 24 DIMM slots available with Base Model; 2 more processor slots and 24 more DIMMs available via optional HP ProLiant DL560 Gen9 CPU Mezzanine Board Kit (795107-B21). |
| **Network Controller** | HP FlexFabric 10Gb 2P 533FLR-T Adapter ||
| **Storage Controller** | HP Flexible Smart Array P840/4GB Controller **NOTE:** Additional Storage controllers also available as options. | HP Flexible Smart Array P440ar/2GB **NOTE:** Additional stand up Storage controllers with up to 4GB FBWC available as options. |
| **Hard Drive** | None ship standard ||
| **Internal Storage** | 16 SFF Drive Bays **NOTE:** Can be expanded upto a max of 24 SFF drives, with optional HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane Kit (795085-B21). Alternatively, optional Universal Media Bay Kits may be chosen for Bay1 - with 2SFF drive bay (793479-B21) or without (795090-B21). **NOTE:** Bay 3 and Bay 2 are populated. | 8 SFF Drive Bays **NOTE:** Can be expanded upto a max of 24 SFF drives, with optional HP ProLiant DL560 Gen9 Bay2 8SFF Cage/Backplane Kit (795084-B21) and HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane Kit (795085-B21). Alternatively, optional Universal Media Bay Kits may also be chosen for Bay1 - with 2SFF drive bay (793479-B21) or without (795090-B21). **NOTE:** When considering drives Server comes with Bay 3 populated as default with 8SFF. Bay 2 must be populated before Bay1. |
| **Optical Drive Bay** | Optional via Universal Media Bay ||
| **Optical Drive** | Optional DVD-ROM (726536-B21) or DVD-RW (726537-B21) via the Universal Media Bay Kits (795090-B21 or 793479-B21) ||
| **PCI-Express Slots** | 7 PCIe 3.0 slots available; Secondary 3 Slot Riser kit (793474-B21) installed ||
| **Power Supply** | (2) HP 1200W Common Slot Platinum Plus Hot Plug Power Supplies ||
| **Fans** | 6 hot plug fans, redundant ||
| **Management** | HP OneView Advanced with iLO Advanced | Integrated Lights-Out 4 (iLO 4) ships standard |
| **Energy Star** | Meets Energy Star requirements ||
| **Form Factor** | Rack (2U), HP Easy Install Rails with CMA ||
| **Warranty** | Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response ||

## Pre-configured Models

| | Entry Models |
|---|---|
| **[SKU Number]** | 741064-B21 |
| **Model Name** | HP ProLiant DL560 Gen9 E5-4610v3 2P 32GB-R B140i 8SFF SATA 1200W PS Entry Server |
| **Processor** | Intel® Xeon® E5-4610v3 |
| **Number of Processors** | Two |
| **Memory** | 32GB (2x16GB Registered DIMMs, 2133 MHz)<br>**NOTE:** 24 DIMM slots available with Entry Model; 2 more processor slots and 24 more DIMMs available via optional HP ProLiant DL560 Gen9 CPU Mezzanine Board Kit (795107-B21). |
| **Network Controller** | HP Ethernet 1Gb 4P 331FLR Adapter |
| **Storage Controller** | HP Dynamic Smart Array B140i<br>**NOTE:** Additional Storage controllers including HP Flexible Smart Array, HP Smart Array and HP Smart HBA also available as options, to enable both SAS capability as well as provide data retention with Flash Backed Write Cache (FBWC). |
| **Hard Drive** | None ship standard |
| **Internal Storage** | 8 SFF Drive Bays<br>**NOTE:** Can be expanded upto a max of 24 SFF drives, with optional HP ProLiant DL560 Gen9 Bay2 8SFF Cage/Backplane Kit (795084-B21) and HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane Kit (795085-B21). Alternatively, optional Universal Media Bay Kits may also be chosen for Bay1 - with 2SFF drive bay (793479-B21) or without (795090-B21).<br>**NOTE:** Server comes with Bay 3 populated as default with 8SFF. When considering drives Bay 2 must be populated before Bay1. |
| **Optical Drive Bay** | Optional via Universal Media Bay |
| **Optical Drive** | Optional DVD-ROM (726536-B21) or DVD-RW (726537-B21) via the Universal Media Bay Kits (795090-B21 or 793479-B21) |
| **PCI-Express Slots** | 4 PCIe 3.0 slots available; upgrade to 7 PCIe 3.0 slots would require optional Secondary Riser kit (793474-B21) |
| **Power Supply** | (1) HP 1200W Common Slot Platinum Hot Plug Power Supply |
| **Fans** | 6 hot plug fans, redundant |
| **Management** | Integrated Lights-Out 4 (iLO 4) ships standard |
| **Energy Star** | Meets Energy Star requirements |
| **Form Factor** | Rack (2U), HP Easy Install Rails with CMA |
| **Warranty** | Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response |

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

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

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

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

**NOTE:** Not all models are available in all regions. Check with your local country HP offices for availability.

| **Country Code Key** | xx1 = B21 | Worldwide |
|---|---|---|
| | xx1 = 291 | Japan |
| | xx1 = AA1 | PRC |

# QuickSpecs

## 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, HI 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 DL560 Gen9 Configure-to-order Server |
|---|---|
| **SKU Number** | 742657-B21 |
| **Processor** | 2U Server Chassis with 2 processor slots available; 4 processor configuration would require optional HP ProLiant DL560 Gen9 CPU Mezzanine Board kit |
| **DIMM Slots** | 24 DIMM slots for RDIMM, LRDIMM DDR4 Memory |
| **Storage Controller** | HP Dynamic Smart Array B140i; additional options including Flexible Smart Array, Smart Array and Smart HBA controllers. |
| **PCIe** | 4 PCIe 3.0 slots (all 4 available if second processor is chosen, which also enables +3 PCI 3.0 slots with optional Secondary Riser Kit upgrade) |
| **Drive Cage** | 8SFF Hot Plug (Upgrades possible with +16SFF optional or +10 optional with optional Universal Media Bay Kit in Bay 1 with optional 2SFF).<br>**NOTE:** Server comes with Bay 3 populated as default. |
| **Network Controller** | Flexible LOM slot (various options can be chosen for networking; NIC cards also available via expansion slots) |
| **Fans** | 6 hot plug fans, redundant |
| **Management** | HP Integrated Lights-Out 4 (iLO4) standard management, HP iLO4 Embedded Remote Support Technology, HP Insight Control Server Provisioning, HP Insight Online, HP Active Health System, System Insight Display |
| **USB** | (8) USB 2.0 ports (2 front, 4 rear, 2 internal) |

(Base Configuration Continued)
Intel® C610 Chipset
(2) video ports (1 front optional via the Universal Media Kit upgrade option, 1 rear)
(1) dual microSD card slot
(1) Trusted Platform Module (TPM) connector
BIOS Legacy mode (field configurable) or Unified Extensible Firmware Interface (UEFI) mode (default)
Easy Install rails and cable management arm are optional

**NOTE:** PCIe slot availability is dependent on the number of processors installed. Please refer to the "Expansion slots" section for more details.
**NOTE:** A minimum of one processor is required. The system supports one, two or four processors installed.

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

## Configuration Information - Factory Integrated Models

**HP Processors**  Select one or two processors from Core options-Processor section below,
- If one processor is desired, select one xxxxxx-L21
- If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.
- Up to 4 processors supported. Mixing different processor models is not supported.
- DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

For the Intel® C610 Chipset E5-4600 Series, the letter preceding the model number indicates the Product Line (, E5); 4600x v#, 4 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, x = L for low power SKUs and v3= version number.

**HP Memory**  Select one or more memory from Core options-Memory section below,
- LRDIMM, RDIMM are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen9 servers support LRDIMM and RDIMM.
- 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.
- 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.
- 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.
- Depending on the memory configuration and processor model, the memory speed may run at 2133MHz, 1866MHz or 1600MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: http://www.hp.com/go/ddr4config.

**HP Power Supplies**  Select one or more power supplies from Core Options-Power Supplies section below:
- 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.
- 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.

## Step 3: Choose Additional Factory Integratable Options

**HP Unique Options**  Select one or more Unique options from Core options section below.
- This section may contain FIO options, please see the Unique options section below.
- FIO indicates that this option is only available as a factory installable option.

**HP I/O Expansion Options**  Select one or more Riser Kit options from Core options section below.
- To take advantage of the additional PCI slot upgrade, the second processor must be installed.
- This section may contain FIO options, please see HP I/O Expansion Options section below.
- FIO indicates that this option is only available as a factory installable option.

**HP Drives**  Select one or more drives from Core options-HP Drives section below:
- The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.
- Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
- The HP ProLiant Gen9 Smart Storage solutions are equipped with re-designed Small Form Factor (SFF 2.5 in) hot plug carriers for HP Qualified Hard Drives and Solid State Drives. These new carriers provide status and activity indicators as well as caution indicators for "Do Not Remove".

**HP Flexible LOM**  Select a FlexibleLOM from Core options-Networking section below,
- Only one FlexibleLOM can be added to the server. These options are upgradeable and can be changed from the original configuration after the server is shipped.
- For 10Gb adapters, a minimum of two Gigabytes (2 GB) of server memory is required per each adapter.
- Please see the QuickSpecs for Technical Specifications and additional information: http://www.hp.com/go/ProLiantNICs.

**HP Networking**  Select a standup NIC adapter from Core options-Networking section below,
- Please see the QuickSpecs for Technical Specifications and additional information:

## Configuration Information - Factory Integrated Models

http://www.hp.com/go/ProLiantNICs.

- These options are upgradeable and can be changed from the original configuration after the server is shipped.
- For 10Gb adapters, a minimum of two Gigabytes (2 GB) of server memory is required per each adapter.

**HP Storage Controllers**

Select one or more Storage options from Additional options section below.

- The embedded B140i controller will operate in UEFI only mode. For legacy support an additional controller will be needed, and for CTO orders please also select the Legacy mode settings part, 758959-B22
- This section may contain FIO options, please see HP Storage Controllers section below.
- FIO indicates that this option is only available as a factory installable option.

**HP Rail Kits**

Select one type of rail kit from Additional options section below.

- Please take a moment to review the installation documentation that comes with the server to help you with the installation of your Gen9 server.
- See HP Rack Options in Additional Options section of this QuickSpecs for more rack kit choices.

**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.

**HP OneView Advanced**

Select the Converged Management option from Additional options section below.

- The FIO version of HP OneView Advanced, E5Y43A, loads the license key onto the physical server for immediate 'Connect and Go' operation when added into the management network of the HP OneView management appliance.
- HP OneView Advanced includes an HP iLO Advanced license -- and the right-to-use HP Insight Control, HP Insight Control server provisioning, and enterprise integrations for VMware vCenter and Microsoft System Center.

## Core Options

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

| | | |
|---|---|---|
| **HP Unique Options** | HP ProLiant DL560 Gen9 CPU Mezzanine Board Kit | 795107-B21 |

**NOTE:** This kit is required if configured with 4 processors.

HP ProLiant DL560 Gen9 Bay2 8SFF Cage/Backplane Kit     795084-B21

**NOTE:** This optional kit adds 8SFF drives for Bay2.

HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane Kit     795085-B21

**NOTE:** This optional kit adds 8SFF drives for Bay1.

HP ProLiant DL560 Gen9 Primary 2 Slot Riser Kit     793475-B21

**NOTE:** This is an optional PCIe riser kit for the Primary Riser Slot 1

HP ProLiant DL560 Gen9 Universal Media Bay Kit     795090-B21

**NOTE:** An optional Optical Disk Drive can be added, either DVD-ROM (726536-B21) or DVD-RW (726537-B21).

HP ProLiant DL560 Gen9 2SFF Universal Media Bay Kit     793479-B21

**NOTE:** Universal Media Bay kit with a 2SFF drive bay; an optional Optical Disk Drive can be added, either DVD-ROM (726536-B21) or DVD-RW (726537-B21).

HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay Kit

                         774743-B21

**NOTE:** "The HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay kit can only be installed in Bay2".

**NOTE:** "The HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane kit cannot be installed in Bay1 when the HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay Kit is installed in Bay2. However, Universal Media Bay kits can be installed in Bay 1.

**NOTE:** Prior to making an HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay kit selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor.

HP ProLiant DL560 Gen9 Bay3 to H240 Slot 7/ Bay 3 to P840/440 Riser1 and 2SFF-UMBay SAS Cable Kit     797924-B21

**NOTE:** Required for connecting Bay1 Universal Media Bay 2SFF drive bay to a P840/P440 controller, or if using controller H240 in slot7 attached to Bay3. Also needed if using controller P840/P440 in riser1 attached to Bay3.

HP ProLiant DL 560 Gen9 Bay 1 to Riser1/AROC and Bay 2/3 to Riser2/Slot7 SAS Cable Kit     797945-B21

**NOTE:** Required if controllers H240/P440ar/H240ar/B140i in riser1/AROC (Smart Array HBA Connector) need to be connected to Bay1, or if controllers P840/P440 in Riser2/slot7 need to be connected to Bay2/3. Also needed if controller P440 in slot7 needs to be connected to Bay2/3.

HP ProLiant DL560 Gen9 Bay 2 to Riser1/AROC and Bay 2/3 to Riser1/2 SAS Cable Kit     797946-B21

**NOTE:** Required if using controllers H240/P440ar/H240ar/B140i in riser1/AROC (Smart Array HBA Connector) which need to be connected to Bay2, or if using controllers P840/P440 in Riser1/2 which need to be connected to Bay2/3.

HP ProLiant DL560 Gen9 SAS Expander Card     804228-B21

HP ProLiant DL560 Gen9 Power Module with SID     795106-Kit     B21

## Core Options

| | |
|---|---|
| **HP Processors** | **Entry Processors - E5-4600v3 series Processors** |

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4610v3 (1.7GHz/10-core/25MB/105W) Processor Kit     742704-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4610v3 (1.7GHz/10-core/25MB/105W) FIO Processor Kit     742704-L21

**Base Processors - E5-4600v3 series Processors**

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4620v3 (2.0GHz/10-core/25MB/105W) Processor Kit     742702-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4620v3 (2.0GHz/10-core/25MB/105W) FIO Processor Kit     742702-L21

**Performance Processors - E5-4600v3 series Processors**

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4627v3 (2.6GHz/10-core/25MB/135W) Processor Kit     742706-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4627v3 (2.6GHz/10-core/25MB/135W) FIO Processor Kit     742706-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4640v3 (1.9GHz/12-core/30MB/105W) FIO Processor Kit     742700-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4640v3 (1.9GHz/12-core/30MB/105W) Processor Kit     742700-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4650v3 (2.1GHz/12-core/30MB/105W) Processor Kit     742698-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4650v3 (2.1GHz/12-core/30MB/105W) FIO Processor Kit     742698-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4655v3 (2.9GHz/6-core/30MB/135W) Processor Kit     742710-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4655v3 (2.9GHz/6-core/30MB/135W) FIO Processor Kit     742710-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4660v3 (2.1GHz/14-core/35MB/120W) Processor Kit     742696-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4660v3 (2.1GHz/14-core/35MB/120W) FIO Processor Kit     742696-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4667v3 (2.0GHz/16-core/40MB/135W) Processor Kit     789024-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4667v3 (2.0GHz/16-core/40MB/135W) FIO Processor Kit     789024-L21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4669v3 (2.1GHz/18-core/45MB/135W) Processor Kit     742708-B21

HP ProLiant DL560 Gen9 Intel® Xeon® E5-4669v3 (2.1GHz/18-core/45MB/135W) FIO Processor Kit     742708-L21

## Core Options

| | | |
|---|---|---|
| **HP Memory** | **NOTE:** HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs . | |
| | **NOTE:** LRDIMM, RDIMM, UDIMM, and HDIMMs are all distinct memory technologies and cannot be mixed within a server. The majority of ProLiant Gen9 servers support LRDIMM, RDIMM and UDIMMs. | |
| | **Registered DIMMs (RDIMMs)** | |
| | HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit | 726718-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 | 728629-B21 |
| | HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit | 759934-B21 |
| | **Load Reduced DIMMs (LRDIMMs)** | |
| | HP 64 GB (1X64GB) Quad Rank x4 DDR4-2133 Load Reduced Memory Kit                                726724-B21 | |
| | HP 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit | 726722-B21 |
| | HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit | 726720-B21 |

| | | |
|---|---|---|
| **HP Optical Drives** | HP 9.5mm SATA DVD-ROM JackBlack Gen9 Optical Drive | 726536-B21 |
| | **NOTE:** The optional Universal Media Bay Kits are required for this option. (HP ProLiant DL560 Gen9 Universal Media Bay kit: 795090-B21 or HP ProLiant DL560 Gen9 2SFF Universal Media Bay kit: 793479-B21). | |
| | HP 9.5mm SATA DVD-RW JackBlack G9 Optical Drive | 726537-B21 |
| | **NOTE:** The optional Universal Media Bay Kits are required for this option. (HP ProLiant DL560 Gen9 Universal Media Bay kit: 795090-B21 or HP ProLiant DL560 Gen9 2SFF Universal Media Bay kit: 793479-B21). | |
| | HP Mobile USB Non Leaded System DVD RW Drive | 701498-B21 |
| | **NOTE:** External drive option. | |

| | | |
|---|---|---|
| **HP Drives** | **NOTE:** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. | |
| | **NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details. | |
| | **12G SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives** | |
| | HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759212-B21 |
| | HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759210-B21 |
| | HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759208-B21 |
| | **12G SAS Hot Plug SFF (2.5-inch) Enterprise Drives** | |
| | HP 1.2TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 781518-B21 |
| | HP 900GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 785069-B21 |
| | HP 600GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 781516-B21 |
| | HP 300GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 785067-B21 |
| | **12G SAS Value Endurance Hot Plug SFF (2.5-inch) Enterprise Value Solid State** | |
| | 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 |
| | **12G SAS Hot Plug SFF (2.5-inch) SC 512e Drives** | |
| | HP 2TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765466-B21 |
| | HP 1.8TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 512e 3yr Warranty Hard Drive | 791034-B21 |
| | HP 1TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765464-B21 |
| | HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC 512e Enterprise 3yr Warranty Hard Drive | 748387-B21 |

## Core Options

**12G SAS Hot Plug SFF (2.5-inch) SC Write Intensive Solid State Drives**

| | |
|---|---|
| HP 800GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802586-B21 |
| HP 400GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802582-B21 |
| HP 200GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802578-B21 |

**12G SAS Read Intensive Hot Plug SFF (2.5-inch) Solid State Drives**

| | |
|---|---|
| HP 1.92TB 12G SAS Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802891-B21 |

**NOTE:** These drives support Gen8 servers and beyond only.

**6G SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise Drives**

| | |
|---|---|
| HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive | 718162-B21 |
| HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652589-B21 |
| HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652583-B21 |
| HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652572-B21 |
| HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652564-B21 |
| HP 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652605-B21 |

**6G SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives**

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

**12G SAS ME Hot Plug SFF (2.5-inch) Enterprise Mainstream H2 Solid State Drives**

| | |
|---|---|
| HP 200GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive | 779164-B21 |
| HP 400GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive | 779168-B21 |
| HP 800GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive | 779172-B21 |
| HP 1.6TB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive | 779176-B21 |

**NOTE:** Please see the HP SAS Hard Drives QuickSpecs for Technical Specifications and additional information.

**6G SATA Hot Plug SFF (2.5 inch) SC Midline Hard Drives**

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

**6G SATA Hot Plug SFF (2.5-inch) SC 512e Drives**

| | |
|---|---|
| HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765453-B21 |
| HP 2TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765455-B21 |

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

| | |
|---|---|
| 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 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 717971-B21 |
| HP 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 739898-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 |

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

## Core Options

| | |
|---|---|
| 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 Value Endurance Hot Plug SFF (2.5-inch) SC Enterprise Value M1 Solid State Drives**

| | |
|---|---|
| HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive | 764923-B21 |
| HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive | 764925-B21 |
| HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive | 764927-B21 |
| HP 800GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty M1 Solid State Drive | 764929-B21 |

**6G SATA Value Endurance Hot Plug SFF (2.5-inch) SC Enterprise Value G1 Solid State Drives**

| | |
|---|---|
| HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756621-B21 |
| HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756636-B21 |
| HP 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756657-B21 |

**6G SATA Light Endurance Hot Plug SFF (2.5-inch) SC 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) SC Read Intensive Solid State Drives**

| | |
|---|---|
| HP 240GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789135-B21 |
| HP 480GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789145-B21 |
| HP 960GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789155-B21 |

**NOTE:** Please see the HP Solid State Drives QuickSpecs for Technical Specifications and additional information.

**NVMe Solid State Drives**

| | |
|---|---|
| HP 400GB NVMe-2.5in VE SC2-PLP SSD | 764904-B21 |
| HP 1.2TB NVMe-2.5in VE SC2-PLP SSD | 764906-B21 |
| HP 400GB NVMe-2.5in LE SC2-PLP SSD | 765034-B21 |
| HP 800GB NVMe-2.5in LE SC2 -PLP SSD | 765036-B21 |
| HP 1.6TB NVMe-2.5in LE SC2-PLP SSD | 765038-B21 |
| HP 400GB NVMe-2.5in ME SC2-PLP SSD | 736936-B21 |
| HP 800GB NVMe-2.5in ME SC2-PLP SSD | 736939-B21 |
| HP 1.6TB NVMe-2.5in ME SC2-PLP SSD | 764892-B21 |

**NOTE:** NVMe SSDs require the HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay kit.

| | |
|---|---|
| HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay Kit | 774743-B21 |

**NOTE:** "The HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay kit can only be installed in Bay2".

**NOTE:** "The HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane kit cannot be installed in Bay1 when the HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay Kit is installed in Bay2. However, Universal Media Bay kits can be installed in Bay 1.

**NOTE:** Prior to making an HP ProLiant DL560 Gen9 NVMe 6 SSD Express Bay kit selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor.

**M.2 SSD**

## Core Options

| | | |
|---|---|---|
| HP Dual 120GB Value Endurance Solid State M.2 Enablement Kit for ProLiant ML/DL Servers | | 777894-B21 |
| HP 120GB Value Endurance Solid State M.2 Enablement Kit for ProLiant ML/DL Servers | | 788028-B21 |

**NOTE:** For additional drive capability, an additional controller apart from the B140i will be required.

**Hard Drive Blank Kits**

| | | |
|---|---|---|
| HP Small Form Factor Hard Drive Blank Kit | | 666987-B21 |

**Hard Drive Kits**

| | | |
|---|---|---|
| HP ProLiant DL560 Gen9 Bay2 8SFF Cage/Backplane Kit | | 795084-B21 |
| HP ProLiant DL560 Gen9 Bay1 8SFF Cage/Backplane Kit | | 795085-B21 |

**Media Bay Kits**

| | | |
|---|---|---|
| HP ProLiant DL560 Gen9 Universal Media Bay Kit | | 795090-B21 |

**NOTE:** Does not include a 2SFF Drive Bay. Optical drive is optional.

| | | |
|---|---|---|
| HP ProLiant DL560 Gen9 2SFF Universal Media Bay Kit | | 793479-B21 |

**NOTE:** It includes a 2SFF Drive Bay. Optical drive is optional.

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| 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 |
| | HP Ethernet 1Gb 4-port 366T Adapter | 811546-B21 |
| | **10 Gigabit Ethernet adapters** | |
| | HP Ethernet 10Gb 2-port 530SFP Adapter | 652503-B21 |
| | HP Ethernet 10Gb 2-port 546SFP+ Adapter | 779793-B21 |
| | HP Ethernet 10Gb 2-port 557SFP+ Adapter | 788995-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. Please see the related NIC QuickSpecs for Technical Specifications and additional information: http://www.hp.com/go/ProLiantNICs.

| | **FlexibleLOM Adapters** | |
|---|---|---|
| | HP Ethernet 1Gb 4-port 331FLR Adapter | 629135-B22 |
| | HP Ethernet 1Gb 4-port 366FLR Adapter | 665240-B21 |
| | HP FlexFabric 10Gb 2-port 533FLR-T Adapter | 700759-B21 |
| | HP FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter | 700751-B21 |
| | HP Ethernet 10Gb 2-port 560FLR-SFP+ Adapter | 665243-B21 |
| | HP Ethernet 10Gb 2-port 561FLR-T Adapter | 700699-B21 |
| | | |
| | HP Ethernet 10Gb 2-port 546FLR-SFP+ Adapter | 779799-B21 |
| | HP FlexFabric 10Gb 2-port 556FLR-SFP+ Adapter | 727060-B21 |

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

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| HP InfiniBand | HP InfiniBand FDR 2-port 545QSFP Adapter | 702211-B21 |
|---|---|---|
| | HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+QSFP Adapter | 764284-B21 |
| | HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter | 764285-B21 |

**NOTE:** Adapter which can be installed in the FlexibleLOM slot

| | | |
|---|---|---|
| | HP InfiniBand QDR/Ethernet 10Gb 2-port 544+FLR-QSFP Adapter | 764286-B21 |

**NOTE:** Adapter which can be installed in the FlexibleLOM slot

**NOTE:** Please see the HP InfiniBand Options for HP ProLiant and Integrity Servers QuickSpecs for additional information.

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## Core Options

| | | |
|---|---|---|
| **HP I/O Expansion Options** | HP ProLiant DL560 Gen9 Secondary 3 Slot Riser Kit | 793474-B21 |
| | NOTE: This is an optional kit which can only be utilized when system is populated with at least two (2) processors. | |

| | | |
|---|---|---|
| **HP Power Supplies** | **HP Common Slot Power Supply Kits** | |
| | HP 1500W Common Slot Platinum Plus Hot Plug Power Supply Kit | 684532-B21 |
| | NOTE: 94% efficiency with support for HP Power Discovery Services. | |
| | NOTE: 1500W Common Slot Platinum Plus Hot Plug Power Supplies only support High Line Voltage. | |
| | HP 1500W Common Slot 48VDC Hot Plug Power Supply Kit | 746708-B21 |
| | HP 1200W Common Slot Platinum Plus Hot Plug Power Supply Kit | 656364-B21 |
| | NOTE: 94% efficiency with support for HP Power Discovery Services. | |
| | HP 1200W Common Slot Platinum Hot Plug Power Supply Kit | 748287-B21 |

NOTE: Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at:
http://www.hp.com/go/hppoweradvisor.
NOTE: All power supplies in a server should match. Mixing Power Supplies is not supported.
NOTE: Option Kits contain the specified power supply and a PDU IEC cable.
NOTE: HP ProLiant servers ship with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs). For a full list of optional HP power cords please go to: http://www.hp.com/products/powercords.

## Additional Options

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

**HP Insight Software HP Insight Control**

| | |
|---|---|
| HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License | C6N27A |
| HP Insight Control Server Provisioning Media Kit | BD883A |
| HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License | C6N36A |

**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 HP Insight Control QuickSpecs.

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

| | |
|---|---|
| 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 |

**NOTE:** For additional license options please see the HP Integrated Lights-Out (iLO) QuickSpecs.

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

**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 for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic | E5Y43A |
| HP Operations Analytics for HP OneView LTU | K8G29A |
| HP Operations Analytics for HP OneView E-LTU | K8G29AAE |
| HP OneView Media Kit Phys No Lic | E5Y37A |

**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.

Please see the HP OneView QuickSpecs for Technical Specifications and additional information.

## Additional Options

| | | |
|---|---|---|
| **High Performance Clusters** | SUSE Linux Enterprise Server HPC Compute Node 1-2 Sockets 3 Year Subscription Flx LTU | M6K35A |
| | SUSE Linux Enterprise Server HPC Compute Node 1-2 Sockets 3 Year Subscription E-LTU | M6K35AAE |
| | SUSE Linux Enterprise Server HPC Head Node 1-2 Sockets 3 Year Subscription 24x7 Support Flx LTU | M6K36A |
| | SUSE Linux Enterprise Server HPC Head Node 1-2 Sockets 3 Year Subscription 24x7 Support E-LTU | M6K36AAE |

| | | |
|---|---|---|
| **HP Computation and Graphics Accelerators** | HP NVIDIA Quadro K2200 GPU Module | 763840-B21 |
| | **NOTE:** The system memory must be < 1TB when an HP NVIDIA Quadro K2200 GPU Module is installed in the server. See HP Service advisory for more details. | |
| | **NOTE:** For Maximum Performance install the K2200 GPU in the following configuration: single K2200 in slot 2 of HP ProLiant DL560 Gen9 Primary 2 Slot Riser (793475-B21) and a single K2200 in slot 4 of HP ProLiant DL560 Gen9 Secondary Riser (793474-B21). | |
| | **NOTE:** Prior to making an HP Nvidia Quadro K2200 GPU module selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor. | |
| | **NOTE:** System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F). | |

| | | |
|---|---|---|
| **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 |
| | **NVME PCIe Workload Accelerators** | |
| | HP 1.6TB NVMe Mixed Use HH/HL PCIe Workload Accelerator | 803202-B21 |
| | HP 1.6TB NVMe Write Intensive HH/HL PCIe Workload Accelerator | 803197-B21 |
| | HP 2.0TB NVMe Mixed Use HH/HL PCIe Workload Accelerator | 803204-B21 |
| | HP 800GB NVMe Mixed Use HH/HL PCIe Workload Accelerator | 803200-B21 |
| | HP 800GB NVMe Write Intensive HH/HL PCIe Workload Accelerator | 803195-B21 |

## Additional Options

| **HP Storage Controllers** | **SAS Controllers** | |
|---|---|---|
| | **HP Smart Array Controllers** | |
| | HP Smart Array P440/4GB FBWC 12Gb 1-port Int SAS Controller | 726821-B21 |
| | HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller | 761872-B21 |
| | HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller | 726897-B21 |
| | HP Smart Array P840/4GB FBWC 12Gb 2-ports Int FIO SAS Controller | 761874-B21 |
| | HP Smart Array P441/4GB FBWC 12Gb 2-ports Ext SAS Controller | 726825-B21 |
| | HP Smart Array P841/4GB FBWC 12Gb 4-ports Ext SAS Controller | 726903-B21 |
| | **HP Flexible Smart Array Controllers** | |
| | HP Smart Array P440ar/2GB FBWC 12Gb 2-ports Int SAS Controller | 726736-B21 |
| | HP Smart Array P440ar/2GB FBWC 12Gb 2-ports Int FIO SAS Controller | 749974-B21 |
| | **HP Host Bus Adapter** | |
| | HP H240ar 12Gb 2-ports Int Smart Host Bus Adapter | 726757-B21 |

**NOTE:** Daughterboard card controller providing for direct attached storage without using a PCIe slot.

| | | |
|---|---|---|
| | HP H240ar 12Gb 2-ports Int FIO Smart Host Bus Adapter | 749976-B21 |

**NOTE:** Daughterboard card controller providing for direct attached storage without using a PCIe slot.

| | | |
|---|---|---|
| | HP H240 12Gb 2-ports Int Smart Host Bus Adapter | 726907-B21 |
| | HP H240 12Gb 2-ports Int FIO Smart Host Bus Adapter | 761873-B21 |
| | HP H241 12Gb 2-ports Ext Smart Host Bus Adapter | 726911-B21 |
| | **Optional Upgrades** | |
| | HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Servers | 727258-B21 |

**NOTE:** If the server has an additional HP Smart Array P441/4G Controller, HP Smart Array P841/4G, or HP H241 controller selected and it does not have at least one of the following internal Controllers: HP Smart Array P440ar/2G FIO Controller or HP Smart Array P440/4G FIO Controller or HP Smart Array P840/4G FIO Controller, then the HP 96W Smart Storage Battery is required.

| | | |
|---|---|---|
| | HP ProLiant DL560 Gen9 SAS Expander Card | 804228-B21 |

**NOTE:** The card has 24 ports for expansion.

| | | |
|---|---|---|
| | HP ProLiant DL560 Gen9 Bay3 to H240 Slot 7/ Bay 3 to P840/440 Riser1 and 2SFF-UMBay SAS Cable Kit | 797924-B21 |

**NOTE:** Required for connecting Bay1 UMB 2SFF to a P840/P440 controller, or if using controller H240 in slot7 attached to Bay3. Also needed if using controller P840/P440 in riser1 attached to Bay3.

| | | |
|---|---|---|
| | HP ProLiant DL 560 Gen9 Bay 1 to Riser1/AROC and Bay 2/3 to Riser2/Slot7 SAS Cable Kit | 797945-B21 |

**NOTE:** Required if controllers H240/P440ar/H240ar/B140i in riser1/AROC (Smart Array HBA Connector) need to be connected to Bay1, or if controllers P840/P440 in Riser2/slot7 need to be connected to Bay2/3. Also needed if controller P440 in slot7 needs to be connected to Bay2/3.

**NOTE:** Required if using controllers H240/P440ar/H240ar/B140i in riser1/AROC (Smart Array HBA Connector) which need to be connected to Bay2, or if using controllers P840/P440 in Riser1/2 which need to be connected to Bay2/3.

| | | |
|---|---|---|
| | HP ProLiant DL560 Gen9 Bay 2 to Riser1/AROC and Bay 2/3 to Riser1/2 SAS Cable Kit | 797946-B21 |

## Additional Options

| | | |
|---|---|---|
| **HP Tape Backup** | **NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP tape backup products see: http://www.hp.com/storage/SPOCK and http://www.hp.com/go/ebs.<br>**NOTE:** For Internal drives to be connected to DL servers please make sure that you order rack mount kits as well. | |
| | **Tape Autoloaders** | |
| | **HP 1/8 G2 Tape Autoloader** | |
| | HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 SAS Tape Autoloader | C0H18A |
| | HP StoreEver 1U SAS Rack-mount Kit | AE459B |
| | **HP MSL2024 Tape Library** | |
| | HP MSL2024 0-Drive Tape Library | AK379A |
| | **HP MSL4048 Tape Library** | |
| | HP MSL4048 0-Drive Tape Library | AK381A |
| | HP Mini SAS High Density to 4-lane Mini SAS External Fanout 2 Meter Cable | K2R09A |
| | HP Mini SAS High Density to 4-lane Mini SAS External Fanout 4 Meter Cable | K2R10A |
| | **HP StoreEver MSL6480** | |
| | HP StoreEver MSL6480 Scaleable Expansion Module | QU626A |
| | HP StoreEver MSL6480 Scalable Base Module | QU625A |
| | **Tape Drives** | |
| | 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-5 Ultrium 3000 SAS External Tape Drive | EH958B |
| | HP StoreEver LTO-5 Ultrium 3280 SAS Tape Drive in 3U Rack-mount | EJ013B |
| | HP StoreEver LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rack-mount | EJ014B |
| | HP StoreEver LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit | EH946C |
| | HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit | C0L99A |
| | HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive | EH964A |
| | HP StoreEver LTO-6 Ultrium 6250 External Tape Drive | EH970A |
| | | |
| **HP Disk Backup** | **HP RDX Removable Disk Backup System** | |
| | HP RDX320 USB3.0 External Disk Backup System | B7B63A |
| | HP RDX500 USB 3.0 External Disk Backup System | B7B66A |
| | HP RDX1000 USB 3.0 External Disk Backup System | B7B69A |
| | HP RDX 2TB USB3.0 External Disk Backup System | E7X53A |
| | HP D3700 Enclosure | QW967A |
| | HP D3600 Enclosure | QW968A |
| | **NOTE:** For the complete range of RDX drives and media see: http://www.hp.com/go/rdx.  For hardware and software compatibility of HP disk backup products see: http://www.hp.com/storage/SPOCK.<br>**NOTE:** For Internal drives to be connected to DL servers please make sure that you order rack mount kit as well. | |
| | | |
| **HP Storage Options** | **QLogic Fibre Channel HBAs** | |
| | HP 81Q 8Gb 1-port PCIe Fibre Channel Host Bus Adapter | AK344A |
| | HP 82Q 8Gb 2-port PCIe Fibre Channel Host Bus Adapter | AJ764A |
| | HP StoreFabric SN1000Q 16GB 1-port PCIe Fibre Channel Host Bus Adapter | QW971A |
| | HP StoreFabric SN1000Q 16GB 2-port PCIe Fibre Channel Host Bus Adapter | QW972A |
| | **Emulex Fibre Channel HBAs** | |
| | HP 81E 8Gb 1-port PCIe Fibre Channel Host Bus Adapter | AJ762B |
| | HP 82E 8Gb 2-port PCIe Fibre Channel Host Bus Adapter | AJ763B |
| | HP StoreFabric SN1100E 16Gb Single Port Fibre Channel Host Bus Adapter | C8R38A |
| | HP StoreFabric SN1100E 16Gb Dual Port Fibre Channel Host Bus Adapter | C8R39A |
| | **HP Converged Network Adapters** | |
| | HP StoreFabric CN1100R Dual Port Converged Network Adapter | QW990A |
| | HP StoreFabric CN1200E 10Gb Converged Network Adapter | E7Y06A |

## Additional Options

| | | |
|---|---|---|
| **HP Disk Storage Systems** | **Disk Enclosures** | |
| | 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 |

**NOTE:** Please see the HP D6000 Disk Enclosure QuickSpecs for Technical Specifications and additional information.

| | | |
|---|---|---|
| | HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle | E7W32A |

**NOTE:** Please see the HP D2000 Disk Enclosures QuickSpecs for Technical Specifications and additional information.

| | | |
|---|---|---|
| **HP Data Center Racks** | **HP 11000 G2 Series Racks** | |
| | 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 Pallet 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** | |
| | 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** | |
| | 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.

| | |
|---|---|
| **HP Power** | **HP Basic Power Distribution Unit (bPDU)** |

## Additional Options

| Distribution Units (PDUs) | **HP Basic Power Distribution Unit: 1U/0U Version** | |
|---|---|---|
| | HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU | H5M54A |
| | HP 3.6kVA 200-240 Volt Detachable C20 Input ( 12xC13) WW Basic PDU | H5M56A |
| | HP 2.8kVA 24A Low Voltage NA/JP Modular Power Distribution Unit | 252663-D71 |
| | 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 7.3kVA 32A High Voltage INTL Core Modular Power Distribution Unit | 252663-B33 |
| | HP 9.2kVA 40A High Voltage INTL Core Modular Power Distribution Unit | 252663-B34 |
| | HP 8.6kVA 24A Three Phase NA/JP Modular Power Distribution Unit | AF512A |
| | HP 11kVA 16A Three Phase INTL Modular Power Distribution Unit | AF513A |
| | HP 14.4kVA 40A Three Phase NA/JP Modular Power Distribution Unit | AF519A |
| | HP 17.3kVA 48A Three Phase NA/JP Modular Power Distribution Unit | AF511A |
| | HP 22kVA 32A Three Phase INTL Core Modular Power Distribution Unit | AF518A |
| | **HP Basic Power Distribution Unit: Half Height Version** | |
| | HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU | H5M55A |
| | HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU | H5M57A |
| | HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU | H5M58A |
| | HP 7.3kVA 230 Volt IEC309 32A Input (20xC13) INTL Basic PDU | H5M68A |
| | HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU | H5M61A |
| | **HP Basic Power Distribution Unit: Mid Height Version** | |
| | HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU | H5M59A |
| | HP 7.3kVA 230 Volt IEC309 32A Input (24xC13/6xC19) INTL Basic PDU | H5M70A |
| | HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU | H5M60A |
| | HP 11kVA 230 Volt IEC309 63A Input (30xC13/6xC19) INTL Basic PDU | H5M71A |
| | HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU | H5M75A |
| | HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU | H5M63A |
| | HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU | H5M64A |
| | HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU | H5M62A |
| | HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/6xC19) INTL Basic PDU | H5M72A |
| | **HP Basic Power Distribution Unit: Full Height Version** | |
| | HP 11kVA 400 Volt IEC309 16A 3-Phase Input (36xC13/6xC19) INTL Basic PDU | H5M73A |
| | HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU | H5M67A |
| | **HP Basic Power Distribution Unit: 480/277 Volt Version** | |
| | HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU | H3X08A |
| | HP 800VA - 277V Input / 230V Output NA Rack Mount Transformer | H3X09A |

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

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

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

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

## Additional Options

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

| | |
|---|---|
| HP 2.8kVA 120 Volt L5-30 Input (12xNEMA 5-20R)NA/JP Monitored PDU | D9N43A |
| HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Monitored PDU | D9N46A |
| HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU | D9N44A |
| HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU | G9Z05A |
| HP 7.3kVA 230 Volt IEC309 32A Input (12xC13) INTL Monitored PDU | G9Z06A |
| HP 17.3kVA 208 Volt IEC309 60A 3-Phase Watertight Input (12xC13/12xC19) NA/JP Monitored PDU | G9Z07A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Watertight Input (12xC13/12xC19) INTL Monitored PDU | G9Z08A |

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

| | |
|---|---|
| HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU | D9N45A |

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

| | |
|---|---|
| HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU | D9N47A |
| HP 7.3kVA 230 Volt IEC309 32A Input (20xC13/4xC19) INTL Monitored PDU | D9N48A |
| HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU | D9N51A |
| HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU | D9N52A |
| HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU | D9N53A |
| HP 11kVA 400 Volt IEC309 16A 3-Phase Input (18xC13/3xC19) INTL Monitored PDU | D9N55A |

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

| | |
|---|---|
| HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU | D9N49A |
| HP 7.3kVA 230 Volt IEC309 32A Input (32xC13/4xC19) INTL Monitored PDU | D9N50A |
| HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU | D9N57A |
| HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU | D9N58A |
| HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU | D9N61A |
| HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU | D9N54A |
| HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU | D9N59A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Input (12xC13/12xC19) INTL Monitored PDU | D9N60A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU | D9N56A |
| HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU | D9N62A |
| HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU | D9N63A |

**HP Environmental Sensor for Remote Monitored PDUs**

| | |
|---|---|
| HP Environmental Sensor for Remote Monitored and Managed PDUs | E2D53A |

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

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

## Additional Options

| | |
|---|---|
| **iPDU Core Units** | |
| HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF520A |
| HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF521A |
| HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF522A |
| HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit | AF533A |
| HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF523A |
| HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit | AF525A |
| HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit | AF526A |
| HP 22kVA 32A Three Phase INTL Core Intelligent Modular Power Distribution Unit | AF527A |
| HP 11.4kVA 16A 415V Three Phase L22-20 NA Core Intelligent Power Distribution Unit | AF900A |
| HP 17.3kVA 24A 415V Three Phase IEC309 NA Core Intelligent Power Distribution Unit | AF901A |
| HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit | AF535A |
| HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit | AF537A |
| HP 22kVA 32A 400V Three Phase 12 Outlet Core INTL  Intelligent Power Distribution Unit | AF538A |

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

| | |
|---|---|
| **HP Managed Power Distribution Units (maPDU)** | |
| HP 2.8kVA 120 Volt L5-30 Input (24x NEMA 5-20) NA/JP Managed PDU | H8B48A |
| HP 3.6kVA 200-240 Volt Detachable C20 Input (7xC13/1xC19) WW Managed PDU | H8B49A |
| HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Managed PDU | H8B50A |
| HP 7.3kVA 200-240 Volt IEC309 32A Input (20xC13/4xC19) INTL Managed PDU | H8B51A |
| HP 8.6kVA 208 Volt L15-30 3 Phase Input (18xC13/6xC19) NA/JP Managed PDU | H8B52A |
| HP 8.6kVA 208 Volt L21-30 3 Phase Input (20xC13/3xC19/1x NEMA 5-20) NA/JP Managed PDU | H8B53A |
| HP 11kVA 400 Volt IEC309 16A 3 Phase Input (21xC13/3xC19) INTL Managed PDU | H8B54A |
| HP 14.4kVA 208V CS8365C 3 Phase Input (12xC13/12xC19) NA/JP Managed PDU | H8B55A |
| HP 17.3kVA 208V IEC309 60A 3 Phase Input (12xC13/12xC19) NA/JP Managed PDU | H8B56A |

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

| | |
|---|---|
| **iPDU Kits with Standard Extension Bars** | |
| HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit | AF531A |
| HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit | AF532A |
| HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit | AF534A |
| **iPDU Extension Bars** | |
| HP 5xC13 Intelligent PDU Extension Bar G2 Kit | AF547A |
| HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar | AF528A |

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

| | | |
|---|---|---|
| **HP Rack Mount Consoles, KVM Switches, and Keyboards** | **HP Location Discovery Services** | |
| | HP Location Discovery Services LCD8500 Kit | TL052A |
| | **HP Rack Mount Consoles** | |
| | HP LCD8500 1U US Rackmount Console Kit | AF630A |
| | HP LCD8500 1U UK Rackmount Console Kit | AF631A |
| | HP LCD8500 1U DE Rackmount Console Kit | AF632A |
| | HP LCD8500 1U FR Rackmount Console Kit | AF633A |
| | HP LCD8500 1U JP Rackmount Console Kit | AF642A |
| | HP LCD8500 1U RU Rackmount Console Kit | AF643A |
| | HP LCD8500 1U INTL Rackmount Console Kit | AF644A |
| | HP LCD8500 1U US TAA Rackmount Console Kit | AF645A |

## Additional Options

**HP KVM Switches**

| | |
|---|---|
| HP TAA 0x2x16 G3 KVM Console Switch | AF653A |
| HP USB Remote Access Key for G3 KVM Console Switches | AF650A |
| HP KVM Console USB Interface Adapter | AF628A |
| HP KVM Console USB 2.0 Virtual Media CAC Interface Adapter | AF629A |

**HP USB Keyboard and Mouse**

| | |
|---|---|
| HP USB BFR with PVC Free US Keyboard/Mouse Kit | 631341-B21 |
| HP USB BFR with PVC Free UK Keyboard/Mouse Kit | 631344-B21 |
| HP USB BFR with PVC Free FR Keyboard/Mouse Kit | 631346-B21 |
| HP USB BFR with PVC Free ES Keyboard/Mouse Kit | 631348-B21 |
| HP USB BFR with PVC Free DE Keyboard/Mouse Kit | 631358-B21 |
| HP USB BFR with PVC Free JP Keyboard/Mouse Kit | 631360-B21 |
| HP USB BFR with PVC Free IT Keyboard/Mouse Kit | 631362-B21 |
| HP USB BFR with PVC Free CN Keyboard/Mouse Kit | 631364-B21 |
| HP USB BFR with PVC Free AE Keyboard/Mouse Kit | 638212-B21 |
| HP USB BFR with PVC Free RU Keyboard/Mouse Kit | 638214-B21 |
| HP USB BFR with PVC Free IN Keyboard/Mouse Kit | 672097-D63 |
| HP USB BFR with PVC Free AP-Intl Keyboard/Mouse Kit | 672097-373 |
| HP USB BFR with PVC Free Intl Keyboard/Mouse Kit | 672097-B33 |
| HP USB BFR with PVC Free PT Keyboard/Mouse Kit | 672097-133 |
| HP USB BFR with PVC Free TR Keyboard/Mouse Kit | 672097-143 |
| HP USB BFR with PVC Free CZ Keyboard/Mouse Kit | 672097-223 |
| HP USB BFR with PVC Free FI Keyboard/Mouse Kit | 672097-353 |
| HP USB BFR with PVC Free SE Keyboard/Mouse Kit | 672097-103 |
| HP USB BFR with PVC Free CH Keyboard/Mouse Kit | 672097-113 |
| HP USB BFR with PVC Free KR Keyboard/Mouse Kit | 672097-KD3 |
| HP 1U INT Rackmount Keyboard with USB | AG086A |
| HP 1U US Rackmount Keyboard with USB | AG072A |

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

http://h18000.www1.hp.com/products/quickspecs/13972_div/13972_div.html (Worldwide).

**HP Server Console Switches**

| | |
|---|---|
| HP 0x1x8 G3 KVM Console Switch | AF651A |
| HP 0x2x16 G3 KVM Console Switch | AF652A |

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

| | |
|---|---|
| HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software | AF618A |
| HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software | AF619A |

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

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

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

http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html (Worldwide).

**Rail Kits**

**NOTE:** Gen9 rail kits have changed significantly from prior generation rail kits. Please take a moment to review the installation documentation that comes with the server to help you with the installation of your Gen9 server.

**NOTE:** Rail kits are optional for DL560 Gen9 and are no longer included standard with the server. Customers have the option to purchase their server without a rail kit.

**NOTE:** Ball bearing and Easy Install rail kits contain telescoping rails which allow for in-rack serviceability.

**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.

## Additional Options

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|---|---|
| HP 2U Large Form Factor Easy Install Rail Kit | 733662-B21 |
| **NOTE:** Does not include CMA (733664-B21). | |
| HP 2U Cable Management Arm for Easy Install Rail Kit | 733664-B21 |
| HP 2U Large Form Factor Ball Bearing Rail Kit | 720864-B21 |
| **NOTE:** Does not include CMA (720865-B21). | |
| HP 2U Cable Management Arm for Ball Bearing Rail Kit | 720865-B21 |
| **HP Other 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 ConvergedSystem Door Branding Kit | TK815A |
| HP ConvergedSystem Rack Light Kit | TK816A |
| HP ConvergedSystem Rack Side Panel 1075mm Kit | TK817A |

| | | |
|---|---|---|
| **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 32A 400-415 Volt Three Phase INTL R12000 DirectFlow UPS IEC309 Input/Output Module | AF488A |
| | HP 30A 400-415 Volt Three Phase NA R10000 DirectFlow UPS IEC309 Input/Output Module | AF489A |
| | HP 32A 380 Volt Three Phase China R12000 DirectFlow UPS Unterminated Input/Output Module | AF490A |
| | 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 |
| | HP DirectFlow UPS Management Card | AF493A |
| | **Power Unit (2U UPS)** | |
| | HP R18000 DirectFlow - 2U Rackmount Uninterruptible Power System | AF479A |
| | **Input/Output Module Options for 2U UPS** | |
| | HP 32A 400-415 Volt Three Phase INTL R18000 DirectFlow UPS IEC309 Input/Output Module | AF483A |
| | HP 30A 380 Volt Three Phase China R18000 DirectFlow UPS Unterminated Input/Output Module | AF485A |
| | 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** | |

## Additional Options

| | |
|---|---|
| **HP T750 G4 UPS Models** | |
| HP T750 G4 NA/JP Uninterruptible Power System | J2P85A |
| HP T750 G4 INTL Uninterruptible Power System | J2P88A |
| **HP T1000 G4 UPS Models** | |
| HP T1000 G4 NA/JP Uninterruptible Power System | J2P86A |
| HP T1000 G4 INTL Uninterruptible Power System | J2P89A |
| **HP T1500 G4 UPS Models** | |
| HP T1500 G4 NA/JP Uninterruptible Power System | J2P87A |
| HP T1500 G4 INTL Uninterruptible Power System | J2P90A |
| **HP Rack/Tower UPS** | |
| **HP R/T2200 G4 UPS Models** | |
| HP R/T2200 G4 NA/JP Uninterruptible Power System | J2R00A |
| **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 G4 High Voltage INTL Uninterruptible Power System | J2R04A |
| **R1500 G4 Models** | |
| HP R1500 G4 NA Uninterruptible Power System | J2Q99A |
| HP R1500 G4 JP/TWN Uninterruptible Power System | J2R05A |
| HP R1500 G4 INTL Uninterruptible Power System | J2R03A |
| **R7000 Uninterruptible Power System (UPS)** | |
| HP R7000 4U 50A High Voltage NA/JP Uninterruptible Power System | AF462A |
| HP R7000 4U IEC-32A High Voltage INTL Uninterruptible Power System | AF463A |
| **R5000 Uninterruptible Power System (UPS)** | |
| HP R5000 3U L630 High Voltage NA/JP Uninterruptible Power System | AF460A |
| HP R5000 3U IEC309-32A High Voltage INTL Uninterruptible Power System | AF461A |
| **Expansion modules for RP36000/3 UPS** | |
| HP RP12000/3 12000VA Three Phase INTL 6U Rackmount Uninterruptible Power System | AF437A |
| **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.

| | | |
|---|---|---|
| **HP Power Cords** | HP C13 - SEV 1011 CH  250V 10Amp 1.83m Power Cord | AF565A |
| | HP C13 - DK-2.5A DK  250V 10Amp 1.83m Power Cord | AF566A |
| | HP C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord | AF567A |
| | HP C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord | AF568A |
| | HP C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord | AF570A |
| | HP C13 - CEI-23-50 IT/CL 250V 10Amp 1.83m Power Cord | AF571A |
| | HP C13 - Nema 6-15P US 250V 15A JP 3.6m Power Cord | A0N33A |
| | HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord | AF556A |
| | HP 8AWG W/Ground Lug 48V DC 3.0m Power Cord | J6X42A |

| | | |
|---|---|---|
| **HP USB and SD Options** | **HP Flash Media Kits for USB Drives** | |
| | HP Dual 8GB microSD Enterprise Midline USB Kit | 741279-B21 |
| | **NOTE:** Please see the HP Flash Media Kits QuickSpecs for additional information. | |
| | **HP Enterprise Mainstream Flash Media Kits for Memory Cards** | |
| | HP 32GB microSD Enterprise Mainstream Flash Media Kit | 700139-B21 |
| | HP 8GB microSD Enterprise Mainstream Flash Media Kit | 726116-B21 |

## Additional Options

| | | |
|---|---|---|
| **HP Care Pack Services** | **Proactive Care** | |
| | HP 3 year 24x7 DL560 Gen9 Proactive Care Service | U8QM3E |
| | HP 3 year 24x7 with Defective Media Retention DL560 Gen9 Proactive Care Service | U8QM4E |
| | HP 3 year Call to Repair DL560 Gen9 Proactive Care Service | U8QM9E |
| | HP 3 year Call to Repair with Defective Media Retention DL560 Gen9 Proactive Care Service | U8QN0E |
| | HP 3 year 24x7 w/Comprehensive Defective Material Retention DL560 Gen9 Proactive Care Service | U8QS3E |
| | HP 3 year Call to Repair w/ComprehensiveDefectiveMaterialRetention DL560 Gen9 Proactive Care Service | U8QS6E |
| | HP 3 year 24x7 DL560 Gen9 with OneView Proactive Care Service | U8QW0E |
| | HP 3 year 24x7 with Defective Media Retention DL560 Gen9 with OneView Proactive Care Service | U8QW1E |
| | HP 3 year Call to Repair DL560 Gen9 with OneView Proactive Care Service | U8QW6E |
| | HP 3 year Call to Repair w/Defective Media Retention DL560 Gen9 with OneView Proactive Care Service | U8QW7E |
| | HP 3 year 24x7 w/Comprehensive Defective Material Retention DL560 Gen9 w/OneView Proactive Care SVC | U8RB0E |
| | HP 3 year Call to Repair wComprehensiveDefectiveMaterialRetention DL560 Gen9 w OV Proactive Care SVC | U8RB3E |
| | **Installation & Start-up Services** | |
| | HP Install ProLiant DL560 Service | U6H58E |
| | HP Startup ProLiant DL560 Service | U6H60E |

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

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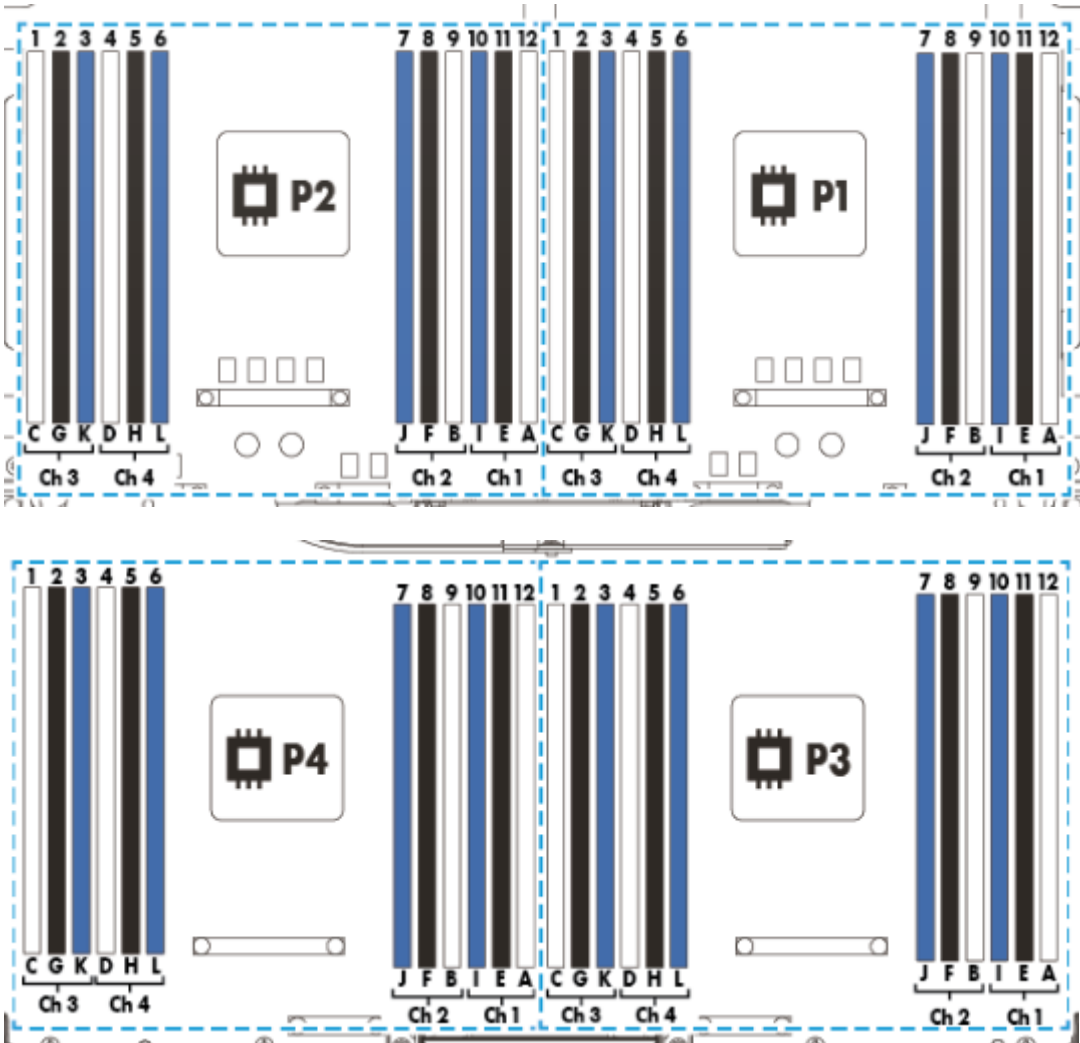
## Memory

**HP SmartMemory**

New HP SmartMemory now provides additional protection for your servers. With HP Authentication it can verify that you have true HP Qua
Memory in your HP ProLiant Gen9 server. With HP SmartMemory your new HP ProLiant server can take advantage of additional Gen9
enhancements in performance, durability and future manageability support through HP Active Health System.

For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool.

**Memory Subsystem** Each Intel® Xeon® E5-4600v3 family processor socket contains four memory channels per installed
**Architecture** processor with three DIMMs per channel for a total of twelve (12) DIMMs or a grand total of forty eight (48) DIMMs for the server.

**Memory Population guidelines**



**General Memory Population Rules and Guidelines**:

## Memory

- To maximize performance, install two memory cartridges per processor and balance the total memory capacity between all installed processors.
- When multiple processors are installed, HP recommends installing the DIMMs in sequential alphabetical order: 4A, 9B, 1C, 12D, and so on.
- LRDIMMs support higher densities than single- and dual-rank RDIMMs, and higher speeds than quad-rank RDIMMs. This support enables you to install more high capacity DIMMs, resulting in higher system capacities and higher bandwidth.
- Do not mix LRDIMMs with any other DIMM type (RDIMM, LVDIMM).
- RDIMM population is limited to a maximum of eight logical ranks per channel. Therefore, only two quad rank RDIMMs are supported per channel. If there are more than eight physical ranks per channel, LRDIMMs rank multiplication provides support for three DIMMs per channel.
- • Lockstep mode requires specific population requirements. See lock-step configuration below for more information.
**NOTE:** UDIMMs are not supported. This server does not support mixing LRDIMMs, RDIMMs, or UDIMMs. Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS initialization. For detailed memory configuration rules and guidelines, use the Online DDR4 Memory Configuration Tool on the HP website (http://www.hp.com/go/ddr4config).

**Intel Gen9 Supported Memory Bandwidth for HP ProLiant Gen9 Intel® Xeon®E5-4600v3 Series Processor Family**

**Memory Bandwidth and Capacity**

| [DIMM Type] | Registered DIMMs (RDIMMs) | | | Load Reduced (LRDIMMs) | Load Reduced (LRD | |
|---|---|---|---|---|---|---|
| **DIMM Rank** | Single Rank | Dual Rank | | | Quad Rank | |
| **DIMM Capacity** | 8GB | 16GB | 32GB | 16GB | 32GB | 64GB |
| **DIMM Native Speed (MT/s)** | 2133 | | | | | |
| **Voltage** | Std Voltage 1.2V | | | | | |
| **SLOTS THAT CAN BE POPULATED** | | | | | | |
| 48 slot servers | 48 | | | | | |
| **MAXIMUM CAPACITY (GB)** | | | | | | |
| | 384 | 768 | 1536 | 768 | 1536 | 3072 |
| **1 DIMM Per Channel** | 2133 | | | | | |
| **2 DIMM Per Channel** | 1866 | | | | 2133 | |
| **3 DIMM Per Channel** | 1600 | | | | | |

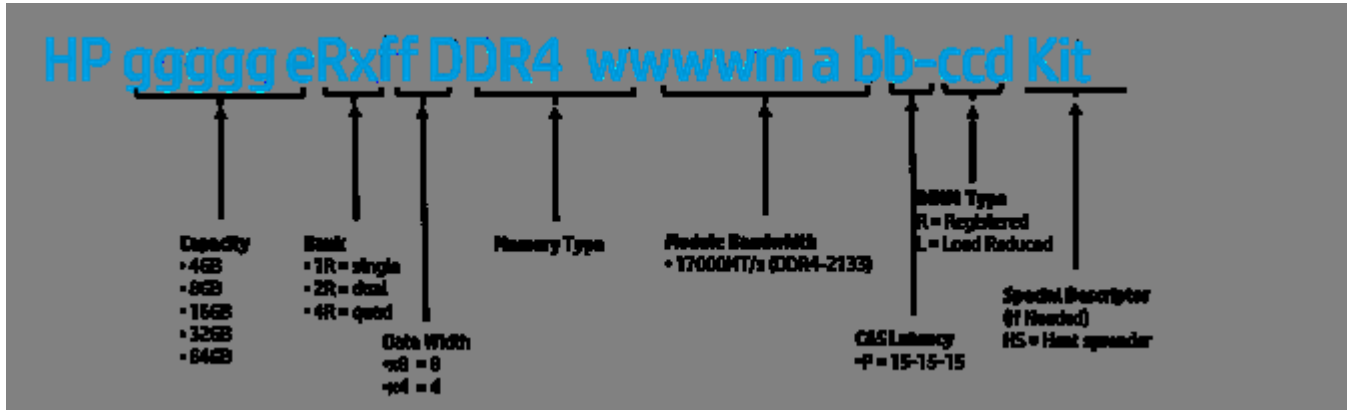| Memory Speed by Processor Model | Processor Models | Supported Memory Speeds |
|---|---|---|
| | E5-4627v3, E5-4650v3, E5-4655v3, E5-4660v3, E5-4667v3, E5-4669v3 | 2133/1866/1600MHz |
| | E5-4620v3, E5-4640v3 | 1866/1600MHz |
| | E5-4610v3 | 1600MHz |

## Memory

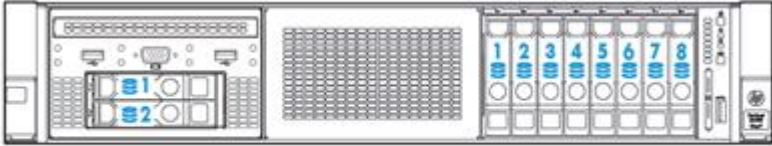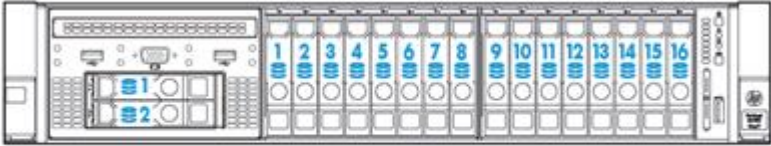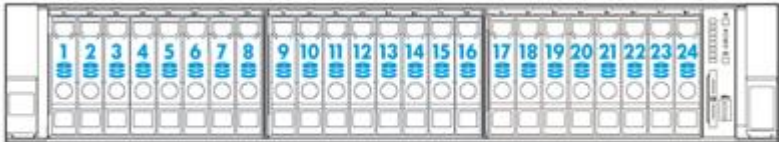| Standard and Maximum Memory Capacity (Pre-configured Models) | Pre-Configured Models | Standard Memory | Maximum Memory Plus Optional Memory | Standard Memory Replaced with Optional Memory |
|---|---|---|---|---|
| | E5-4640v3 | 128GB (8x16GB) | 1408GB (40x32GB, 8x16GB) | 1536GB (48x32GB) |
| | E5-4620v3 | 64GB (4x16GB) | 1472GB (44x32GB, 4x16GB) | 1536GB (48x32GB) |
| | E5-4610v3 | 32GB (2x16GB) | 1504GB (46x32GB, 2x16GB) | 1536GB (48x32GB) |

**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

## Storage

8 SFF (+2 SFF) hot-plug drive model with Universal Media Bay

1-8     8 x SFF SATA/SAS/SDD Hot Pluggable Hard driv bays

1-2     2 x SFF SATA/SAS/SSD Hot Pluggable Hard Driv Bays
Universal Media Bay Kit with 2xSFF drives

16 SFF (+2 SFF) hot-plug drive model with Universal Media Bay

1-16     16 x SFF SATA/SAS/SDD Hot Pluggable Hard driv bays
**NOTE:** If Universal Media Bay Kit is not chosen, even Bay 1 can be populated with 8xSFF drives t give a maximum of 24xSFF drives

1-2     2 x SFF SATA/SAS/SSD Hot Pluggable Hard Drive Bays
Universal Media Bay Kit with 2xSFF drives

24 SFF hot-plug drive model without Universal Media Bay

1-24     24 x SFF SATA/SAS/SDD Hot Pluggable Hard driv bays

**NOTE:** In 24 SFF configuration, System performance during standard operating support may be reduced if operating with a fan fault or at 30°C (86°F).

## Technical Specifications

| | | |
|---|---|---|
| **System Unit** | **Dimensions** (H x W x D) (with bezel) | 3.44" (8.74 cm) Height x 17.54" (44.55 cm) Width x 29.5" (74.94 cm) Length |
| | **Weight (approximate)** (all hard drives, power supplies, DIMMs and processors installed) | Maximum:      69 lb (31.3 kg) |
| | | Minimum:      39.0 lb (17.69 kg) |
| | **Input Requirements** (per power supply) | Range Line Voltage    100 - 120 VAC (1200W PS only)<br>200 - 240 VAC (1200W & 1500W PS) |
| | | Rated Input Current    9.2A (100 VAC), 6.6A (200 VAC) - 1200W PS8.3A (200 VAC) - 1500W PS |
| | | Rated Input Frequency    50 to 60 Hz |
| | | Rated Input Power 1000 W (120 VAC), 1320 W (230VAC)- 1200W PS 1652 W (at 230 VAC) - 1500W PS |
| | **BTU Rating** | Maximum    For 1200 W Power Supply: 3530 BTU/hr (at 100 VAC), 4600 BTU/hr (at 200 VAC)<br>For 1500W Power Supply: 5749 BTU/hr (at 200 VAC), 5835 BTU/hr (at 240 VAC) |
| | **Power Supply Output** (per power supply) | Rated Steady-State Power    For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC)<br>For 1500 W Power Supply: 1500W (at 200 to 240VAC) |
| | | Maximum Peak Power    For 1200 W Power Supply: 800 W (at 100 VAC), 900 W (at 120 VAC), 1200 W (at 200 to 240 VAC)<br>For 1500W Power Supply: 1500W (at 200 to 240 VAC)<br>**NOTE:** To review typical system power ratings use the HP Power Advisor which is available online located at url: http://www.hp.com/go/proliant-energy-efficient or http://www.hp.com/go/hppoweradvisor. |
| | **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. |
| | | Non-operating    -30° to 60°C (-22° to 140°F).   Maximum rate of change is 20°C/hr (36°F/hr). |

## Technical Specifications

| | | |
|---|---|---|
| **Relative Humidity** | Operating | 10% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing. |
| **(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 | 5.21 B |
| L pAm | 30.0 |

**Operating**

| | |
|---|---|
| L WAd | 6.09 B |
| L pAm | 48.0 |

| | | |
|---|---|---|
| **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 transfer 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 |
| | **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 Ethernet 1Gb 4-** | **Network Interface** | 10Base-T/100Base-TX/1000Base-TX |

## Technical Specifications

| port 331FLR Adapter | Compatibility | IEEE 802.3 10Base-T |
|---|---|---|
| | | IEEE 802.3ab 1000Base-T |
| | | IEEE 802.3u 100Base-TX |
| | | IEEE 802.3x |
| | | IEEE 802.3ad 1000Base-TX |
| | | IEEE 802.3az |
| | | IEEE 1588 |
| | **Data Transfer Method** | PCI-Express 2.0 x4 |

| 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. |
|---|---|---|

## Summary of Changes

| Date | Version History | Action | Description of Change |
|---|---|---|---|
| 17-Aug-2015 | From Version 2 to 3 | Added | New Hard Drives offering was added to Core Options.<br><br>HP Computation and Graphics Accelerators was added to Core Options. |
| | | Changed | Memory and Expansion Slots under Standard Features section were revised.<br><br>Core Options, Memory, and Storage sections were revised. |
| 26-Jun-2015 | From Version 1 to 2 | Changed | Interfaces entry under Standard Features section was revised.<br><br>Base configuration under Configuration Information - Factory Integrated Models section (Step 1) was revised. |