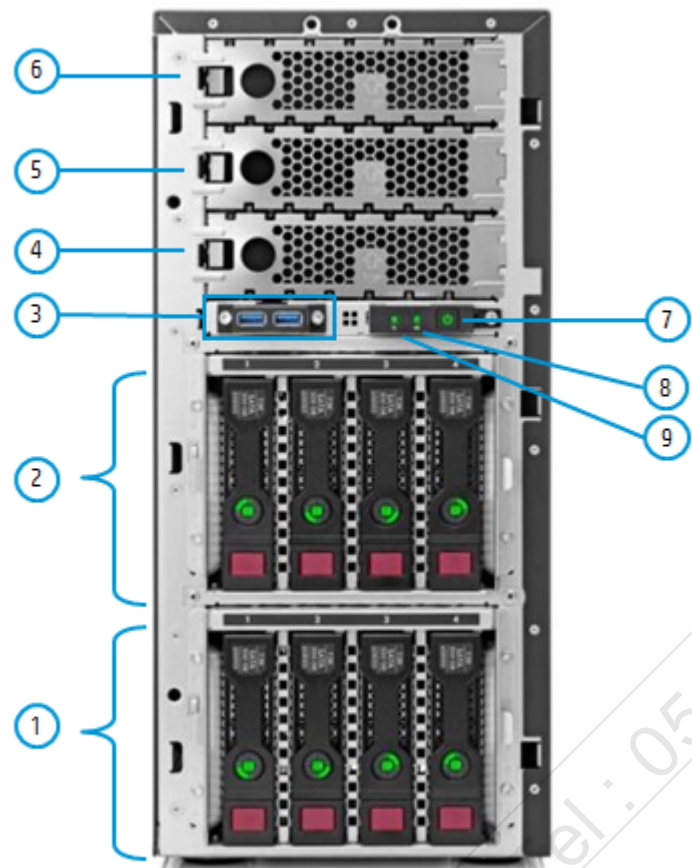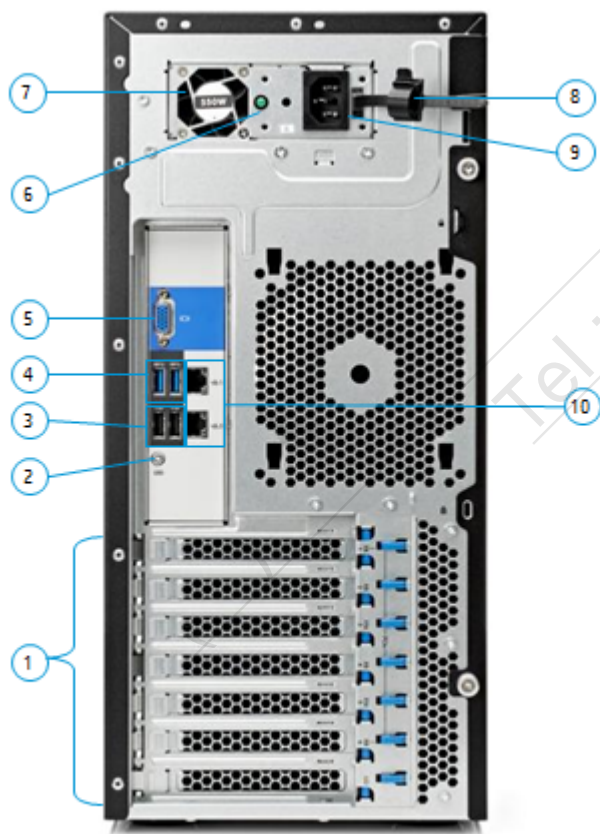Overview

## HP ProLiant ML150 Generation9 (Gen9)

The HP ProLiant ML150 Gen9 Server delivers the essential mix of performance, price and expandability to fit the needs of growing budget conscious businesses. Designed as a dual-socket tower server, it is a right size tower with performance and expandability. With expansion options, it allows you to grow as needed with a low initial capital outlay. Covering a wide range of applications and workloads and addressing our customers from sophisticated SMB to large enterprise class server environments.

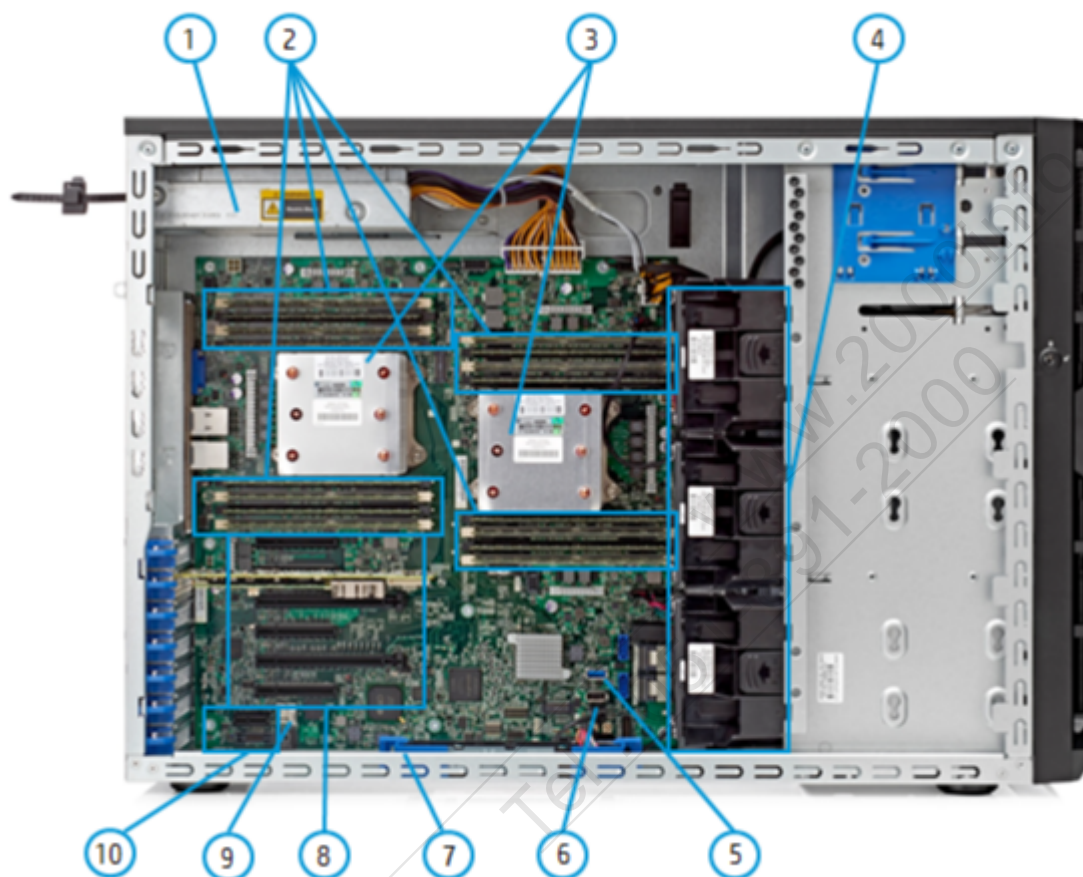**Front view details for Tower (LFF)**

## Overview

1. Drive Cage (4 LFF shown) Alternative server choice would offer 8 SFF
2. Drive Cage (4 LFF shown) Alternative server choice would offer 8 SFF
3. USB 3.0 (2)
4. Media bay, Optional SATA 9.5mm DVD-ROM shown
5. Media bay, blank shown*
   **NOTE:** Optional choices: SATA 9.5mm DVD-ROM or DVD RW Optical Drive, Tape Drive, or LFF.
   **NOTE:** When populating 10 LFF, not able to install Tape Drive or Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).
6. Media bay, blank shown*
   **NOTE:** Optional choices: SATA 9.5mm DVD-ROM or DVD RW Optical Drive, Tape Drive, or LFF.
   **NOTE:** When populating 10 LFF, not able to install Tape Drive or Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).
7. Power On/Standby button and system power LED button
8. NIC status
9. Health LED



**Rear View (Tower Model)**

## Overview

1.  PCI Slots (Slots 1-6) Slot 1 and 3 can support Optional GPU
2.  Unit ID LED
3.  USB 2.0 (2)
4.  USB 3.0 (2)
5.  Video Connector
6.  Power supply Power LED
7.  HP 550W Power Supply
8.  Cable tie back
9.  Power Supply Power connection
10. Network RJ-45 Ports (2)



**Interior View (Tower Model)**

1.  Power Supply
2.  Sixteen (16) DDR4 DIMM slots. Shown fully populated in 16 slots (8 per processor)
3.  Two (2) processors and heatsinks with HP Smart Socket Guide (Second Processor is Optional)
4.  System Fans:   Three fans for 2P SKU
5.  Internal USB 3.0 connector
6.  Internal USB 2.0 connector
7.  Gen9 Smart Storage Battery Holder Kit
8.  Six (6) PCIe expansion slots
9.  MicroSD slot
10. Dedicated iLO module slot

## Standard Features

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

| | Model | CPU frequency | Cores | L3 Cache | Power | QPI | DDR4 Hz |
|---|---|---|---|---|---|---|---|
| **Processor** One of the following depending on model | E5-2660v3 | 2.6GHz | 10 | 25MB | 105W | 9.6GT/s | 2133 |
| | E5-2650v3 | 2.3GHz | 10 | 25MB | 105W | 9.6GT/s | 2133 |
| | E5-2650Lv3 | 1.8GHz | 12 | 30MB | 65W | 9.6GT/s | 2133 |
| | E5-2640v3 | 2.6GHz | 8 | 20MB | 90W | 8.0GT/s | 1866 |
| | E5-2630v3 | 2.4Ghz | 8 | 20MB | 85W | 8.0GT/s | 1866 |
| | E5-2620v3 | 2.4GHz | 6 | 15MB | 85W | 8.0GT/s | 1866 |
| | E5-2609v3 | 1.9GHz | 6 | 15MB | 85W | 6.4GT/s | 1600 |
| | E5-2603v3 | 1.6GHz | 6 | 15MB | 85W | 6.4GT/s | 1600 |

**NOTE:** Up to 2 processors supported. Mixing different processor models is not supported.
**NOTE:** Recommend to select 900W for 2P config. or check power advisor for power consumption for the customer usage case.

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

15MB (1 x 15MB) Level 3
**NOTE:** For Six-core processors.
20MB (1 x 20MB) Level 3
**NOTE:** For Eight-core processors.
30MB (1 x 30MB) Level 3
**NOTE:** For Twelve-core processors.

**Chipset**

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

**On System Management Chipset**

HP iLO (Firmware HP iLO4 2.0) 2GB NAND
**NOTE:** 1GB USB user space configurable via UEFI and accessible via iLO. Read and learn more in the iLO QuickSpecs.

**Memory**

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

| | | |
|---|---|---|
| DIMM Slots Available | 16 | |
| Maximum Capacity (LRDIMM) | 256GB | (16 x 16GB LRDIMM @2133MHz) |
| Maximum Capacity (RDIMM) | 512GB | (16 x 32GB RDIMM @2133MHz) |

**NOTE:** 32GB RDIMM is available in 2015
**NOTE:** This server does not support mixing LRDIMMs or RDIMMs. Attempting to mix any combination of these DIMMs can cause the server to halt during BIOS installation.

**Memory Protection**

Advanced ECC — Advanced ECC uses single device data correction to detect and correct single and all 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.

**Network Controller** Broadcom 5717 Dual-port 1Gb

**Expansion Slots**

## Standard Features

| Expansion Slots # | Technology | Bus Width | Connector Width | Bus Number | Form Factor | Notes |
|---|---|---|---|---|---|---|
| 6 | PCIe 3.0 | x8 | x8 | | Half Length/Full Height | For processor 1 |
| 5 | PCIe 3.0 | x16 | x16 | | Full Length/Full Height | For processor 1 |
| 4 | PCIe 3.0 | x8 | x8 | | Half Length/Full Height | For processor 1 |
| 3 | PCIe 3.0 | x16 | x16 | | Full Length/Full Height | For processor 2 |
| 2 | PCIe 3.0 | x8 | x8 | | Half Length/Full Height | For processor 1 |
| 1 | PCIe 3.0 | x8 | x8 | | Half Length/Full Height | For processor 2 |

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

**NOTE:** Six total expansion PCIe 3.0 slots. Two PCIe 3.0 x16 (x16 speed); Four PCIe 3.0 x 8 (x8 speed).

| Expansion Slots # | Technology | Bus Width | Connector Width | Bus Number | Device Number | Form Factor | Notes |
|---|---|---|---|---|---|---|---|
| 7 | HP ML Gen9 Dedicated iLO Port Kit | x1 | x1 | | | Dedicate for ML Series | |

| | | |
|---|---|---|
| **Storage Controller** | Entry Models | HP Dynamic Smart Array B140i Controller |
| One of the following depending on model | **NOTE:** B140i can't mix with any standup internal controller. | |
| | Base Models | HP Dynamic Smart Array B140i Controller |
| | **NOTE:** B140i can't mix with any standup internal controller. | |
| | Performance Models | HP H240 FIO Smart Host Bus Adapter |

| | | |
|---|---|---|
| **Internal Storage Devices** | Optical Drive | Optional SATA 9.5mm DVD-ROM Optical Drive |
| One of the following depending on model | | Optional SATA 9.5mm DVD RW Optical Drive |
| | | **NOTE:** Optical is optional in entry, base and performance BTO models. |
| | | **NOTE:** ML150 Gen9 Slim ODD Enablement Kit (P/N: 784603-B21) is required for any DVD options. |
| | Hard Drives | None ship standard |
| | Hard Drive Bays | Up to 10 Non-hot plug SATA 3.5" drives |

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

**NOTE:** All Pre-configured Models come populated with hard drive blanks installed. The 4LFF configurations includes 2 blanks and 8SFF includes 6 blanks. Additional hard drive blanks can be ordered using either P/N 666986-B21 for the HP LFF HDD Blank Kit or P/N 666987-B21 for the HP SFF HDD Blank Kit. These part numbers for single HDD blanks below are also provided should you require replacement HDD blanks for your server.

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

**NOTE:** When populate 10 LFF, not able to install any Tape Drive and Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

**NOTE:** Must select two 4LFF NHP drive cage and 10LFF enablement kit if customer wants to support 10 LFF drives.

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

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

**NOTE:** 16SFF is limited to P840 controller.

**NOTE:** 10LFF is limited to H140i controller

**NOTE:** H240 8LFF/8SFF require 2 cable kit P/N: 784606-B21.

**NOTE:** P84016SFF require 2 cable kit P/N: 784608-B21.

## Standard Features

| Maximum Internal Storage | | CAPACITY | CONFIGURATION |
|---|---|---|---|
| One of the following depending on model | Hot Plug LFF SAS | 60TB | 10x6TB |
| | Hot Plug LFF SATA | 60TB | 10x6TB |
| | Hot Plug SFF SAS | 19.2TB | 16x1.2TB |
| | Hot Plug SFF SATA | 16TB | 16xTB |
| | Non-Hot Plug LFF SATA | 30TB | 10x3TB |
| | Hot Plug LFF SAS SSD | 16TB | 10x1.6TB |
| | Hot Plug LFF SATA SSD | 16TB | 10x1.6TB |
| | Hot Plug SFF SAS SSD | 25.6TB | 16x1.6TB |
| | Hot Plug SFF SATA SSD | 25.6TB | 16x1.6TB |

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

HP 550W FIO Power Supply

HP 800W/900W Gold AC Power Input Module

**NOTE:** Each Redundant Power Supply Backplane can support up to two (2) power input modules.   Non-redundant configurations with a single power input module installed can provide up to 900W (200 – 240VAC) and up to 550W (100 – 127VAC) of power.   Redundant configurations with two power input modules installed can provide up to 800W (200 – 240VAC) and up to 550W (100 – 127VAC) of power.

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

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

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

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

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

**Rack Options**
One of the following depending on model

HP T/R CONV TRAY UNIVERSAL Kit

**System Fans**
One of the following depending on model

| | Non-redundant | Redundant |
|---|---|---|
| 1P model | 2 fans | NA |

**NOTE:** Two (2) Non-hot plug, non-redundant fans ship as standard.

| | Non-redundant | Redundant |
|---|---|---|
| 2P model | 3 fans | NA |

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

## Standard Features

| **Interfaces** | Video | 1 (rear) |
|---|---|---|
| | Network RJ-45 (Ethernet) | 2 |
| | HP iLO Remote Management Network Port | 2GB NAND |
| | Micro SD Slot | 1 (internal) |

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

| | | |
|---|---|---|
| | USB 3.0 | 5 (2 rear, 1 internal, 2 front ) |
| | USB 2.0 | 3 (2 rear, 1 internal) |

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

Microsoft Windows Server
Canonical Ubuntu
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
VMware
Oracle Solaris
**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/ML150Gen9.

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**Upgradeability**

Upgradeable to two processors (24 cores)
**NOTE:** Total 6, 8, 12cores.
Up to 16 SFF Hard Drive Bays; Or 10 LFF Hard Drive Bays
Up to 16 DIMM slots
Redundant Power Supply
Tower to rack conversion
Optional optical drive (up to 1)
**NOTE:** When populate 10 LFF, not able to install Optical Drive.   Possible Configurations: 1) 8LFF +1 ODD + 1  Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

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**Industry Standard Compliance**

ACPI 2.0b Compliant
PCIe 3.0 Compliant
PXE Support
WOL Support
Novell Certified
IPMI 2.0, SMASH CLP, DCMI 1.0 compliant
Microsoft®Logo certifications
USB 3.0 Support
SMBIOS 2.7.1
ASHRAE A3

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**Graphics**

Integrated Matrox G200 video standard
**DisplayPort:**
- Up to 4096 x 2160 x 30 bpp @ 60Hz
- Supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)

**DL-DVI(I) output:**
- Up to 2560 x 1600 x 32 bpp @ 60Hz

**Single Link-DVI(I) output:**
- Up to 1920 x 1200 x 32 bpp @ 60Hz

**VGA (via adapter cable):**
- 2048 × 1536 × 32 bpp at 85 Hz

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## Standard Features

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

- Secure Boot

- Operating system specific functionality

- Support for > 2.2 TB (using GPT) boot drives

- USB 3.0 Stack

- Embedded UEFI Shell

- Mass Configuration Deployment Tool  using HP RESTful API.

- PXE boot support for IPv6 networks

- Boot support for option cards that only support a UEFI option ROM

For more information please visit http://www.hp.com/go/proliant/uefi.
**NOTE:**  For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.
**NOTE:** HP UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory.

| | |
|---|---|
| **Form Factor** | Tower or Rack (5U) |

| | | |
|---|---|---|
| **Embedded Management** | **HP Integrated Lights-Out (HP iLO)** | Monitor your servers for ongoing management, service alerting, reporting and remote management with HP iLO. Learn more at http://www.hp.com/go/ilo. |
| | **UEFI** | Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at http://www.hp.com/go/ProLiant/uefi. |
| | **HP RESTful API** | RESTful API is an application programming interface. RESTful Web Service API served by iLO' s web server: Learn more at  http://www.hp.com/go/restfulapi. |
| | **Intelligent Provisioning** | Provision servers by discovering and deploying 1 to few servers with Intelligent Provisioning. Learn more at http://www.hp.com/go/intelligentprovisioning. |
| | **Embedded Remote Support** | HP' s embedded remote support, when used with Insight Online direct connect or HP Insight Remote Support, allows HP ProLiant servers to transmit hardware events directly to HP or an HP Authorized Partner for automated phone home support. Learn more at http://www.hp.com/go/insightonline/info. |

## Standard Features

| | | |
|---|---|---|
| **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. HP SIM also integrates with HP SUM to provide quick and seamless firmware updates. Learn more at http://www.hp.com/go/sim. |
| | **Scripting Tool Kit and Windows PowerShell** | Provision 1 to many servers using your own scripts to discover and deploy them with HP Scripting Tool Kit for Windows and Linux or HP Scripting Tools for Windows PowerShell. Learn more at http://www.hp.com/go/ProLiantSTK or http://www.hp.com/go/powershell. |
| | **HP RESTful Interface Tool** | HP RESTful Interface tool is a scripting tool to provision servers using RESTful API Interface to discover and deploy servers at scale. Learn more at http://www.hp.com/go/restfulapi. |
| | **HP iLO Mobile Application** | Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: http://www.hp.com/go/ilo/mobileapp. |
| | **HP Insight Online** | HP Insight Online, available at no additional cost as part of your HP warranty, Care Pack or contractual support agreement with HP, is a personalized dashboard for simplified tracking of IT operations and support information from anywhere, anytime. Learn more at http://www.hp.com/go/insightonline/info. **NOTE:** The Service Pack for ProLiant (which includes HP SUM) can be downloaded from http://www.hp.com/go/spp/download. More information can be found:  http://www.hp.com/go/SmartUpdate, http://www.hp.com/go/spp/download and http://www.hp.com/go/hpsum. |
| **Security** | | Power-on password<br>Setup password<br>Serial interface control<br>Power switch security<br>Administrator's password<br>TPM 1.2<br>UEFI |
| **Warranty** | | This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.<br>**NOTE:** Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html. |

## Optional Features

| | | |
|---|---|---|
| **Embedded Management** | **iLO Essentials** | HP iLO Essentials is the preferred license for small and medium business that offers full remote server management capabilities for small and medium business via the Integrated Remote Console (IRC), virtual media, and e-mail based alerts. Learn more about HP iLO Essentials at http://www.hp.com/go/iLO/essentials. |
| | **iLO Scale-Out** | HP iLO Scale-Out is the preferred license built for web hosting, cloud service providers, and high performance computing data centers, managing massive scale out environments. This license offers sophisticated scripting tools that provides remote access through Text Console via SSH, Dynamic power capping, Email-based Alerting and proactive notifications. For more information, visit http://www.hp.com/go/iLO/scale-out. |
| | **iLO Advanced** | HP iLO Advanced licenses offer smart remote functionality without compromise, for all HP ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality. Learn more about HP iLO Advanced at http://www.hp.com/go/iloadvanced. |
| **Server Management** | **HP Insight Control** | HP Insight Control, lets you deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol.<br>**NOTE:** HP OneView support for HP ProLiant Gen9 rack (DL) and blade (BL) servers will be available with a future version of HP OneView to be released Early 2015. Customers may purchase HP OneView licenses now, and will be granted rights to use HP Insight Control software and transition to HP OneView with a free upgrade, when available. Customers also have the option to purchase HP Insight Control. |
| **High Performance Clusters** | | HP Insight Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu.<br>HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters. |
| **HPC Interconnects** | | **NOTE:** High Performance Computing (HPC) interconnect technologies are available for this server under the HP Cluster Platform product portfolio. These high-speed interconnects are fully supported by HP when they are part of these configure to order clusters. Solutions can be defined with a lot of flexibility with the help of configuration tools. Please visit the following URL to configure HPC Clusters with InfiniBand Interconnects: http://www.hp.com/techservers/clusters/ucp/index.html. |

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

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

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

## Service and Support

| | |
|---|---|
| **Service and Support** | **HP Technology Services for Industry Standard Servers** HP Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HP to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time. |
| | **Protect your business beyond warranty with HP Care Pack Services** HP Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select. |
| **Optimized Care** | **Supports maintaining servers at optimum performance availability** |
| | **HP Proactive Care with 24x7 coverage, three year Care Pack Service** HP Proactive Care helps prevent problems and stabilize IT by utilizing secure, real-time, predictive analytics and proactive consultations when your products are connected to HP.   This Care Pack Service combines three years' proactive reporting and advice with our 24x7 coverage and enhanced escalation management, four hour hardware response time and two hour call back for software questions on leading industry standard software running on your HP ProLiant server. http://h20195.www2.hp.com/v2/GetPDF.aspx/4AA3-8855ENW.pdf |
| **Standard Care Package** | **Supports maintaining high level of server availability** |
| | **Foundation Care 24x7, three-year Care Pack Service** HP Foundation Care 24x7 connects you to HP 24 hours a day, seven days a week for assistance on resolving issues. Hardware onsite response within four hours   if needed; collaborative software included in this Care Pack service provides troubleshooting assistance on industry leading software running on your HP server. Simplify your support experience and make HP your first call for hardware or software questions. http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en |
| **Related Services** | **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf |
| | **Factory Express for Servers and storage** HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express. |
| | **Data Privacy Services** Protect your data through better media management.   HP Data privacy services help manage and protect sensitive data to reduce the risk of unauthorized access to private information and help meet compliance requirements.   Our retention services allow you to keep drives and other devices upon failure, our removal services provide convenient data sanitization and our recovery services allow you to safely retire IT assets and capture any remaining value from the hardware. http://www.hp.com/services/dataprivacy |
| | Additional HP Care Pack services can be found at: http://www.hp.com/go/cpc |
| **Get connected to HP to improve your support experience** | Prevent problems with innovative, automated monitoring tools and proactive services. Combining Proactive Care Services with our remote support technology  such as Insight Online  provides you with expert advice and personalized, cloud-based automated IT support, helping to prevent unplanned down time and solve problems quickly. For more information, visit: www.hp.com/go/proactiveinsightexperience |
| **HP Support Center** | Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc |

## Service and Support

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

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

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

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

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

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

## Pre-configured Models

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

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

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

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

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 or P/N 666986-B21: HP LFF Hard Drive Blank Kit.

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

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

| | Entry Models | Base Models |
|---|---|---|
| **[SKU Number]** | 776274-xx1 | 776275-xx1 |
| **Model Name** | HP ProLiant ML150 Gen9 E5-2603v3 4GB B140i Non-hot Plug 4LFF SATA Entry 550W PS Server | HP ProLiant ML150 Gen9 E5-2609v3 8GB B140i Hot Plug 4LFF SATA Base 550W PS Server |
| **Processor** | Intel®Xeon®E5-2603v3 | Intel®Xeon®E5-2609v3 |
| **Number of Processors** | One | |
| **Memory** | 4GB (1x4GB Registered DIMMs, 2133 MHz) | 8GB (1x8GB Registered DIMMs, 2133 MHz) |
| **Network Controller** | Broadcom 5717 Dual-port 1GbE | |
| **Storage Controller** | HP Dynamic Smart Array B140i | |
| **Hard Drive** | None ship standard | |
| **Internal Storage** | 4 LFF HDD Bays (Non Hot Plug) | 4 LFF HDD Bays |
| **Optical Drive Bay** | 1; (Optional: DVD-ROM, DVD-RW) | |
| **Optical Drive** | Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive) | |
| **PCI-Express Slots** | 6 PCIe slots | |
| **Power Supply** | (1) HP 550W FIO Power Supply | |
| **Fans** | 2 non hot plug, non-redundant fans | |
| **Management** | Mid-tier iLO with 2GB NAND | |
| **Form Factor** | Tower (5U) | |
| **Warranty** | Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. | |

## Pre-configured Models

|  | **Performance Models** |
|---|---|
| **[SKU Number]** | 776276-xx1 |
| **Model Name** | HP ProLiant ML150 Gen9 E5-2620v3 16GB H240 Hot Plug 8SFF SAS Perf 900W PS Server |
| **Processor** | Intel®Xeon®E5-2620v3 |
| **Number of Processors** | One |
| **Memory** | 16GB (1x16GB Registered DIMMs, 2133 MHz) |
| **Network Controller** | Broadcom 5717 Dual-port 1GbE |
| **Storage Controller** | HP H240 Smart Host Bus Adapter<br>**NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is included while order Performance Model with H240 Storage Controller |
| **Hard Drive** | None ship standard |
| **Internal Storage** | 8 SFF HDD Bays |
| **Optical Drive Bay** | 1; (Optional: DVD-ROM, DVD-RW) |
| **Optical Drive** | Optional Slim Optical Bay (SATA DVD-RW/ROM Optical Drive) |
| **PCI-Express Slots** | 6 PCIe slots |
| **Power Supply** | (1) HP 900W FIO Power Supply |
| **Fans** | 2 non hot plug, non-redundant fans |
| **Management** | Mid-tier iLO with 2GB NAND |
| **Form Factor** | Tower (5U) |
| **Warranty** | Server Warranty includes 3-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. |

**Country Code Key**　xx1 = B21　　Worldwide
　　　　　　　　　　　xx1 = 001　　US
　　　　　　　　　　　xx1 = 031　　UK
　　　　　　　　　　　xx1 = 291　　Japan
　　　　　　　　　　　xx1 = 371　　AP
　　　　　　　　　　　xx1 = 421　　EU
　　　　　　　　　　　xx1 = AA1　　PRC

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

## 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, F 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 w 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 ML150 Gen9 Non-hot Plug 4LFF Configure-to-order Server | HP ProLiant ML150 Gen9 Hot Plug 4LFF Configure-to-order Server | HP ProLiant ML150 Gen9 Hot Plug 8SFF Configure-to-order Server |
|---|---|---|---|
| SKU Number | 767062-B21 | 767063-B21 | 767064-B21 |
| Processor | 2 (optional) x HP Smart Socket Guides | | |
| DIMMSlots | 16 DIMM slots for RDIMM, LRDIMM DDR4 Memory | | |
| Storage Controller | HP Dynamic Smart Array B140i | | |
| PCIe | 6 Standard (4FH/HL, 2FH/FL) | | |
| Drive Cage | 4LFF Non Hot Plug | 4LFF Hot Plug | 8SFF Hot Plug |
| Network Controller | Broadcom 5717 Dual-port 1GbE | | |
| Fans | 2 non hot plug, non-redundant fans | | |
| Management | Mid-tier iLO with 2GB NAND | | |
| USB | 2 front, 2 internal, 4 rear | | |

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

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

**HP Memory**
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, 1600MHz or 1333MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: http://www.hp.com/go/ddr4memory-configurator.

**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

## Configuration Information - Factory Integrated Models

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 Networking**    Select a standup NIC adapter from Core options-Networking section below,

- Please see the QuickSpecs for Technical Specifications and additional information: 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 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) and Large Form Factor (LFF 3.5 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 Graphics Options**    Select one or more graphics adapter from Additional options section below.

- Please see the HP Power Advisor for estimated power consumption of your individual system configuration prior to installing GPUs. The HP Power Advisor is located at: http://www.hp.com/go/hppoweradvisor.
- This section may contain FIO options, please see HP Computation & Graphics Accelerators section below.

**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 Cooling Options**    Select one or more Fan Kits from Core options section below.

- This section may contain FIO options, please see HP Cooling Options section below.
- FIO indicates that this option is only available as a factory installable option.

**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.

## Core Options

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

| | | |
|---|---|---|
| **HP Unique Options** | HP ML150 Gen9 4LFF Hot Plug Drive Cage | 725872-B21 |
| | **NOTE:** Adding 4LFF Hard Drive Cage allow up to 8FF Drive Bays. | |
| | HP ML150 Gen9 8SFF Hot Plug Drive Cage | 725874-B21 |
| | **NOTE:** Adding 8SFF Hard Drive backplane allow up to 16SFF Drive Bays. | |
| | HP ML150 Gen9 4LFF Non-hot Plug Drive Cage | 779859-B21 |
| | **NOTE:** Adding 4LFF Hard Drive Cage allow for up to 8LFF Drive Bays. | |
| | HP ML150 Gen9 PCI Baffle Kit | 779861-B21 |

**NOTE:** Must select when a PCIe card is installed with any Networking, Controllers (SAS, SCSI and Fiber Channel), and Graphic options.

**NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is included while order Performance Model with H240 Storage Controller

| | | |
|---|---|---|
| | HP ML150 Gen9 Slim ODD Enablement Kit | 784603-B21 |

**NOTE:** Must select with the ODD option.

| | | |
|---|---|---|
| | HP ML150 Gen9 Smart Storage Battery Holder Kit | 786710-B21 |

**NOTE:** Must select when install Smart Store Battery P/N: 727258-B21.

**NOTE:** Must select when install P440/840 FIO controller P/N: 761872-B21/761874-B21.

**NOTE:** Must select when support upgrade battery.

| | | |
|---|---|---|
| | HP ML150 Gen9 9/10LFF Drive Enablement Kit | 788567-B21 |

**NOTE:** When populate 10 LFF, not able to install any Tape Drive or Optical Drive. Possible Configurations: 1) 8LFF +1 ODD + 1 Tape Drive (Full/Half), or 2) 9LFF + 1 ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

**NOTE:** 10LFF is limited to B140i controller

**NOTE:** Must select both 4LFF NHP drive cage and 10LFF enablement kit if plan to expand to 10LFF.

**NOTE:** Only support NHP SATA HDD.

**NOTE:** Must select B140i controller.

| | | |
|---|---|---|
| | HP ML150 Gen9 Dedicated iLO Management Port Kit | 780310-B21 |
| | HP ML150 Gen9 Mini SAS H240 Cable Kit | 784606-B21 |

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

1 cable kit is required for Hot Plug 4LFF.

2 cable kits are required for below:

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

| | | |
|---|---|---|
| | HP ML150 Gen9 Mini SAS P440/P840 Cable Kit | 784608-B21 |

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

1 cable kit is required for P440x1.

2 cable kits are required for P840x1.

| | | |
|---|---|---|
| | HP Tower to Rack Conversion Tray Universal Kit | 417705-B21 |
| | HP AHCI-Enable FIO Setting | 801845-B21 |

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

## Core Options

| | | |
|---|---|---|
| **HP Processors** | **Entry Processors - E5-2600v3 series Processors** | |
| | HP ML150 Gen9 Intel®Xeon®E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit | 726663-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit | 726663-L21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit | 726660-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit | 726660-L21 |
| | **Base Processors - E5-2600v3 series Processors** | |
| | HP ML150 Gen9 Intel®Xeon®E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit | 726657-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit | 726657-L21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit | 726653-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit | 726653-L21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit | 726650-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit | 726650-L21 |
| | **Performance Processors - E5-2600v3 series Processors** | |
| | HP ML150 Gen9 Intel®Xeon®E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit | 726667-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit | 726667-L21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2650v3 (2.3GHz/10-core/30MB/105W) Processor Kit | 726647-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2650v3 (2.3GHz/10-core/30MB/105W) FIO Processor Kit | 726647-L21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit | 726644-B21 |
| | HP ML150 Gen9 Intel®Xeon®E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit | 726644-L21 |

**NOTE:** Recommend to select 900W for 2P configurations or check power advisor for power consumption for the customer usage case.

| | | |
|---|---|---|
| **HP Memory** | **Registered DIMMs (RDIMMs) for E5-2600v3 Series** | |
| | HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit | 726717-B21 |
| | HP 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit | 803026-B21 |
| | **NOTE:** Available WW except EMEA. | |
| | HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit | 726718-B21 |
| | HP 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit | 759934-B21 |
| | HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit | 803028-B21 |
| | **NOTE:** Available WW except EMEA. | |
| | 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 |
| | **Load Reduced DIMMs (LRDIMMs) for E5-2600v3 Series** | |
| | HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit | 726720-B21 |

## Core Options

| | | |
|---|---|---|
| **HP Optical Drives** | HP 9.5mm SATA DVD-ROM JackBlack Gen9 Optical Drive | 726536-B21 |
| | HP 9.5mm SATA DVD-RW JackBlack G9 Optical Drive | 726537-B21 |
| | HP ML150 Gen9 Slim ODD Enablement Kit | 784603-B21 |
| | **NOTE:** Must be selected with the ODD option. | |
| | **NOTE:** Must select ODD enablement kit, one kit per ODD. | |

**HP Drives**

**NOTE:** User may select any combination of SAS or SATA Hard Drives.
However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set.
**NOTE:** If B140i is the primary controller, user can only select SATA drives.
**NOTE:** SAS drives require the selection of a SAS controller. See card lists in Controllers section.

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

| | |
|---|---|
| HP 1.2TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 781518-B21 |
| HP 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive | 718162-B21 |
| HP 900GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 785069-B21 |
| HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652589-B21 |
| HP 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759212-B21 |
| HP 600GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 781516-B21 |
| HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652583-B21 |
| HP 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759210-B21 |
| HP 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652572-B21 |
| HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 759208-B21 |
| HP 300GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 785067-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 |
| HP 1TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765464-B21 |
| 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 600GB 12G SAS 15K rpm SFF (2.5-inch) SC 512e Enterprise 3yr Warranty Hard Drive | 748387-B21 |

**SAS Hot Plug SFF (2.5-inch) Midline (MDL) Drives**

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

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

| | |
|---|---|
| HP 450GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive | 737394-B21 |
| HP 300GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive | 737261-B21 |
| HP 600GB 12G SAS 15K rpm LFF (3.5-inch) SC Converter Enterprise 3yr Warranty Hard Drive | 765424-B21 |
| HP 6TB 12G SAS 7.2K rpm LFF (3.5-inch) SC 512e Performance 1yr Warranty Hard Drive | 793671-B21 |
| HP 4TB 12G SAS 7.2K rpm LFF (3.5-inch) SC 512e Performance 1yr Warranty Hard Drive | 793669-B21 |

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

| | |
|---|---|
| HP 6TB 12G SAS 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive | 765259-B21 |
| HP 6TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 761477-B21 |
| HP 4TB 12G SAS 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive | 765257-B21 |
| HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 695510-B21 |
| HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 652766-B21 |
| HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 652757-B21 |
| HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 652753-B21 |

## Core Options

**SATA Hot Plug SFF (2.5-inch) Midline (MDL) Drives**

| | |
|---|---|
| HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive | 655710-B21 |
| HP 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive | 655708-B21 |
| HP 2TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765455-B21 |
| HP 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive | 765453-B21 |

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

| | |
|---|---|
| HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive | 765255-B21 |
| HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 753874-B21 |
| HP 4TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive | 765253-B21 |
| HP 4TB 6G SATA 7.2k rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 693687-B21 |
| HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 628061-B21 |
| HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 658079-B21 |
| HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 657750-B21 |
| HP 500GB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 1yr Warranty Hard Drive | 658071-B21 |
| HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC 512e Performance 1yr Warranty Hard Drive | 793667-B21 |
| HP 4TB 6G SATA 7.2K rpm LFF (3.5-inch) SC 512e Performance 1yr Warranty Hard Drives | 793665-B21 |

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

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

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

| | |
|---|---|
| HP 400GB 12G SAS High Endurance SFF 2.5-in SC Enterprise Performance 3yr Wty Solid State Drive | 741155-B21 |
| HP 200GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802578-B21 |
| HP 400GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802582-B21 |
| HP 800GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802586-B21 |
| HP 1.92TB 12G SAS Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 802891-B21 |

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

| | |
|---|---|
| HP 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762263-B21 |
| HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762261-B21 |

**12G SAS Hot Plug LFF (3.5-inch) Enterprise Value Solid State Drives**

| | |
|---|---|
| HP 800GB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762270-B21 |
| HP 1.6TB 12G SAS Value Endurance LFF 3.5-in SC Enterprise Value 3yr Wty Solid State Drive | 762272-B21 |

**SAS Hot Plug SmartDrive LFF (3.5-inch) Midline 512e Helium Drives**

| | |
|---|---|
| HP 8TB 12G SAS 7.2K rpm LFF (3.5-inch) SC 512e Helium 1yr Warranty Hard Drive | 793703-B21 |
| HP 6TB 12G SAS 7.2K rpm LFF (3.5-inch) SC 512e Helium 1yr Warranty Hard Drive | 793699-B21 |

## Core Options

| | |
|---|---|
| **6G SATA Hot Plug LFF (3.5-inch) Enterprise Light G1 Solid State Drives** | |
| HP 960GB 6G SATA Light Endurance LFF 3.5-in SC Converter ENT Light 3yr Wty G1 Solid State Drive | 756604-B21 |
| **6G SATA Hot Plug SFF (2.5-inch) SC Read Intensive Solid State Drives** | |
| HP 960GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789155-B21 |
| HP 480GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789145-B21 |
| HP 240GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive | 789135-B21 |
| **6G SATA 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 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756657-B21 |
| HP 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756636-B21 |
| HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive | 756621-B21 |
| **6G SATA Hot Plug SFF (2.5-inch) Enterprise Light G1 Solid State Drives** | |
| HP 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive | 756601-B21 |
| **6G SATA Hot Plug LFF (3.5-inch) SC Read Intensive Solid State Drives** | |
| HP 960GB 6G SATA Read Intensive LFF 3.5-in SC Converter 3yr Wty Solid State Drive | 789157-B21 |
| HP 480GB 6G SATA Read Intensive LFF 3.5-in SC Converter 3yr Wty Solid State Drive | 789147-B21 |
| HP 240GB 6G SATA Read Intensive LFF 3.5-in SC Converter 3yr Wty Solid State Drive | 789137-B21 |
| **6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value M1 Solid State Drives** | |
| HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive | 764943-B21 |
| HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive | 764941-B21 |
| HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty M1 Solid State Drive | 764939-B21 |
| **6G SATA Hot Plug LFF Value Endurance (3.5-inch) Converter Enterprise Value G1 Solid State Drives** | |
| HP 1.6TB 6G SATA Value Endurance LFF 3.5-in SC Converter Enterprise Value 3yr Wty Solid State Drive | 757342-B21 |
| HP 480GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive | 756660-B21 |
| HP 240GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive | 756639-B21 |
| HP 120GB 6G SATA Value Endurance LFF 3.5-in SC Converter ENT Value 3yr Wty G1 Solid State Drive | 756624-B21 |
| **6G SATA Hot Plug with SmartDrive LFF (3.5-inch) Midline 512e Helium Drives** | |
| HP 8TB 6G SATA 7.2K rpm LFF (3.5-inch) SC 512e Helium 1yr Warranty Hard Drive | 793695-B21 |
| HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC 512e Helium 1yr Warranty Hard Drive | 793683-B21 |
| **Hard Drive Blank Kits** | |
| HP Large Form Factor Hard Drive Blank Kit | 666986-B21 |
| HP ML150 Gen9 4LFF Hot Plug Drive Cage | 725872-B21 |
| HP ML150 Gen9 4LFF Non-hot Plug Drive Cage | 779859-B21 |
| HP ML150 Gen9 9/10LFF Drive Enablement Kit | 788567-B21 |
| HP Small Form Factor Hard Drive Blank Kit | 666987-B21 |
| HP ML150 Gen9 8SFF Hot Plug Drive Cage | 725874-B21 |

## Core Options

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

**HP Power Supplies**

**HP Entry-Level Power Supplies**

HP 550W FIO Power Supply Kit — 730941-B21

**NOTE:** The above power supply option is 80Plus Silver-certified with an efficiency rating of up to 89%. Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

HP Server Redundant Power Supply Backplane Kit — 745813-B21

HP 800W Gold (Redundant)/900W (Non-Redundant) AC Power Input Module — 744689-B21

**NOTE:** The above power supply option is 80Plus Gold-certified with an efficiency rating of up to 92%. Each power backplane kit (745813-B21) can support up to two (2) AC power input modules (744689-B21). Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

**NOTE:** HP 800W/900W Gold AC Power Input Module only support up to maximum 800W redundant with 2 x 900W power module.

**NOTE:** Each Redundant Power Supply Backplane can support up to two (2) power input modules. Non-redundant configurations with a single power input module installed can provide up to 900W (200 – 240VAC) and up to 550W (100 – 127VAC) of power. Redundant configurations with two power input modules installed can provide up to 800W (200 – 240VAC) and up to 550W (100 – 127VAC) of power.

**NOTE:** Must select power backplane along with 900W power module:

900w power module x 1 requires 900W power backplane x 1 (Non-redundant PSU).

900w power module x 2 requires 900W power backplane x 1 (Redundant PSU).

**NOTE:** Recommend to select 900W for 2P configurations or check power advisor for power consumption for the customer usage case. Power specifications and technical content for all HP Server power supplies can be found at http://www.hp.com/go/proliant/powersupply.

**HP Computation and Graphics Accelerators**

HP NVIDIA Quadro K2200 Graphics Accelerator — J0G89A

**NOTE:** Must select 2 processor if 2 graphic cards are selected.

**NOTE:** Must select 900W power supply when 2 graphic cards are selected.

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

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

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

**HP Cooling Options**

HP ML150 Gen9 PCI Baffle Kit — 779861-B21

**NOTE:** Must be selected when a PCIe card is installed with any Networking, Controllers (SAS, SCSI and Fiber Channel), and Graphic options.

**NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is included while order Performance Model with H240 Storage Controller.

## Additional Options

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

| | | |
|---|---|---|
| **Embedded Management** | **HP iLO Advanced** | |
| | 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 1yr 24x7 Technical Support and Updates Single Server License | 512485-B21 |
| | HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU | E6U64ABE |
| | **HP iLO Essentials** | |
| | HP Integrated Lights-Out Essentials including 3yr 24x7 Tech Support and Updates Single Svr License | BD774A |
| | HP Integrated Lights-Out Essentials including 1yr 24x7 Tech Support and Updates Single Svr License | BD775A |
| | HP Integrated Lights-Out Essentials including 3yr 24x7 Technical Support and Updates E-LTU | E6U61ABE |
| | HP Integrated Lights-Out Essentials including 1yr 24x7 Technical Support and Updates E-LTU | E6U62ABE |
| | | |
| **High Performance Clusters** | **HP Insight Cluster Management Utility** | |
| | HP Insight Cluster Management Utility 3yr 24x7 Flexible License | BD476A |
| | HP Insight Cluster Management Utility 1yr 24x7 Flexible License | QL803B |
| | **NOTE:** These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement. | |
| | HP Insight Cluster Management Utility Media | BD477A |
| | | |
| **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 P441/4GB FBWC 12Gb 2-ports Ext SAS Controller | 726825-B21 |
| | HP Smart Array P840/4GB FBWC 12Gb 2-ports Int SAS Controller | 726897-B21 |
| | **NOTE:** 16SFF is limited to P840. | |
| | HP Smart Array P841/4GB FBWC 12Gb 4-ports Ext SAS Controller | 726903-B21 |
| | HP Smart Array P440/4GB FBWC 12Gb 1-port Int FIO SAS Controller | 761872-B21 |
| | **NOTE:** Smart Storage Battery included. | |
| | **NOTE:** Must select battery holder P/N: 786710-B21 when purchase P440. | |
| | **NOTE:** B140i can't mix with any standup internal controller. | |
| | **NOTE:** HP ML150 Gen9Mini SAS P440/P840 Cable Kit must be selected P/N: 784606-B21 for P440 controller (1 cable kit is required for P440x1). | |
| | **NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order H240 controller card. | |
| | HP Smart Array P840/4GB FBWC 12Gb 2-ports Int FIO SAS Controller | 761874-B21 |
| | **NOTE:** Smart Storage Battery included. | |
| | **NOTE:** B140i can't mix with any standup internal controller. | |
| | **NOTE:** Must select P840/4G FIO Controller when additional drive cage is selected. | |
| | **NOTE:** Must select P840/4G Controller when apply 16SFF. | |
| | **NOTE:** Must select battery holder when purchase P440 P/N: 786710-B21. | |
| | **NOTE:** HP ML150 Gen9Mini SAS P440/P840 Cable Kit must be selected P/N: 784606-B21 for P840 controller (2 cable kits are required for P840x1). | |
| | **NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order controller card. | |
| | **SAS Controller Options** | |
| | HP 96W Smart Storage Battery with 145mm Cable for DL/ML/SL Servers | 727258-B21 |
| | **HP Host Bus Adapter** | |

## Additional Options

| | |
|---|---|
| HP H240 12Gb 2-ports Int Smart Host Bus Adapter | 726907-B21 |
| HP H241 12Gb 2-ports Ext Smart Host Bus Adapter | 726911-B21 |
| HP H240 12Gb 2-ports Int FIO Smart Host Bus Adapter | 761873-B21 |

**NOTE:** Must select for H240 controller when select Tape Drive

**NOTE:** Cable Rule:

1 cable kit is required for Hot Plug 4LFF.

2 cable kits are required for below:

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

- 8SFF

**NOTE:** If H240 is the primary controller and if HP Mfg FIO Enable HBA Mode Setting is selected, then RAID is not allowed.

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

**NOTE:** HP ML150 Gen9 PCI BAFFLE Kit (779861-B21) is required while order controller card.

**HP Cable Options**

| | |
|---|---|
| HP ML150 Gen9 Mini SAS H240 Cable Kit | 784606-B21 |
| HP ML150 Gen9 Mini SAS P440/P840 Cable Kit | 784608-B21 |

**Battery Holder**

| | |
|---|---|
| HP ML150 Gen9 Smart Storage Battery Holder Kit | 786710-B21 |

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**HP Tape Backup**

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

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

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

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

**Tape Drives**

| | |
|---|---|
| HP StoreEver LTO-6 Ultrium 6650 SAS External Tape Drive | EH964A |
| HP StoreEver LTO-6 Ultrium 6650 SAS Internal Tape Drive | EH963A |
| HP StoreEver 1/8 G2 LTO-6 Ultrium 6250 FC Tape Autoloader | C0H19A |
| HP StoreEver LTO-6 Ultrium 6250 Tape Drive in 1U Rack-mount Kit | C0L99A |
| HP StoreEver LTO-6 Ultrium 6250 External Tape Drive | EH970A |
| HP StoreEver LTO-6 Ultrium 6250 Internal Tape Drive | EH969A |
| HP StoreEver LTO-5 Ultrium 3000 SAS Tape Drive in 1U Rack-mount | EJ014B |
| HP StoreEver LTO-5 Ultrium 3000 SAS External Tape Drive | EH958B |
| HP StoreEver LTO-5 Ultrium 3000 SAS Internal Tape Drive | EH957B |
| HP StoreEver LTO-5 Ultrium 3280 SAS Tape Drive in 3U Rack-mount | EJ013B |
| HP StoreEver LTO-5 Ultrium 3280 SAS External Tape Drive | EH900B |
| HP StoreEver LTO-5 Ultrium 3280 SAS Internal Tape Drive | EH899B |
| HP StoreEver LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit | EH946C |
| HP StoreEver LTO-4 Ultrium 1760 SCSI External Tape Drive | EH922B |
| HP StoreEver LTO-4 Ultrium 1760 SAS External Tape Drive | EH920B |
| HP StoreEver LTO-4 Ultrium 1760 SAS Internal WW Tape Drive | EH919B |
| HP StoreEver LTO-3 Ultrium 920 SAS External Tape Drive | EH848B |
| HP StoreEver 1U SAS Rack-mount Kit | AE459B |

**HP Tape Storage Systems HP StoreEver MSL6480**

| | |
|---|---|
| HP StoreEver MSL6480 Scaleable Expansion Module | QU626A |
| HP StoreEver MSL6480 Scalable Base Module | QU625A |
| HP MSL2024 0-Drive Tape Library | AK379A |
| HP MSL4048 0-Drive Tape Library | AK381A |

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14604_div/14604_div.html (Worldwide).

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## Additional Options

| | | |
|---|---|---|
| **HP Disk Backup** | **HP RDX Removable Disk Backup System** | |
| | HP RDX1000 USB 3.0 External Disk Backup System | B7B69A |
| | HP RDX500 USB 3.0 External Disk Backup System | B7B66A |
| | HP RDX320 USB3.0 External Disk Backup System | B7B63A |
| | HP RDX 2TB USB3.0 External Disk Backup System | E7X53A |
| | HP RDX 2TB USB3.0 External Disk Backup System | E7X53B |
| | HP D3700 Enclosure | QW967A |
| | HP D3600 Enclosure | QW968A |
| | HP RDX+ 1TB External Backup System | B7B69B |
| | HP RDX+ 500GB External Backup System | B7B66B |
| | HP RDX+ External Docking System | C8S07B |
| | **NOTE:** For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk backup products see: http://www.hp.com/storage/SPOCK. | |
| **HP 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 |
| | HP D2600 w/12 4TB 6G SAS 7.2K LFF Dual Port MDL HDD 48TB Bundle | E7W32A |
| **HP Power Distribution Units (PDUs)** | **HP Basic Power Distribution Unit (bPDU)** | |
| | 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 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 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 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 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 |
| | 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 |

## Additional Options

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|---|---|
| HP 22kVA 32A Three Phase INTL Core Modular Power Distribution Unit | AF518A |

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

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

| | |
|---|---|
| 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 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU | D9N45A |
| 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 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 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 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU | D9N62A |
| 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 17.3kVA 208 Volt IEC309 60A 3-Phase Watertight Input (12xC13/12xC19) NA/JP Monitored PDU | G9Z07A |
| HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU | D9N63A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU | D9N56A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Input (12xC13/12xC19) INTL Monitored PDU | D9N60A |
| HP 22kVA 400 Volt IEC309 32A 3-Phase Watertight Input (12xC13/12xC19) INTL Monitored PDU | G9Z08A |
| HP Environmental Sensor for Remote Monitored and Managed PDUs | E2D53A |

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

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

## Additional Options

| | |
|---|---|
| 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 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit | AF523A |
| HP 11.4kVA 16A 415V Three Phase L22-20 NA Core Intelligent Power Distribution Unit | AF900A |
| HP 17.3kVA 24A 415V Three Phase IEC309 NA Core Intelligent Power Distribution Unit | AF901A |
| HP 7.3kVA 32A Single Phase INTL Core Intelligent Modular Power Distribution Unit | AF525A |
| HP 11kVA 16A Three Phase INTL Core Intelligent Modular Power Distribution Unit | AF526A |
| HP 22kVA 32A Three Phase INTL Core Intelligent Modular Power Distribution Unit | AF527A |
| HP 17.3kVA 48A 208V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit | AF535A |
| HP 17.3kVA 24A 415V Three Phase 12 Outlet Core NA/JP Intelligent Power Distribution Unit | AF537A |
| HP 22kVA 32A 400V Three Phase 12 Outlet Core INTL   Intelligent Power Distribution Unit | AF538A |
| 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 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit | AF533A |
| HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit | AF534A |
| HP 5xC13 Intelligent PDU Extension Bar G2 Kit | AF547A |
| HP 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar | AF528A |

**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.

**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 |
| | **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: | |
| | http://h18000.www1.hp.com/products/quickspecs/14429_div/14429_div.html (Worldwide) | |
| | **HP Rack Mount Consoles** | |

## Additional Options

| | |
|---|---|
| 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 |
| HP TFT7600 G2 KVM Console Rackmount Keyboard UK Monitor | AZ871A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard DE Monitor | AZ872A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard FR Monitor | AZ873A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard IT Monitor | AZ874A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard ES Monitor | AZ875A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard DK Monitor | AZ876A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard NO Monitor | AZ877A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard SE/FI Monitor | AZ878A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard CH Monitor | AZ879A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard PT Monitor | AZ880A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard BE Monitor | AZ881A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard JP Monitor | AZ882A |
| HP TFT7600 G2 KVM Console Rackmount Keyboard RU Monitor | AZ883A |
| **HP KVM Switches** | |
| HP Server Console 0x2x8 Port Analog Switch | AF616A |
| HP Server Console 0x2x16 Port Analog Switch | AF617A |
| HP 0x1x8 G3 KVM Console Switch | AF651A |
| HP 0x2x16 G3 KVM Console Switch | AF652A |
| 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 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software | AF618A |
| HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software | AF619A |
| HP KVM Console USB 2.0 Virtual Media CAC Interface Adapter | AF629A |
| HP 1x4 USB/PS2 KVM Console Switch | AF611A |
| HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software | AF620A |
| HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software | AF621A |
| HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software | AF622A |

**NOTE:** To learn more, please visit the HP KVM Switches web page.

| **HP USB Keyboard and Mouse** | |
|---|---|
| HP USB BFR with PVC Free US Keyboard/Mouse Kit | 631341-B21 |
| HP USB BFR with PVC Free Intl Keyboard/Mouse Kit | 672097-B33 |
| 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 SE Keyboard/Mouse Kit | 672097-103 |
| HP USB BFR with PVC Free CH Keyboard/Mouse Kit | 672097-113 |
| 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 AP-Intl Keyboard/Mouse Kit | 672097-373 |
| HP USB BFR with PVC Free IN Keyboard/Mouse Kit | 672097-D63 |
| HP USB BFR with PVC Free KR Keyboard/Mouse Kit | 672097-KD3 |

## Additional Options

| | |
|---|---|
| HP 1U INT Rackmount Keyboard with USB | AG086A |
| HP 1U US Rackmount Keyboard with USB | AG072A |

**NOTE:** Please see the HP USB Keyboard and Mouse QuickSpecs for information on additional options and product specifications.

**HP Other Options**

| | |
|---|---|
| HP Rack LED Light Kit | BW939A |
| HP Kit LCD 1.83m Latch Display Port Cable | G7T29A |

| | | |
|---|---|---|
| **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 |
| | **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 T750 G2 UPS Models** | |
| HP T750 G2 750VA NA Tower Uninterruptible Power System | AF446A |
| HP T750 G2 750VA INTL Tower Uninterruptible Power System | AF447A |
| HP T750J JP Uninterruptible Power System | AF456A |
| **HP T1000 G3 UPS Models** | |
| HP T1000 G3 1000VA INTL Tower Uninterruptible Power System | AF449A |
| **HP T1500 G3 UPS Models** | |
| HP T1500 G3 1400VA INTL Tower Uninterruptible Power System | AF451A |
| **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 |
| **HP R/T3000 G2 Uninterruptible Power System (UPS)** | |
| HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System | AF466A |
| HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System | AF467A |
| HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System | AF468A |
| **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 |
| **R1.5kVA G3 Models** | |
| HP R1.5kVA G3 1U NA Uninterruptible Power System | AF469A |
| HP R1.5kVA G3 1U JP/TW Uninterruptible Power System | AF470A |
| HP R1.5kVA G3 1U INTL Uninterruptible Power System | AF471A |
| **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 |

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

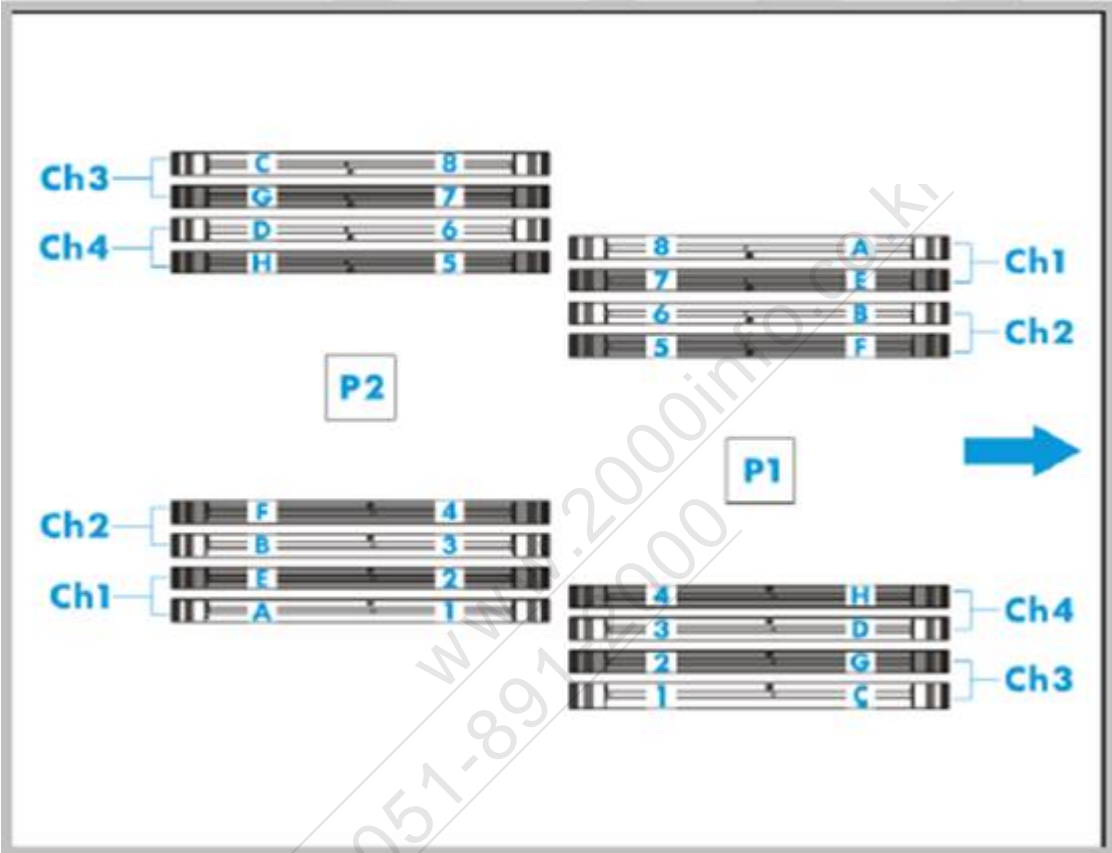| | | |
|---|---|---|
| **HP USB and SD Options** | **HP Enterprise Mainstream Flash Media Kits for Memory Cards** | |
| | HP 8GB microSD Enterprise Mainstream Flash Media Kit | 726116-B21 |
| | HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit | 737953-B21 |
| | HP Dual 8GB microSD Enterprise Midline USB Kit | 741279-B21 |

## Additional Options

| **HP Care Pack Services** | **Installation & Start-up Services** | |
|---|---|---|
| | HP Installation ML350e/ML150 Service | U6D41E |
| | HP Startup ML350e/ML150 Service | U6D43E |
| | **Foundation Care** | |
| | HP 3 year 24x7 ML150 Gen9 Foundation Care Service | U7WR1E |
| | HP 3 year 24x7 with Defective Media Retention ML150 Gen9 Foundation Care Service | U7WR2E |
| | HP 3 year 24x7 w/Comprehensive Defective Material Retention ML150 Gen9 Foundation Care Service | U7WR3E |
| | **Proactive Care** | |
| | HP 3 year 24x7 ML150 Gen9 Proactive Care Service | U7WT8E |
| | HP 3 year 24x7 with Defective Media Retention ML150 Gen9 Proactive Care Service | U7WT9E |
| | HP 3 year 24x7 w/CompDefectiveMaterialRetention ML150 Gen9 Proactive Care Service | U7WU0E |

## Memory

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

**Memory Population guidelines**





**General Memory Population Rules and Guidelines**:

## Memory

. Install DIMMs only if the corresponding processor is installed.
. If only one processor is installed in a two processor system, only half of the DIMM slots are available.
. To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.
. When two processors are installed, balance the DIMMs across the two processors.
. White DIMM slots denote the first slot to be populated in a channel.
. Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.
. Do not mix RDIMMs or LRDIMMs.
. Quad rank RDIMMs are not supported in HP ProLiant ML150 Gen9 servers.
. Quad rank LRDIMMs are capable of up to three DIMMs per channel.
. RDIMMs operating at 1.2V.
. DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
. The maximum memory speed is a function of the memory type, memory configuration, and processor model.
. The maximum memory capacity is a function of the memory type and number of installed processors.
. To realize the performance memory capabilities listed in this document, HP SmartMemory is required.
. There are four (4) channels per processor; eight (8) channels per server.
  There are three (2) DIMM slots for each memory channel; twenty-four (16) total slots.
  Memory channels1 and 3 consists of the two (2) DIMMs that are furthest from the processor.
  Memory channel 2 and 4 consists of the two (2) DIMMs that are closest to the processor.

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

**Memory Bandwidth and Capacity**

| [DIMM Type] | Registered Dimms (RDIMMs) | | | Load Reduced (LRDIMMs) |
|---|---|---|---|---|
| DIMM Rank | Single Rank | | Dual Rank | Dual Rack |
| DIMM Capacity | 4GB | 8GB | | 16GB |
| Voltage | Std Voltage 1.2V | | | |
| **SLOTS THAT CAN BE POPULATED** | | | | |
| 16 slot servers | 16 | | | |
| **MAXIMUM CAPACITY (GB)** | | | | |
| | 64 | 128 | | 256 |
| | | | | |
| **1 DIMM Per Channel** | 2133 | | | |
| **2 DIMM Per Channel** | 2133 | | | |
| | | | | |

## Memory

**DIMM slot and configuration diagram**

**DIMM slot and configuration diagrams**

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

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

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

| | | CPU 1 | | CPU 2 | | |
|---|---|---|---|---|---|---|
| | Slot # | population order | Slot # | population order | | |
| Chnl 2 | 5 | F | 5 | H | | Chnl 4 |
| | 6 | B | 6 | D | | |

| | | CPU 1 | | CPU 2 | | |
|---|---|---|---|---|---|---|
| | Slot # | population order | Slot # | population order | | |
| Chnl 1 | 7 | E | 7 | G | | Chnl 3 |
| | 8 | A | 8 | C | | |

**Memory Speed by Processor Model**

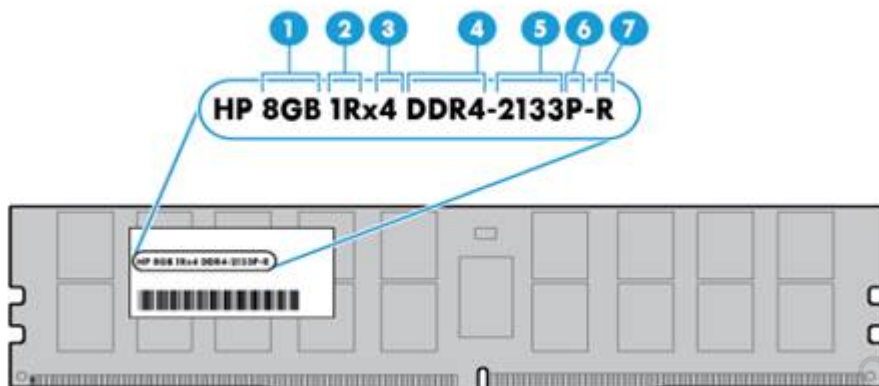| Processor Models | Supported Memory Speeds |
|---|---|
| E5-2603v3, E5-2609v3, | 1600MHz |
| E5-2620v3, E5-2630v3, E5-2640v3, | 1866MHz |
| E5-2650Lv3, E5-2650v3, E5-2660v3, | 2133MHz |

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

| Pre-Configured Models | Standard Memory | Maximum Memory Plus Optional Memory | Standard Memory Replaced with Optional Memory |
|---|---|---|---|
| E5-2603v3, | 4GB (1x4GB) | 484GB (15x32GB, 1x4GB) | 256GB (16x16GB) |
| E5-2609v3, | 8GB (1x8GB) | 488GB (15x32GB, 1x8GB) | 256GB (16x16GB) |
| E5-2620v3, | 16GB (1x16GB) | 496GB (15x32GB, 1x16GB) | 256GB (16x16GB) |

## Memory

**DDR4 memory options part number decoder**

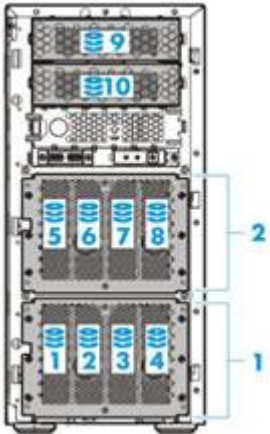**NOTE:** Capacity references are rounded to the common gigabyte (GB) values.

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

**HP 8GB 1Rx4 DDR4-2133P-R**

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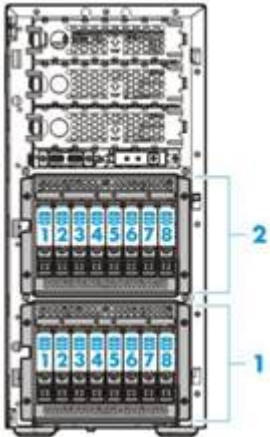6.  CAS latency: P = 15
7.  DIMM type: R = RDIMM (registered); L = LRDIMM (load reduced)

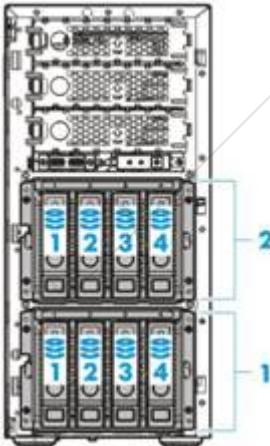## Storage

4-bay LFF non-hot-plug drive model



| | |
|---|---|
| 1-8 | 8 x LFF SATA/SSD Non-hot-plug Hard Drive Bays |
| 9-10 | Media Bays |

**NOTE:** When populating 10 LFF, not able to install Tape Drive or Optical Drive.Possible Configurations: 1) 8LFF +1 ODD+ 1 Tape Drive (Full/Half), or 2) 9LFF + 1ODD, or 3) 9LFF + 1 Tape Drive (Full/Half).

8-bay SFF hot-plug drive model



| | |
|---|---|
| 1 x 1-8 | 8 x LFF SAS/SSD Hot Pluggable Hard Drive Bays |
| 2 x 1-8 | 8 x LFF SAS/SSD Hot Pluggable Hard Drive Bays |

4-bay LFF hot-plug drive model



| | |
|---|---|
| 1 x 1-4 | 4 x LFF SATA/SSD   Hot Pluggable Hard Drive Bays |
| 2 x 1-4 | 4 x LFF SATA/SSD Hot Pluggable Hard Drive Bays |

**Maximum Storage Capacity -**
Total (10 LFF Drive)     60TB
Total (16 SFF Drive)     25.6TB

## Technical Specifications

| System Unit | Tower Dimensions | | 17.03(H) x 7.87(W) x 24.41(D) in (43.26 x 20 x 62 cm) |
|---|---|---|---|
| | **Tower Weight** | Minimum: | 32lb (14.51kg) |
| | | Maximum: | 41lb (18.60kg) |
| | **Input Requirements** (for Standard 460W PSU, see power specifications tables for detail on 460W, 750W and 1200W power supplies) | Range Line Voltage | 100 to 240 VAC |
| | | Rated Input Current | For 550W Power Supply:6.7 A (at 100 VAC)3.3 A (at 200 VAC) |
| | | Rated Input Frequency | 47 to 63 Hz |
| | | Rated Input Power | For 550 W Power Supply:< 670 W (at 100 VAC),< 660 W (at 200 VAC), |
| | **BTU Rating** | Maximum | For 550 W Power Supply:2201 BTU/hr (at 100 VAC),2153 BTU/hr (at 200 VAC) |
| | **Power Specifications** | | To review typical system power ratings use the Power Advisor which is available via the online tool located at URL: http://www.hp.com/go/proliant-energy-efficient or http://www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: ML150 Gen9-Follow the instructions of the next screens. |
| | **Power Supply Output** | Rated Steady-State Power | For 550 W Power Supply:550 W (at 100 VAC),550 W (at 200 VAC), |
| | | Maximum Peak Power | For 550 W Power Supply:550 W (at 100 VAC),550 W (at 200 VAC), |
| | **System Inlet Temperature** | Standard Operating Support | 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°Cper every 304.8 m (1.8°F per every 1000 ft) above sea level to amaximum of 3048 m (10,000 ft), no direct sustainedsunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limitand rate of change may be limited by the type and number of optionsinstalled. System performance during standard operating supportmay be reduced if operating with a fan fault or above 30°C(86°F). |
| | | Extended Ambient Operating Support | For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae |
| | | | For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3048 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hp.com/servers/ashrae |
| | | | System performance may be reduced if operating in the extended ambient operating range or with a fan fault. **NOTE:** Supports A3 extended ambient, A4 extended ambience will be available in early 2015. |
| | | Non-operating | -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr(36°F/hr). |
| | **Relative Humidity** | Operating | Minimum to be the higher (more moisture) of -12°C (10.4°F) dew pointor 8% relative humidity. Maximum to be the lower (less moisture) of24°C (75.2°F) dew point or 90% relative humidity. |

## Technical Specifications

| | | |
|---|---|---|
| | Non-operating | 5% to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulbtemperature, non-condensing. |
| **Altitude** | Operating | 3048 m (10,000 ft). This value may be limited by the type and numberof options installed. Maximum allowable altitude change rate is 457m/min (1500 ft/min). |
| | Non-operating | 9144 m (30,000 ft). Maximum allowable altitude change rate is 457m/min (1500 ft/min). |

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

**Idle**

L WAd
- 3.8 Bels (1P LFF Non Hot-Plug Entry)
- 3.8 Bels (1P LFF Hot-plug Base)
- 4.3 Bels (1P SFF Hot-plug Performance)

L pAm
- 22 dBA (1P LFF Non Hot-Plug Entry)
- 22 dBA (1P LFF Hot-plug Base)
- 25 dBA (1P SFF Hot-plug Performance)

**Operating**

L WAd
- 3.8 Bels (1P LFF Non Hot-Plug Entry)
- 3.8 Bels (1P LFF Hot-plug Base)
- 4.1 Bels (1P SFF Hot-plug Performance)

L pAm
- 23 dBA (1P LFF Non Hot-Plug Entry)
- 22 dBA (1P LFF Hot-plug Base)
- 25 dBA (1P SFF Hot-plug Performance)

**NOTE:** Configurations tested for 1P LFF Entry models included two (2) 500GB LFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.

**NOTE:** Configurations tested for 1P and 2P SFF models included two (2) 500GB SFF SATA Midline HDD and Windows 2012 Enterprise 64-bit.

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

| **Emissions Classification** | FCC Rating | Class 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.

## Technical Specifications

| | | |
|---|---|---|
| **HP Dynamic Smart Array B140i Controller** | **Number of PCI links** | Four |
| | **PCI link rate** | 4 Gb/s |
| | **Storage protocol support** | SATA |
| | **SAS/SATA peak data tranfer rate** | 6 Gb/s |
| | **Number of SAS/SATA links** | 10 links |
| | **SAS/SATA connectivity** | 2x4 connectors; 2x1 connectors |
| | **Expander support** | No |
| | **Drives supported (max)** | Up to 10 Internal Drives |
| | **RAID support** | 0, 1, 10, 5 SATA |
| | **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-port 331i Adapter** | **Network Interface** | 10Base-T/100Base-TX/1000Base-TX |
| | **Compatibility** | IEEE 802.3 10Base-T<br>IEEE 802.3ab 1000Base-T<br>IEEE 802.3u 100Base-TX |
| | **Ports** | |
| | **Data Transfer Method** | PCI Express, two lanes (x2) |
| | **Controller** | BCM5717 |
| | **Network Transfer Rate** | 10Base-T (Half-Duplex) — 10 Mb/s per port, 40 Mb/s combined<br>10Base-T (Full-Duplex) — 20 Mb/s per port, 80 Mb/s combined<br>100Base-TX (Half-Duplex) — 100 Mb/s per port, 400 Mb/s combined<br>100Base-TX (Full-Duplex) — 200 Mb/s per port, 800 Mb/s combined<br>100Base-TX (Half-Duplex) — 1000Mb/s per port, 4000 Mb/s combined<br>100Base-TX (Full-Duplex) — 2000Mb/s per port, 8000 Mb/s combined |
| | **Connector** | RJ-45 |
| | **Cable Support** | 10 Base-T — Categories 3, 4 or 5 UTP; up to 328 ft (100 m)<br>10/100/1000 Base-TX — Category 5 or higher UTP; up to 328 ft (100 m) |

## Technical Specifications

**Environment-friendly Products and Approach**

**End-of-life Management and Recycling**

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

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

## Summary of Changes

| Date | Version History | Action | Description of Change |
|------|-----------------|--------|------------------------|
| 06/01/2015 | From Version 4 to 5 | Added | New Hard Drives were added to Core Options.<br><br>New RDX+ external backup options were added. |
| | | Changed | Standard Features and HP Power Supplies were revised. |
| | | Removed | Obsolete SKUs were removed from QuickSpecs. |
| 04/24/2015 | From Version 3 to 4 | Added | Added 813534-B21 and 813535-B21 to HP Power Supplies. |
| 03/30/2015 | From Version 2 to 3 | Added | New Hard Drives offering.<br><br>Optional Software added to HP Storage Controllers.<br><br>Added HP Smart Array P841/4GB FBWC 12Gb 4-ports Ext SAS Controller. |
| | | Changed | HP Memory and HP Disk Storage Systems were updated. |
| 02/09/2015 | From Version 1 to 2 | Added | Added HP Insight Software section and Network controller sections.<br><br>Added new HP Drives and new G4 UPS models. |
| | | Changed | HP Processors, HP Memory, HP Drives, HP Tape Backup, HP Disk Backup, HP Rack Mount Consoles, KVM Switches, and Keyboards, HP Uninterruptible Power Systems (UPS), and HP USB and SD Options sections were updated. |

hp.com/qref/ml150gen9