

Overview

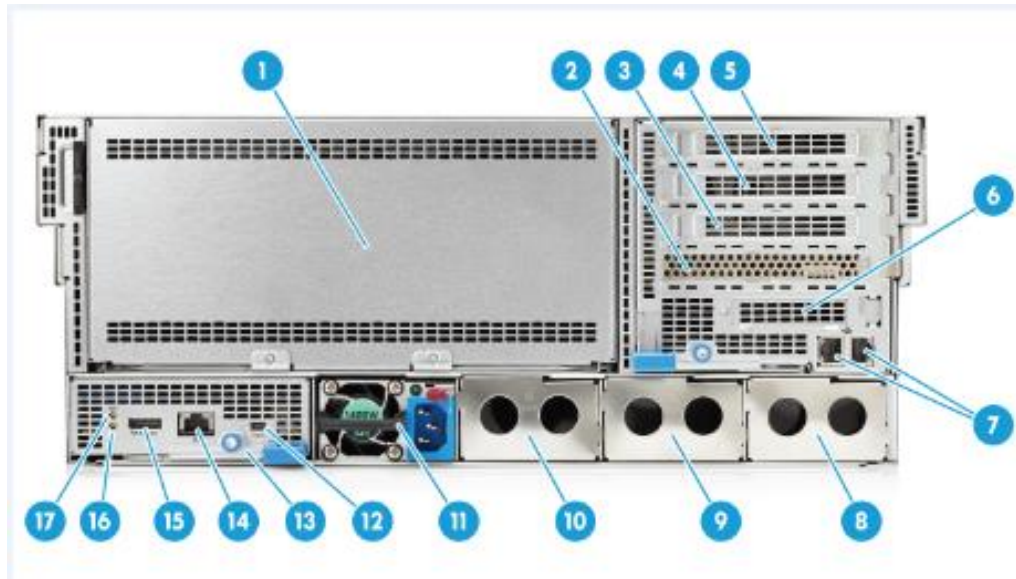
HP Apollo 4500 System

With HP Apollo 4500 Systems, HP challenges the notion that one-size-fits-all for Big Data infrastructure by creating two purpose-built systems that specifically address storage and analytics workloads: the Apollo 4510 and Apollo 4530, respectively. For object storage, the ultra-dense Apollo 4510 includes 1 server and up to 68 Large Form Factor (LFF) in a 4U chassis. For Hadoop analytics, the Apollo 4530 uniquely offers 3 servers per chassis, ideal for housing 3 copies of data in a single system.



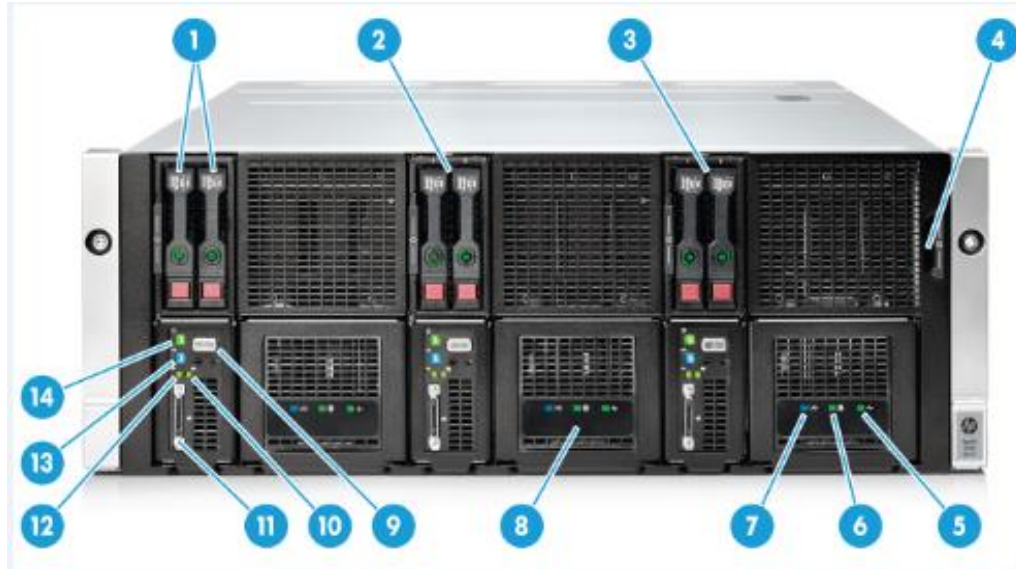
HP Apollo 4510 Model Front View:	
1.	SFF 2.5" hard drives on node
2.	Quick Reference Code
3.	Health LED
4.	Logical array status
5.	UID LED
6.	Eject node button
7.	NIC Status LED
8.	SUV Connector – EGA and USB
9.	Health LED
10.	UID LED
11.	Power Indicator LED

Overview



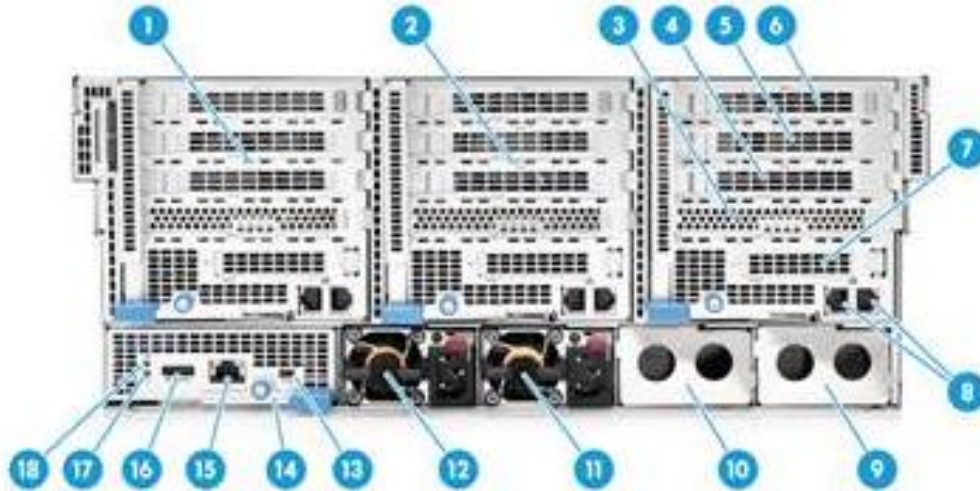
HP Apollo 4510 Model Rear View:	
1.	Rear cage kit (blank) – Supports up to 8 LFF HDD/SSD
2.	PCIe Slot 1
3.	PCIe Slot 2
4.	PCIe Slot 3
5.	PCIe Slot 4
6.	FlexibleLOM
7.	2 X 1Gb Ethernet ports
8.	Power Supply 1 (blank)
9.	Power Supply 2 (blank)
10.	Power Supply 3 (blank)
11.	Power Supply 4
12.	HP Tools Service port
13.	Module Removal Pin (non-hot-pluggable)
14.	Dedicated iLO4 Port
15.	HP-APM 2.0 Interface Port (Rack management interface)
16.	Chassis management controlled health indicator
17.	Chassis management controller UID indicator

Overview



HP Apollo 4530 Model Front View:	
1.	SFF 2.5" hard drives on node (2)
2.	Storage Node 2
3.	Storage Node 3
4.	Quick Reference Code
5.	Health LED
6.	Logical array status
7.	UID LED
8.	LFF hard drives connected to Server Node 2
9.	Eject node button
10.	NIC Status
11.	SUV Connector – EGA and USB
12.	Health LED
13.	UID LED
14.	Power Indicator LED

Overview



HP Apollo 4530 Model Rear View:	
1.	I/O Module Server Node 3
2.	I/O Module Server Node 2
3.	PCIe Slot 1 in Server Node 1
4.	PCIe Slot 2 in Server Node 1
5.	PCIe Slot 3 in Server Node 1
6.	PCIe Slot 4 in Server Node 1
7.	FlexibleLOM in Server Node 1
8.	2 X 1Gb Ethernet ports
9.	Power Supply 1 (blank)
10.	Power Supply 2 (blank)
11.	Power Supply 3
12.	Power Supply 4
13.	HP Tools Service port
14.	Module Removal Pin
15.	Dedicated iLO4 Port
16.	HP-APM 2.0 Interface Port (Rack management interface)
17.	Chassis management controlled health indicator
18.	Chassis management controller UID indicator
19.	Chassis management controller power indicator

Overview



HP Apollo 4510 System



HP Apollo 4530 System

Overview

What's New

- Intel® Xeon® Processor E5-2600 v3 Series
- HP DDR4-2133 Low Voltage Memory Kit
- 4U Form Factor
- Up to 4 PCIe Gen 3.0 Slots
- Up to 68 LFF drives
- M.2 support
- HBA support for node drives
- 16 DIMMs – DDR4 memory
- Gen9 Power supplies (800W and 1400W) – 48VDC
- 12G SAS
- VDC Power Supply Kit

Standard Features

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

Processor

One model of the following per server node

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
E5-2698v3	2.3GHz	16	40MB	135W	9.6GT/s	2133
E5-2695v3	2.3GHz	14	35MB	120W	9.6GT/s	2133
E5-2690v3	2.6GHz	12	30MB	135W	9.6GT/s	2133
E5-2683v3	2.0GHz	14	35MB	120W	9.6GT/s	2133
E5-2670v3	2.3GHz	12	30MB	120W	9.6GT/s	2133
E5-2650v3	2.3GHz	10	25MB	105W	9.6GT/s	2133
E5-2650Lv3	1.8GHz	12	30MB	65W	9.6GT/s	2133
E5-2640v3	2.6GHz	8	20MB	90W	8.0GT/s	1866
E5-2630v3	2.4GHz	8	20MB	85W	8.0GT/s	1866
E5-2630Lv3	1.8GHz	8	20MB	55W	8.0GT/s	1866
E5-2620v3	2.4GHz	6	15MB	85W	8.0GT/s	1866
E5-2603v3	1.6GHz	6	15MB	85W	6.4GT/s	1600

E5-2600 v3 Series

Sixteen-Core Processors

Intel® Xeon® E5-2698v3 (2.3GHz/16core/40MB/135W) Processor

Fourteen-Core Processors

Intel® Xeon® E5-2695v3 (2.3GHz/14core/35MB/120W) Processor

Intel® Xeon® E5-2683v3 (2GHz/14core/35MB/120W) Processor

Twelve-Core Processors

Intel® Xeon® E5-2690v3 (2.6GHz/12core/30MB/135W) Processor

Intel® Xeon® E5-2670v3 (2.3GHz/12core/30MB/120W) Processor

Intel® Xeon® E5-2650Lv3 (1.8GHz/12core/30MB/65W) Processor

Ten-Core Processors

Intel® Xeon® E5-2650v3 (2.3GHz/10core/25MB/105W) Processor

Eight-Core Processors

Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor

Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor

Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor

Six-Core Processors

Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor

Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed (options for 2133 memory speed is available).

NOTE: Memory will run slower if a lower speed processor is used

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

NOTE: For the Intel® C610 Series Chipset E5-2600v3 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

Cache Memory

40MB (1x40MB) Level3

Standard Features

One of the following depending on model

- NOTE:** For Sixteen-core processors.
35MB (1x35MB) Level3
- NOTE:** For Fourteen-core processors.
30MB (1x30MB) Level3
- NOTE:** For Twelve-core processors.
25MB (1x25MB) Level3
- NOTE:** For Ten-core processors.
20MB (1x20MB) Level3
- NOTE:** For Eight-core processors.
15MB (1x15MB) Level3
- NOTE:** For Six-core processors.

Chipset

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

Upgradeability

Upgradeable to two processors
NOTE: Processor upgrade available from Intel® Xeon® Processors E5-2600 to E5-2400 v3. Please contact HP Technology Sales (<http://www.hp.com/support>), your local HP Re-seller,.

On System Management Processor

HP iLO (Firmware: HP iLO 4)
NOTE: For more information, visit: <http://www.hp.com/go/ilo>.

Memory Protection

Advanced ECC (multi-bit error protection)
Online Spare
Lock Step Mode

Memory

Dedicated to each server node

Type	HP SmartMemory DDR4 Registered (RDIMM and LRDIMM)
DIMM Slots Available	16 DIMM Slots available
Maximum (RDIMM) (per server tray)	512GB (16 x 32GB) Registered memory configurations

NOTE: HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html
NOTE: HP certified SmartMemory must be used to guarantee full 2133 MHz speeds.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133 MHz, 1866MHz, 1600MHz, or 1333MHz. Please see the Online Memory Configuration Tool at: <http://h22195.www2.hp.com/DDR4memoryconfig/Home/Legal>.

Network Controller

HP Ethernet 1Gb 2-port 361i Adapter

Expansion Slots

Dedicated to each server node

Expansion Slots #	Technology	Bus Width*	Connector Width	Form Factor	Notes
0	PCIe 3.0	X8	X16	Low profile slot	CPU0; FlexibleLOM
1	PCIe 3.0	X8	X16	Low profile slot	CPU0; SA/HBA
2	PCIe 3.0	X8	X16	Low profile slot	CPU0; SA/HBA

Standard Features

3	PCIe 3.0	X8	X16	Low profile slot	CPU1
4	PCIe 3.0	X8	X16	Low profile slot	CPU1

*Indicates the number of physical electrical lanes running to the connector.

HP Server ROM

HP ROM (Read Only Memory) is now digitally signed using HP's Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HP ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HP ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

HP's ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (Integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration (using the HP ROM-Based Setup Utility (RBSU)).

NOTE: For further information, please refer to HP's RBSU (ROM based setup utility) user guide: <http://www.hp.com/support/rbsu>.

Storage Controllers

Dedicated to each server node

Software RAID
HP Dynamic Smart Array B140i SATA RAID

NOTE: HP Dynamic Smart Array B140i SATA RAID is located on the server node and controls the two small form factor (SFF/2.5") hard drives and M.2 drives in the server node itself.

HP Smart Array P244br/1G FIO Controller
HP H244br FIO Smart HBA

NOTE: The P244br and H244br may be used for hardware RAID/HBA of the 2 SFF drives per server node.

NOTE: If SAS drive is selected, P244br or H244br is required.

NOTE: NOTE: P244br and H244br connect to the 2 SFF drives in the node and provide capability for up to 12G SAS or 6G SATA. If not installed, then the Intel 610 chipset SATA controls the drives.

NOTE: If you do not wish to use RAID/HBA using software or hardware RAID, then the Intel Chipset controls the RAID. The Intel Chipset is the default controller for the SFF drives.

For hardware RAID/HBA of bulk storage drives, one of the following controlled is required:

HP Smart Array P440/4G Controller
HP Smart Array P441/4G Controller
HP Smart Array P840/4G Controller
HP Smart Array P841/4G Controller
HP H240 Smart HBA
HP H241 Smart HBA

NOTE: The above options control the large form factor (LFF/ 3.5") drives.

NOTE: SA/HBA that end in 1 refer to external controllers for storage outside of the system.

Standard Features

0 refers to internal storage

Internal Storage Devices	USB Drive	Via USB port, external support only
	Hard Drives	None ship standard
	Drive Bays	2 SFF drive bays total for each node 68 LFF drive bays total in chassis for a Apollo 4510 model 45 LFF drive bays total in chassis for a Apollo 4530 (15 drives per node)

Maximum Internal Storage

Apollo 4510: 1x68 Model - 68 LFF Drives per node

NOTE: To achieve 68 LFF drives, the optional 8 drive rear cage must be purchased

NOTE: The default bulk drive support is 60 LFF drives.

Hot Plug LFF SAS	408 TB	68 x 6TB
Hot Plug LFF SATA	408 TB	68 x 6TB
Hot Plug LFF SAS SSD	108.8 TB	68 x 1.6TB
Hot Plug LFF SATA SSD	65.3 TB	68 x 960 GB
Hot Plug SFF SATA SSD	1.6TB	2 x 800GB
Hot Plug SFF SAS SSD	3.2 TB	2 x 1.6TB
Hot Plug SFF SATA	2 TB	2 x 1TB
M.2 2280 SSD	680 GB	2 x 340GB

NOTE: The node consists of two SFF (2.5") hard drive bays on the front of the server

NOTE: M.2s were not previously available with the SL4500, but are available for the Apollo 4500 Gen9 Systems

NOTE: The main storage section in the chassis has 60 LFF (3.5") hard drive bays, with an optional rear drive cage (only available on the Apollo 4510) which fits 8 additional LFF drives and they can be populated with any combination of SAS, SATA, or SATA SSD drives to achieve desired performance.

Apollo 4530: 15 LFF Drives per node, 3 nodes total for a total of 45 LFF Drives per chassis

Hot Plug LFF SAS	270TB	45x 6TB
Hot Plug LFF SATA	270TB	45 x 6TB
Hot Plug LFF SAS SSD	72 TB	45 x 1.6TB
Hot Plug LFF SATA SSD	43.2TB	45 x 960 GB
Hot Plug SFF SATA SSD	4.8TB	6 x 800GB
Hot Plug SFF SAS SSD	9.6 TB	6 x 1.6TB
Hot Plug SFF SATA	6TB	6 x 1TB
M.2 2280 SSD	2.04TB	6 x 340 GB

NOTE: Each node contains two SFF (2.5") hard drive bays on the front of the node.

NOTE: M.2s were not previously available with the SL4500, but are available for the Apollo 4500 Gen9 Systems

NOTE: The main storage section in the chassis has 45 LFF (3.5") hard drive bays, 15 bays per node, and they can be populated with any combination of SAS, SATA, or SATA SSD drives to achieve desired performance.

Interfaces

Dedicated to each server node

Network RJ-45 Two 1GbE NIC ports

NOTE: Customers can elect to use a FlexibleLOM, which enables customers to increase I/O capacity

Management Network 1GbE Dedicated

Standard Features

Port	NOTE: Management port is shared (located on management module)
Health LED	1 front
Power	1 front
UID for node	1 front per node and 1 rear on management module
UID for storage	1 per display board
SUV	Serial + USB + video (all in one)

Industry Standard Compliance

ACPI 5.0 Compliant
 PCIe 3.0 Compliant
 WOL Support
 Microsoft® Logo certifications
 PXE Support
 USB 1.1 and 2.0 Compliant
 SMBIOS 3.0.0

Server Power Cords

6' Highline (IEC-IEC) power cord ships standard
NOTE: HP Apollo servers are primarily connected to PDU's in data center racks so they ship standard with only a PDU power cord (416151-B21). If a user wishes to power an Apollo system using a 120V receptacle (NEMA-15), the NEMA power cord must be ordered separately.

NOTE: If customers require a local power cord, they can check the power cord matrix for the appropriate cord. Please see the following power cord matrix:
<http://www.hp.com/go/powercordmatrix>.

Power Specifications

To review typical system power ratings use the HP Power Advisor which is available via the online tool located at URL: <http://www.hp.com/go/proliant-energy-efficient> or <http://www.hp.com/go/hppoweradvisor>.

NOTE: Power Specification and Technical Content for supported power supplies can be found at: http://h18000.www1.hp.com/products/quickspecs/14209_div/14209_div.html

Common Slot Power Supply

HP's Common Slot (CS) power supplies allow for commonality of power supplies across a wide range of ProLiant and Integrity servers, as well as HP Storage solutions, and are designed to provide the highest power supply efficiency without degrading system performance. HP CS power supplies are tested by the Electric Power Research Institute (EPRI) and certified through the ECOS 80 Plus power supply program. HP CS power supply options provide efficiency ratings of up to 94% and are available in two power output options - 800W, and 1400W - allowing the user to "right-size" a power supply for their specific server configuration. All HP Common Slot power sources are UL, CE Mark Compliant, hot-plug and support redundant configurations. It is highly recommended that you use the HP Power Advisor in defining the "Right-Size" power supply for your needs. HP Power Advisor can be accessed at: <http://www.hp.com/go/hppoweradvisor>.

NOTE: Mixing of power supplies in the same server is not supported. All power supplies must be of the same output and efficiency rating. If non-matched power supplies are inserted you will get errors and operation will fail.

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

NOTE: Redundant Power: Optional redundant power supplies can be purchased through power supply

Standard Features

option kits (see Power Supplies for part numbers).

System Fans

System ships standard with 5 hot-plug fan modules.

Operating Systems and Virtualization Software Support for ProLiant Servers

[Microsoft Windows Server](#)
[Canonical Ubuntu](#)
[Red Hat Enterprise Linux \(RHEL\)](#)
[SUSE Linux Enterprise Server \(SLES\)](#)
[VMware](#)

NOTE: Only 64-bit versions of these operating systems are supported.

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 including how to purchase from HP, please visit our OS Support Site at: <http://www.hp.com/go/ossupport> and our driver download page: <http://www.hp.com/support/HPAPOLLO4500Gen9>

Graphics (per node)

Integrated Matrox G200 video standard

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

Form Factor

4U form factor

On System Management

HP iLO Management Engine

HP iLO Management Engine is a comprehensive set of embedded management features supporting the complete lifecycle of the server, from initial deployment, through ongoing management, to service alerting and remote support. HP iLO Management Engine comes standard on all HP ProLiant Gen9 servers. The HP iLO Management Engine portfolio includes:

- **HP iLO:** The HP iLO (Integrated Lights-Out) management processor is the core foundation for the HP iLO Management Engine
- **HP Agentless Management:** Provides built in server health monitoring and alerting capability without OS agents, that starts working the moment a power cord and an Ethernet cable are connected.
- **HP Active Health System:** Always on, continuous monitoring for increased stability and shorter downtimes; 100% configuration history; Health and service alerts and easy export and upload to Service and Support.
- **HP Intelligent Provisioning:** Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVD are needed.
 - To start Intelligent Provisioning:
 - Press the F10 key during the ProLiant Gen9 server boot process (also known as power on self test or POST).
 - Please go to the Intelligent Provisioning website at <http://www.hp.com/go/intelligentprovisioning> for additional information and to view usage videos.
 - Use the Service Pack for ProLiant (SPP) at <http://www.hp.com/go/spp> to get firmware and

Standard Features

software updates.

- **HP iLO Mobile App:** Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: <http://www.hp.com/go/ilo/mobileapp>

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

HP Insight Management HP Service Pack for ProLiant

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

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

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

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

Security

Power-on password
QuickLock, Network Server Mode
Serial interface control
Administrator's password

Standard Features

iLO 4 (Integrated Lights-Out 4) has 12 customizable user accounts and SSL encryption

iLO 4 can be disabled via a Global Setting

iLO Advanced supports directory services integration

Warranty

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

NOTE: Server Warranty includes 1-Year Parts, 1-Year Labor, 1-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Optional Features

HP Insight management	HP Insight Control	<p>HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see http://www.hp.com/go/insightcontrol.</p>
	HP iLO Advanced	<p>HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, see: http://www.hp.com/services/insight.</p> <p>HP Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HP ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: http://www.hp.com/go/iloadvance</p>
	HP Matrix Operating Environment	<p>The HP Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business.</p> <p>The HP Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HP CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS).</p> <p>NOTE: For more information, visit: http://www.hp.com/go/matrixoe</p>
High Performance Clusters	HP HPC Interconnects	<p>High Performance Computing (HPC) interconnect technologies are available for this server. These high-speed InfiniBand and 10 Gigabit interconnects are fully supported by HP.</p> <p>http://www.hp.com/techservers/clusters/ucp/index.html</p>
	HP Insight Cluster Management Utility	<p>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.</p> <p>http://www.hp.com/go/cmu</p>
	HP HPC Linux Value Pack	<p>HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported option to HP Insight CMU, for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform LSF workload scheduler and Platform Application Center, as well as the HP-MPI parallelization library.</p>
HP Insight Online	<p>HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at anytime.</p> <p>http://www.hp.com/go/insightonline</p>	

Optional Features

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

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

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

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

Service and Support

Service and Support **HP Technology Services for Apollo 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 **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 **Data Privacy – 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>

HP Datacenter Care service

HP Datacenter Care helps you improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services “building blocks.” You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HP Datacenter Care, you benefit from a personalized relationship with HP via a single point of accountability for HP and others' products. For more information, visit

<http://www.hp.com/services/datacentercare>

Data Center Platform Consulting Services

Choose HP Technology Services Consulting to modernize and migrate your key systems. These services help fine tune your data center to improve security, management and efficiency across IT infrastructure, operations, and facilities and prepare you for the new style of IT. HP understands the needs of the data center of the future and will serve as your guide for the journey.

<http://www.hp.com/services/consulting>

Connect your devices to Unlock all of the benefits of your technology investment by connecting your products to HP. Achieve

Service and Support

HP: up to 77% reduction in down time, near 100% diagnostic accuracy and a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HP Proactive Care Service and HP Datacenter Care Service customers will also benefit from proactive activities to help prevent issues and increase optimization. All of these benefits are already available to you with your server storage and networking products, securely connected to HP support.

HP Support Center

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

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

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

Warranty / Service Coverage

For ProLiant servers and storage systems, the services cover HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

For more information

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

Configuration Information - Factory Integrated Models

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

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

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

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

NOTE: Rack chosen is required to have 1200mm to provide space for cable management arm at the rear of the chassis and host PDU in the rear of the rack

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

HP Chassis - Apollo 4510 Model HP Apollo 4510 Gen9 CTO Chassis 799581-B21
NOTE: Standard 5 hot-plug fan modules included in the chassis.
NOTE: Supports up to 68 LFF drives (rear drive cage kit required). One node total

HP Chassis - Apollo 4530 Model HP Apollo 4530 Gen9 CTO Chassis 799581-B23
NOTE: Standard 5 hot-plug fan modules included in the chassis.
NOTE: Supports 45 LFF drives with up to 15 per node. Three nodes total

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

HP Flex Slot Titanium Power Supply Kits

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W FS Ti Ht Plg Pwr Supply Kit 720482-B21

HP Flex Slot Platinum Plus Power Supply Kits

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W Flex Slot Platinum Plus Hot Plug Power Supply Kit 720479-B21

HP 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit 720620-B21

HP Flex Slot Slot Power Supplies

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W FS -48VDC Ht Plg Pwr Supply Kit 720480-B21

HP 800W FS Univrsal Ht Plg Pwr Spply Kit 720484-B21

NOTE: Kits contain optional power supply, an IEC power cable and PDU IEC cables. ---

HP Rail Kits **NOTE:** One Rail Kit is required for every chassis in a rack.

HP 4.3U Server Rail Kit* 681254-B21

*The is the same rail kit that was used in the HP ProLiant SL4540 Gen8 Server.

HP 4.3U Rack Adapter Kit 744697-B21

HP Rack Adapter Kits

Step 1A: Select Nodes

HP Server Nodes - Apollo 4510 model HP ProLiant XL450 Gen9 Configure-to-order Server Node for Apollo 4510 Chassis 786593-B21
NOTE: Select quantity of one

HP Server Nodes - Apollo 4530 model HP ProLiant XL450 Gen9 Configure-to-order Server Node for Apollo 4530 Chassis 786595-B23

Configuration Information - Factory Integrated Models

Apollo 4530 model

NOTE: Select quantity of three

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

HP Processors

NOTE: If 2 processor servers are desired, select one xxxxx-L21 and one xxxxxx-B21 for every processor option chosen per node

E5-2600 v3 Series

Sixteen-Core Processors

Intel® Xeon® E5-2698v3 (2.3GHz/16core/40MB/135W) Processor 797319-B21

Fourteen-Core Processors

Intel® Xeon® E5-2695v3 (2.3GHz/14core/35MB/120W) Processor 797321-B21

Intel® Xeon® E5-2683v3 (2GHz/14core/35MB/120W) Processor 797323-B21

Twelve-Core Processors

Intel® Xeon® E5-2690v3 (2.6GHz/12core/30MB/135W) Processor 783936-L21

Intel® Xeon® E5-2670v3 (2.3GHz/12core/30MB/120W) Processor 783934-L21

Intel® Xeon® E5-2650Lv3 (1.8GHz/12core/30MB/65W) Processor 783940-B21

Ten-Core Processors

Intel® Xeon® E5-2650v3 (2.3GHz/10core/25MB/105W) Processor 783932-L21

Eight-Core Processors

Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor 783930-B21

Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor 783901-L21

Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor

Six-Core Processors

Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor 783899-L21

Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor 783897-L21

HP Memory

NOTE: Please choose memory options for the first processor of each server node. Up to 8 DDR4 DIMM slots are dedicated per processor socket.

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: HP certified SmartMemory must be used to guarantee full 2133MHz speeds.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133, or 1866MHz, 1600MHz, or 1333MHz. Please see the Online Memory Configuration Tool at: <http://www.hp.com/go/ddr4memory-configurator>

Registered DIMMs (RDIMM) - For E5-2600 v3 Series Processors

NOTE: The Following memory is supported by E5-2600 v3 series processors

HP 4GB (1x4GB) Single Rank x4 DDR4-2133 726717-B21

HP 8GB (1x8GB) Single Rank x4 DDR4-2133 726718-B21

Configuration Information - Factory Integrated Models

HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 726719-B21

Load Reduced DIMMs (LRDIMM) - For E5-2600 v3 Series Processors

NOTE: The Following memory is supported by E5-2600 series processors

HP 16GB (1x16GB) Dual Rank x4 DDR4 726720-B21

HP 32GB (1x32GB) Quad Rank x4 DDR 726722-B21

HP Storage Controllers

NOTE: The Host Bus Adapters below control the 2 SFF drives in the HP ProLiant XL450 Gen9 Server. If SFF SAS drives are selected, H244br or P244br is required.

FIO Host Bus Adapters

HP H244br FIO Smart HBA 761878-B21

NOTE: This controller does not consume a PCIe slot.

NOTE: Maximum of one FIO "br" controller (H244br, P244br) is allowed to support SFF SAS drives.

FIO Smart Array Controller

HP Smart Array P244br/1G FIO Controller 761871-B21

NOTE: This controller does not consume a PCIe slot.

NOTE: Maximum of one FIO "br" controller (H244br, P244br) is allowed to support SFF drives.

Host Bus Adapters

HP H244br Smart HBA 726809-B21

NOTE: H244br will be used in BTO SKU.

HP H241 Smart HBA 726911-B21

HP H240 Smart HBA 726907-B21

NOTE: The I/O module associated with each server node can support up to two of the Gen9 storage controllers to manage the bulk LFF hard drives.

NOTE: Megacell battery must be selected per each P440/P441/P840/P841 ordered.

Smart Array Controller

HP Smart Array P441/4G Controller 726825-B21

HP Smart Array P841/4G Controller 726903-B21

HP Smart Array P440/4G Controller 726821-B21

HP Smart Array P840/4G Controller 726897-B21

NOTE: Minimum of one PCIe stand-up internal controller (H240/P440) is required to support LFF drives, and maximum two PCIe stand-up internal controllers allowed. However, one of the following configurations is supported: One H240 or One P440 or Two H240 or Two P440

NOTE: Total number of PCIe slots available is 4. This is the total selection from any combination of PCIe options in the following categories: Infiniband, Networking, Controllers, PCIe Accelerators.

NOTE: Total PCIe slots available depends on the number of processors selected. If one processor is installed, 2 PCIe slots (Slots 1 and 2). If two processors are installed, 4 PCIe slots are available.

HP 96w Megacell Batt Cntrl Bd 727258-B21

NOTE: One 96W Megacell Battery fits in the management assembly and is for the Smart Array cache during an AC power fault.

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

HP Insight Software	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	C6N27A
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	C6N28ABE
	HP Insight Control Server Provisioning Media Kit	BD883A

Configuration Information - Factory Integrated Models

HP Insight Management Media Kit

C6N31A

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

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

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

NOTE: For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html.

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.

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

HP Processors **NOTE:** Please choose Processor options for the second processor of each server node.

E5-2600 v3 Series

Sixteen-Core Processors

Intel® Xeon® E5-2698v3 (2.3GHz/16core/40MB/135W) Processor	797319-B21
Intel® Xeon® E5-2698v3 (2.3GHz/16core/40MB/135W) FIO Processor Kit	797319-L21

Fourteen-Core Processors

Intel® Xeon® E5-2695v3 (2.3GHz/14core/35MB/120W) Processor	797321-B21
Intel® Xeon® E5-2695v3 (2.3GHz/14core/35MB/120W) FIO Processor Kit	797321-L21
Intel® Xeon® E5-2683v3 (2GHz/14core/35MB/120W) Processor	797323-B21
Intel® Xeon® E5-2683v3 (2GHz/14core/35MB/120W) FIO Processor Kit	797323-L21

Twelve-Core Processors

Intel® Xeon® E5-2690v3 (2.6GHz/12core/30MB/135W) Processor	783936-B21
Intel® Xeon® E5-2690v3 (2.6GHz/12core/30MB/135W) FIO Processor Kit	783936-L21
Intel® Xeon® E5-2670v3 (2.3GHz/12core/30MB/120W) Processor	783934-B21
Intel® Xeon® E5-2670v3 (2.3GHz/12core/30MB/120W) FIO Processor Kit	783934-L21
Intel® Xeon® E5-2650Lv3 (1.8GHz/12core/30MB/65W) Processor	783940-B21
Intel® Xeon® E5-2650Lv3 (1.8GHz/12core/30MB/65W) FIO Processor Kit	783940-L21

Ten-Core Processors

Intel® Xeon® E5-2650v3 (2.3GHz/10core/25MB/105W) Processor	783932-B21
Intel® Xeon® E5-2650v3 (2.3GHz/10core/25MB/105W) FIO Processor Kit	783932-L21

Eight-Core Processors

Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor	783930-B21
Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	783930-L21
Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor	783901-B21
Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit	783901-L21
Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor	783938-B21
Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) FIO Processor Kit	783938-L21

Six-Core Processors

Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor	783899-B21
Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	783899-L21
Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor	783897-B21
Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	783897-L21

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed

Configuration Information - Factory Integrated Models

may depend on the quantity and type of DIMMs installed.

HP Memory

NOTE: Please choose memory options for the second processor of each node. Up to 8 DDR4 DIMM slots are dedicated per socket.

NOTE: HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at:

http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: HP certified SmartMemory must be used to guarantee full 2133 MHz speeds.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133 or 1866MHz, 1600MHz, or 1333MHz/1066MHz. Please see the Online Memory Configuration Tool at: <http://www.hp.com/go/ddr4memory-configurator>.

Registered DIMMs (RDIMM) - For E5-2600 v3 Series Processors

NOTE: The Following memory is supported by E5-2600 v3 series processors

HP 4GB (1x4GB) Single Rank x4 DDR4-2133 726717-B21

HP 8GB (1x8GB) Single Rank x4 DDR4-2133 726718-B21

HP 16GB (1x16GB) Dual Rank x4 DDR4-2133 726719-B21

Load Reduced DIMMs (LRDIMM) - For E5-2600 Series Processors

NOTE: The Following memory is supported by E5-2600 v3 series processors

HP 16GB (1x16GB) Dual Rank x4 DDR4 726720-B21

HP 32GB (1x32GB) Quad Rank x4 DDR 726722-B21

HP Hard Drives

NOTE: For the Apollo 4510 model, choose up to a total of 68 LFF 3.5" hard drives from the following options using any mix of SAS/SATA/SSD hard drives for desired performance, up to a total of 2 SFF 2.5" hard drives per server node from the following options for OS, boot or additional storage purposes, and up to 2 M.2 SSDs per node.

NOTE: For the Apollo 4530 model, choose up to a total of 15 LFF 3.5" hard drives per server node from the following options using any mix of SAS/SATA/SSD hard drives for desired performance, up to a total of 2 SFF 2.5" hard drives per server node from the following options for OS, boot or additional storage purposes, and up to 2 M.2 SSDs per node.

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components for the subsystem.

NOTE: Hard drives have either a one year or three year warranty.

NOTE: For the Apollo 4510 model, up to 8 additional LFF drives may be added in the rear of the system using "HP Apollo 4510 8HDD Rear Cage Kit" (P/N: 799377-B21).

6G SATA Hot Plug SFF (2.5-inch) SC Midline (MDL) Drives

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

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

6G SAS Hot Plug SFF (2.5-inch) SC Midline (MDL) Drives

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

12G SAS Hot Plug SFF (2.5-inch) SC Enterprise Drives

HP 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 759208-B21

6G SAS Hot Plug SFF (2.5-inch) SC Enterprise Drives

HP 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652564-B21

HP 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652583-B21

HP 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive 652589-B21

Configuration Information - Factory Integrated Models

6G SATA Value Endurance Hot Plug SFF (2.5-inch) SC Enterprise Boot Solid State Drives
 HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive 734360-B21

12G SAS Value Endurance Hot Plug LFF (2.5-inch) SC Enterprise Value Solid State Drives
 HP 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive 762261-B21

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

HP 300GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive 797285-B21
 HP 450GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive 797287-B21

HP 600GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive 797283-B21

6G SAS Hot Plug with Low Profile LFF (3.5-inch) LP Midline (MDL) Drives
 HP 6TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797263-B21
 HP 4TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797267-B21
 HP 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797277-B21
 HP 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797279-B21
 HP 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797281-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html

6G SATA Hot Plug with Low Profile LFF (3.5-inch) LP Midline (MDL) Drives
 HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797269-B21
 HP 4TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797265-B21
 HP 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797271-B21
 HP 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive 797273-B21
 HP 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty 797275-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13021_div/13021_div.html (Worldwide)

6G SATA Value Endurance Hot Plug LFF (3.5-inch) LP Enterprise Value Solid State Drives
 HP 480GB 6G SATA Value Endurance LFF 3.5-in LP Enterprise Value 3yr Wty Solid State Drive 797303-B21

6G SATA Light Endurance Hot Plug LFF (3.5-inch) LP Solid State Drives
 HP 960GB 6G SATA LE 3.5-in LP EL Solid State Drive 797305-B21

12G SAS ME Hot Plug LFF (3.5-inch) LP Enterprise Mainstream Solid State Drives
 HP 400GB 12G SAS Mainstream Endurance LFF 3.5-in LPC Enterprise Midline 3yr Wty Solid State Drive 797289-B21

HP 800GB 12G SAS Mainstream Endurance LFF 3.5-in LP Enterprise Midline 3yr Wty Solid State Drive 797291-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)

12G SAS Value Endurance Hot Plug LFF (3.5-inch) LP Enterprise Performance Solid State Drives
 HP 800GB 12G SAS Value Endurance LFF 3.5-in LPC Enterprise Performance 3yr Wty Solid State Drive 797299-B21

HP 1.6TB 12G SAS Value Endurance LFF 3.5-in LPC Enterprise Performance 3yr Wty Solid State Drive 797301-B21

NOTE: If SAS drive is selected, then one of the following SAS controllers is required: HP H244br FIO Smart HBA or HP Smart Array P244br/1G FIO Controller.

Configuration Information - Factory Integrated Models

M.2 Solid State Drives

HP 120GB 6G SATA VE M.2 2280 SSD	777262-B21
HP 340GB 6G SATA VE M.2 2280 SSD	777264-B21

HP Networking

1 Gigabit Ethernet Adapters

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

10 Gigabit Ethernet adapters

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

NOTE: Total number of PCIe slots available is 4. This is the total selection from any combination of PCIe options in the following categories: Infiniband, Networking, Controllers, PCIe Accelerators.

NOTE: Total PCIe slots available depends on the number of processors selected. One processor: 2 PCIe slots (slots 1 and 2); Two processors: 4 PCIe slots

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

HP IB FDR 2P 545QSFP Adptr	702211-B21
HP IB FDR/EN 10/40Gb 2P 544QSFP Adptr	649281-B21

NOTE: Total number of PCIe slots available is 4. This is the total selection from any combination of PCIe options in the following categories: Infiniband, Networking, Controllers, PCIe Accelerators.

NOTE: Total PCIe slots available depends on the number of processors selected. If one processor is installed, 2 PCIe slots (Slots 1 and 2). If two processors are installed, 4 PCIe slots are available.

FlexibleLOM

HP 1Gb Ethernet 4P 331FLR Adptr	629135-B22
HP FlexFabric 10Gb 2P 533FLR-T Adptr	700759-B21
HP Ethernet 10Gb 2P 560FLR-SFP+ Adptr	665243-B21
HP Ethernet 10Gb 2P 561FLR-T Adptr	700699-B21
HP IB FDR 2P 545FLR-QSFP Adptr	702212-B21
HP IB FDR/EN 10/40Gb2P 544FLR-QSFP Adptr	649282-B21

NOTE: Does not consume a PCIe slot

NOTE: Total number of FlexibleLOM slots available is 1. This is the total selection from a combination of FlexibleLOM options in the following categories: Infiniband and Networking

HP Power Supplies

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

HP Flex Slot Titanium Power Supply Kits

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W FS Ti Ht Plg Pwr Supply Kit	720482-B21
-------------------------------------	------------

HP Flex Slot Platinum Plus Power Supply Kits

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W Flex Slot Platinum Plus Hot Plug Power Supply Kit	720479-B21
---	------------

NOTE: Kits contain optional power supply, an IEC power cable and PDU IEC cables

HP 1400W Flex Slot Platinum Plus Hot Plug Power Supply Kit	720620-B21
--	------------

HP Flex Slot Slot Power Supplies

Configuration Information - Factory Integrated Models

NOTE: The following power supplies offer up to 94% efficiency.

HP 800W FS -48VDC Ht Plg Pwr Supply Kit

720480-B21

HP 800W FS Univrsal Ht Plg Pwr Spplly Kit

720484-B21

NOTE: Kits contain optional power supply, an IEC power cable and PDU IEC cables

HP Apollo 4510 8HDD Rear Cage Kit

799377-B21

HP Rear Cage Kits **NOTE:** This kit is only available for the Apollo 4510 System.

NOTE: This kit supports an additional 8 LFF SSD/HDD

NOTE: This is an FIO option as well as a field-upgradable option after purchasing system.

Memory

HP Advanced Power Manager	<p>The Advanced Power Manager is an optional rack level solution for the HP Apollo 4500 Systems which enable server-level DC (or hardware) power on and off and server-level monitoring. In addition, the APM will automatically discover hardware components which are connected into the APM solution.</p> <p>The APM does not replace rack PDUs, but is designed to enable the utilization of basic, low cost, rack PDUs while providing the functionality of 'switched' PDUs (which provide hardware power on/off of individual servers by turning off the AC power to the power supplies of a given server). Because the servers share power supplies to optimize power efficiency, using 'switched' PDUs to turn off all the power supplies in the chassis will result in the loss of all server nodes in that chassis. The APM solves this by allowing server node-level hardware power on/off of the DC power to the individual server node motherboards.</p>	
	HP Advanced Power Manager Kit	741192-B21
HP Insight Software	<p>HP Insight Control</p> <p>HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License NOTE: The Electronic software license is available in EMEA only.</p> <p>HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License</p> <p>HP Insight Control Server Provisioning Media Kit</p> <p>HP Insight Management Media Kit</p> <p>NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key.</p> <p>NOTE: Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service.</p> <p>NOTE: Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates.</p> <p>NOTE: For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html</p> <p>HP Integrated Lights-Out (iLO)</p> <p>HP iLO Scale-Out</p> <p>HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU</p> <p>HP Integrated Lights-Out Scale-Out 3yr 24x7 Tech Support and Updates Flex Quantity License</p> <p>HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License</p> <p>HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU</p> <p>HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License</p> <p>HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License</p> <p>NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.</p> <p>NOTE: For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html</p> <p>HP Integrated Lights-Out (iLO) Advanced for ProLiant</p> <p>HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU</p> <p>NOTE: The Electronic software license is available in EMEA only.</p> <p>HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU</p> <p>NOTE: The Electronic software license is available in EMEA only.</p> <p>HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License</p>	<p>C6N28ABE</p> <p>C6N27A</p> <p>BD883A</p> <p>C6N31A</p> <p>BD776AAE</p> <p>BD776A</p> <p>BD777A</p> <p>BD778AAE</p> <p>BD778A</p> <p>BD779A</p> <p>E6U59ABE</p> <p>E6U64ABE</p> <p>512485-B21</p>

Memory

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

NOTE: For additional license options please see the QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html
NOTE: For more information, visit: <http://www.hp.com/go/ilo>.

High Performance Clusters

HP Cluster Management Utility

HP Insight Cluster Management Utility 1yr 24x7 Flexible License QL803B

HP Insight Cluster Management Utility 3yr 24x7 Flexible License BD476A

NOTE: These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer also will receive a support agreement.

HP Insight Cluster Management Utility Media BD477A

HP Insight Cluster Management Utility 3yr 24x7 Flexible Electronic License BD476AAE

HP Insight Cluster Management Utility 1yr 24x7 Flexible Electronic License QL803BAE

NOTE: For additional license kits please see the QuickSpecs at:
http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html

HP PCIe Workload Value Endurance (VE) PCIe Workload Accelerators

Accelerator Options

HP 1.3TB VE PCIe Workload Accelerator HH/HL 763834-B21

HP 1.6TB VE PCIe Workload Accelerator HH/HL 763836-B21

HP 3.2TB VE PCIe Workload Accelerator HH/HL 763838-B21

Light Endurance (LE) PCIe Workload Accelerators

HP 1.0TB LE PCIe Wrkld Accelerator HH/HL 775666-B21

HP 1.3TB LE PCIe Wrkld Accelerator HH/HL 775668-B21

HP 2.6TB LE PCIe Wrkld Accelerator HH/HL 775670-B21

HP Security

HP Trusted Platform Module Option 488069-B21

NOTE: The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: <http://www.hp.com/go/TPM>.

NOTE: ProLiant OS pre-installed units will come with the partition required for TPM deployment.

NOTE: The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

HP Storage Controllers

SAS Controllers

Smart Array P244br Controller

HP Smart Array P244br/1G FIO Controller 761871-B21

Host Bus Adapters: Smart H240/241 HBA

HP H240 Smart HBA 726907-B21

HP H241 Smart HBA 726911-B21

Optional Upgrades

Smart Array P440/4G and P441/4G Controller

Memory

HP Smart Array P440/4G Controller	726821-B21
Smart Array P440/4G and P441/4G Controller	726897-B21
HP Smart Array P840/4G Controller	726903-B21
HP Smart Array P841/4G	
HP Cable Options	
HP Apollo 4500 Mini SAS H240 Cable Kit	808961-B21
NOTE: If one H240 Controller is ordered, then two cables are required	
HP Apollo 4500 Mini SAS Dual H240 Cable Kit	808963-B21
NOTE: If two H240 controllers are ordered, then 2 cables are required	
HP Apollo 4500 Mini SAS P440 Cable Kit	808965-B21
NOTE: If one P440 Controller is ordered, then 1 cable is required	
HP Apollo 4500 Mini SAS Dual P440 Cable Kit	808967-B21
NOTE: If two P440 Controllers are ordered, then 1 cable is required	
NOTE: If one P840 Controller is ordered, then 1 cable is required	808969-B21
HP Apollo 4500 Mini SAS P440 Cable Kit	
HP SmartCache No Media 24x7 Technical Support 1 Svr License	D7S26A
Support Flexible License HP SmartCache No Media 24x7 Technical	D7S27A
HP SmartCache No Media 24x7 Technical Support Electronic License	D7S27AAE
NOTE: Please see the QuickSpecs for Technical Specifications and additional information:	
http://h18000.www1.hp.com/products/quickspecs/14229_div/14229_div.html	
(Smart Array P421 Controller)	
http://h18000.www1.hp.com/products/quickspecs/14532_div/14532_div.html	
(SmartCache)	

HP Power Cords **NOTE: HP ProLiant servers ships with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs).**

HP C13 - C14 WW 250V 10A Gray 0.7m Jumper Cord	A0K03A
HP C13 - C14 WW 250V 10A Gray 1.37m Jumper Cord	A0K04A
HP C13 - SEV 1011 CH 250V 10Amp 1.83m Power Cord	AF565A
HP C13 - DK-2.5A DK 250V 10Amp 1.83m Power Cord	AF566A
HP C13 - CEE-VII EU 250V 10Amp 1.83m Power Cord	AF568A
HP C13 - SI-32 IL 250V 10Amp 1.83m Power Cord	AF564A
HP C13 - NBR-14136 BR 250V 10Amp 1.83m Power Cord	AF591A
HP C13 - BS-1363A UK/HK/SG 250V 10Amp 1.83m Power Cord	AF570A
HP C13 - CEI-23-50 IT/CL 250V 10Amp 1.83m Power Cord	AF571A
HP C13 - C14 WW 250V 10Amp 2.0m Jumper Cord	A0K02A
HP C13 - IS-1293 IN 250V 10Amp HV 2.5m Power Cord	SG579A
HP C13 - AS3112-3 AU 250V 10Amp 2.5m Power Cord	AF569A
HP C13 - SABS-164 ZA 250V 10Amp 2.5m Power Cord	AF567A
HP C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	AF572A
HP C13 - C14 WW 250V 10A Gray 3.0m Jumper Cord	A0K06A
HP C13 - Nema 6-15P US 250V 15A JP 3.6m Power Cord	A0N33A
HP C13 - GB-1002 CN 250V 10Amp 1.83m Power Cord	AF557A
HP C13 - KSC- 8305 KR 250V 10Amp 1.83m Power Cord	AF560A
HP C13 - CNS-690 TW 110V 13Amp 1.83m Power Cord	AF561A
HP C13 - Nema 5-15P TH/PH 250V 10Amp 1.83m Power Cord	AF559A
HP C13 - Nema 5-15P US/CA 110V 10Amp 1.83m Power Cord	AF556A

Memory

HP C13 - IS-1293 IN 240V 6Amp LV 2.0m Power Cord	AF562A
HP C13 - IRAM -2073 AR 250V 10A 2.5m Power Cord	AF558A
HP C13 - C14 WW 250V 10Amp Flint Gray 2.0m Jumper Cord	AF573A

HP Uninterruptible Power Systems

HP Rack-mountable UPS	
HP R1500 G3 Uninterruptible Power Supply (UPS)	
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

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html (Worldwide)

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

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html (Worldwide)

R5000 Uninterruptible Power System (UPS)	
HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A
HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html (Worldwide)

R7000 Uninterruptible Power System (UPS)	
HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System	AF463A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html (Worldwide)

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

<http://www.hp.com/servers/rackups>.

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

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

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

HP Basic Power Distribution Units (bPDU)

HP Basic Power Distribution Unit: 1U/0U Version

HP 1.9kVA 120 Volt L5-20 Input (12xNEMA 5-20R) NA/JP Basic PDU	H5M54A
HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Basic PDU	H5M56A
HP Basic Power Distribution Unit: Half Height Version	
HP 2.8kVA 120 Volt L5-30 Input (18xNEMA 5-20R) NA/JP Basic PDU	H5M55A
HP 3.6kVA 200-240 Volt Detachable C20 Input (18xC13) WW Basic PDU	H5M57A
HP 4.9kVA 208 Volt L6-30 Input (20xC13) NA/JP Basic PDU	H5M58A
HP 7.3kVA 230 Volt IEC309 32A Input (20xC13) INTL Basic PDU	H5M68A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13) NA/JP Basic PDU	H5M61A

HP Basic Power Distribution Unit: Mid Height Version

HP 4.9kVA 208 Volt L6-30 Input (24xC13/6xC19) NA/JP Basic PDU	H5M59A
---	--------

Memory

HP 7.3kVA 230 Volt IEC309 32A Input (24xC13/6xC19) INTL Basic PDU	H5M70A
HP 8.3kVA 208 Volt CS8265C Input (30xC13/6xC19) NA/JP Basic PDU	H5M60A
HP 11kVA 230 Volt IEC309 63A Input (30xC13/6xC19) INTL Basic PDU	H5M71A
HP Hardwired 200-240 Volt Input (30xC13/6xC19) WW Basic PDU	H5M75A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (24xC13/3xNEMA 5-20R) NA/JP Basic PDU	H5M63A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (24xC13/3xC19/3xNEMA 5-20R) NA/JP Basic PDU	H5M64A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (24xC13/6xC19) NA/JP Basic PDU	H5M62A
HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/6xC19) INTL Basic PDU	H5M72A
HP Basic Power Distribution Unit: Full Height Version	
HP 11kVA 400 Volt IEC309 16A 3-Phase Input (36xC13/6xC19) INTL Basic PDU	H5M73A
HP 11kVA 400 Volt IEC309 30A 3-Phase Input (36xC13/6xC19) NA Basic PDU	H5M67A
HP Basic Power Distribution Unit: 480/277 Volt Version	
HP 13.2kVA 480 Volt IEC309 30A 3-Phase Input (15 Outlet) NA Basic PDU	H3X07A
HP 19.9kVA 480 Volt IEC309 30A 3-Phase Input (30 Outlet) NA Basic PDU	H3X08A

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14557_div/14557_div.html (Worldwide)
NOTE: Additional HP Power Distribution Units are available. For a complete list of all HP PDUs and additional information please visit: <http://www.hp.com/go/rackandpower>

HP Remote Monitoring Power Distribution Units (mPDU)

HP Remote Monitored Power Distribution Unit: 1U Version

HP 2.8kVA 120 Volt L5-30 Input (12xNEMA 5-20R)NA/JP Monitored PDU	D9N43A
HP 3.6kVA 200-240 Volt Detachable C20 Input (12xC13) WW Monitored PDU	D9N46A
HP 4.9kVA 208 Volt L6-30 Input (12xC13) NA/JP Monitored PDU	D9N44A
HP Remote Monitored Power Distribution Unit: Half Height Version	
HP 3.6kVA 200-240 Volt Detachable C20 Input (16xC13) WW Monitored PDU	D9N45A
HP Remote Monitored Power Distribution Unit: Mid Height Version	
HP 4.9kVA 208 Volt L6-30 Input (20xC13/4xC19) NA/JP Monitored PDU	D9N47A
HP 7.3kVA 230 Volt IEC309 32A Input (20xC13/4xC19) INTL Monitored PDU	D9N48A
HP 8.6kVA 208 Volt L15-30 3-Phase Input (18xC13/3xC19) NA/JP Monitored PDU	D9N51A
HP 5.7kVA 208 Volt L21-20 3-Phase Input (18xC13/3xNEMA 5-20R) NA/JP Monitored PDU	D9N52A
HP 8.6kVA 208 Volt L21-30 3-Phase Input (20xC13/3xC19/3xNEMA 5-20R) NA/JP Monitored PDU	D9N53A
HP 11kVA 400 Volt IEC309 16A 3-Phase Input (18xC13/3xC19) INTL Monitored PDU	D9N55A
HP Remote Monitored Power Distribution Unit: Full Height Version	
HP 8.3kVA 208 Volt CS8265C Input (30xC13/3xC19) NA Monitored PDU	D9N49A
HP 7.3kVA 230 Volt IEC309 32A Input (32xC13/4xC19) INTL Monitored PDU	D9N50A
HP 11kVA 400 Volt IEC309 16A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N57A
HP 14.4kVA 208 Volt CS8365C 3-Phase Input (12xC13/12xC19)NA Monitored PDU	D9N58A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (30xC13/3xC19) NA Monitored PDU	D9N61A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (24xC13/3xC19) NA/JP Monitored PDU	D9N54A
HP 17.3kVA 208 Volt IEC309 60A 3-Phase Input (12xC13/12xC19) NA/JP Monitored PDU	D9N59A
HP 22kVA 400 Volt IEC309 32A 3-Phase Input (12xC13/12xC19) INTL Monitored PDU	D9N60A
HP 22kVA 400 Volt IEC309 32A 3-Phase Input (30xC13/3xC19) INTL Monitored PDU	D9N56A
HP 16.6kVA 400 Volt IEC309 30A 3-Phase Input (12xC13/12xC19) NA Monitored PDU	D9N62A
HP 19.9kVA 480 Volt 3-Phase (30 Outlet) NA Monitored PDU	D9N63A

Memory

HP Environmental Sensor for Remote Monitored PDUs

HP Environmental Sensor for Remote Monitored PDUs

E2D53A

NOTE: Please see the QuickSpecs for additional information:

http://h18000.www1.hp.com/products/quickspecs/14669_div/14669_div.html (Worldwide)

HP Intelligent Power Distribution Units (iPDU)

iPDU Core Units

HP 4.9kVA 24A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit AF520A

HP 8.3kVA 40A Single Phase NA/JP Core Intelligent Modular Power Distribution Unit AF521A

HP 8.6kVA 24A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit AF522A

HP 14.4kVA 40A Three Phase NA/JP Intelligent Modular Power Distribution Unit AF533A

HP 17.3kVA 48A Three Phase NA/JP Core Intelligent Modular Power Distribution Unit AF523A

HP 17.3kVA 24A 415V Three Phase L22-30 NA Core Intelligent Power Distribution Unit AF902A

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

iPDU Kits with Standard Extension Bars

HP 4.9kVA 24A Single Phase NA/JP Intelligent Modular Power Distribution Kit AF531A

HP 8.6kVA 24A Three Phase NA/JP Intelligent Modular Power Distribution Kit AF532A

HP 7.3kVA 32A Single Phase INTL Intelligent Modular Power Distribution Kit AF534A

iPDU Extension Bars

HP 5x13 Intelligent PDU Extension Bar G2 Kit AF547A

HP 5x13 Outlets Power and UID LEDs Pair Standard Extension Bar AF528A

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

http://h18000.www1.hp.com/products/quickspecs/13650_div/13650_div.html (Worldwide)

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

HP Rack Series

HP Intelligent Rack Series

HP 636 1200mm Pallet Intelligent Series Rack BW899A

HP 636 1200mm Shock Intelligent Series Rack BW900A

HP 642 1200mm Pallet Intelligent Series Rack BW907A

HP 642 1200mm Shock Intelligent Series Rack BW908A

HP 647 1200mm Pallet Intelligent Series Rack BW913A

HP 647 1200mm Shock Intelligent Series Rack BW914A

NOTE: Rack chosen is required to have a depth of 1200mm to provide space for cable management arm at the rear of the chassis and host PDU in the rear of the rack.

NOTE: Please see the QuickSpecs for Technical Specifications such as height, width, depth, weight, and color:

http://h18000.www1.hp.com/products/quickspecs/14223_div/14223_div.html (Worldwide)

NOTE: For additional information regarding Rack Cabinets, please see the following URL:

<http://www.hp.com/go/rackandpower>.

Memory

HP Rack Options	HP TFT7600 G2 KVM Console and Monitor (TFT7600 G2)	
	HP TFT7600 G2 KVM Console Rackmount Keyboard US Monitor	AZ870A
	HP TFT7600 G2 KVM Console Rackmount Keyboard 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 TFT7600 G2 KVM Console Rackmount Keyboard Intl Monitor	AZ884A
	HP TFT7600 G2 KVM Console Rackmount Keyboard US TAA Monitor	AZ885A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13731_div/13731_div.html (Worldwide)	
	HP Server Console Switches	
	HP Server Console 0x2x8 Port Analog Switch	AF616A
	HP Server Console 0x2x16 Port Analog Switch	AF617A
	HP TAA 0x2x16xKVM Server Console G2 Switch	AF626A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/11834_div/11834_div.html (Worldwide)	
	HP Server Console Switch G2 with Virtual Media & CAC	
	HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
	HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
	HP KVM CAT5 1-pack USB Interface Adapter	336047-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13475_div/13475_div.html (Worldwide)	
	HP IP Console Switch G2 with Virtual Media & CAC	
	HP 1x4 USB/PS2 KVM Console Switch	AF611A
	HP 1x1Ex8 KVM IP Console Switch G2 with Virtual Media CAC Software	AF620A
	HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
	HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13474_div/13474_div.html (Worldwide)	
	HP 32GB microSD Mainstream Flash Media Kit	700139-B21
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack .	
	Solutions Software	
	HDP Ent 4N/50TB Rw Strg 1yr 24x7 E-LTU	F5Z52AAE
	Cloudera Ent Basic Ed 1yr 24x7 Phys Lic	G7M27A
	Cloudera Ent Basic Ed 1yr 24x7 E-LTU	G7M27AAE

Memory

Cloudera Ent Basic Ed 1yr 8x5 Phys Lic	G7M28A
Cloudera Ent Basic Ed 1yr 8x5 E-LTU	G7M28AAE
Cloudera EDH Ed 1yr 24x7 Phys Lic	G7M29A
Cloudera EDH Ed 1yr 24x7 E-LTU	G7M29AAE
Cloudera EDH Ed 1yr 8x5 Phys Lic	G7M30A
Cloudera EDH Ed 1yr 8x5 E-LTU	G7M30AAE
Cloudera EDH Ed 1yr 24x7 Premium E-LTU	G7M31AAE
HDP EntPl 4N/50TB Rw Strg 1yr 24x7 LTU	JP408A
HDP EntPl 4N/50TB Rw Strg 1yr 24x7 E-LTU	JP408AAE
Cloudera Entrprs 1y 24x7 Support Flx Lic	L4Z37A
Cloudera Ent 1yr 24x7 Support Flx E-LTU	L4Z37AAE
HP 3y 24x7 Apollo 4530 FC SVC	U8LY6E
HP 3y 24x7 w/DMR Apollo 4530 FC SVC	U8LY7E
HP 3y 24x7 w/CDMR Apollo 4530 FC SVC	U8LY8E
HP 3y 24x7 Apollo 4530 PC SVC	U8LY9E
HP 3y 24x7 w/DMR Apollo 4530 PC SVC	U8LZ0E
HP 3y 24x7 w/CDMR Apollo 4530 PC SVC	U8LZ1E
HP Install Service	UR285E
HP StartUp Service	UR286E

HP Apollo 4530 and Apollo 4510 Systems

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

NOTE: Chart does not represent all possible memory configurations.

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

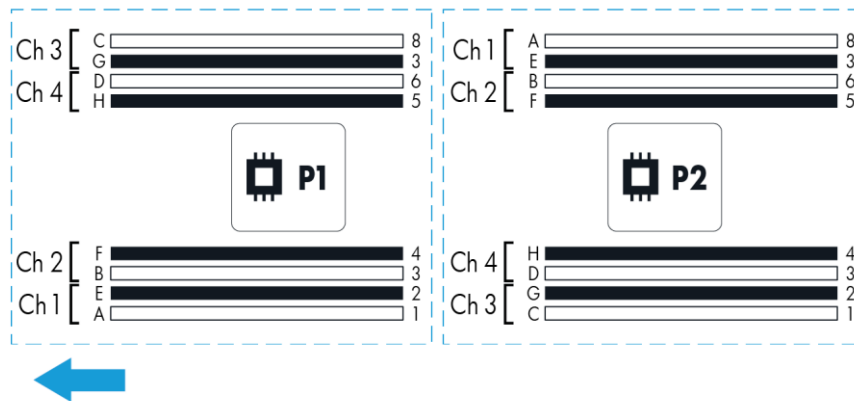
<http://www.hp.com/go/ddr4memory-configurator>

Memory Subsystem Architecture

Each Intel® Xeon® E5-2600 family processor socket contains four memory channels that support two DIMMs each for a total of eight (8) DIMM per installed processor or a grand total of sixteen (16) DIMMs for the server. Up to 32GB capacity DIMMs are supported for 512GB of memory (16 DIMM slots x 32GB per DIMM).

DIMM slot and configuration diagrams

Memory



Memory population guidelines

General Memory Population Rules and Guidelines:

- Light DIMM slots denote the first slot of a channel. For 1 DPC (DIMM per channel) populate light slots only.
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and to load the channels similarly whenever possible.
- Populate DIMMs from heaviest load (dual-rank) to lightest load (single-rank) within a channel. Heaviest load (DIMM with most ranks) within a channel goes furthest from the processor
- 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.
- HP memory from previous generation servers is not qualified on the HP Apollo 4530 and Apollo 4510 Gen9 Systems. Certain HP SmartMemory features such as memory authentication and enhanced performance may not be supported.
- To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html.

Memory

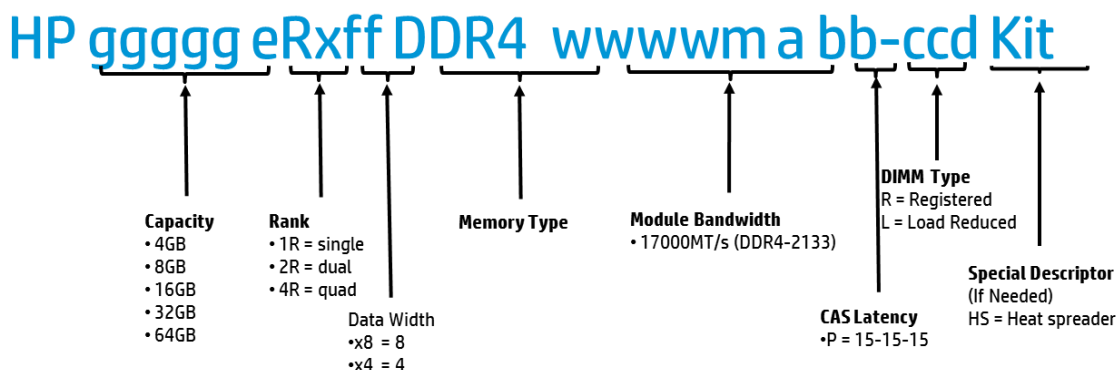
DIMM Type	Registered DIMMS for E5-2600 v3 Series Processors (RDIMMs)				
DIMM Rank	Single Rank (1R)		Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)
DIMM Capacity	4GB	8GB	16GB	16GB	32GB
DIMM Native Speed (MHz)	2133	2133	2133	2133	2133
Voltage	LV	LV	LV	LV	LV
SLOTS THAT CAN BE POPULATED					
16 slot server nodes	16	16	16	16	16
MAXIMUM CAPACITY (GB)*	64	128	256	256	512
1 DIMM Per Channel	2133	2133	2133	2133	2133
2 DIMM Per Channel	2133	2133	2133	2133	2133

NOTE: Memory speed is a function of the processor QPI bus speed.
*** Maximum capacity will vary based on individual server platform qualification schedule**

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

- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB
- 32GB = 32768MB

DDR4 memory options part number decoder



Following are memory options available from HP:

HP Memory

NOTE: Please choose memory options for socket 2 of each server node. Up to 8 DDR4 DIMM slots dedicated per socket.

NOTE: HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_div/14225_div.html

NOTE: HP certified SmartMemory must be used to guarantee full 2133MHz speeds.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133MHz, 1866MHz or 1600MHz. Please see the Online Memory

Memory

Configuration Tool at: <http://www.hp.com/go/ddr4memory-configurator>.

Registered DIMMs (RDIMM) - For E5-2600 v3 Series Processors

NOTE: The Following memory is supported by E5-2600 v3 series processors

HP 4GB (1x4GB) Single Rank x4 DDR4-2133	726717-B21
HP 8GB (1x8GB) Single Rank x4 DDR4-2133	726718-B21
HP 16GB (1x16GB) Dual Rank x4 DDR4-2133	726719-B21

Load Reduced DIMMs (LRDIMM) - For E5-2600v3 Series Processors

NOTE: The Following memory is supported by E5-2600v3 series processors

HP 16GB (1x16GB) Dual Rank x4 DDR4	726720-B21
HP 32GB (1x32GB) Quad Rank x4 DDR	726722-B21

Storage

Apollo 4510 Model Drive Zoning

1x68*:

If two storage controllers installed:

- Controller 1 communicates with drives 1-30 and 61-64 through Ports 1A/1B
- Controller 2 communicates with drives 31-60 and 65-68 through Ports 2A/2B

If one storage controller installed:

- Controller 1, communicates with drives 1-30 and 61-64 through Ports 1A and/or 1B
- Controller 1, communicates with drives 31-60 and 61-64 through Ports 2A and/or 2B

* Note: Drives 61-68 only apply if 8 HDD Option Cage is installed

	61	62	63	64	65	66	67	68			
25	26	27	28	29	30	55	56	57	58	59	60
19	20	21	22	23	24	49	50	51	52	53	54
13	14	15	16	17	18	43	44	45	46	47	48
7	8	9	10	11	12	37	38	39	40	41	42
1	2	3	4	5	6	31	32	33	34	35	36

Front of Chassis

NOTE: This is simple drive zoning

Maximum Storage Capacity – Apollo 4510 Model

Internal (2 SFF Drive Cage)	3.2TB (2 x 1.6TB SFF SAS SSD)
Internal (68 LFF Drive Cage)	408TB (68 x 6TB SAS/SATA LFF)
M.2	680GB (2 x 340GB M.2 SSD)
Total	411.9TB

NOTE: This configuration requires a rear cage kit to support 8 additional LFF drives.

Technical Specifications

System Unit	Chassis Dimensions (H x W x D) Add fan extension kit (with bezel)	6.88 x 17.45 x 35in (17.48 x 44.33 x 88.9cm)	
	Weight (approximate)	Minimum (empty chassis with all pluggable modules removed, including fans)	60 lbs (27.22kg)
		Maximum (all hard drives, power supply, and processor installed)	220lb (99.8kg)
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC 200 to 240 VAC
		Rated Input Current	For 1400 W Power Supply: 8 A (at 200 VAC), 6.7 A (at 240 VAC)
			For 800 W Power Supply: 9.4 A (at 100 VAC), 4.5 A (at 240 VAC)
		Rated Input Frequency	50 to 60
	Power Supply Output (per power supply)	Maximum Power	For 1400 W Power Supply: 1400 W (at 200 to 240 VAC)
			For 800W Power Supply: 800W (at 100-240VAC)
	Power Specifications	To review typical system power ratings use the HP 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 .	
	Power Supply Output (per power supply)	Rated Steady-State Power	
	System Inlet Temperature	Operating	50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 304.8 m) above sea level to a maximum of 10,000 ft (3048 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C).
		Non-operating	-22° to 140° F (-30° to 60° C) Maximum rate of change is 36°F/hr (20°C/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	10,000 ft (3048 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).
		Non-operating	30,000 ft (9144 m). Maximum allowable altitude change rate is

Technical Specifications

Emissions Classification (EMC)	FCC Rating	1500 ft/min (457 m/min).
	Normative Standards	Class A
		CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

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

HP Ethernet 1Gb 2-port 361i Adapter	Network Interface Compatibility	10Base-T/100Base-TX/1000Base-TX	
		IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
		IEEE 1588, IEEE 802.1AS	
		IEEE 802.3az - Energy Efficient Ethernet (EEE)	
	Data Transfer Method Controller	PCI Express v 3.0, 8.0 GT/s, 5.0 GT/s and 2.5 GT/s bus speeds for a x1 link.	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 20 Mb/s Combined
		10Base-T (Full-Duplex)	20 Mb/s per port, 40 Mb/s Combined
		100Base-TX (Half-Duplex)	100 Mb/s per port, 200 Mb/s Combined
	100Base-TX (Full-Duplex)	200 Mb/s per port, 400 Mb/s Combined	
	1000Base-TX (Half and Full-Duplex)	1000Mb/s per port, 2000 Mb/s Combined	
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		10/100/1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

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

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



hp.com/qref/apollo4530gen9

Technical Specifications



hp.com/qref/apollo4510gen9

Summary of Changes

Date	Version History	Action	Description of Change
28-Aug-2015	From version 4 to 5	Changed	Update images from Apollo 4510 and 4530.
17-Aug-2015	From version 3 to 4	Changed	Updates throughout the QuickSpecs
17-Jun-2015	From version 2 to 3	Changed	Remove non supported items and add carepacks info.
12-June-2015	From version 1 to 2	Changed	Changes in Technical specifications
1-June-2015	Version 1	Created	Create QuickSpecs for HP Apollo 4500 System

© Copyright 2015 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

Microsoft and Windows NT are US registered trademarks of Microsoft Corporation. Unix is a registered trademark of The Open Group.

Intel, the Intel logo, Xeon and Xeon Inside are trademarks of Intel Corporation in the U.S. and other countries.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

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