

Overview

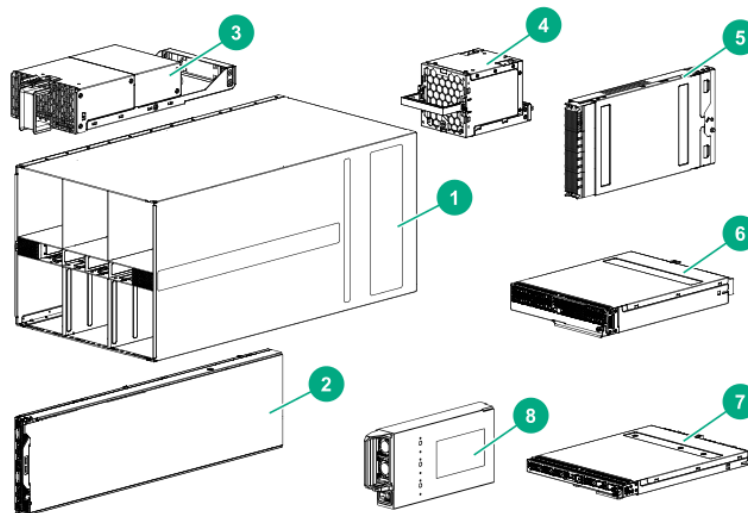
HPE Apollo k6000 Chassis

Is it time for a real workhorse server solution to take your business to the next level?

The HPE Apollo k6000 Chassis is designed with density optimization and HPC solution integration in mind to help you manage and scale to your HPC computing demands. The new modular HPE Apollo k6000 Chassis is designed to hold the next generation of compute servers to fit your specific HPC workloads.

The new modular, fully integrated, and highly flexible HPE Apollo k6000 Chassis accommodates up to 24 XL230k server trays, redundant power and cooling, ethernet and high speed fabric switches to address various HPC workload needs. The Apollo k6000 System is a performance optimized, air-cooled solution that fits in customer's space limitations. This solution offers outstanding configuration flexibility, simplified administration and rack-scale efficiency that lowers the total cost of ownership needed for mass scale HPC deployments.

Cooling concerns are reduced by 12 hot-pluggable dual rotor fans while the chassis power can be managed by either HPE Chassis Controller or enhanced (simplified) with optional HPE Apollo Platform Manager (APM) which allows granular power control at rack level.



1. HPE Apollo k6000 Chassis

Front chassis components:

2. Server trays (qty. depends on configuration ordered)

3. Front chassis fan modules (4)

Rear chassis components:

4. HPE Apollo 6000 dual-rotor fan modules (12) (fan type depends on the configuration ordered)

Rear chassis components continued:

5. Chassis controller or HPE Platform Manager

- Power data management cable (1) (Not shown)
- APM power data management cable (1) (Not shown)

6. High-speed fabric switches

7. Data switches

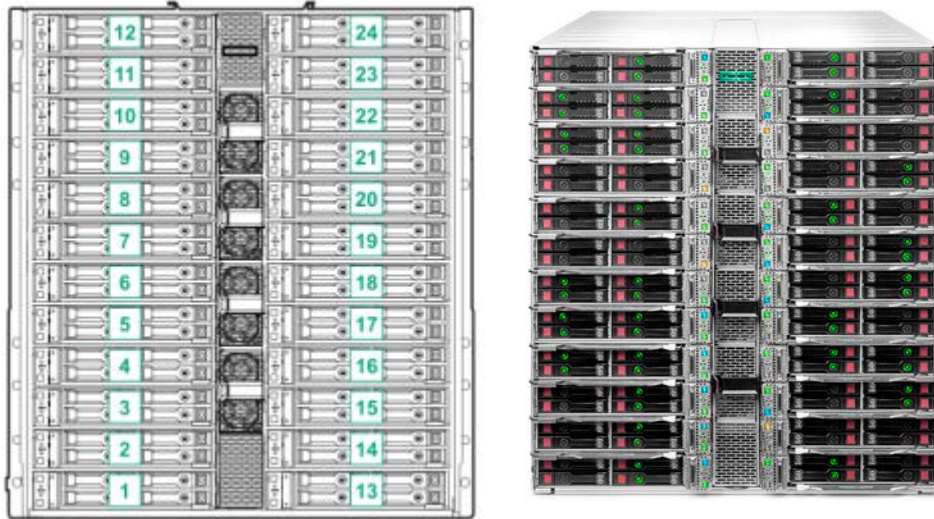
8. Power supplies (6)

Cables (per chassis) – (Not shown)

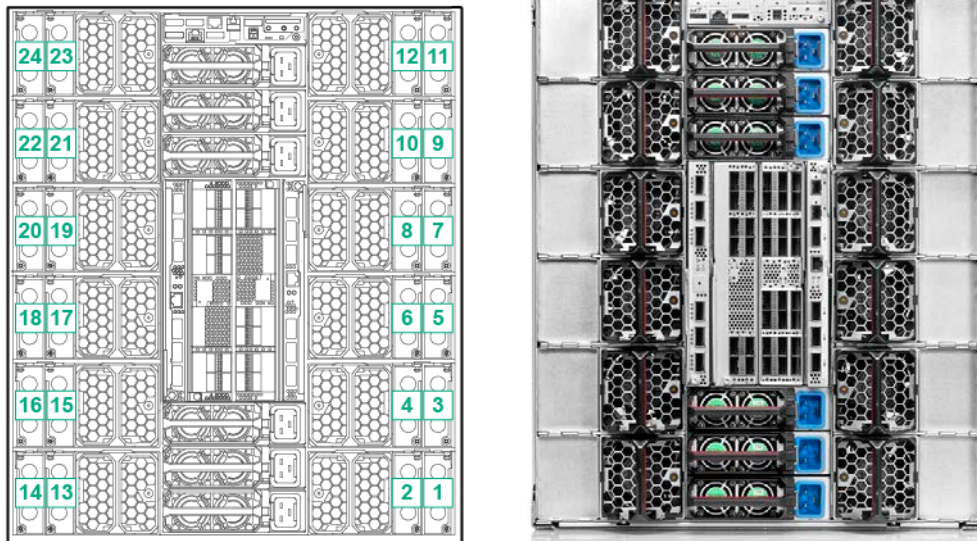
- Power supply cables (3)
- 2.5M 20 Pin Consolidated Management w/Latch Cable
- APM USB to DB9 cable (1)

Overview

Front View with server bay numbering:



Rear View with I/O module bay numbering:



Standard Features

Chassis

Each HPE Apollo k6000 Chassis can be fully configured with the following:

- Up to 24 single slot server trays per 12U air-cooled chassis.
- Optional 24 external PCIe I/O module slots (optional with dual rotor fans only).
- Up to six (6) 2650W power supplies providing up to 15,900W of power per chassis (14 kW usable when power capping is enabled)
- Or up to six (6) 3400W power supplies providing up to 20,400W of power per chassis (19 kW usable when power capping is enabled)
- HPE Chassis Controller contains the thermal logic technology for lower power consumption and airflow when nodes are fully utilized.
- Twelve (12) dual rotor fan assemblies for redundancy, improved power consumption and acoustics.
- Front 4 hot-swappable fans to provide thermal cooling for integrated switches

System Fans

The Chassis supports 12 dual rotor fan modules and 4 hot pluggable front fans to direct air to switch bays.

Server Blank Kit

HPE Apollo 6000 Server Tray Blank Kit

NOTE: Use this Server Blank tray kit in the absence of a server tray in one of the assigned server slots to maintain the airflow in the chassis to meet thermal requirements during operation or servicing.

Service Kit

HPE Apollo 6000 Chassis Service Kit

NOTE: Chassis Service kit can be used during service events. This kit includes 4 handles necessary to remove the chassis from the rack.

Rack Airflow Requirements

HPE Apollo k6000 Chassis

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. For maximum cooling, HPE racks are recommended to allow these racks to be fully loaded with servers using the latest processors.

NOTE: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment.

NOTE: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels will result in improper cooling that can lead to thermal damage.

Service and Support

Warranty

This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners (may vary by region). 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 HPE Pointnext operational services or customized service agreements. Hard drives have either a one year or three year warranty.

NOTE: Server Warranty includes 3 year Parts, 3 year Labor, 3-year on-site 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 Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: <http://www.hpe.com/support/ProLiantServers-warranties>

Warranty - Options

Warranty and Support Services will extend to include HPE options configured with your server or storage device. The price of support service is not impacted by configuration details. HPE sourced options that are compatible with your product will be covered under your server support at the same level of coverage allowing you to upgrade freely. Installation for HPE options is available as needed. To keep support costs low for everyone, some high value options will require additional support. Additional support is only required on select high value workload accelerators, fibre switches, InfiniBand and UPS batteries over 12KVA. See the specific high value options that require additional support at: www.hpe.com/services/excludedoptions

Pointnext – Service and Support

It is recommended to have the same attached support level for all products included in the HPE Apollo k6000 chassis.

The support of HPE Apollo k6000 the chassis covers the chassis, the included options, and APM.

HPE Pointnext for Industry Standard Servers

HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation. From the onset of your transformation journey, Advisory and Transformational Services focus on designing the transformation and creating a solution roadmap. Professional Services specializes in creative configurations with flawless and on-time implementation, and on-budget execution. Finally, operational services provides innovative new approaches like Flexible Capacity and Datacenter Care, to keep your business at peak performance. HPE is ready to bring together all the pieces of the puzzle for you, with an eye on the future, and make the complex simple.

Recommended HPE Support Services for your HPE Apollo 6000

Optimized Recommendation

Proactive Care, 24x7, three-year Support Service

HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice. This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers.

<https://www.hpe.com/h20195/v2/getdocument.aspx?docname=4AA5-3259ENW>

NOTE: *HPE Proactive Care and HPE Proactive Care Advanced require that the customer connect their devices to make the most of these services and receive all the deliverables.

Standard Recommendation

Foundation Care 24x7, three-year Support Service

HPE Foundation Care 24x7 gives you access to HPE 24 hours a day, seven days a week for assistance on resolving issues. This service includes need based Hardware onsite response within four hours. In addition, collaborative software support is included in this service that provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make HPE your first call to help resolve hardware or software problems.

Service and Support

<https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Basic Recommendation

HPE Foundation Care NBD, three-year Support Service HPE Foundation Care Next Business Day connects you to HPE during business hours for assistance on resolving issues – This service features need based next business day hardware onsite response and software call back within two hours. In addition, Collaborative software support and provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make HPE your first call to help resolve hardware or software problems.

<https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Related Services

HPE Datacenter Care service HPE 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 HPE Datacenter Care, you benefit from a personalized relationship with Hewlett Packard Enterprise via a single point of accountability for Hewlett Packard Enterprise and others’ products. For more information, visit <http://www.hpe.com/services/datacentercare>

HPE Flexible Capacity With Flexible Capacity, you get the speed, scalability, and economics of the public cloud in the privacy of your data center. Gain the advantages of the public cloud—consumption-based payment, rapid scalability without worrying about capacity constraints. Reduce the “heavy lifting” needed to operate a data center. And retain the advantages that IT provides the business (i.e., control, security). Deliver the right user experience, choose the right technology for the business, manage privacy and compliance, and manage the cost of IT. And, you have the option to use the public cloud when needed.

Datacenter Care for Hyperscale Datacenter Care for Hyperscale is available for Service Providers and HPC customers who use a scale out approach to computing with a high volume homogenous infrastructure and resilient architecture can take advantage of this environment support tailored to their operating model.

HPE ProLiant Server Hardware Installation Provides for the basic hardware installation of Hewlett Packard Enterprise branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

<https://www.hpe.com/h20195/V2/GetPDF.aspx/5981-9356EN.pdf>

Factory Express for servers and storage HPE Factory Express offers configuration, customization, integration and deployment services for Hewlett Packard Enterprise 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. HPE products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE Apollo, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers as well as the MSAxxx3PAR suite, 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.

Data Privacy Services Protect your data through better media management. HPE 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.

[hpe.com/services/lifecycleevent](http://www.hpe.com/services/lifecycleevent)

Additional can be found at: <http://www.hpe.com/services>

HPE Education Services Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment.

<http://www.hpe.com/ww/learn>

Service and Support

Connect your devices Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Reduce down time and improve diagnostic accuracy with a single consolidated view of your environment. By connecting, you will receive 24x7 monitoring, pre-failure alerts, automatic call logging, and automatic parts dispatch. HPE Proactive Care Service and HPE 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 HPE support.

Learn more about getting connected at <http://www.hpe.com/services/getconnected>

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Parts and Materials HPE will provide HPE-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 HPE due to malfunction.

NOTE: APM is covered under the HPE Service Contract applied to the HPE Apollo 6000 Chassis. No separate HPE support services need to be purchased.

HPE Support Center The HPE Support Center is a personalized online support portal with access to information, tools, and experts to support HPE business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more <http://www.hpe.com/support/hpesc>

HPE'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.

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

*HPE Support Center Mobile App is subject to local availability

For More Information

To learn more on services for Hewlett Packard Enterprise Apollo please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: <http://www.hpe.com/services>

Configuraiton Information

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

Step 1: Choose a Chassis Configuration

HPE Chassis	HPE Apollo k6000 1.2m Chassis	847077-B21
	NOTE: This Chassis requires 1.2m Racks and comes with rack rail kit.	
	NOTE: The rack rail kit only supports HPE racks and 3 rd Party racks with square holes.	
	NOTE: Hewlett Packard Enterprise recommends that a minimum of four people are required for all rack installations. Please refer to your installation instructions for proper tools and number of people to use for any installation.	
HPE Chassis Service Kit	HPE Apollo 6000 Chassis Service Kit	859501-B21
	NOTE: Chassis handles are not included as part of the chassis. It is highly recommended to have handles if the Chassis is not being installed in a rack or for servicing Chassis.	
HPE Additional Options	HPE Apollo k6000 2 Slots IO Module	851666-B21
	NOTE: This module is required for external/rear PCIe cards	
HPE Cooling Options	HPE Apollo 6000 Server Tray Blank Kit	870868-B21
	NOTE: Required for any non-populated slots in the chassis to prevent thermal related issues.	
	HPE Apollo 6000 Dual Rotor Fan	851664-B21
	NOTE: QTY 12 Required for sufficient air flow and can be combined with IO blanks or PCIe IO option.	
	HPE k6000 Rear IO Blank Kit	851669-B21
	NOTE: Rear IO Blank Kit is required to prevent thermal issues if Dual Rotor Fans and no external PCIe slots are required in the chassis.	

Step 2: Choose Power

Power Supplies	HPE Synergy 12000F 6x2650W AC Ti PS	798096-B21
	NOTE: The above SKU comes with six 2650W power supplies.	
	HPE Synergy 12000F 2650W AC Ti PS	798095-B21
	NOTE: The above SKU comes with 1 2650W power supply.	
	HPE 3400W 12V Hot Plug Power Supply Kit	876929-B2
	NOTE: The above SKU comes with 1 3400W power supplies	
	HPE 3400W 12V Hot Plug Power Supply x6 Kit	876930-B21
	NOTE: The above SKU comes with six 3400W power supplies.	
G2 Basic PDUs	HPE G2 Basic Mdlr 3Ph 17.3kVA/NA/JP PDU	P9Q60A
	HPE G2 Basic 3Ph 17.3kVA/C13 NA/JP PDU	P9Q61A
	HPE G2 Basic Mdlr 3Ph 22kVA/C19 INTL PDU	P9Q63A
G2 Metered PDUs	HPE G2 Mtrd Md 3P 17.3kVA/1U NA/J PDU	P9R80A
	HPE G2 Mtrd Md 3P 22kVA/60309 INTL PDU	P9R81A
Intelligent PDUs (Blue Plug)	HPE Intelligent Modular 3Ph 17.3kVA/60309 60A 4-wire 48A/208V (6) C19/Horizontal NA/JP PDU	AF523A
	HPE Intelligent Modular 3Ph 22kVA/60309 5-wire 32A/230V Outlets (6) C19/Horizontal INTL PDU	AF527A

Configuration Information

CAUTION: To avoid loss of data or damage to the PDU, each power supply must be plugged into a dedicated Circuit Breaker. Do not connect multiple power supplies to a single breaker. Connecting 2 or more power supplies to a single breaker will cause the breakers to trip. Minimum recommended PDU Capacity 17.28 kVA
 Minimum number of six breakers required
 Maximum of one 2650W Power Supply per breaker

Step 3: Choose a Compute Server Tray

Server Trays

NOTE: For full server configuration options and details, please see HPE ProLiant XL230k QuickSpecs.

HPE ProLiant XL230k Gen10 Single-width 2P 1.2m Compute Tray 865404-B21

NOTE: This is single slot server tray which contains 2P server. Each HPE Apollo k6000 Chassis can fit up to 24 XL230k compute server trays. For additional information on configuration of server tray refer to HPE ProLiant XL230k Server QuickSpecs998

<https://www.hpe.com/h20195/v2/gethtml.aspx?docname=a00016634enw>

Step 4: Choose Additional Options - Choose one of the following two options:

Chassis Management

HPE Apollo 6000 Chassis Controller 859362-B21

NOTE: The Chassis Controller is required to manage the power and thermals of the chassis.

HPE Apollo Platform Manager for Apollo 6000 859364-B21

NOTE: One Apollo Platform Manager per rack can be installed in place of the Chassis Controller that can connect up to 3 Chassis Controllers for full rack level control.

NOTE: One HPE Network to Serial port (SKU: 859365-B21) is included with HPE Apollo Platform Manager.

NOTE: For additional information on APM, please refer to HPE Apollo Platform Manager QuickSpecs:

HPE 2.5M 20 Pin Consolidated Management w/Latch Cable 872890-B21

NOTE: This cable is required for connectivity HPE APM to Chassis Controller

Step 5: Choose network and high speed fabric backplane and switches

Backplane

HPE Apollo 6000 Fabric FIO Backplane 859368-B21

NOTE: The Fabric Backplane is required if high speed EDR InfiniBand or OmniPath Architecture is desired.

Network Switches

HPE Apollo 10GbE Pass Thru Module 851928-B21

NOTE: The HPE Apollo 10GbE Pass Thru Module allows customers to connect to their desired top of rack switches. Quantity of 1 or 2 modules can be installed into the Apollo k6000 Chassis.

HPE Apollo 10/40GbE Ethernet Switch 846633-B21

NOTE: The HPE Apollo 10/40GbE Ethernet Switch is an integrated switch to be placed in switch Bay 1, 2 or both depending on the desired configuration

HPE Apollo 10/40GbE TAA-compliant Switch 846633-B22

High-Speed Fabric Switches

HPE Apollo InfiniBand EDR 36-port Unmanaged Switch 843407-B21

NOTE: The HPE Apollo InfiniBand EDR Switch can be installed in High Speed Switch Bay 3, 4 or both depending on switch radix alignment. 1 installed switch represents 2:1 radix alignment while 2 switches allow 1:1 radix alignment.

HPE Apollo 100Gb 48-port Intel Omni-Path Architecture Unmanaged Switch 851341-B21

NOTE: The Apollo 100Gb 48-port Intel Omni-Path Architecture (OPA) Switch can

Configuration Information

be installed in Switch Bay 3, 4 or both depending on single or dual rail.

NOTE: This switch requires either OPA mezzanine card or Intel –F processor installed in the HPE ProLiant XL230k Server tray.

HPE Pointnext Support Services

Installation and start-up services	HPE Install Apollo 6000Gen10 Chassis SVC	H2GA8E
	HPE Apollo 6000 Gen10 Startup SVC	H6SV1E
Support Services	HPE 3Y PC 24x7 Apollo 6000 Chassis SVC	H2FP5E
	HPE 3Y FC 24x7 Apollo 6000 Chassis SVC	H2FP4E
	HPE 3Y FC NBD Apollo 6000 Chassis SVC	H2FP1E

Technical Specifications

HPE Apollo k6000 Chassis

Dimensions	Height	53.14 cm (20.92 in)
	Width	44.816 cm (17.64 in)
	Depth	102.59 cm (40.39 in)
Shipping Dimensions	Height	95.50 cm (37.6 in)
	Width	62.48 cm (24.6 in)
	Depth	124.97 cm (49.2 in)
Chassis Weight	Empty	66.68 kg (147 lb)
Max Enclosure Weight	Approx.	301.64 kg (665 lb)
Temperature Range	Operating	10° to 35° C (50° to 95° F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F). NOTE: Operating temperature has an altitude derating of 1.8° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.
Temperature Range	Extended Ambient Operating Support	For approved hardware configurations, the supported system inlet range is extended to be: 10° to 5°C (50° to 41°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hpe.com/servers/ASHRAE
Temperature Range	Non-Operating	-30° to 60° C (-22° to 140° F) - System performance may be reduced if operating in the extended ambient operating range or with a fan fault.
Relative Humidity	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.
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).

Configuration SKU	Entry	Base	Performance
Idle			
LWAd	6.9B	6.9B	6.9B
LpAm	53dBA	53dBA	53dBA
Operating			
LWAd	8.1B	8.6B	9.0B
LpAm	64dBA	69dBA	73dBA

Technical Specifications

Environmental-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life product return, trade-in, and recycling programs, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) 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 Enterprise web site:

<http://www.hpe.com/RECYCLE>. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
5-Feb-2018	From version 4 to 5	Updated	Update configuration information section
23-Oct-2017	From version 3 to 4	Changed	Care Pack naming and Service and Support- Parts and Materials updated
25-Sept-2017	From version 2 to 3	Updated	Updates made throughout the QuickSpecs
11-Aug-2017	From version 1 to 2	Updated	Update headers in the QuickSpecs
11-July-2017	Version 1	Created	Create QuickSpecs for the HPE Apollo



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