

Overview

HPE Apollo f8000 Rack

With industry-leading performance density, the HPE Apollo f8000 Rack holds up to 144 ProLiant servers with plenty of CPU, accelerator, memory and networking options in a standard rack footprint.

The Apollo f8000 Rack powers your research with 3-phase high voltage AC, single stage power rectification and high voltage DC distribution. Smart sensors automatically track and dynamically adjust system components for optimum efficiency.

Water coming into the rack is distributed through manifolds that split out to thermal bus bars for heat transfer from the dry disconnect server trays. Water going out of the rack features isolation valves and is aggregated for energy recycling. The HPE f8000 Rack Solution is a water-cooled rack solution that provides device-level cooling for processors, DIMMs, and accelerators. Additional components are air-cooled, with heat being removed by an air-to-liquid heat exchanger within the rack. The f8000 Rack is a closed-loop cooling system integrated as part of a limited-ventilation server rack, in contrast to a conventional "open" rack with perforated front and rear doors.

HPE Apollo 8000 System Manager is an integrated solution for the HPE Apollo 8000 infrastructure that provides real time data from multiple sensors and environmental controls.

It consists of:

- HPE Apollo 8000 Rack manager
 - It incorporates the features of the HPE Advanced Power Manager to provide aggregation of server data through iLO, granular control of power measurement and monitoring, dynamic power capping, asset management capabilities and system monitoring.
- HPE Apollo iCDU Rack Manager
 - One HPE Apollo 8000 iCDU Rack Manager is needed for each HPE Apollo 8000 System with a common set of parameters on a common water loop.
 - For detailed overview see the HPE Apollo 8000 iCDU Rack QuickSpecs.

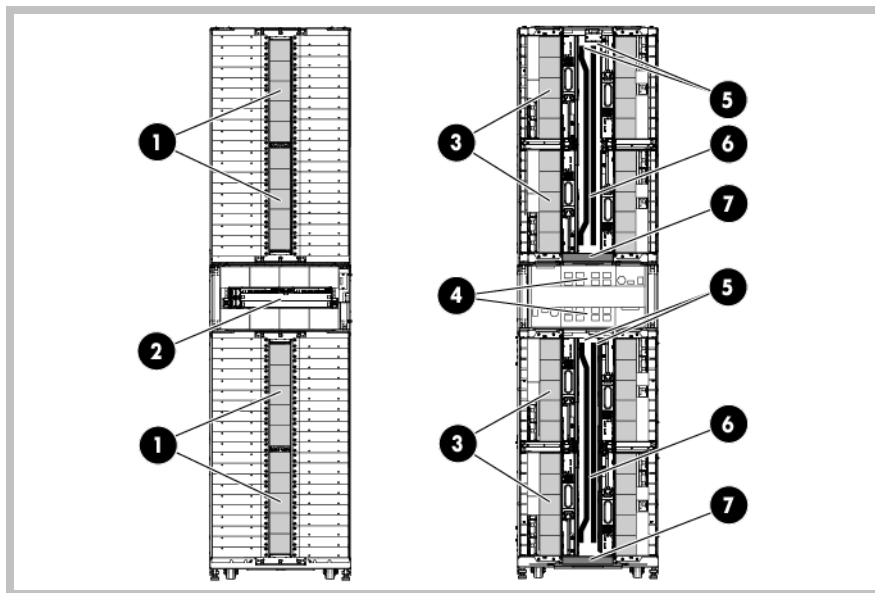
Apollo f8000 Rack Key Features

The HPE Apollo 8000 System Solution is comprised of the following components:

- One or more Apollo f8000 Racks with HPE ProLiant XL730f, XL740f and XL750f Gen9 Servers, one or more HPE Apollo 8000 iCDU Racks, and their associated onboard CDU control system.
- Primary plumbing interface assembly kit that connects the individual Apollo 8000 iCDUs Racks to the facility water system.
- Secondary plumbing system that connects the individual the Apollo f8000 Racks to the HPE Apollo 8000 iCDU Racks. This secondary closed loop system provides cooling for the Apollo f8000 Rack and isolates it from untreated, potentially incompatible primary water.
- High-speed (FDR) InfiniBand networking built into the Apollo f8000 Rack.
- Integrated 1GbE Ethernet switch built into the utility section of Apollo f8000 Rack.

Overview

HPE Apollo f8000 Rack front and rear components



Item	Description	Purpose
1	Front fans	Provide circulation of cooled air through the rack.
2	HPE Apollo 8000 Rack Manager	Management module which integrates management and monitoring data from the IT and CDU rack.
3	Rear fans	Provide circulation of cooled air through the rack.
4	Power supplies	Provides power to the rack.
5	Pressure ports	Used during initial installation only.
6	Rack piping	Allows flow of cool water into the rack and heated water out of the rack.
7	Drain pans	Collect water condensation, removed through the gravity drain.

Configuration Information—Factory Integrated Models

Service and Support

HPE Technology Services for Apollo Servers

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability powered by a rich portfolio of consulting and support services designed to add value to our core products and solutions. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you 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 HPE Support Services

HPE support services offer complete care and support expertise with committed response choices that are designed to meet your IT and business needs.

Optimized services recommendation

Optimized recommendation: Supports maintaining servers at optimum performance availability **Foundation Care 24x7, three-year Support Service**

HPE Foundation Care 24x7 connects you to HPE 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 Support service provides troubleshooting assistance on industry leading software running on your Hewlett Packard Enterprise server. Simplify your support experience and make Hewlett Packard Enterprise your first call for hardware or software questions.

<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en>

Basic services recommendation

Basic recommendation: minimum support recommendation

Foundation Care NBD, three-year Support Service

HPE Foundation Care Next Business Day connects you to Hewlett Packard Enterprise during business hours for assistance on resolving issues – features next business day hardware onsite response if needed and software call back within two hours. Collaborative software support is included and provides troubleshooting assistance on industry leading software running on your server. Simplify your support experience and make Hewlett Packard Enterprise 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

HPE Apollo 8000 System Startup Service

This service provides site readiness verification, installation planning and management, unpacking, plug-in of the system, installation of a secondary water loop between HPE Apollo 8000 System racks, setup the cooling distribution unit, power-up, and basic connectivity testing.

<http://www8.hp.com/h20195/v2/GetPDF.aspx/4AA5-6248ENN.pdf>

HPE Data Center Platform Consulting Services

Choose HPE 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. Hewlett Packard Enterprise 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>

HPE 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

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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>.

HPE 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. Hewlett Packard Enterprise 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 or go to: <http://www.hp.com/go/factory-express>.

Additional Support Services can be found at HPE Support Services Central
<http://ssc.hp.com>

Connect your devices:

Unlock all of the benefits of your technology investment by connecting your products to Hewlett Packard Enterprise. Achieve up to 77%1 reduction in down time, near 100%2 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. 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 Hewlett Packard Enterprise support.

1- IDC Whitepaper

2 – HPE CSC reports 2014 - 2015

Parts and Materials

Hewlett Packard Enterprise will provide Hewlett Packard Enterprise -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 Hewlett Packard Enterprise due to malfunction

NOTE: The HPE Apollo 8000 System ships as a Configured-To-Order (CTO) product only.

The Apollo 8000 System consists of up to seventy-two (72) HPE ProLiant XL730f Gen9 Server Trays in a single HPE Apollo f8000 Rack, cooled by a single HPE Apollo 8000 iCDU Rack.

The Apollo 8000 System is only sold as a Factory Integrated Model. To ensure only valid configurations are ordered, the sales

Configuration Information—Factory Integrated Models

system acts as a configurator. Contact your local sales representative for information on configurable product offerings and requirements. This section lists some of the steps required to configure a Factory Integrated Model of the Apollo 8000 System.

NOTE: The Configure-To-Order Apollo 8000 System must include an Apollo f8000 Rack, an Apollo 8000 iCDU Rack, at least seventy-two (72) ProLiant XL730f Gen9 Server Trays and eight (8) HPE InfiniBand Switches for Apollo 8000.

NOTE: Configure-To-Order Apollo 8000 Systems start with the 144 ProLiant Servers part of 72 HPE ProLiant XL730f Gen9 Server Trays.

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

HPE ProLiant XL730f Gen9 Server

Step 1. Choose at least seventy-two (72) ProLiant XL730f Gen9 Server Trays for 144 servers total.

For each ProLiant XL730f Gen9 Server choose the processor type. Four processors (two 2P servers) ship standard with each ProLiant XL730f Gen9 Server Tray. For more information see the HPE ProLiant XL730f Gen9 Server QuickSpecs.

NOTE: Processor mixing of different frequencies and Wattage is not supported in any single tray.

Step 2. Choose one of the following kits for the Intel E5 2600v3 Xeon processor for each server tray.

Intel Xeon E5-2699 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	775159-L21
Intel Xeon E5-2698 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	775160-L21
Intel Xeon E5-2697 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	775159-L21
Intel Xeon E5-2667 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	775160-L21
Intel Xeon E5-2670 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	775159-L21
Intel Xeon E5-2680 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	775160-L21
Intel Xeon E5-2690 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) FIO Processor Kit	775161-L21
Intel Xeon E5-2695 v3	
HP XL7x0f Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) FIO Processor Kit	775162-L21

Step 3. Choose memory for each ProLiant XL730f, XL740f and XL750f Gen9 Server Tray.

NOTE: Choose a minimum of 4 kits per server tray or a maximum of 32 kits per server tray. Choose in multiples of 4.

HP 8GB (1x8GB) Single Rank x4 PC4-17000P (DDR4-2133) Registered Heat Spreader Memory Kit	778267-B21
HP 16GB (1x16GB) Dual Rank x4 PC4-17000P (DDR4-2133) Registered Heat Spreader Memory Kit	778268-B21

Step 4. Choose the SFF SSD for the server tray.

NOTE: Choose a minimum of 0 kits or a maximum of 2 kits per server tray, must be ordered in pairs.

NOTE: If you choose to have SSDs in the server tray, both SSDs must be the same size.

HP 120GB 6G SATA 2.5in VE Non Hot-plug Solid State Drive	745794-B21
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Step 5. Choose a hard drive enablement kit for the SSD.

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NOTE: Choose an enablement kit for each drive chosen.

HP XL7x0f Solid State Drive Enablement Kit 777899-B21

Step 6. Choose the required network solution.

NOTE: Each ProLiant XL730f Gen9 Server Tray ships with 2 network adapters, 1 per server.

HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+A8L Adapter 778509-B21

HPE Apollo f8000 Rack

Choose the Apollo f8000 Racks.

For 1-72 Server Trays, a single Apollo f8000 Rack is required. Please see the Apollo f8000 Rack QuickSpec for additional information.

Step 7. Choose one of each of the following.

NOTE: The Top and Bottom Rack must be ordered together

HPE Apollo f8000 Performance Bottom Rack 822584-B21

HPE Apollo f8000 Performance Top Rack 822583-B21

Step 8. Choose the infrastructure kits to support the Apollo f8000 Rack.

NOTE: Choose a minimum of 2 kits or a maximum of 2 kits per top or bottom of each Apollo f8000 Rack, must be ordered in pairs

HP XL7x0f Integrated InfiniBand 18 2-port Fabric FIO Cartridge Cable Kit 774057-B21

HPE InfiniBand FDR/Ethernet 10/40Gb 2-port 544+A8L Adapter

HP XL7x0f Integrated InfiniBand FDR 18-port FIO Switch Tray Kit 774059-B21

HPE Apollo 8000 Switch FIO Base Plate 818274-B21

Step 9. Choose the rack plumbing kit for each Apollo f8000 Rack.

HP Apollo f8000 Rack Plumbing Kit J1P10A

Step 10. Choose a power meter for each Apollo f8000 Rack, one per rack.

HP 480VAC Watertight FIO Power Meter 779240-B21

HP 415VAC FIO Power Meter Kit 779245-B21

Step 11. Choose a packaging option kit.

NOTE: Select this option only when shipping the rack stacked is an option. This option available only in North America.

HP Apollo f8000/iCDU Rack Packaging FIO Kit 778976-B21

HPE Apollo 8000 iCDU Rack

This cooling rack requires special site considerations, which can be understood with the HPE Apollo 8000 System Site Preparation Guide available from your Hewlett Packard Enterprise advisor. A single Apollo iCDU Rack can support up to four Apollo f8000 Racks. Please see the Apollo 8000 iCDU Rack QuickSpecs for additional information.

Choose the Apollo 8000 iCDU Racks. For 1-4 Apollo f8000 Racks an Apollo 8000 iCDU Rack is required.

Step 12. Choose one of each of the rack bottoms.

NOTE: The Top and Bottom Rack must be ordered together.

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HP Apollo 8000 iCDU Top Rack J1P09A

NOTE: The Top iCDU Rack (J1P09A) is included as default with the Bottom iCDU Rack selection

HP Apollo 8000 iCDU Bottom Rack J1P08A

HP Apollo 8000 iCDU International Bottom Rack J1P08B

Step 13. Choose the plumbing kits required.

HP Apollo 8000 iCDU Rack Plumbing Kit J1P12A

NOTE: The Hose Kit is required for each rack.

HP Apollo 8000 Secondary Plumbing Kit J1P14A

NOTE: One Apollo 8000 Secondary Plumbing Kit can support up to 3 full racks of any combination: an Apollo 8000 iCDU (Top and Bottom) or an Apollo f8000 (Top and Bottom) Rack.

HP Apollo 8000 End Assembly Kit J1P15A

NOTE: One Apollo 8000 end plumbing kit maximum per cooling loop

Step 14. Choose a power meter for the Apollo 8000 iCDU Rack.

HP 480VAC Watertight FIO Power Meter 779240-B21

HP 415VAC FIO Power Meter Kit 779245-B21

HPE 150A 480V/277V 3PH NA PDU FIO Kit 819229-B21

Step 15. Choose other rack options.

HP Apollo Rack Ramps Packaging Kit 778975-B21

NOTE: One HPE rack ramps kit per site needed for deployment as determined by Site Analysis.

HP 5900AF-48XG-4QSFP+ Switch JC772A

NOTE: A minimum of 0 and a maximum of 6 per Bottom iCDU Rack and a minimum of 0 and a maximum of 22 per Top iCDU Rack.

HP A58x0AF 650W AC Power Supply JC680A

NOTE: One for every switch ordered above.

HP A58x0AF Back (power side) to Front (port side) Airflow Fan Tray JC682A

NOTE: Two for every switch ordered above.

Core Options

HPE Apollo f8000 Rack Models	HPE Apollo f8000 Performance Bottom Rack	822584-B21
	HPE Apollo f8000 Performance Top Rack	822583-B21
The Apollo f8000 iCDU Rack consists of a top and bottom portion that are assembled together on site.	HP Apollo f8000/iCDU Rack Packaging FIO Kit	778976-B21

NOTE: With a full rack kit, a rack in North America can ship with the top and bottom assembled.

Rack Infrastructure	HP Apollo f8000 Rack Plumbing Kit	J1P10A
	HP Apollo Rack Ramps Packaging Kit	778975-B21

Power Metering	HP 480VAC Watertight FIO Power Meter	779240-B21
	The power meter for the North America racks.	
	HP 415VAC FIO Power Meter Kit	779245-B21
	The power meter for the non-North America racks.	

Cabling Options	HP XL7x0f Integrated InfiniBand 18 2-port Fabric FIO Cartridge Cable Kit	774057-B21
	Cables for the InfiniBand switch	
	HP XL7x0f Integrated InfiniBand FDR 18-port FIO Switch Tray Kit	774059-B21

Networking	HPE Apollo f8000 160-port 1GbE Switch	819220-B21
	HPE f8000 Ethernet Cable Kit	794368-B21

Server Trays	HP ProLiant XL730f Gen9 2x Configure-to-order Server Tray	774055-B21
	HPE Apollo 8000 Server Bulk Package	845193-B21

Server Tray Blanking Plate	HPE SL8500 Tray Blank FIO Kit	818273-B21
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Technical Specifications

Apollo f8000 Rack Specifications		
NOTE: The specifications below are for the base Apollo f8000 Rack.		
Unpacked Dimensions (HxWxD)	Height	94 in. (2,382 mm.)
	Width	24 in (610 mm.)
	Depth	57 in (1,448 mm.)
	Net Weight (with 8 InfiniBand Switches)	4700 lbs. (2,136 kg.)
Packed Specifications*	Shipping Height	102 in (2,575 mm.)
	Shipping Width	42 in (1,067 mm.)
	Shipping Depth	64 in (1,626 mm.)
	Shipping Weight	2,914 lbs. (1,322 kg.)
	Shipping Ramp Length	103 in (2,616 mm.)
	Offloading Ramp Clearance	219 in (5,567 mm.)
Rack	Static IT Rack Load	4700 lbs. (2,136 kg.)
	Door Color	Black With Silver Extrusion
	Frame Color	Black
	Rack Front Door	Contained - Transparent Polycarbonate Insert Behind Mesh
	Rack Rear Doors	Contained - Solid, Split Doors
	Rack Side Panels Included	Yes
	Water Connection Location	Bottom, Overhead
	Water Connection Pipe Size	1.75 in. (44.45 mm.)
	Water Connection Coupling	1.25 in. (31.75 mm. BSPP (G type) supplied in Apollo f8000 Rack Hook up Kit
Condensation Evacuation	Yes (gravity drain standard and condensate pump option)	
Power Input	Operating Voltage	220/380VAC, 3 phase with N + PE 277/480VAC, 3 phase with N + PE
	Voltage Frequency Range	50/60 Hz
	Input Power Draw	1,800 Watts Max.
	Rated Line Current	380VAC - 415VAC 32A per input meter 480VAC 24A per input meter
	Max Inrush Current	Less than 2 times the peak full load current at any line condition
	Circuit Breaker Rating	380-415VAC source - 32A 480VAC source - 30A
	Power Factor Correction	>0.98 At all loads above 20%
	Ground Leakage Current (Ma)	<3.0mA per line cord
	Input Connections	3 meter, 8AWG, 5-wire with IEC 60309-32 plug

Technical Specifications

		3 meter, 8AWG, 5-wire with NEMA L22-30P plug
Environmental Monitoring	Water Temperature Monitor	Yes
	SIM 5.0 Integration	Yes (SNMP traps)
Supported InfiniBand Data Rates	Mellanox InfiniBand Integrated Leaf Switch	QDR, FDR10, and FDR
Data Connectors	QSFP	18 external per switch
Warranty	Standard Apollo f8000 Rack Warranty	3-3-3
Certifications	Regulatory Approvals	FCC for entire rack: ETL Listing, UL/CSA 60950-1 CISPR 22 EN 55022 EN 55024 EN61000-3-2 EN61000-3-3 Flicker EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-8 EN61000-4-11
Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett Packard Enterprise offers end-of-life HPE 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 Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise 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 Enterprise web site at: http://www.hp.com/go/green . 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
1-Dec-2015	From version 3 to 4	Updated	Updated SKUs on the configuration section
30-Mar-2015	From version 2 to 3	Changed	Updates on the configuration information
1-Dec-2014	From version 1 to 2	Changed	Updates made throughout the whole QuickSpecs
29-Sept-2014	Version 1	Created	Create QuickSpecs for HPE Apollo f8000 Rack



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