

Overview

HPE Apollo 8000 iCDU Rack

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

- One or more Apollo f8000 Racks with HPE ProLiant XL730f 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.

HPE Apollo 8000 iCDU Rack

The HPE Apollo 8000 iCDU Rack provides 320kW of efficient and resilient cooling using the lower half of a standard rack footprint. The iCDU connects to a standard 2.5 inch facility pipe and with ASHRAE-spec water, cools up to 4 HPE Apollo f8000 Racks.

The iCDU serves as a heat exchanger between the primary facilities and the secondary IT cooling. It isolates the secondary IT cooling loop for consistent water quality, containment, pressure and flow. The secondary loop remains at sub atmospheric temperatures and the water flowing from redundant iCDUs to Apollo f8000 racks is pumped under vacuum keeping water in place, for operational resiliency and serviceability.

Smart sensors automatically track thermal activity, dynamically adjusting system components to enhance system cooling for optimum efficiency.

The unit comes with a modular plumbing kit with quick disconnect 2.5 inch stainless connectors and flexible hoses for fast and easy deployment.

The Apollo 8000 iCDU Rack performs the following functions:

- Accepts water supplied from the facility water system
- Returns heated water back to the facility water system
- Supplies cooled water to the HPE Apollo f8000 Racks through the secondary plumbing system
- Accepts heated water returned from the Apollo f8000 Racks
- Maintains the preset water temperature and pressure in the secondary plumbing system
- Monitors system health
- Isolates primary and secondary water in case of a leak

The HPE Apollo 8000 system manager consists of an HPE Apollo 8000 iCDU Rack Manager.

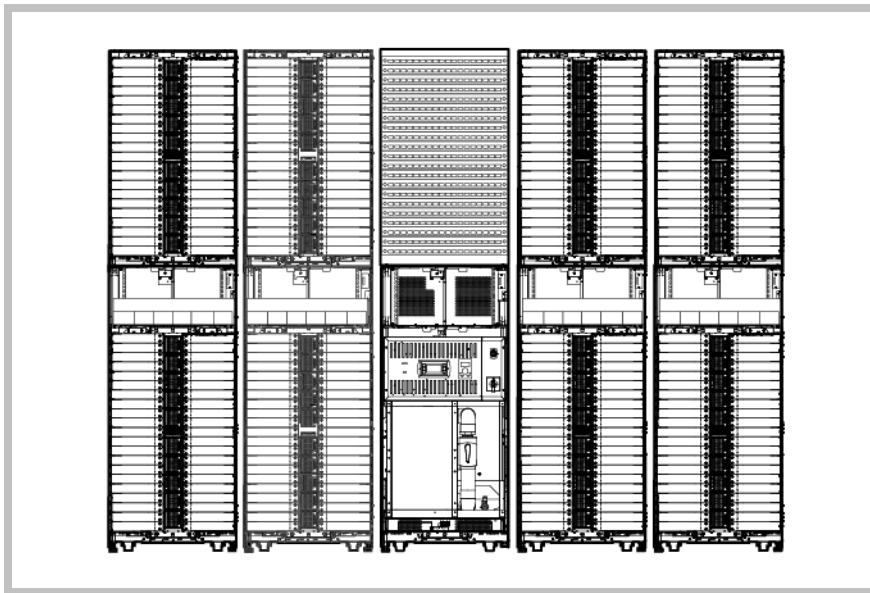
One HPE Apollo 8000 iCDU Rack Manager is needed for each HPE Apollo 8000 System with a common set of parameters on a common water loop.

Overview

Features for the Apollo 8000 iCDU Rack Manager

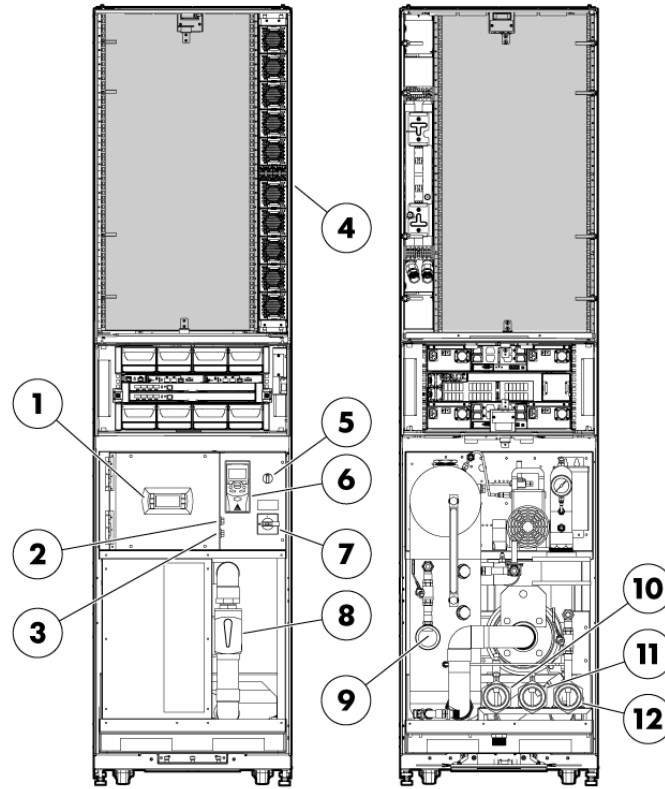
- Health monitoring and reporting environmental data such as power, thermal, water, airflow, and door status of the Apollo 8000 iCDU Rack and the Apollo f8000 Rack infrastructure.
- Supports email alerts, and web interface.
- Alarm threshold configuration.
- Event logging and data storage, data trending and data analysis.
- CMU license optionally available for Apollo 8000 system level iLO and server management: **HPE Insight Cluster Management Utility QuickSpecs**.

HPE Apollo 8000 System Configuration with a single Apollo 8000 iCDU Rack in the center and two HPE Apollo f8000 Racks with HPE ProLiant XL730f Gen9 Servers on each side.



Overview

HPE Apollo 8000 iCDU Rack front and rear components



Item	Description	Purpose
1	Display panel	Provides general cooling unit status
2	Serial connector	Provides connection to second CDU in redundant configurations
3	RJ-45 connector	Provides network connection
4	General IT area	Allows installation of general rack mount equipment
5	Control switch	Allows override of pump control for maintenance and testing
6	VFD (Variable Frequency Drive)	Displays pump frequency
7	Power switch	Controls main power to the CDU
8	Two-way facility water control valve	Electro-mechanical valve that controls flow of facility water
9	Water inlet 2-1/2" male cam-lock	Secondary water in
10	Water outlet 2-1/2" male cam-lock	Facility water out
11	Water inlet 2-1/2" male cam-lock	Facility water in
12	Water outlet 2-1/2" male cam-lock	Secondary water out

Service and Support

Service and Support **HPE Technology Services for Apollo 8000 systems**

Capitalizing on the capabilities of this technology requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know Hewlett Packard Enterprise infrastructure hardware and software best - the experienced professionals at Hewlett Packard Enterprise. We provide several recommendations of services to help optimize your IT operations and minimize risk to drive better business outcomes.

What HPE Technology Services can do for you

Our services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions to save deployment time, reduce errors and simplify your support experience. We offer several support levels; you select the type and level of service that is most suitable for your business need – HPE Datacenter Care supports your IT environment, providing the right mix of proactive services and reactive hardware and software and support coverage to meet your IT and budget needs. HPE Proactive Care delivers high levels of system availability through proactive service management and advanced technical response while HPE Foundation Care offers scalable hardware and software support.

For maximum flexibility on the Apollo 8000, we sell HPE Care Pack Services on Apollo 8000 iCDU Rack, the Apollo f8000 Rack, the server trays and the switches. The recommendations below cover the Apollo 8000 iCDU Rack only.

Recommended Services HPE Installation of iCDU rack

Provides factory implementation and onsite installation of rack and contents. Required service.

HPE Foundation Care NBD Service, 3 year Care Pack

Provides hardware support for your HPE rack; next business day onsite response.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf>

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. Supplies and consumable parts will not be provided as part of this service; standard warranty terms and conditions apply. Parts and components that have exceeded their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual or the technical product data sheet will not be provided, repaired or replaced as part of this service.

For more information

To learn more on services for HPE ESSN Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:

<http://www.hp.com/services/proliant> or <http://www.hp.com/services/bladesystem>

Configuration Information – Factory Integrated Models

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 XL7x0f 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 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 XL7x0f 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 XL7x0f Gen9 Server Trays.

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

HPE ProLiant XL7x0f Gen9 Server

Step 1. Choose at least seventy-two (72) ProLiant XL7x0f Gen9 Server Trays for 144 servers total.

For each ProLiant XL7x0f Gen9 Server choose the processor type. Four processors (two 2P servers) ship standard with each ProLiant XL7x0f Gen9 Server Tray. For more information see the HPE ProLiant XL730f Gen9 Server, HPE ProLiant XL740f Gen9 Server, and HPE ProLiant XL750 Gen9 Server QuickSpecs.

Server Trays

HP ProLiant XL730f Gen9 2x Configure-to-order Server Tray	774055-B21
HP ProLiant XL740f Gen9 2x Configure-to-order Server Tray	776495-B21
HP ProLiant XL750f Gen9 2x Configure-to-order Server Tray	778745-B21

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.

HP XL7x0f Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) Processor Kit	795560-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) FIO Processor Kit	795560-L21
HP XL7x0f Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) Processor Kit	795559-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) FIO Processor Kit	795559-L21
HP XL7x0f Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) Processor Kit	795558-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) FIO Processor Kit	795558-L21
HP XL7x0f Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) Processor Kit	800826-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) FIO Processor Kit	800826-L21
HP XL7x0f Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) Processor Kit	775159-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	775159-L21

Configuration Information – Factory Integrated Models

HP XL7x0f Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) Processor Kit	775160-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	775160-L21
HP XL7x0f Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) Processor Kit	775161-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) FIO Processor Kit	775161-L21
HP XL7x0f Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) Processor Kit	775162-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) FIO Processor Kit	775162-L21
HP XL7x0f Intel® Xeon® E5-2683v3 (2.0GHz/14-core/35MB/135W) Processor Kit	795557-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) FIO Processor Kit	795557-L21
HP XL7x0f Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit	795572-B21
HP XL7x0f Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit	795572-L21

Step 3. Choose memory for each ProLiant XL7x0f 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.

HPE 8GB (1x8GB) Single Rank x4 PC4-17000P (DDR4-2133) Registered Heat Spreader Memory Kit	778267-B21
HPE 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	845794-B21
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Step 5. Choose a hard drive enablement kit for the SSD.

NOTE: Choose an enablement kit for each drive chosen.

HPE XL7x0f Solid State Drive Enablement Kit	777899-B21
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Step 6. Choose the required network solution.

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

HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+A8L Adapter	778509-B21
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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 Bottom IT Rack	J1P06A
HPE Apollo f8000 Top IT Rack	J1P07A

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

Configuration Information – Factory Integrated Models

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

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

HPE Apollo f8000 Rack Plumbing Kit	J1P10A
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Step 10. Choose a power meter for each Apollo f8000 Rack, one per rack.

HP 480VAC Watertight FIO Power Meter	779240-B21
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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
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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 QuickSpec 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.

HPE Apollo 8000 iCDU Top Rack	J1P09A
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NOTE: The Top iCDU Rack (J1P09A) is included as default with the Bottom iCDU Rack selection

HPE Apollo 8000 iCDU Bottom Rack	J1P08A
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Step 13. Choose the plumbing kits required.

HPE Apollo 8000 iCDU Rack Plumbing Kit	J1P12A
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NOTE: The Hose Kit is required for each rack.

HPE Apollo 8000 Secondary Plumbing Kit	J1P14A
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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.

HPE Apollo 8000 End Assembly Kit	J1P15A
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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
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Step 15. Choose other rack options.

HPE Apollo Rack Ramps Packaging Kit	778975-B21
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Configuration Information – Factory Integrated Models

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

HPE 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.

HPE A58x0AF 650W AC Power Supply

JC680A

NOTE: One for every switch ordered above.

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

JC682A

NOTE: Two for every switch ordered above.

Warranty

Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response.

Core Options

HPE Apollo 8000 iCDU Rack Models	HPE Apollo 8000 iCDU Top Rack	J1P09A
	HPE Apollo 8000 iCDU Bottom Rack	J1P08A
<p>The Apollo 8000 iCDU Rack consists of a top and bottom portion that are assembled together on site.</p>		
Ethernet Connectivity	HPE 5900AF-48XG-4QSFP+ Switch	JC772A
	Ethernet switch for 1Gb communication	
	HPE A58x0AF 650W AC Power Supply	JC680A
	Power supply for the Ethernet Switch	
	HPE f8000 Ethernet Cable Kit	794368-B21
	HPE Apollo f8000 144-port 1GbE Switch	819220-B21
Cooling Options	HPE A58x0AF Back (power side) to Front (port side) Airflow Fan Tray	JC682A
Plumbing Kits	HPE Apollo 8000 iCDU Rack Plumbing Kit	J1P12A
	HPE Apollo 8000 Secondary Plumbing Kit	J1P14A
	HPE Apollo 8000 End Assembly Kit	J1P15A
Additional Options	HPE Apollo Rack Ramps Packaging Kit	778975-B21
	One per data center.	

Standard Features

Apollo 8000 iCDU Unit Specifications

HPE Apollo 8000 iCDU Rack

Parameter	Packaged system (as shipped on pallet)	Unpackaged system (off pallet, unwrapped)
Height	2575 mm (102 in)	2382 mm (94 in)
Width	1016 mm (40 in)	607 mm (24 in)
Depth	1676 mm (66 in)	1427 mm (57 in)
Weight	993 kg (2188 lb)*	896 kg (1974 lb)**
Height top assembly	1253 mm (50 in)	1060 mm (42 in)
Height mid and bottom assembly	1555 mm (62 in)	1362 mm (54 in)
Weight top assembly	370 kg (814 lb)*	273 kg (600 lb)**
Weight mid and bottom assembly	720 kg (1588 lb)*	624 kg (1374 lb)**

*Weight for a completely packaged system with no hose kits or IT equipment installed

**Weight for an unpackaged system with no hose kits or IT equipment installed

The following table lists the electrical specifications for the HPE Apollo 8000 iCDU Rack.

Parameter	Value	Comments
Operating Voltage		There are two CDU versions:
Minimum	220/380VAC, 3 phase with N + PE	North American—Supports 480VAC
Maximum	288/480VAC, 3 phase with N + PE	International—Supports 380VAC to 415VAC
AC line frequency	50/60 Hz	—
AC line phase	Three phase	—
Rated input current	480VAC source—7.1 A 380VAC to 415VAC source—9.5 A	Per line cord
Maximum inrush current	580 A peak-to-peak available	Per line cord
Circuit breaker rating	15 A	Per cord
Power factor	Typical value = 0.80	At all loads
Maximum power consumption	5.7 kVA	Steady state
Power cords	30A	480VAC source—NEMA L22-30P watertight connector 380VAC to 415VAC source—IEC 60309 watertight connector

Standard Features

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

Warranty

Standard Rack Warranty

3-3-3

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise 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 2 to 3	Updated	Update SKUs on the configuration section
30-Mar-2015	From version 1 to 2	Created	Updates to the technical specifications part
13-Jun-2014	Version 1	Created	Create version for Apollo 8000 iCDU Rack



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

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