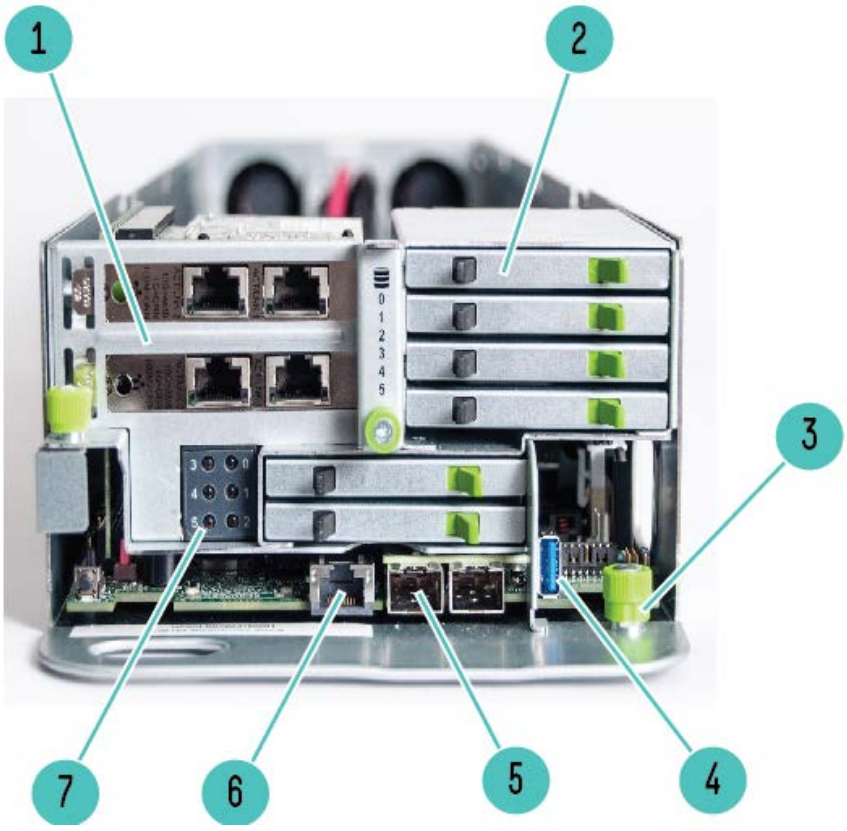
Overview

HPE Cloudline CL7100 Server

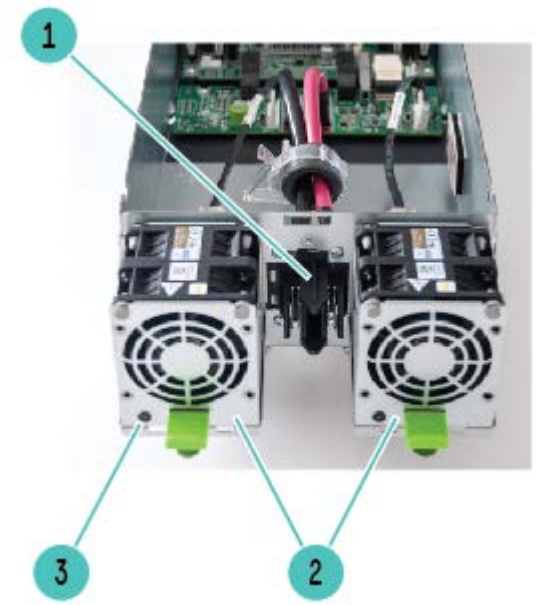
The HPE Cloudline CL7100 Server is Open Compute Compliant and is designed for service providers that need very high density compute platforms for Open Rack deployment. The CL7100 is based upon the OCPv1 (Open Compute Project) specification and utilizes industry standard Intelligent Platform Management Interface (IPMI). The CL7100 is built on a RackScale Architecture and has a highly efficient rack level power and cooling system. The Cloudline CL7100 is a 2 OU (Open Unit) sled severer featuring Intel® Xeon® E5-2600v4 series processors.



Front Sled view:

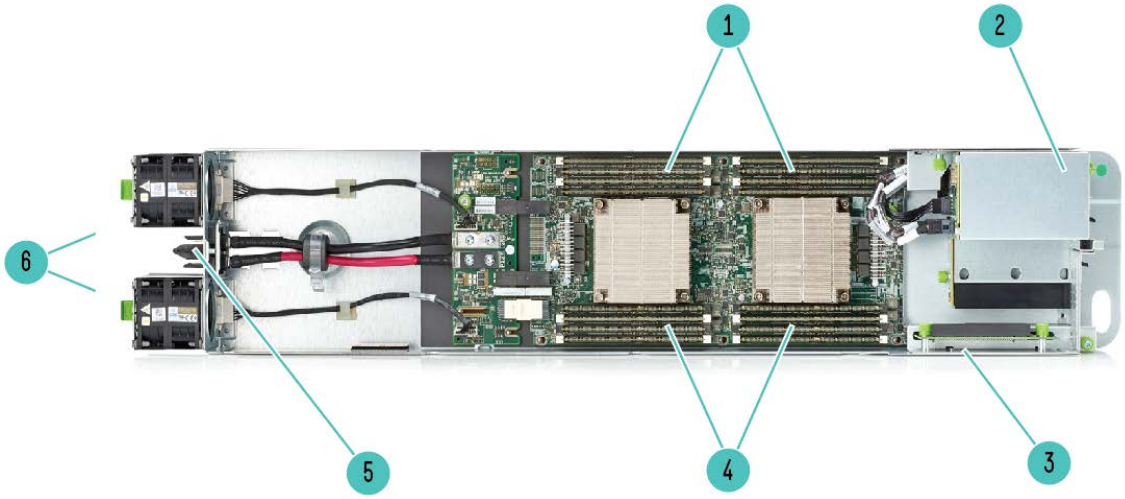
1. 2x PCI-E Slots
2. 6x Removable SSDs
3. Sled Release Lever
4. USB 3.0 Port
5. OCP Networking Mezzanine Card
6. RJ-45 Management Port (IPMI)
7. Drive Activity LED Panel

Overview



Rear view:

1. 12V DC blind mate Power Connector
2. 2x Hot Plug Fan Modules
3. Fan failure LED



Internal Sled view:

1. 16x DDR4 DIMM Slots
2. SSD Drive Cage
3. PCI-E Risers
4. 2x Intel Xeon E5-2600 v4 CPUs
5. 12V DC Blind Mate Connector
6. Hot Swap Fan Modules

Standard Features

Processor

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

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

Intel® Xeon® processor E5-2600 v4 product family

Model	CPU frequency	Cores	L3 Cache	TDP	QPI	DDR4 Maximum Speed
E5-2695v4	2.1GHz	18	45MB	120W	9.6GT/s	2400 MHz
E5-2680v4	2.4GHz	14	35MB	120W	9.6GT/s	2400 MHz
E5-2660v4	2.0GHz	14	35MB	105W	9.6GT/s	2400 MHz
E5-2620v4	2.1GHz	8	20MB	85W	8.0GT/s	2133 MHz
E5-2609v4	1.7GHz	8	20MB	85W	6.4GT/s	1866 MHz
E5-2603v4	1.7GHz	6	15MB	85W	6.4GT/s	1866 MHz

Chipset

Intel® C610 Series Chipset

NOTE: For more information regarding Intel chipsets, please see the following URL: **http://www.intel.com/products/server/chipsets/**

Upgradeability

Upgradeable to 2 processors (40 Cores)
Up to 16 DIMM slots available for higher Memory capacity
OCP Mezzanine connector for 40 Gigabit networking options
6 SFF Drive Bay

On System Management Processor

iBMC ASPEED AST2400 with KVM Support

Memory

Industry Standard DDR4 Registered (RDIMM)

DIMM Slots Available 16 (8 DIMM slots per processor, 4 channels per processor, 2 DIMMs per channel)

Maximum Capacity 1024GB (16 x 64GB RDIMM) 8GB/16GB/32GB/64GB DDR4 up to 2400MT/s

Memory Protection

Advanced ECC

Advanced ECC uses single device data correction to detect and correct single and all multibit error that occurs within a single DRAM chip.

Online spare

Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.

Expansion Slots depending on model

Expansion Slots #	Technology	Bus Width	Connector Width	Form Factor	Notes
OCP Mezz	PCIe 3.0	x8	x8	OCP	CPU 0, depends on the motherboard
Slot1	PCIe 3.0	x8	x8	HH/HL	CPU 0
Slot2	PCIe 3.0	x16	x16	HH/HL	CPU 1

NOTE: Bus Width data indicates the number of physical electrical lanes running to the connector.

Internal Storage Devices depending on model

Hard DrivesUp to 6 SFF SSD

Maximum Internal Storage

Hot Plug SFF SSD 10.74 TB 6 x 1.79 TB

Power Supply

None

One of the following depending on model

System Fans

2 Fans, hot-swap

Interfaces

Network ports None embedded

Standard Features

	OCP NIC ports	2x ports (for OCP NIC Mezzanine card)
	IPMI management port	Dedicated 10/100M LAN port and shared 1GbE/10GbE LAN port
	USB 3.0 Ports	1 front
Operating Systems Test	Cent OS Red Hat Enterprise Linux (RHEL) RHEL 7.0 (latest version) CentOS 7.0 (latest version) Windows Server 2012 R2 (Datacenter, Standard, Essentials, Foundation, HyperV, Storage) VMware ESXi 5.5.0 U2d VMware ESXi 6.0 U1	
Industry Standard Compliance	ACPI 2.0b Complaint PCIe 3.0 Complaint PXE Support WOL Support USB 3.0 Support	
Graphics	Integrated PCIe VGA/2D Controller via ASPEED 2400 BMC, 1600 x 1200 @ 60Hz (32 bpp)	
Form Factor	2OU Rack form factor 3.46" x 6.85"Height x 36.08" (8.8cm) Width x 17.4cm x 91.7cm) Length	
Security	Power-on password Administrator's password UEFI	
Warranty	This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services. The Limited Warranty Period for a Hewlett Packard Enterprise hardware Product is a specified, fixed period commencing on the date of purchase. Your HPE Limited Warranty may include a parts only warranty service. Under the terms of parts only service, Hewlett Packard Enterprise will provide replacement parts free of charge. If Hewlett Packard Enterprise carries out the repair, labor and logistics costs are at your expense. Hardware support and is available for 3 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; refer to the HPE Cloudline Servers and Options Global Limited Warranty and Technical Support for details. **NOTE:** Server Warranty includes 3 year five (5) day Parts response time, 0-Years Labor, 0-Years Onsite support. Addition information regarding worldwide limited warranty and technical support is available at **http://www.hp.com/support/cloudline_warranty_en** Response time: Response times are based on local standard business days and working hours. Unless otherwise stated, all responses are measured from the time the customer calls until Hewlett Packard Enterprise has either established a mutually acceptable time for support to be performed, or Hewlett Packard Enterprise has begun to provide support or remote diagnostics. Response time is based on commercially reasonable effort. In some countries and under certain supplier constraints, response time may vary. If your location is outside the customary service zone, response time may be longer or there may be an additional charge. Contact your local Hewlett Packard Enterprise service organization for response time availability in your area.	

Warranty

HPE Support Services

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise 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 HPE Support Services

HPE Support 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.

Standard Support recommendation

Connect to Hewlett Packard Enterprise for faster problem resolution. Cloudline Support Services provides hardware onsite response. Simplify your support experience and make Hewlett Packard Enterprise your first call for hardware or software questions.

Parts and Materials

Hewlett Packard Enterprise 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 QuickSpecs, 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.

For HPE Cloudline spare parts replenishment, see the Hewlett Packard Enterprise website: **http://www.hp.com/support/cloudline_parts**

Configuration Information - Factory Integrated Models for E5-2600

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 a Hewlett Packard Enterprise approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

1. Factory Integrated Models must start with a CTO Server.
2. FIO indicates that this option is only available as a factory installable option.
3. All Factory Integrated Models will be populated with sufficient hard drive blanks
4. Some options may not be integrated at the factory. Contact your local sales representative for additional information.

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

Chassis	HPE CL7100 G3 6 SFF Configure-to-order Server
SKU Number	855428-B21
Processor	2 (optional) up to 135W
DIMM Slots	16 DIMM slots for RDIMM DDR4 Memory
Storage Controller	Intel Chipset SATA (Standard)
PCIe	(1) PCIe x16 Gen3 slot for 1x HHHL add-on card (1) PCIe x8 Gen3 slot for 1x HHHL add-on card (1) PCIe x8 Gen3 OCP NIC Mezzanine slot for OCP NIC card
Drive Cage	6 SFF Hot Plug
Network Controller	1 x OCP mezzanine slot
Fans	2 hot swap fans
Management	ASPEED 2400, IPMI v2.0 compliant, on board "KVM over IP" support
Power Supply	None
USB	1 USB 3.0 Ports front

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

HPE Processors 1

NOTE: Select up to two (2) Processors, Processor one and two have the same heatsinks

Segmented Optimized - E5-2600v4 series Processors

HPE CL G3 Intel Xeon E5-2695 v4 (2.1GHz/18-core/120W) FIO Processor Kit 857635-L21

Advanced - E5-2600v4 series Processors

HPE CL G3 Intel Xeon E5-2680 v4 (2.4GHz/14-core/35MB/120W) FIO Processor Kit 847792-L21

HPE CL G3 Intel Xeon E5-2660 v4 (2.0GHz/14-core/105W) FIO Processor Kit 847798-L21

Standard - E5-2600v4 series Processors

HPE CL G3 Intel Xeon E5-2620 v4 (2.1GHz/8-core/85W) FIO Processor Kit 848499-L21

Basic - E5-2600v4 series Processors

HPE CL G3 Intel Xeon E5-2609 v4 (1.7GHz/8-core/85W) FIO Processor Kit 857634-L21

HPE CL G3 Intel Xeon E5-2603 v4 (1.7GHz/6-core/85W) FIO Processor Kit 847824-L21

NOTE: If two processors are desired, select one xxxxxx-L21 and one xxxxxx-B21.

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

Configuration Information - Factory Integrated Models for E5-2600

	NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.	
HPE Processors 2	**NOTE:** Select up to two (2) Processors , Processor one and two have the same heatsinks	
	Segmented Optimized - E5-2600v4 series Processors	
	HPE CL G3 Intel Xeon E5-2695 v4 (2.1GHz/18-core/120W) Processor Kit	857635-B21
	Advanced - E5-2600v4 series Processors	
	HPE CL G3 Intel Xeon E5-2680 v4 (2.4GHz/14-core/35MB/120W) Processor Kit	847792-B21
	HPE CL G3 Intel Xeon E5-2660 v4 (2.0GHz/14-core/105W) Processor Kit	847798-B21
	Standard - E5-2600v4 series Processors	
	HPE CL G3 Intel Xeon E5-2620 v4 (2.1GHz/8-core/85W) Processor Kit	848499-B21
	Basic - E5-2600v4 series Processors	
	HPE CL G3 Intel Xeon E5-2609 v4 (1.7GHz/8-core/85W) Processor Kit	857634-B21
	HPE CL G3 Intel Xeon E5-2603 v4 (1.7GHz/6-core/85W) Processor Kit	847824-B21
HPE Heatsink	**NOTE:** Each processor needs a dedicated heatsink	
	HPE CL7100 G3 Processor 1 Heat Sink Kit	864856-B21
HPE Memory DDR4-2400	**NOTE:** The following memory is supported by the E5-2600v4 series Processors.	
	HPE CL 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-15-15-15 Registered Memory Kit	851005-B21
	HPE CL 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-15-15-15 Registered Memory Kit	851007-B21
	HPE CL 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	859992-B21
	NOTE: Select one or more memory. A minimum of two memory kits are required if server is configured with two processors.	
	NOTE: If only one processor is installed, only half of the total DIMM slots are available. When populating with two processors, all DIMM slots are available.	
	NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MHz, 2133MHz or 1866MHz.	

Step 3: Choose Additional Options

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

HPE Storage Controllers	HPE CL LSI MegaRAID SAS 9380-4i4e Adapter	860000-B21
	HPE CL LSI MegaRAID SAS 9341-8i Adapter Kit	859910-B21
	HPE CL LSI Mega RAID SAS 9361-8i Adapter	859912-B21

Configuration Information - Factory Integrated Models for E5-2600

	HPE CL LSI MegaRAID SAS 9300-8i Host Bus Adapter Kit	859916-B21
	HPE CL PMC-ASR-8885 RAID Adapter Kit	860004-B21
	HPE CL LSI MegaRAID SAS 9300-8e RAID Adapter	851320-B21
	HPE CL PMC-AFM-700 Super Capacitor Flash Module Device for 8885e RAID Adapter	860046-B21
HPE Drives	**Hot Plug SFF SSD**	
	HPE CL 256GB 6G SATA Value Endurance SFF (2.5in) Enterprise Value Sandisk Solid State Drive Kit	851019-B21
	HPE CL 960GB 6G SATA Value Endurance SFF Enterprise Value Samsung PM863 Solid State Drive Kit	858337-B21
	HPE CL 1.6TB 6G SATA Read Intensive-2 SFF (2.5in) Intel S3520 3yr Wty Solid State Drive	872624-B21
HPE M.2 Drives	HPE CL 128GB M.2 2280 SATA MLC Hynix Solid State Drive Kit	858311-B21
HPE Networking	HPE CL Eth X520-DA2 10Gb PCIe Adapter Kit	859908-B22
	HPE CL Ethernet 25Gb 2-port SFP28 Mellanox ConnectX-4 Lx OCP Mezzanine Adapter	847936-B21
	HPE CL 40GbE QSFP28 Dual Port Mellanox OCP Mezzanine Adapter	847934-B21
	HPE CL Ethernet 10Gb 2-port SFP+ Intel X520 OCP Mezzanine Adapter	851279-B21

Memory

Memory Subsystem Architecture

Each Intel® Xeon® E5-2600v4 family processor socket contains four memory channels per installed processor with two DIMM per channel for a total of eight (8) DIMMs or a grand total of sixteen (16) DIMMs for the server.

General Memory Population Rules and Guidelines

Install DIMMs only if the corresponding processor is installed.

If only one processor is installed in a two processor system, only half of the DIMM slots are available.

To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.

When two processors are installed, balance the DIMMs across the two processors.

DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed. The maximum memory speed is a function of the memory type, memory configuration, and processor model.

The maximum memory capacity is a function of the memory type and number of installed processors.

DIMM slot and configuration diagram

	CPU 0		CPU 1	
Channel #	**Slot #**	**Population Order**	**Slot #**	**Population Order**
Channel 3	A4	5	B4	6
	A7	13	B7	14
Channel 4	A6	7	B6	8
	A8	15	B8	16
Channel 2	A2	3	B2	4
	A3	11	B3	12
Channel 1	A0	1	B0	2
	A1	9	B1	10

Memory Bandwidth and Capacity

[DIMM Type]	**Registered Dimms (RDIMMs)**			
DIMM Rank	**Single Rank**		**Dual Rank**	
DIMM Capacity	4GB	8GB	16GB	32GB
Voltage	Standard Voltage 1.2V			
16 slot servers	16			
MAXIMUM CAPACITY (GB)	64	128	256	512

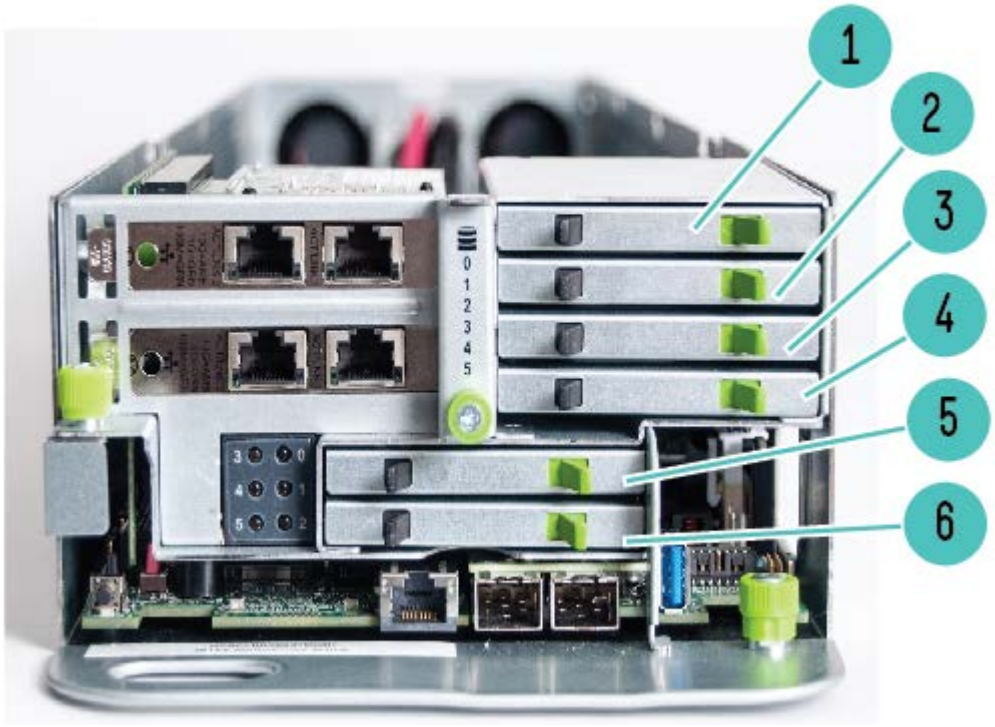
Memory Speed by Processor

Processor Models	Supported Memory Speeds
E5-2603v4, E5-2609v4	1866MHz
E5-2620v4	2133MHz
E5-2660v4, E5-2680v4, E5-2695v4.	2400MHz

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

- 2GB = 2,048MB
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB
- 64GB = 65,536MB

Technical Specifications



Drive Numbering Front view:

6X SFF Hot Pluggable Drive Bays. Drive 0 is upper right hand side then next drive down is Drive 1, then Drive 2 etc

Technical Specifications

System Unit	**Dimensions** (H x W x D)	3.46” x 6.85” x 36.08” (8.8cm x 17.4cm x 91.7cm)	
	Weight (approximate)	Maximum: (all hard drives, power supplies, and processors installed	19.44 lbs. (8.82 kg)
		Minimum: (one hard drive, power supply, and processor installed)	16.1 lbs. (7.32 kg)
	System Inlet Temperature	Standard Operating Support	10° to 35°C (50° to 95°F)
		Non-operating	-40° to 70°C.
	Relative Humidity	Operating	50% to 80% relative humidity (Rh)
		Non-operating (non-condensing)	50% to 90% relative humidity (Rh))
	Altitude	Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Summary of Changes

Date	Version History	Action	Description of Change
23-Oct-2017	Version 6	Changed	Care Pack naming and Service and Support- Parts and Materials updated.
27-Mar-2017	From version 4 to 5	Updated	Updated Configuration Information section
13-Feb-2017	From version 3 to 4	Updated	Add HPE CL 1.6TB 6G SATA Read Intensive solid state drive
9-Dec-2016	From version 2 to 3	Changed	Remove some SKU´s from the QuickSpecs
7-Oct-2016	From version 1 to 2	Updated	Update the entire QuickSpecs sections
6-Jun-2016	Version 1	Created	Create QuickSpecs HPE Cloudline CL7100 Server

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

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