## Overview

HPE Cloudline CL3100 Gen10 Server

The HPE Cloudline CL3100 Gen10 is an ideal 1U 2P dense storage server for Cloud Service Providers that features the latest Intel Xeon Scalable processor family. The CL3100 Gen10 can be configured in either 12 Large Form Factor (LFF) SATA HDDs or 20 Small Form Factor (SFF) NVMe SSDs configurations. The 12 LFF HDD configuration is perfect for storage-rich, Hadoop, and Casandra workloads while the 20 NVMe SSD configuration offers great support for fast big data and real-time analytic workloads.
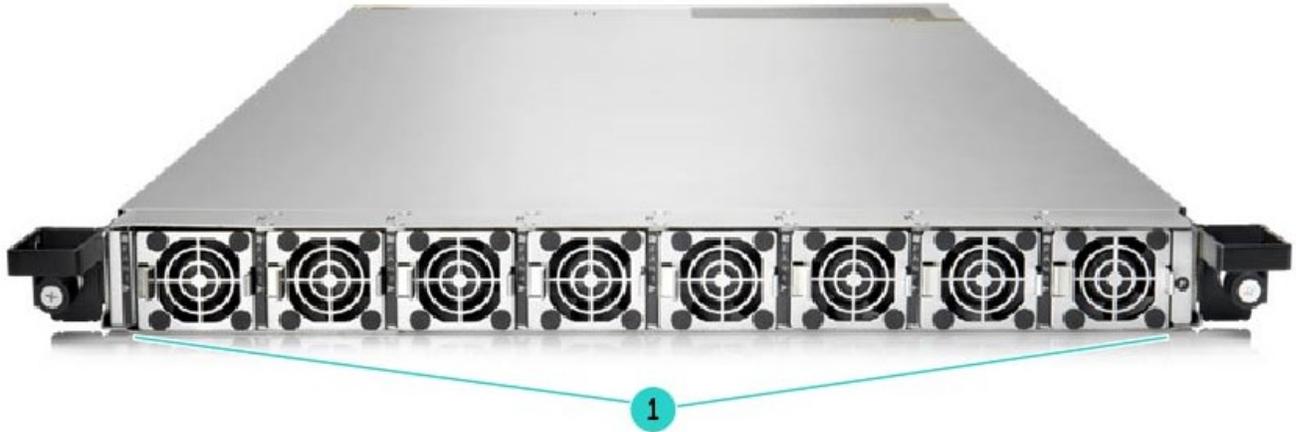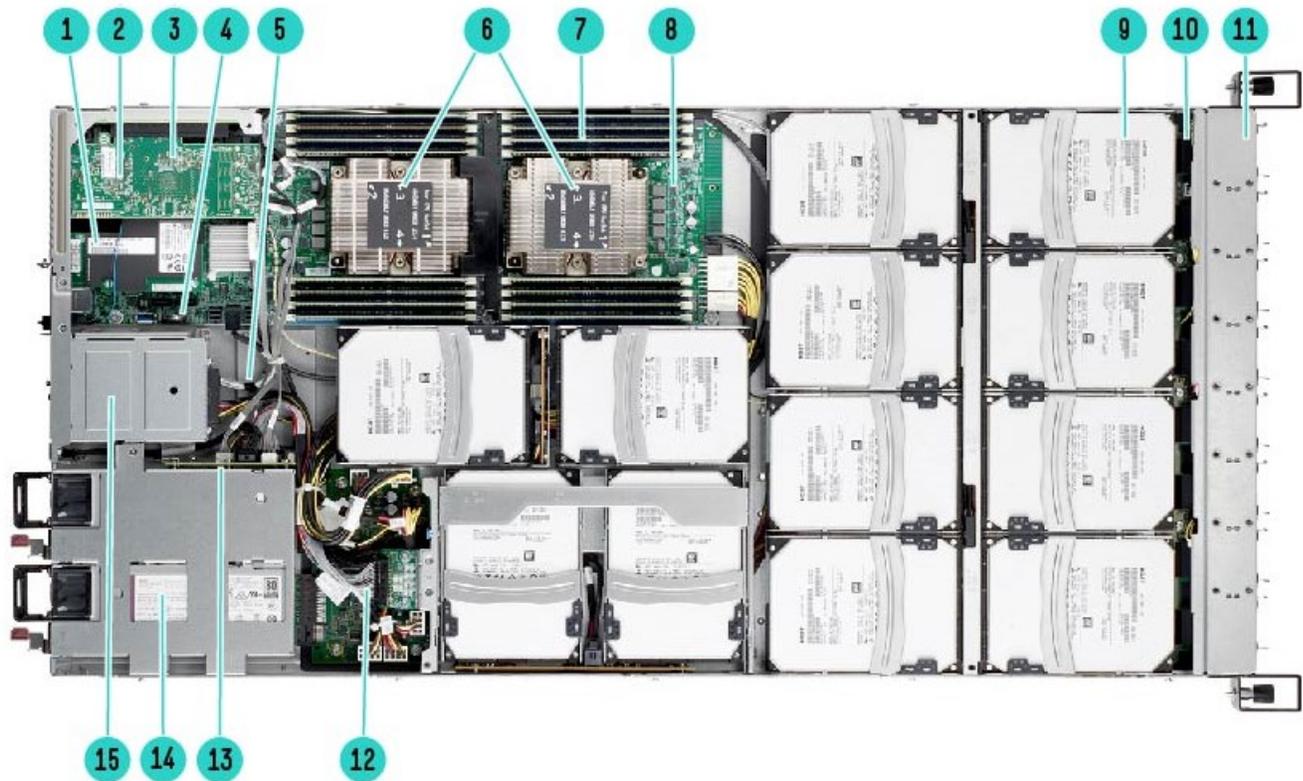

CL3100 Gen10 Front View

1. (8) Hot-plug fans
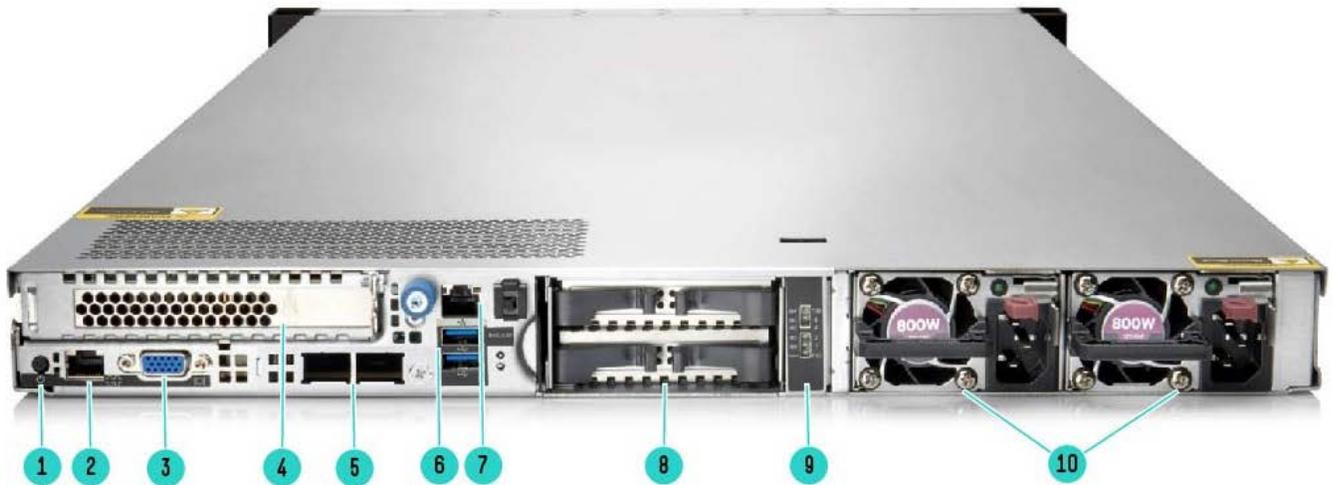
CL3100 Gen10 Rear View

1.	Power Button	6.	(2) USB 3.0 Ports
2.	RJ45 Port for Serial Console	7.	RJ45 for iBMC Management
3.	VGA Display Port	8.	(2) SFF SATA SSDs (Optional for Boot)
4.	PCI-e Expansion Slot	9	HDD LED Panel
5.	OCP Mezzanine NIC Ports	10.	(2) 800/1600W Redundant PSUs

Hewlett Packard Enterprise

Overview

12 LFF HDD SKU- Internal View

1.	(1) OCP Mezzanine NIC	9.	(12) SATA LFF HDDs
2.	Onboard M.2 NVMe SSD Port (Under PCI-e Card)	10.	(1) Fan Control Board
3.	(1) PCI-e Expansion Card	11.	(8) Hot Swappable System Fans
4.	Internal USB 3.0 Port	12.	1) Power Interposer Board
5.	(1) Supercap Space	13.	(1) CPLD Board
6.	(2) Intel Xeon Processor Scalable Family CPUs w/ Heatsink	14.	(2) 800W Redundant PSUs
7.	(16) DDR4 DIMMs	15.	(2) SFF SATA SSDs
8.	(1) System Board		

Overview
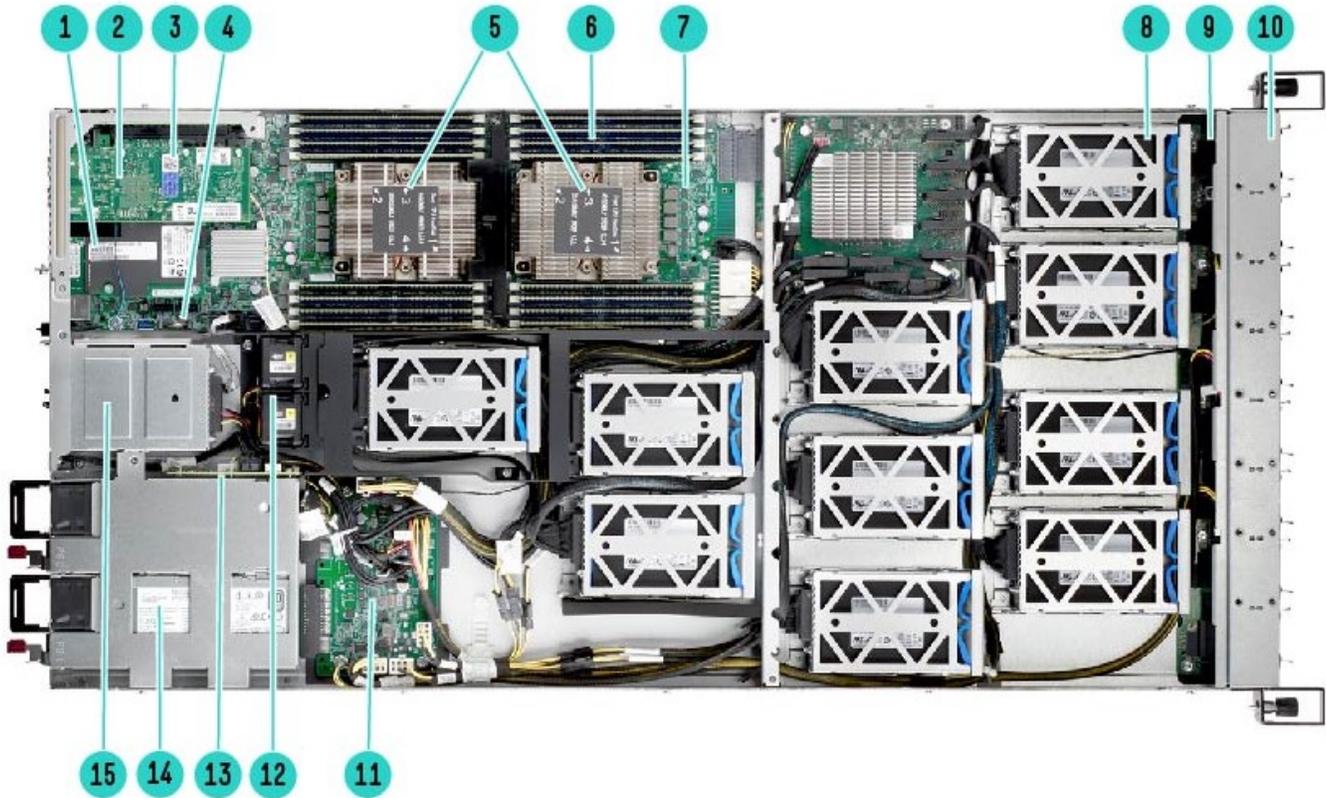
20 NVMe SSD SKU- Internal View

1.	(1) OCP Mezzanine NIC	9.	(1) Fan Control Board
2.	Onboard M.2 NVMe SSD Port (Under PCI-e card)	10.	(8) Hot Swappable System Fans
3.	(1) PCI-e Expansion Card	11.	(1) Power Interposer Board
4.	Internal USB 3.0 Port	12.	(2) Internal Rear Fans
5.	(2) Intel Xeon Processor Scalable Family CPUs w/ Heatsinks	13.	(1) Fan Control Board
6.	(16) DDR4 DIMMs	14	(2) 1600W Redundant PSUs
7.	(1) System Board	15.	(2) SFF SATA SSDs
8.	(20) SFF NVME SSDs		

Platform Information
Form Factor
1U rack storage 1.69"(H) x 17.18" (W) x 36" (D) (43.00 mm x 436.50mm x 914.40mm)

Chassis Type
12 LFF SATA SSD with optional rear 2 SFF SATA SSD
20 SFF NVMe with optional rear 2 SFF SATA SSD

System Fans
(8) Front Fans Standard (+2 internal rear fans for 20 NVMe SSDs) Redundant

Standard Features

Standard Features
Processor
Processors - Up to 2 of the following
NOTE: Up to 2 processors supported. Mixing different processor models is not supported.
NOTE: 2 processors are required for NVMe CTO Server.
Intel® Xeon® Processor Scalable Family

Gold Processors

Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Gold 6152 Processor	2.1 GHz	22	30.25MB	140W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6140 Processor	2.3 GHz	18	24.75MB	140W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6138 Processor	2.0 GHz	20	27.50MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 6130 Processor	2.1 GHz	16	22.00MB	125W	3 @ 10.4 GT/s	2666 MT/s	768GB
Gold 5120 Processor	2.2 GHz	14	19.25MB	105W	2 @ 10.4 GT/s	2400 MT/s	768GB
Gold 5118 Processor	2.3 GHz	12	16.50MB	105W	2 @ 10.4 GT/s	2400 MT/s	768GB

Silver Processors

Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Silver 4116 Processor	2.1 GHz	12	16.50MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4114 Processor	2.2 GHz	10	13.75MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4110 Processor	2.1 GHz	8	11.00MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB
Silver 4108 Processor	1.8 GHz	8	11.00MB	85W	2 @ 9.6 GT/s	2400 MT/s	768GB

NOTE: Silver - 4100 Series - 2 Socket supports 2UPI @ 9.6 GT/s, 6-Channel DDR4 @ 2400 MT/s providing up to 768 GB memory capacity. Intel Turbo Boost Technology, Intel Hyper-Threading Technology, Intel AVX-512(1x 512-bit FMA), 48 lanes PCIe 3.0, standard RAS supported.

Bronze Processors

Intel Xeon Models	CPU Frequency	Cores	L3 Cache	Power	UPI	DDR4	Memory per socket
Bronze 3106 Processor	1.7 GHz	8	11.00MB	85W	2 @ 9.6 GT/s	2133 MT/s	768GB
Bronze 3104 Processor	1.7 GHz	6	8.25MB	85W	2 @ 9.6 GT/s	2133 MT/s	768GB

NOTE: Bronze - 3100 Series - 2 Socket supports 2UPI @ 9.6 GT/s, supports 6-Channel DDR4 @ 2133 MT/s providing up to 768GB memory capacity. Intel AVX-512(1x 512-bit FMA), 48 lanes PCIe 3.0, standard RAS supported.

Standard Features

Chipset
Intel® C621 Chipset
NOTE: For more information regarding Intel chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/.

On System Management Chipset
iBMC ASPEED AST2500 with KVM Support IPMI 2.0
AMI MegaRAC, Virtual Media

Memory
Industry Standard DDR4 Registered (RDIMM) and Load Reduced (LRDIMM)

DIMM Slots Available	16	(8 DIMM slots per processor, 6 channels per processor, 2 DIMMs per channel)
Maximum Capacity (LRDIMM)	1024 GB	16 x 64 GB LRDIMM @ 2666 MT/s
Maximum Capacity (RDIMM)	512 GB	16 x 32 GB RDIMM @ 2666 MT/s

Memory Protection
Memory Static Virtual Lockstep
Memory Mirror: Set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half.
Memory Rank Sparing
Memory Correctable Error Threshold: Use for sparing, tagging, and leaky bucket
Memory SDDC Plus One

Expansion Slots

Expansion Slots #	Technology	Bus Width	Connector Width	Form Factor	Notes
Slot1	PCIe 3.0	X16	OCP	OCP 2.0 Mezz Type 1	Processor 0
Slot2	PCIe 3.0	X16	X16	Low Profile	Processor 0

NOTE: Bus Width data indicates the number of physical electrical lanes running to the connector.
NOTE: All risers are included. Expansion slot will only be available if the processor is installed.

Internal Storage Devices

Optical Drive	None
Hard Drives	None ship standard, all drive carriers included
Optional Drive	NVMe Chassis
	(20) Internal SFF NVMe drives
	Optional 2 rear SFF

Maximum Internal Storage

	Capacity	Configurations
SFF NVMe	82TB	20X 4TB +2x960GB rear (20x Internal NVMe drives plus 2x rear SFF SATA drive)
LFF SATA drives	170 TB	12X 14TB +2x960GB rear (12x Internal SATA drives plus 2x rear SFF SATA drive)

Power Supply
(2) 800 Flex Hot Plug Redundant Power Supplies for LFF version
(2) 1600W Flex Hot Plug Redundant Power Supplies for NVMe version

System Fans
(8) hot-swappable non redundant fans (+2 internal rear fans for NVMe SSD SKU)

Standard Features

Interfaces

Video	1
Serial Port	1
Network ports	N/A
OCP NIC ports	1 x OCP 2.0 Mezzanine Type 1 Card
IPMI management port	dedicated 1GbE LAN port
USB 3.0 Ports	2 rear

Operating Systems

- Red Hat Enterprise Linux 7.3 (64 bit) (Includes KVM)
- Red Hat Enterprise Linux 7.5 (64 bit) (includes KVM)
- Ubuntu 16.04
- Ubuntu 18.04
- VMware vSphere 6.7
- CentOS 7.3

Industry Standard Compliance

- ACPI 6.1
- PCIe 3.0
- PXE Support
- WOL Support
- USB 3.0 Support

Graphics

Integrated PCIe VGA/2D Controller via ASPEED 2500 BMC, 1920 x 1200 @ 60Hz (32 bpp)

Form Factor

1U Rack form factor 1.69" (4.3cm) Height x 17.18" (43.65 cm) Width x 36" (91.44 cm) Length

Security

- Power-on password
- Administrator's password
- TPM 2.0 (Optional)
- UEFI Secure Boot

Warranty

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. 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-Years Parts, 0-Years Labor, 0-Years Onsite support with next business day response. Additional information regarding worldwide limited warranty and technical support is available at
http://www.hpe.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.

Service and Support

HPE Services

HPE Pointnext 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 Cloudline Support Services (coming soon) provide remote diagnosis and support, scheduled onsite hardware repair/troubleshooting, and coverage for replacement components, including defective media retention (DMR). With HPE Cloudline Support Services, you can purchase the services that meet your specific needs.
- HPE CL3100 Parts + Remote Technical Support + Defective Media Retention
- HPE CL3100 Parts + Remote Technical Support + Onsite Labor
- HPE CL3100 Parts + Remote Technical Support + Onsite Labor + Defective Media Retention

Additional information regarding HPE packaged support services for Cloudline servers is available at:
https://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA5-9207ENN.pdf.

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 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.

Datacenter Care for Hyperscale

DC 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. Customers can take advantage of this environment support tailored to their operating model. More information at **https://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA6-3460ENW.pdf**.

Spares Management Service

Provides customers with spare parts inventory for onsite stocking, and access to the HPE Spares Management Tool – an automated inventory management tool that helps enable real-time inventory management. More information at
https://h20195.www2.hpe.com/v2/GetPDF.aspx/4AA1-3116ENW.pdf.

Advisory & Transformational Services

Design, strategy, road map, and other services to help enable the digital transformation journey, tuned to IT and business needs. Advisory Services helps customers on their journey to Hybrid IT, Big Data, and the Intelligent Edge. More information at
https://www.hpe.com/us/en/services/consulting.html.

Lifecycle Event Services

Operational offerings to improve performance and securely handle retirement of customers' IT environments. More information at **https://h20195.www2.hpe.com/v2/GetPDF.aspx/5981-8521ENE.pdf**.
- Operate & Improve performance, minimize risk of downtime, and reduce security risks.

Retire & Sanitize to safely and securely dispose of retired IT, and ensuring customer data cannot be compromised.

Service and Support

Professional Services

Integrate the new solution with project management, installation and startup, relocation services, and more. We help mitigate risk to the business so there is no interruption when new technology is being integrated in the existing IT environment. More information at **https://www.hpe.com/us/en/services/professional.html**.

Configuration Information

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 CL3100 Gen10 12 LFF HDD CTO Svr	HPE CL3100 Gen10 20 NVMe CTO Svr
SKU Number	P03229-B21	P03232-B21
Processor	2 (optional 1 for LFF) up to 140W	
DIMM Slots	16 DIMM slots for RDIMM or LRDIMM DDR4 Memory	
Storage Controller	N/A	N/A
PCIe	Processor 0 supports	
	1 x16 PCIe3 lowprofile Optional 1 x OCP Mezz 2.0 Type 1	
	Processor 1 supports	
	N/A	x16 High Density Connector to support PCI-e Switch Board for NVMe drives
Drive Cage	12 Internal LFF HDDs + 2 SFF SATA Rear	20 Internal SFF NVMe SSDs + 2 SFF SATA Rear
Network Controller	2x 1GbE ports, optional 2x10Gb, 2x25GB, 50Gb, 100Gb, 10G-base-T	
Fans	8 hot swappable fans	
Management	ASPEED 2500, IPMI v2.0 compliant, on board "KVM over IP" support, Redfish API Conformant	
Power Supply	2x 800W 80 Plus Platinum Redundant PSU	2x 1600W 80 Plus Platinum Redundant PSU
USB	2 USB 3.0 Ports rear	

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

HPE Processors

NOTE: Select up to two Processors for LFF Server
NOTE: MUST select two Processors for NVMe Server
NOTE: Mixing of 2 different processor models are NOT allowed.
NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed

Gold Processors – In stock

HPE CL Intel Xeon-Gold 6152 (2.1GHz/22-core/140W) FIO Processor Kit	P01905-L21
HPE CL Intel Xeon-Gold 6140 (2.3GHz/18-core/140W) FIO Processor Kit	P01904-L21
HPE CL Intel Xeon-Gold 6138 (2.0GHz/20-core/125W) FIO Processor Kit	P01903-L21
HPE CL Intel Xeon-Gold 6130 (2.1GHz/16-core/125W) FIO Processor Kit	P01902-L21
HPE CL Intel Xeon-Gold 5120 (2.2GHz/14-core/105W) FIO Processor Kit	P01901-L21
HPE CL Intel Xeon-Gold 5118 (2.3GHz/12-core/105W) FIO Processor Kit	P01900-L21

Silver Processors – In stock

HPE CL Intel Xeon-Silver 4116 (2.1GHz/12-core/85W) FIO Processor Kit	P01899-L21
HPE CL Intel Xeon-Silver 4114 (2.2GHz/10-core/85W) FIO Processor Kit	P01898-L21
HPE CL Intel Xeon-Silver 4110 (2.1GHz/8-core/85W) FIO Processor Kit	P01897-L21
HPE CL Intel Xeon-Silver 4108 (1.8GHz/8-core/85W) FIO Processor Kit	P01896-L21

Configuration Information

Bronze Processors

HPE CL Intel Xeon-Bronze 3106 (1.7GHz/8-core/85W) FIO Processor Kit   P01895-L21
HPE CL Intel Xeon-Bronze 3104 (1.7GHz/6-core/85W) FIO Processor Kit   P01894-L21

HPE Memory DDR4-2666

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 different speeds.

Registered DIMMs

HPE CL 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit   P07029-B21
HPE CL 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit   880841-B21

Load Reduced DIMMs

HPE CL 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Memory FIO Kit   880842-B21

HPE Power Supplies

NOTE: Required 2x 800W Power Supplies for LFF CTO Server and 2x 1600W Power Supplies for NVMe CTO Server.
HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit   865414-B21
HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit   830272-B21

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 Memory

HPE CL 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit   P07029-B21
HPE CL 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit   880841-B21
HPE CL 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Memory FIO Kit   880842-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 different speeds.

HPE Drives

NOTE: Up to 2SFF SATA SSDs supported in both LFF and NVMe CTO servers in rear cage.

SFF (2.5-inch) SATA SSD

HPE CL 240GB SATA 6G Read Intensive SFF (2.5in) Intel S4510 FIO SSD   P08796-B21
HPE CL 480GB SATA 6G Read Intensive SFF (2.5in) Intel S4510 FIO SSD   P08799-B21
HPE CL 960GB SATA 6G Mixed Use SFF (2.5in) Intel S4610 FIO SSD   P08811-B21

NOTE: NVMe SSDs only supported on NVMe CTO server.

Configuration Information

SFF (2.5-inch) NVMe SSD

HPE CL 2TB NVMe Read Intensive SFF (2.5in) x 15mm Intel P4500 FIO Solid State Drive Kit	880845-B21
HPE CL 2TB NVMe x4 Lanes Read Intensive SFF (2.5in) Intel P4510 FIO SSD	P04600-B21
HPE CL 3.2TB NVMe Mixed Use SFF (2.5in) x 15mm Intel P4600 3yr Wty Solid State Drive Kit	880859-B21
HPE CL 4TB NVMe x4 Lanes Read Intensive SFF (2.5in) Intel P4500 FIO SSD	880858-B21
HPE CL 4TB NVMe x4 Lanes Read Intensive SFF (2.5in) Intel P4510 FIO SSD	P06663-B21

NOTE: LFF SATA HDDs only supported on LFF HDD CTO server.

LFF (3.5") SATA HDD

HPE CL 4TB SATA 6G Enterprise 7.2K LFF (3.5in) Seagate ISE FIO HDD	881461-B21
HPE CL 6TB 6G SATA 7.2K rpm LFF (3.5in) Seagate Midline Hard Drive	847820-B21
HPE CL 6TB SATA 6G Enterprise 7.2K LFF (3.5in) Hitachi SE 512e FIO HDD	P08756-B21
HPE CL 8TB SATA 6G Enterprise 7.2K LFF (3.5in) Seagate 512e FIO HDD	848539-B21
HPE CL 10TB 6GB SATA 7.2K rpm LFF (3.5in) HGST Midline Hard Drive Kit	860036-B21
HPE CL 10TB SATA 6G Enterprise 7.2K LFF (3.5in) Seagate 512e FIO HDD	P08762-B21
HPE CL 12TB SATA 7.2K rpm LFF (3.5in) Seagate 512e Hard Drive	880851-B21
HPE CL 12TB 6G SATA 7.2K rpm LFF (3.5in) Hitachi 512e Hard Drive	880852-B21
HPE CL 14TB SATA 6G Enterprise 7.2K LFF (3.5in) Hitachi ISE 512e FIO HDD	P08759-B21

NOTE: M.2 NVMe max ambient operating temperature of 25°C.

M.2 NVMe SSD (80mm)

HPE CL 256GB NVMe x4 Lanes Read Intensive M.2 - UFF to SFF Intel P4101 FIO SSD	P08793-B21

**HPE Networking**

OCP Mezzanine Adapters

HPE CL Ethernet 10Gb 2-port X710-DA2 SFP+ OCP FIO Adapter	P06629-B21
HPE CL Ethernet 10GBASE-T 2-port Q41132 OCP FIO Adapter	P08547-B21
HPE CL Ethernet Intel X540 2-port 10GBASE-T OCP Mezzanine Adapter	847932-B21
HPE CL Ethernet 10Gb 2-port SFP+ Intel X520 OCP Mezzanine Adapter	851279-B21
HPE CL 10GbE SFP+ Dual Port Mellanox OCP Mezzanine Adapter	860040-B21
HPE CL Ethernet 25Gb 2-port Mellanox ConnectX-4 Lx EN SFP28 OCP NC-SI FIO Adapter	P10014-B21
HPE CL Ethernet 50Gb 1-port SFP28 Mellanox ConnectX-4 Lx OCP FIO Mezzanine Adapter	880843-B21
HPE CL Ethernet 100Gb 1-port QSFP28 Mellanox ConnectX-5 EN PCIe3 FIO Card	880150-B21

Memory

Memory Subsystem Architecture
Intel® Xeon® Processor Scalable Family socket contains six memory channels per installed processor with two DIMM per channel for a grand total of sixteen (16) DIMMs for the server.

Memory Population guidelines
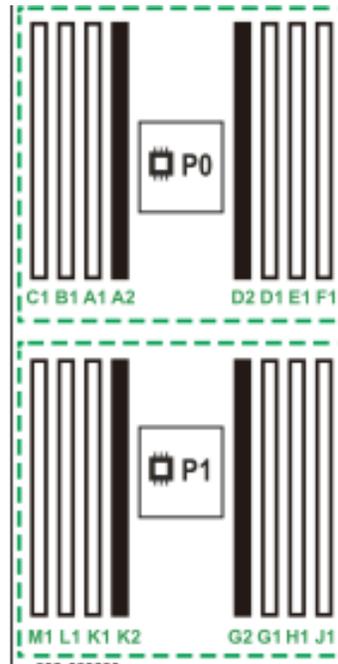
General Memory Population Rules and Guidelines
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors.
- When two processors are installed, balance the DIMMs across the two processors.
- White DIMM slots denote the first slot to be populated in a channel.
- Mixing of DIMM types (UDIMM, RDIMM, and LRDIMM) is not supported.
- 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 number of DIMM slots on the platform, the largest DIMM capacity qualified on the platform, the number and model of installed processors qualified on the platform.

Memory

DIMM slot and configuration order for each CPU

Rear

				P0				
1 DIMM			A1					
2 DIMMs		B1	A1					
3 DIMMs	C1	B1	A1					
4 DIMMs		B1	A1			D1	E1	
5 DIMMs *	C1	B1	A1			D1	E1	
6 DIMMs	C1	B1	A1			D1	E1	F1
7 DIMMs *	C1	B1	A1		A2	D1	E1	F1
8 DIMMs *	C1	B1	A1	D2	A2	D1	E1	F1

* Unbalanced

Front

				P1				
1 DIMM						G1		
2 DIMMs						G1	H1	
3 DIMMs						G1	H1	J1
4 DIMMs		L1	K1			G1	H1	
5 DIMMs *		L1	K1			G1	H1	J1
6 DIMMs	M1	L1	K1			G1	H1	J1
7 DIMMs *	M1	L1	K1	G2		G1	H1	J1
8 DIMMs *	M1	L1	K1	G2	K2	G1	H1	J1

* Unbalanced

Memory Bandwidth and Capacity

Type	Rank Per DIMM and Data Width	Memory Capacity (GB)	Speed (MT/s); Voltage (V); Slots per Channel (SPC) & DIMMs per Channel (DPC)	
			1DPC	2DPC
			1.2V	1.2V
	2Rx8	16GB		
RDIMM	2Rx4	32GB	2666 MT/s	2666 MT/s
LRDIMM	4Rx4	64GB		

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

- 16GB = 16,384MB
- 32GB = 32,768MB
- 64GB = 65,536MB

Memory

DIMM Type

| HPE SKU P/N	DIMMs		
	880841-B21	**P07029-B21**	**880842-B21**
SKU Description	HPE CL 32GB (1x32GB) Dual Rank x4 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit	HPE CL 16GB (1x16GB) Dual Rank x8 DDR4-2666 CAS-19-19-19 Registered Memory FIO Kit	HPE CL 64GB (1x64GB) Quad Rank x4 DDR4-2666 CAS-19-19-19 Load Reduced Memory FIO Kit
DIMM Capacity	32GB	16GB	64GB
DIMM Rank	2R	2R	4R
Voltage	1.2	1.2	1.2
DRAM Depth[bit]	4G	1G	2G
DRAM width[bit]	x4	x8	x4
DRAM Density	8G	8G	8G
CAS Latency	19-19-19	19-19-19	19-19-19
DIMM Native Speed	2666 MT/s	2666 MT/s	2666 MT/s
Processors Officially Supported Memory Speed:			
Intel Xeon® Gold 61xx Processors Officially Supported Memory Speed (MT/s)			
1 DIMM Per Channel	2666 MT/s	2666 MT/s	2666 MT/s
2 DIMMs Per Channel	2666 MT/s	2666 MT/s	2666 MT/s
Intel Xeon® Gold/Silver 51xx/41xx Processors Officially Supported Memory Speed (MT/s)			
1 DIMM Per Channel	2400 MT/s	2400 MT/s	2400 MT/s
2 DIMMs Per Channel	2400 MT/s	2400 MT/s	2400 MT/s
HPE Server Memory Speed (MT/s): Intel Xeon® Gold 61xx Processors			
1 DIMM Per Channel	2666 MT/s	2666 MT/s	2666 MT/s
2 DIMMs Per Channel	2666 MT/s	2666 MT/s	2666 MT/s
HPE Server Memory Speed (MT/s): Intel Xeon® Gold/Silver 51xx/41xx Processors			
1 DIMM Per Channel	2400 MT/s	2400 MT/s	2400 MT/s
2 DIMMs Per Channel	2400 MT/s	2400 MT/s	2400 MT/s
NOTE: The maximum memory speed is a function of the memory type, memory configuration, and processor model. For details on the HPE Server Memory speed, visit: https://www.hpe.com/docs/memory-speed-table			

Storage

Device Mapping

12 LFF HDDs without HDD backplane and non-HBA card

HW	BIOS Physical	MB Connector	Cable Label	HDD Conn./Cage#	Port Name Under OS	OS Numbering (Full Pop.)
sSATA Port	P0	J11	sSATA0	Rear SSD1 (top)	ata1	sda
	P1	J14	sSATA1	Rear SSD2 (bottom)	ata2	sdb
	P2	J22	sSATA2-5	HDD9	ata3	sdc
	P3			HDD10	ata4	sdd
	P4			HDD11	ata5	sde
	P5			HDD12	ata6	sdf
SATA Port	P0	J3	SATA0-3	HDD1	ata7	sdg
	P1			HDD2	ata8	sdh
	P2			HDD3	ata9	sdi
	P3			HDD4	ata10	sdj
	P4	J12	SATA4-7	HDD5	ata11	sdk
	P5			HDD6	ata12	sdl
	P6			HDD7	ata13	sdm
	P7			HDD8	ata14	sdn

Storage
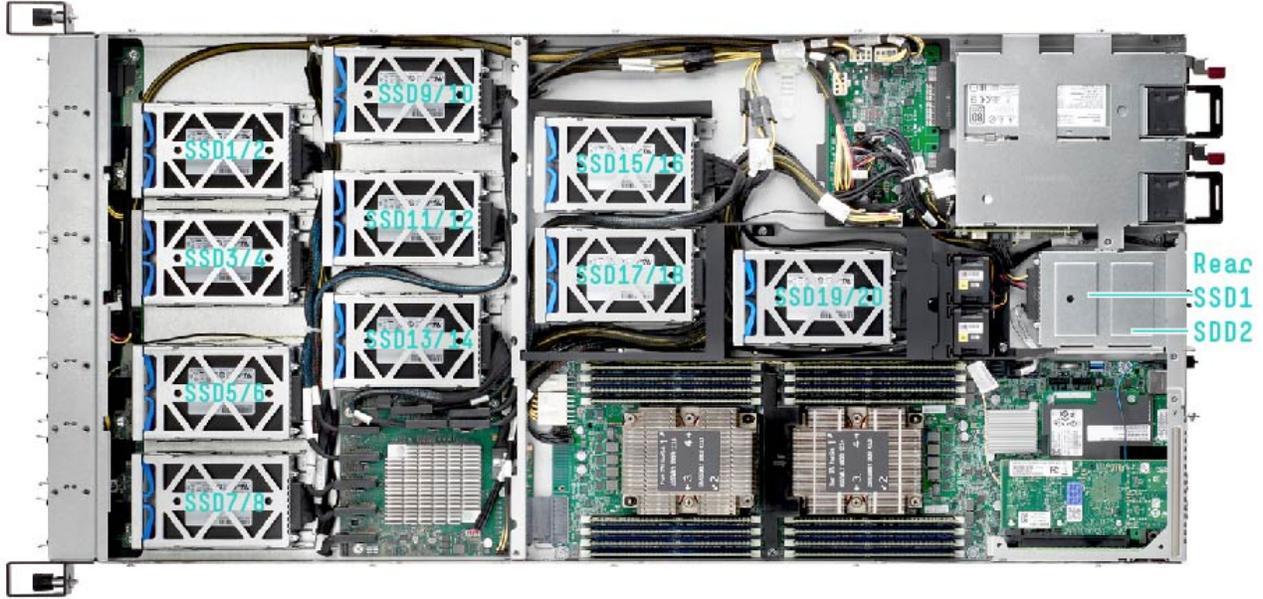
BIOS	PCIe Switch Board	Cable Label #	SSD Cable End#	HDD Conn. / Cage#	Slot Number under OS	OS Numbering (Full Pop.)
Slot1	PORT1	PORT1	1	SSD1	slot1	NVMe0N1
Slot2			2	SSD2	slot2	NVMe1N1
Slot3	PORT2	PORT2	3	SSD3	slot3	NVMe2N1
Slot4			4	SSD4	Slot4	NVMe3N1
Slot5	PORT3	PORT3	5	SSD5	Slot5	NVMe4N1
Slot6			6	SSD6	Slot6	NVMe5N1
Slot7	PORT4	PORT4	7	SSD7	Slot7	NVMe6N1
Slot8			8	SSD8	Slot8	NVMe7N1
Slot9	PORT5	PORT5	9	SSD9	Slot9	NVMe8N1
Slot10			10	SSD10	Slot10	NVMe90N1
Slot11	PORT6	PORT6	11	SSD11	Slot11	NVMe10N1
Slot12			12	SSD12	Slot12	NVMe11N1
Slot13	PORT7	PORT7	13	SSD13	Slot13	NVMe12N1
Slot14			14	SSD14	Slot14	NVMe13N1
Slot15	PORT8	PORT8	15	SSD15	Slot15	NVMe14N1
Slot16			16	SSD16	Slot16	NVMe15N1
Slot17	PORT9	PORT9	17	SSD17	Slot17	NVMe16N1
Slot18			18	SSD18	Slot18	NVMe17N1
Slot19	PORT10	PORT10	19	SSD19	Slot19	NVMe18N1
Slot20			20	SSD20	Slot20	NVME19N1

Technical Specifications

All NVMe drives are supported by the PCIe switch board with the above mapping.

BIOS	MB Connector	Cable Label #	SSD Cable End #	HDD Conn. / Cage#	Slot Number under OS	OS Numbering (Full Pop.)
SATA Port0	J3	MB_J3	SSD1	Rear SSD1 (top)	ata7	sda
SATA Port1		MB_J3	SSD2	Rear SSD2 (bottom)	ata8	sdb

12LFF SATA CTO Server Thermal Limitations

Ambient	LFF system			
	12 LFF			
	CPU -Max	LFF HDD-Max (W/ BP)	Rear SFF Drive-Max	OCP-Max
35C	85W*	6TB/8TB (8W)	480GB(5W)	2x10Gb/2x25Gb
30C	105W	6TB/8TB/10TB/12TB/14TB (10W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb
25C	125w	6TB/8TB/10TB/12TB/14TB (10W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb
20C	140W	6TB/8TB/10TB/12TB/14TB (10W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb

20SFF NVMe CTO Server Thermal Limitations

Ambient	NVMe system			
	20 NVMe			
	CPU -Max	NVMe-Max	Rear Drive-Max	OCP-Max
35C	85W*	P4510 2T/4T NVMe(14W)	480GB(5W)	2x10Gb/2x25Gb
30C	105W	P4510 2T/4T, P4500 2T/4T(18W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb
25C	125W	2T/3.2T/4T(21W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb
20C	140W	P4500 2T/4T, P4510 2T/4T, P4600 3.2T NVMe(21W)	480GB/960G/1.6T(6W)	2x10Gb/2x25Gb/1x50Gb/1x100Gb

NVMe M.2 Information			
NVMe M.2	Processor Supported	CL3100 G10 configuration	
		12LFF	20NVMe
256G NVMe M.2	85W or below	25C	25C

Technical Specifications

System Unit		
Dimensions (H x W x D)	1.69" (4.3cm) Height x 17.18" (43.65 cm) Width x 36" (91.44 cm) Length	
Weight (approximate)	**Maximum:** (all hard drives, power supplies, and processors installed)	25.58 kg 12LFF / 21.28kg 20 NVMe
	Minimum: (one hard drive, power supply, and processor installed)	16.52 kg
Input Requirements	**Rated Line Voltage**	100 – 240 VAC
	Rated Input Current	For 800W: 9.4-4.5A For 1600W: 8.7A Max
	Rated Input Frequency	50 - 60Hz
	Rated Output Power	800W @ +12VDC, 67A Max 1600W @ +12VDC, 133.3A Max
	Rated Input Power	100 – 127V @ 1,185W 200 – 240V @ 1,345W
BTU Rating	**Maximum**	For 800W Power Supply: 3207 BTU/hr (at 100 VAC), 3071 BTU/hr (at 200 VAC) , 3112 BTU/hr (at 240 VAC) 200 – 240V @ 4586.45 BTU/hour
System Inlet Temperature	**Standard Operating Support**	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).
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
Relative Humidity (non-condensing)	**Operating**	8% to 90% - Relative humidity (Rh), 28°C 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**	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	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
04-Feb-2019	Version 2	Changed	Standard Features section was updated
03-Dec-2018	Version1	Created	New QuickSpecs

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