

Overview

HPE Cray XD665

HPE is bringing the power of supercomputing to datacenters of any size with the HPE Cray XD665 System .

HPE Cray XD665 System is a top-performing GPU-accelerated server, delivering mixed-HPC/AI workload solutions to rack-scale, in a rack and roll fashion.

HPE Cray XD665 System is a 4U chassis system that contains a single 2x CPU node with 4x Nvidia H100 Tensor Core SXM5 GPUs. It offers a complete, scalable solution for AI & HPC customers everywhere, with flexibility of fabric, memory, storage and operating system. HPE Cray XD665 System provides maximum performance for advanced HPC Simulations, AI Training and Deep Learning.

Built with Exascale-ready networking technologies, integrated storage, extensive software portfolio and management tools, HPE Cray XD665 Systems can enable customers to innovate and prepare for tomorrow's challenges.

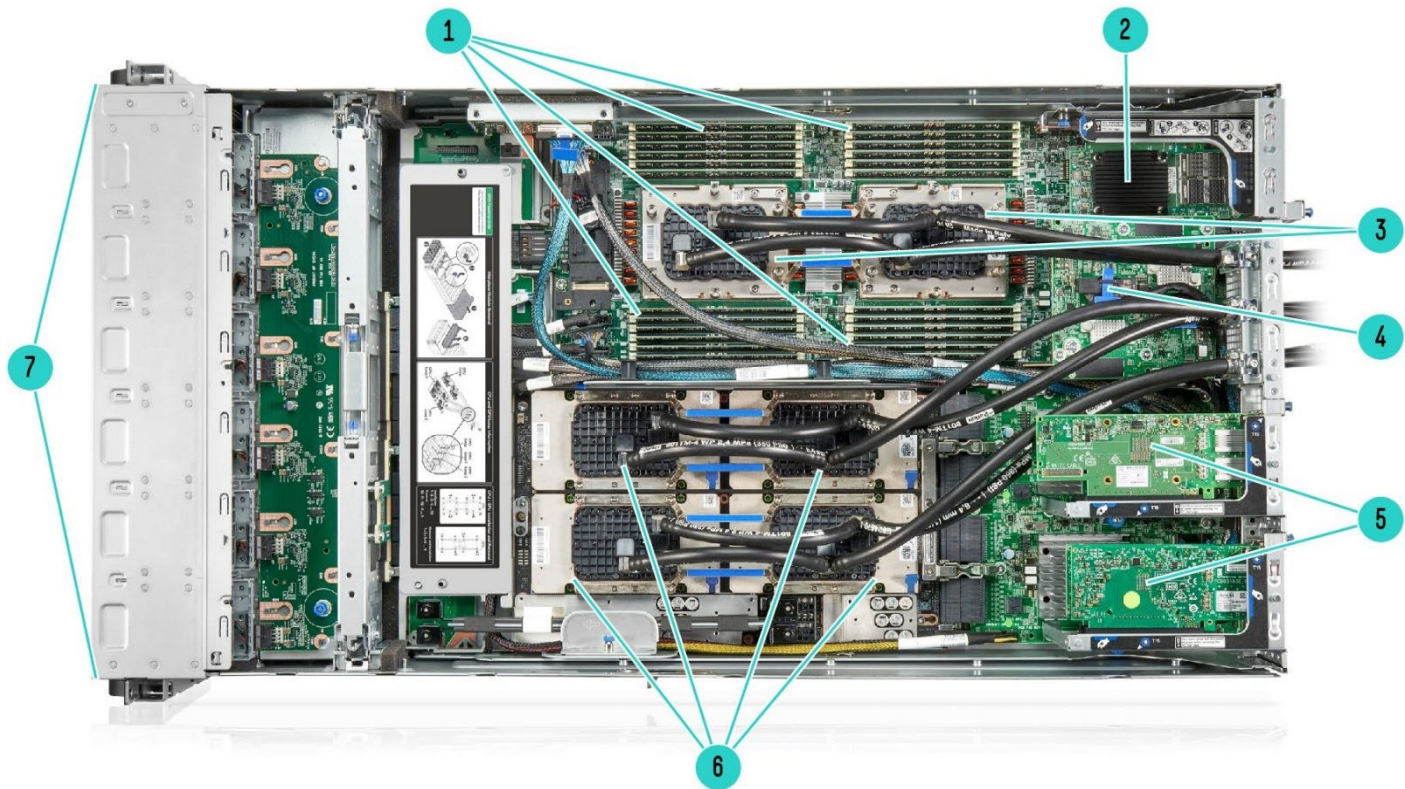
HPE Cray XD665 Server System Key Features

- 4U Single-Node Chassis (Air & Liquid-Cooled)
- GPUs: 4x NVIDIA® H100 Tensor Core SXM5 GPUs providing leadership performance for AI Training, Deep Learning and advanced HPC simulations. *PCIe GPUs are not supported on Cray XD665.*
- CPUs: Support for 4th Generation AMD® EPYC® Scalable Processors: "Genoa"
- DRAM: Support for up to 24x DDR5 4800MT/s DIMMs
- High-Speed Fabric: 5x PCIe Gen 5.0 Half-Height, Half-Length slots supporting Slingshot 11, Infiniband NDR and Ethernet, providing direct switchable connections between High-Speed Fabric, GPUs, NVMe drives and CPUs.
- Storage: Up to 8 SFF NVME U.3 and 2 M.2 RAID SSDs
- Power Supplies: 6x 3,000-Watt capacity per server system, providing full N+N redundancy.
- PCIe Expansion: 1x HHHL PCIe 5.0, 1x OCP 3.0 expansion slot with embedded 2-port 10G Base-T (RJ45), 1 1GbE NIC, 1x BMC Port, 1x VGA, 1x USB3.0, PWR Button/Reset/ID Button/Status LEDs

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Overview

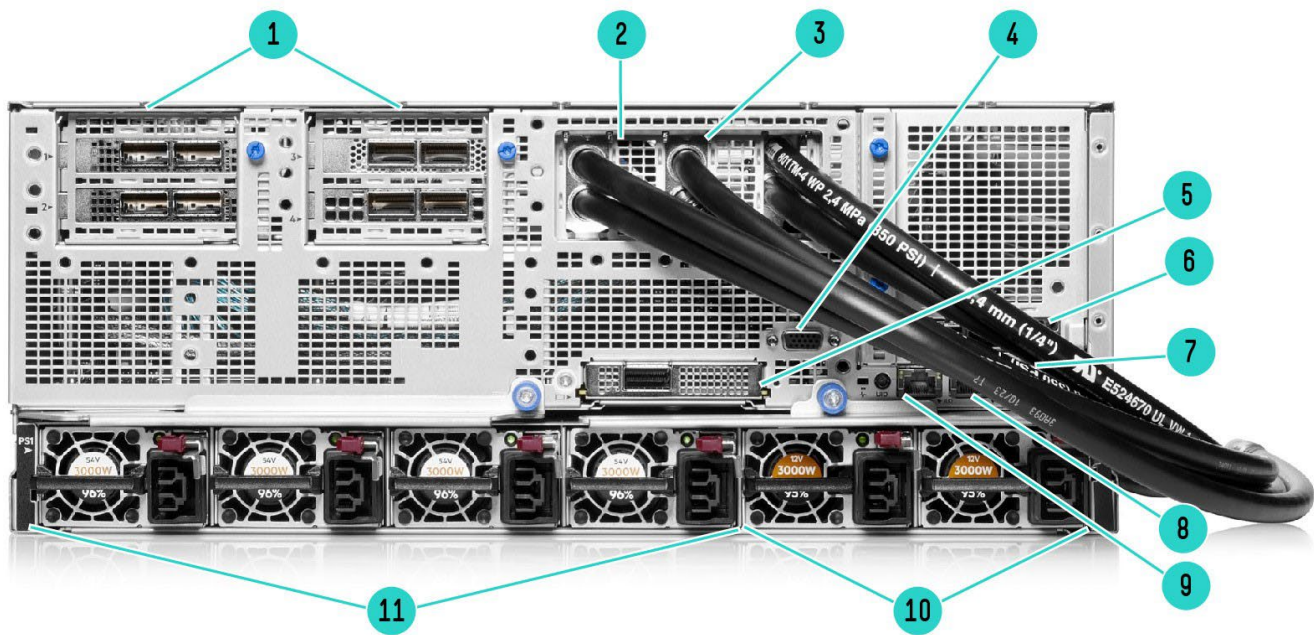


HPE Cray XD665 System Server Top View

Item	Description	Item	Description
1.	DIMMs for CPU 1 & 2	5.	HHL PCIe Board(s)
2.	PCIe Switch	6.	GPU Module
3.	CPU 1 & 2	7.	12x System Fans
4.	Management I/O board		



Overview



HPE Cray XD665 System Server Rear View

Item	Description	Item	Description
1.	Primary(1-2) & Secondary(3-4) PCIe Slot	7.	USB 3.0 port
2.	Vented blank (air solution)	8.	1G NIC Port
3.	DLC port with Coolant Hose (DLC solution)	9.	BMC port
4.	VGA port	10.	12V PSU units (x2)
5.	OCP 3.0 Slot	11.	54V PSU units (x4)
6.	PCIe Slot		



Overview



HPE Cray XD665 System Server Front View

Item					
1.	System Fan (x12)	5.	UID button	Off	Off
				Blue	ID
				Blinking blue	Remote management session in progress
2.	Backup battery tray	6.	Health LED	Blinking red	System is on or off, critical (remains latched on power off)
3.	Hard drives (x8)	7.	Power button	Off	No AC
				Solid amber	Standby mode
				Blinking green	User has requested system
				Solid green	Powered on
				Blinking amber	Chassis manager is booting
4.	I/O Module and Pull tab				

Rack Airflow Requirements

HPE Cray XD665 System

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. For detail information please see Cray XD665 System User Guide:
https://support.hpe.com/connect/s/search?language=en_US#q=XD6500

Thermal Boundaries

The HPE Cray XD XD665 system offers choices in Direct Liquid Cooling or Liquid-Assisted Air-Cooling. The ability to operate up to 35C will come with limitations on choice of CPU and Memory SKUs. The tables below outline the thermal operating ranges for the CPU and Memory SKUs



Overview

HPE Cray XD665 Air-Cooled CPU Support

	CPU SKU	Max Ambient for Full Performance
Genoa	XD665 AMD EPYC 9224 2.25G 24C 200W	35°C
	XD665 AMD EPYC 9654 2.15G 96C 360W	30°C
	XD665 AMD EPYC 9174F 3.8G 16HFC 320W	25°C
	XD665 AMD EPYC 9534 2.4G 64C 280W	35°C
	XD665 AMD EPYC 9554 2.65G 64C 320W	25°C
	XD665 AMD EPYC 9354 2.85G 32C 260W	35°C
	XD665 AMD EPYC 9634 2.00G 84C 290W	35°C
	XD665 AMD EPYC 9474F 3.4G 48HFC 360W	20°C
	XD665 AMD EPYC 9254 2.55G 24C 200W	35°C
	XD665 AMD EPYC 9454 2.35G 48C 290W	35°C
	XD665 AMD EPYC 9374F 3.5G 32HFC 320W	20°C
	XD665 AMD EPYC 9274F 3.6G 24HFC 320W	25°C
	XD665 AMD EPYC 9334 2.5G 32C 210W	35°C
Bergamo	XD665 AMD EPYC 9754	25°C

	DIMM	SKU	35°C	30°C	25°C	20°C
DLC	32GB DIMM - Samsung	P58356-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	64GB DIMM - Samsung	P58358-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	64GB DIMM - Hynix	P68663-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	128GB DIMM - Hynix	P68664-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	128GB DIMM - Samsung	P58359-H21	Projected Impact	Projected Yes	Projected Yes	Projected Yes
Air	32GB DIMM - Samsung	P58356-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	64GB DIMM - Samsung	P58358-H21	Projected Impact	Projected Impact	Projected Yes	Projected Yes
	64GB DIMM - Hynix	P68663-H21	Projected Yes	Projected Yes	Projected Yes	Projected Yes
	128GB DIMM - Hynix	P68664-H21	Projected Impact	Projected Yes	Projected Yes	Projected Yes
	128GB DIMM - Samsung	P58359-H21	Projected Impact	Projected Impact	Projected Impact	Projected Yes

Notes:

- If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment.
- When selecting Direct Liquid Cooling (DLC), HPE racks are required for factory integration.
- 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.



Standard Features

Processors (Select two of the following)

4 th Gen AMD® EPYC® Processor	Cores	Base Frequency	Max Frequency	Max Memory	Default TDP	Cache	Memory
XD665 AMD EPYC 9224	24C	2.5G	3.7G	1.5TB	200W	64MB	4800MT/s
XD665 AMD EPYC 9654	96C	2.4G	3.9G	1.5TB	360W	384MB	4800MT/s
XD665 AMD EPYC 9174F	16HFC	4.1G	4.15G	1.5TB	320W	256MB	4800MT/s
XD665 AMD EPYC 9534	64C	2.45G	3.55G	1.5TB	280W	256MB	4800MT/s
XD665 AMD EPYC 9554	64C	3.1G	3.75G	1.5TB	320W	256MB	4800MT/s
XD665 AMD EPYC 9354	32C	3.25G	3.75G	1.5TB	260W	128MB	4800MT/s
XD665 AMD EPYC 9634	84C	2.25G	3.1G	1.5TB	290W	384MB	4800MT/s
XD665 AMD EPYC 9474F	48HFC	3.6G	3.95G	1.5TB	360W	256MB	4800MT/s
XD665 AMD EPYC 9254	24C	2.9G	3.9G	1.5TB	200W	128MB	4800MT/s
XD665 AMD EPYC 9454	48C	2.75G	3.65G	1.5TB	290W	256MB	4800MT/s
XD665 AMD EPYC 9374F	32HFC	3.85G	4.1G	1.5TB	320W	256MB	4800MT/s
XD665 AMD EPYC 9274F	24HFC	4.05G	4.1G	1.5TB	320W	128MB	4800MT/s
XD665 AMD EPYC 9334	32C	2.7G	3.85G	1.5TB	210W	128MB	4800MT/s

Notes:

- Mixing of Processors is not allowed
- All AMD® EPYC® processors can support up to 1.5TB of memory each on the HPE Cray XD665 System
- Certain limitations may apply to select processors, please contact your HPE sales representative

Memory (Select up to 24 of the following)

Type	DDR5 Registered (RDIMM)
DIMM slots available	24 slots per server for XD665 6 channels per processor, 2 DIMMs per channel
Minimum capacity	640 GB DDR @4800 MT/s
Maximum capacity	Up to 3TB DDR @4800 MT/s

Description

HPE Cray XD 32GB (1x32GB) Dual Rank x8 DDR5-4800 Registered Standard Memory Kit
HPE Cray XD 64GB (1x64GB) Dual Rank x4 DDR5-4800 Registered Standard Memory Kit
HPE Cray XD 128GB (1x128GB) Quad Rank x4 DDR5-4800 Registered 3DS Standard Memory Kit
HPE Cray Supercomputing XD 64GB (1x64GB) Dual Rank x4 DDR5-4800 Registered Standard Memory Kit
HPE Cray Supercomputing XD 128GB (1x128GB) Quad Rank x4 DDR5-4800 Registered 3DS Standard Memory Kit

SKU

P58356-H21
P58358-H21
P58360-H21
P68663-H21
P68664-H21



Standard Features

Notes:

- Minimum memory density per platform is 640 GB to insure adequate performance
- Mixing of x4, x8, 3DS memory is not allowed
- Mixing of Memory DIMMs is not allowed
- Optimal performance requires 6 (1 DIMM / channel) or 12 (2 DIMMs / channel) DIMMs per processor

Cooling (select one of the following)

Description

HPE Cray Supercomputing XD665 FIO Radiator Cooling Kit
HPE CRAY XD6500 DLC FIO kit

SKU

P54096-B21
P59457-B21

Graphics Options (select one of the following)

Description

NVIDIA H100 80GB GPU FIO Accelerator

SKU

P63395-B21

Storage

M.2 Controllers - All CTO Models (System: Std 0 // Max 1) (User Selection: Min 0 // Max 1)

Description

HPE NS204i-t Gen10 Plus x2 Lanes NVMe PCIe 3 x8 Boot Controller

SKU

P20292-B21

M.2 NVME Drives - All CTO Models (System: Std 0 // Max 2) (User Selection: Min 0 // Max 2)

Samsung PM9A3 960GB PCIe Gen4 Mixed Use M.2 22110 Self-encrypting SSD for HPE Cray XD 2000

P48695-H21

Notes: M.2 Controller supports up to 2x M.2 drives

SFF RAID Controllers

HPE Cray Supercomputing XD665 MR9560-16i 8-port 8GB Cache PCIe4 x8 Tri-Mode Controller

P68050-B21

Notes:

- If RAID is not required for SFF SSDs, no controllers are required
- For RAID with over 4 SFF Drives, select 1x P68050-B21 + 1x CVPM05 Super-Cap P69144-B21
- For RAID with 4 or less SFF Drives, select 1x P68050-B21
- All drive cable kits are included in the top-level SKU and do not need to be ordered separately
- When configuring XD665 with XD665 Broadcom MegaRAID 9560-16i (P68050-B21), the Firmware of the backplane cannot be updated.

SFF Drives - All CTO Models (System: Std 0 // Max 8) (User Selection: Min 0 // Max 8)

HPE Cray Supercomputing 960GB NVMe Read Intensive SFF U.3 7450 SSD

P65375-H21

HPE Cray Supercomputing 1.92TB NVMe Read Intensive SFF U.3 7450 SSD

P65376-H21

HPE Cray Supercomputing 3.84TB NVMe Read Intensive SFF U.3 7450 SSD

P65377-H21

HPE Cray Supercomputing 7.68TB NVMe Read Intensive SFF U.3 7450 SSD

P65378-H21

HPE Cray Supercomputing 15.36TB NVMe Read Intensive SFF U.3 7450 SSD

P68661-H21

HPE Cray Supercomputing 800GB NVMe Mixed Use SFF U.3 7450 SSD

P69368-H21

HPE Cray Supercomputing 1.6TB NVMe Mixed Use SFF U.3 7450 SSD

P69369-H21

HPE Cray Supercomputing 3.2TB NVMe Mixed Use SFF U.3 7450 SSD

P69370-H21

HPE Cray Supercomputing 6.4TB NVMe Mixed Use SFF U.3 7450 SSD

P69371-H21

HPE Cray Supercomputing 12.8TB NVMe Mixed Use SFF U.3 7450 SSD

P69372-H21

RAID Settings

HPE RAID 0 Drive 1 FIO Setting

339777-B21

HPE RAID 1 Drive 1 FIO Setting

339778-B21

HPE RAID 5 Drive 1 FIO Setting

339779-B21

HPE Raid 5 w/SP Drive 1 FIO Setting

339780-B21

HPE RAID FIO Advanced Data Guarding Option

339781-B21

HPE Customer Defined RAID Setting Service

389692-B21



Standard Features

Notes:

- If SKU 389692-B21 is selected then the following RAID rules do not apply:
 - All integrated hard drives must match.
 - Minimum drive quantity requirement for each RAID level.
 - RAID level must be selected if Factory Installed OS is present and MegaRAID controller (embedded or otherwise) is the primary controller.
- If SKU 389692-B21 is selected, then at least 1 hard drive must be on the order.
- If SKU 389692-B21 is selected, then preinstalled OS must be on the order."
 - A Customer Intent Document must be supplied if SKU 389692-B21 is ordered.
- This Customer Intent Document should include all details about the desired RAID custom configuration. (This includes drive part numbers and quantities, RAID levels desired, which drives should be applied to each RAID level, and if a preinstalled OS has been ordered - which RAID set it should be installed on).
- Warning Message - HPE Recommends using below standard RAID Settings.
 - 339777-B21 HPE RAID 0 Drive 1 FIO Setting
 - 339778-B21 HPE RAID 1 Drive 1 FIO Setting
 - 339779-B21 HPE RAID 5 Drive 1 FIO Setting
 - 339780-B21 HPE RAID 5 w/SP Drive 1 FIO Setting
 - 339781-B21 HPE Raid Adv Data Guarding FIO"
- General RAID rules:
 - Only a single set of RAID will be offered and will only be applied to all applicable drives installed in a server.
 - RAID requires selection of a controller and a specific number of matching drives. (i.e., same part number)
 - RAID must be selected if both Factory Installed OS and controller (embedded or otherwise) are present.
 - RAID 0 requires at least 1 drive.
 - RAID 1 requires at least 2 or even number of drives.
 - RAID 1 with Spare requires at least 3 drives
 - RAID 5 requires at least 3 drives.
 - RAID 5 with Spare requires at least 4 drives.
 - RAID 6 requires at least 4 drives.
- RAID levels are not allowed if is not included in the order

InfiniBand & Ethernet - All CTO Models (System: Std 0 // Max 5) (User Selection: Min 0 // Max 5)

Description

	SKU
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 MCX653105A-HDAT Adapter	P23664-H21
HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe4 x16 MCX653105A-ECAT Adapter	P23665-H21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe4 x16 MCX653106A-ECAT Adapter	P23666-H21
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 OCP3 MCX653435A-HDAI Adapter	P31323-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 MCX653106A-HDAT Adapter	P31324-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 OCP3 MCX653436A-HDAI Adapter	P31348-H21

Notes:

- The MAX PCIe Card capacity limit is 5. It is “all inclusive” and must account for ALL PCIe cards from all categories and sub-categories (except Graphic Options category and sub-category).
- If configured for a Cray or Slingshot Solution, select the Slingshot networking card.

InfiniBand & Ethernet - All CTO Models (System: Std 0 // Max 5) (User Selection: Min 0 // Max 5)

HPE InfiniBand NDR 1-port OSFP PCIe5 x16 MCX75310AAS-NEAT Adapter	P45641-H21
HPE InfiniBand NDR200 1-port OSFP PCIe5 x16 MCX75310AAS-HEAT Adapter	P45642-H21
Mellanox MCX623105AS-VDAT Ethernet 200Gb 1-port QSFP56 Adapter for HPE	P10180-B21
Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 Adapter for HPE	P25960-B21
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 Adapter for HPE	P21112-B21
Mellanox MCX512F-ACHT Ethernet 10/25Gb 2-port SFP28 Adapter for HPE	P13188-B21
HPE Slingshot SA210S Ethernet 200Gb 1-port PCIe NIC	R4K46A
Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE	P10106-B21
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 OCP3 Adapter for HPE	P22767-B21
Intel I210 (Embedded NIC)	N/A

Standard Features

Transceivers

HPE 100Gb 1-port OP101 QSFP28 x16 PCIe Gen3 with Intel Omni-Path Architecture Adapter	829335-B21
Drive Cage (1 cage with up to 8 carrier per chassis)	P22894-002
ASSY, CARRIER,HDD,BASIC,SNAP IN,SFF,10P	
Rail Kit (1 per chassis)	
HPE 4U Server Rail Kit	878571-B21
Blanks	
ASSY, HDD BLANK,SFF,Gen8	652999-001
P/S ASSY, BLANK, A6500, Gen10P	P26595-001
XD665 OCP blank, Vented	P59863-001
XD665 DLC blank, Vented	P59864-001

Power Supplies - All CTO Models Require 1 power supply kit from the menu below

Description	SKU
HPE Apollo 6500 Gen10 Plus Modular Accelerator Titanium Hot Plug Power Supply Kit	P49948-B21
HPE Apollo 6500 Gen10 Plus Modular Accelerator Platinum Hot Plug N Power Supply Kit	P31662-B21

Interfaces

USB Port	1 external USB 3.0 port
HPE Cray XD Management Network Port	Dedicated 1Gbps network management port
Health LED	1
Power	1
UID	1
Do not remove LED	1

Industry Standard Compliance

- ACPI 6.3 Compliant
- PCIe 5.0 Compliant
- WOL Support
- PXE Support
- USB 3.0 External Port
- SMBIOS 3.4
- UEFI 2.8
- Redfish API

HPE Cray XD665 System UEFI

Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better manageability and more secured configuration than the legacy ROM while interacting with your server at boot time.

The UEFI System utilities is embedded in the system ROM. Its features enable you to perform a wide range of configuration activities, including:

- Configuring system devices and installed options.
- Enabling and disabling system features.
- Displaying system information.
- Selecting the primary boot controller including configuring drive arrays and partitions.
- Configuring memory options.
- Launching other pre-boot environments.

HPE Cray XD665 Systems with UEFI can provide:

- Secure Boot that enables the system firmware, option card firmware, operating systems, and software collaborate to enhance platform security.
- An Embedded UEFI Shell that provides a preboot environment for running scripts and tools.
- Boot support for option cards that only support a UEFI option ROM.



Standard Features

UEFI

UEFI provides a higher level of security by protecting against unauthorized operating systems and malware rootkit attacks, validating that only authenticated ROMs, pre-boot applications, and OS boot loaders that have been digitally signed are run. Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). The HPE Cray XD665 System is a UEFI Class 3 solution and does not support the less secure CSM (Combability Support Module) BIOS.

Software Portfolio for HPE Cray XD665 System

- **Operating Systems and Virtualization Software Support** Red Hat Enterprise Linux (RHEL) 9.0, 8.6
- SUSE Linux Enterprise Server (SLES) 15 SP4
- Ubuntu (22.04 LTS)
- Cray Operating System (supported by not certified)
- VMware ESXi 8.0, 7.0 U3

Notes: For more information on Hewlett Packard Enterprise Certified and Supported Servers for OS and Virtualization Software and latest listing of software drivers available for your server. Open Source software is not factory-installed nor is it supported by HPE. <https://www.hpe.com/us/en/servers/server-operating-systems.html>

Fabric software

Description	SKU
NVIDIA UFM Enterprise with Business Standard per HCA 1-year Subscription E-LTU	S1D73AAE
NVIDIA UFM Enterprise with Business Standard per HCA 3-year Subscription E-LTU	S1D74AAE
NVIDIA UFM Enterprise with Business Standard per HCA 5-year Subscription E-LTU	S1D75AAE

Server Management

HPE Cray XD665 System Baseboard Management Controller

Embedded, in-depth server-level monitoring and management technology offering system management, service alerting, reporting and remote management including remote console and virtual media mount.

Industry Standard Redfish

The HPE Cray XD665 System supports industry standard DMTF Redfish that provides API conformance and offers simplified server management automation such as configuration and maintenance tasks based on modern industry standards. Learn more at: <https://dmtf.org/standards/redfish>.

For clustered HPE Cray XD665 System deployments (for HPC or other emerging workloads such as AI), customers can use the following cluster management software solutions:

HPE Performance Cluster Manager

Fully integrated system management solution offering all the functionalities you need to manage your HPE Linux®-based high performance computing (HPC) clusters, all day every day.
HPE Performance Cluster Manager aggregates system metrics.

The software provides:

- System setup
- Hardware monitoring and management including GPU management
- Image management and software updates
- Power management
- Integration with ISV & open-source software solutions

Alternatively, to manage heterogeneous clusters or for customers with additional requirements, HPE also offers:

Bright Cluster Manager

Automates process of building cluster in the datacenter and in the cloud. Ideal for heterogeneous clusters or customers with additional requirements.



Standard Features

Software Development Tools (Programming languages, debuggers, libraries)

HPE Cray Programming Environment is a fully integrated software development suite offering programmers comprehensive set of tools for developing, porting, debugging, and tuning of their applications so they can shorten application development time and accelerate their performance. CPE cannot be supported on Ubuntu OS.

Notes: For more information on HPE Cray Programming Environment [visit this page](#)

Additional 3rd party software developmental tools:

- Intel® oneAPI
- GNU Compiler Collection
- Perforce® TotalView®
- Mellanox HPC-X
- Nvidia (Various)

HPE Message Passing Interface (MPI) - an MPI development environment designed by HPE to enable optimization of high-performance computing (HPC) applications on HPE Cray XD665 Systems . The HPE Performance Software—MPI leverages a scalable MPI library and boosts performance of existing applications without requiring recompilation.

Security

- Secure Start – only boot Signed FW
 - UEFI Secure Boot
 - NIST SP800-193 Protect, Detect, Recover for BIOS and BMC Tamper-free updates – components digitally signed and verified using CNSA strength RSA4096 signing key.
 - Secure Recovery – recover critical firmware to known good state on detection of compromised firmware. Event recorded in the event log.
 - UEFI TPM 2.0 (Trusted Platform Module 2.0) HPE Cray XD665 System supports OpenSSL 3.0 provide for secure remote connectivity session to system
 - SPI BUS monitoring to ensure BIOS and BMC FW are always signed and secure.
 - Secure out-of-the-box high-entropy RMC administrator password is unique for each system.
 - Support for multiple Redfish role-based access control (RBAC) accounts ensuring that passwords need not be shared and can provide separation of duties.
-

Service and Support

HPE Services - Service and Support

Get the most from your HPE Products. Get the expertise you need at every step of your IT journey with **HPE Services Services**. We help you lower your risks and overall costs using automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally. HPE Services **Advisory Services** focus on your business outcomes and goals, partnering with you to design your transformation and build a roadmap tuned to your unique challenges. Our **Professional** and **Operational Services** can be leveraged to speed up time-to-production, boost performance and accelerate your business. HPE Services specializes in flawless and on-time implementation, on-budget execution, and creative configurations that get the most out of software and hardware alike.

Recommended Services

HPE Tech Care Service.

HPE Tech Care Service is the new operational service experience for HPE products. Tech Care goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service has been reimagined from the ground up to support a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. For HPE Cray XD665 Systems, HPE Tech Care Service is available in two response levels. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents. <https://www.hpe.com/services/techcare>

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimizing your entire IT environment and achieving agreed upon IT outcomes and business goals through a personalized and customer-centric experience. All delivered by an assigned team of HPE Services Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

<https://www.hpe.com/services/complecare>

HPE Server Hardware Installation

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

HPE Installation and Startup Service

Provides for the installation of your HPE hardware according to product specifications including options. The HPE service delivery technician will connect the product to a LAN as appropriate and enable remote support to allow for automatic case creation for hardware failures. Installation and start up services also include the installation of one supported operating system type (Windows® or Linux).

HPE Service Credits

Offers flexible services and technical skills to meet your IT demands as your business evolves. With a menu of services, you can access additional resources and specialist skills to help you maintain peak performance in your IT. HPE Service Credits help you proactively respond to your dynamic IT and business needs.

HPE Education Services

Provides comprehensive training designed to expand the skills of your IT staff and keep them up to speed with the latest technologies.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and support options



Service and Support

HPE Factory Express for Servers and storage

HPE Factory Express offers configuration, customization, integration, and deployment services for HPE 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 Cray EX, HPE Cray XD, HPE Integrity, HPE ProLiant, HPE Apollo, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers, as well as the HPE MSAXxxx, HPE 3PAR suite, HPE XP, rackable tape libraries and configurable network switches.

HPE support high-security system builds at HPE manufacturing facility in Chippewa Falls, Wisconsin. From our Chippewa Falls facility, HPE has built and deployed systems to the most security-conscious government agencies in the world.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and support options

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 3 years from date of purchase. Enhancements to warranty services are available through HPE Services operational services or customized service agreements.

Notes: Server Warranty includes 3 years of Parts, Labor and on-site. Warranty repairs may be accomplished using Customer Self Repair (CSR) parts. Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part.

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.

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.

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

A Mechanized Lift will be required to accompany the order due to the excessive size and weight of the HPE Cray XD665 Systems. If the customer already confirms that they already have an appropriate Lift in-house, one will not need to be ordered.

Step 1: Choose a Chassis

HPE Cray Supercomputing XD665 Configure-to-order Server Chassis	P52377-B21
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Step 2: Select Cooling Method

HPE Cray Supercomputing XD665 FIO Radiator Cooling Kit	P54096-B21
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HPE CRAY XD6500 DLC FIO kit	P59457-B21
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Step 3: Select M.2 Storage Options (max 2)

HPE Cray Supercomputing 960GB NVMe Read Intensive SFF U.3 7450 SSD	P65375-H21
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HPE Cray Supercomputing 1.92TB NVMe Read Intensive SFF U.3 7450 SSD	P65376-H21
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HPE Cray Supercomputing 3.84TB NVMe Read Intensive SFF U.3 7450 SSD	P65377-H21
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HPE Cray Supercomputing 7.68TB NVMe Read Intensive SFF U.3 7450 SSD	P65378-H21
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HPE Cray Supercomputing 800GB NVMe Mixed Use SFF U.3 7450 SSD	P69368-H21
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HPE Cray Supercomputing 1.6TB NVMe Mixed Use SFF U.3 7450 SSD	P69369-H21
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HPE Cray Supercomputing 3.2TB NVMe Mixed Use SFF U.3 7450 SSD	P69370-H21
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HPE Cray Supercomputing 6.4TB NVMe Mixed Use SFF U.3 7450 SSD	P69371-H21
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HPE Cray Supercomputing 12.8TB NVMe Mixed Use SFF U.3 7450 SSD	P69372-H21
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Notes:

- Maximum quantity of 2 M.2 SSD Drives
- All selected M.2 drive quantity are of the same SKU | capacity

Step 4: Select a Processor (Dual Processor Configuration Only)

AMD EPYC 9224 2.25GHz 24-core 200W Processor Kit for HPE Cray Supercomputing	P61457-B21
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AMD EPYC 9654 2.4GHz 96-core 360W Processor Kit for HPE Cray Supercomputing	P56262-B21
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AMD EPYC 9174F 3.8GHz 16-core 320W Processor Kit for HPE Cray Supercomputing	P56263-B21
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AMD EPYC 9534 2.4GHz 64-core 280W Processor Kit for HPE Cray Supercomputing	P56264-B21
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AMD EPYC 9554 2.65GHz 64-core 320W Processor Kit for HPE Cray Supercomputing	P56265-B21
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AMD EPYC 9354 2.85GHz 32-core 260W Processor Kit for HPE Cray Supercomputing	P56266-B21
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AMD EPYC 9634 2.00GHz 84-core 290W Processor Kit for HPE Cray Supercomputing	P56267-B21
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AMD EPYC 9474F 3.4GHz 48-core 360W Processor Kit for HPE Cray Supercomputing	P56268-B21
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AMD EPYC 9254 2.55GHz 24-core 200W Processor Kit for HPE Cray Supercomputing	P56269-B21
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AMD EPYC 9454 2.35GHz 48-core 290W Processor Kit for HPE Cray Supercomputing	P56270-B21
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AMD EPYC 9374F 3.5GHz 32-core 320W Processor Kit for HPE Cray Supercomputing	P56271-B21
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AMD EPYC 9274F 3.6GHz 24-core 320W Processor Kit for HPE Cray Supercomputing	P56272-B21
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AMD EPYC 9334 2.5GHz 32-core 210W Processor Kit for HPE Cray Supercomputing	P56273-B21
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Notes: Certain limitations may apply to select processors. Please refer to the thermal table above or contact your HPE sales representative



Configuration Information

Step 5: Select from the following Memory options (minimum 1,028 GB)

HPE Cray XD 32GB (1x32GB) Dual Rank x8 DDR5-4800 Registered Standard Memory Kit	P58356-H21
HPE Cray XD 64GB (1x64GB) Dual Rank x4 DDR5-4800 Registered Standard Memory Kit	P58358-H21
HPE Cray XD 128GB (1x128GB) Quad Rank x4 DDR5-4800 Registered 3DS Standard Memory Kit	P58360-H21

Notes:

- Minimum System Memory of 1,024 GB Required
- Certain limitations may apply to select Memory options. Please refer to the thermal table above or contact your HPE sales representative

Step 6: Choose from the following SFF Storage and RAID options

Hot Plug SFF SSD

HPE Cray Supercomputing 960GB NVMe Read Intensive SFF U.3 7450 SSD	P65375-H21
HPE Cray Supercomputing 1.92TB NVMe Read Intensive SFF U.3 7450 SSD	P65376-H21
HPE Cray Supercomputing 3.84TB NVMe Read Intensive SFF U.3 7450 SSD	P65377-H21
HPE Cray Supercomputing 7.68TB NVMe Read Intensive SFF U.3 7450 SSD	P65378-H21
HPE Cray Supercomputing 800GB NVMe Mixed Use SFF U.3 7450 SSD	P69368-H21
HPE Cray Supercomputing 1.6TB NVMe Mixed Use SFF U.3 7450 SSD	P69369-H21
HPE Cray Supercomputing 3.2TB NVMe Mixed Use SFF U.3 7450 SSD	P69370-H21
HPE Cray Supercomputing 6.4TB NVMe Mixed Use SFF U.3 7450 SSD	P69371-H21
HPE Cray Supercomputing 12.8TB NVMe Mixed Use SFF U.3 7450 SSD	P69372-H21

SFF Hardware RAID Controller

Notes: Cable Kits are automatically included with the Chassis top-level SKU

Super-Cap option required for > 4 SFF SSDs requiring hardware RAID

2x Controllers required for > 4 SFF SSDs requiring hardware RAID

1x Controller required for 4 or fewer SSDs requiring hardware RAID

HPE Cray Supercomputing XD665 MR9560-16i 8-port 8GB Cache PCIe4 x8 Tri-Mode Controller	P68050-B21
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Step 7: Choose Factory Configuration Setting

Cray Compute Node Identifier (no max)

HPE Cray Compute Node FIO Configuration	R9H92A
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Step 8: Choose Networking Card Configuration (Max 4)

Ethernet PCIe

Broadcom BCM57416 Ethernet 10Gb 2-port BASE-T OCP3 Adapter for HPE	P10097-B21
Mellanox MCX623105AS-VDAT Ethernet 200Gb 1-port QSFP56 Adapter for HPE	P10180-B21
Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 Adapter for HPE	P25960-B21
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 Adapter for HPE	P21112-B21
Mellanox MCX512F-ACHT Ethernet 10/25Gb 2-port SFP28 Adapter for HPE	P13188-B21
HPE Slingshot SA210S Ethernet 200Gb 1-port PCIe NIC	R4K46A
Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE	P10106-B21
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 OCP3 Adapter for HPE	P22767-B21
Intel E810-XXVDA4 Ethernet 10/25Gb 4-port SFP28 OCP3 Adapter for HPE	P41614-B21

Configuration Information

InfiniBand PCIe

HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 MCX653105A-HDAT Adapter	P23664-H21
HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe4 x16 MCX653105A-ECAT Adapter	P23665-H21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe4 x16 MCX653106A-ECAT Adapter	P23666-H21
HPE InfiniBand HDR/Ethernet 200Gb 1-port QSFP56 PCIe4 x16 OCP3 MCX653435A-HDAI Adapter	P31323-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 MCX653106A-HDAT Adapter	P31324-H21
HPE InfiniBand HDR/Ethernet 200Gb 2-port QSFP56 PCIe4 x16 OCP3 MCX653436A-HDAI Adapter	P31348-H21
HPE InfiniBand NDR 1-port OSFP PCIe5 x16 MCX75310AAS-NEAT Adapter	P45641-H21
HPE InfiniBand NDR200 1-port OSFP PCIe5 x16 MCX75310AAS-HEAT Adapter	P45642-H21
HPE Data Processing Unit InfiniBand NDR/Ethernet 400Gb 1-port QSFP112 HHHL B3140H Adapter	P66387-H21
HPE IB NDR/EN 400G 1p OSFP Adptr	P45641-H23
HPE IB NDR200/EN 200G 1p OSFP Adptr	P45642-H22

Step 9: Select Power Cables (Max 6)

A power supply kit consisting of 6x Titanium 3,000-Watt Supplies is already embedded within the chassis.

Select Power Cords (required - max 6)

HPE SDG300 - C20 250V 16Amp Black 1m Jumper Cord	P24675-B21
HPE SDG300 - C20 250V 16Amp Black 0.5m Jumper Cord	P24672-B21
HPE SDG300 - C20 250V 16Amp Black 2m Jumper Cord	P24678-B21
HPE SDG23A-SDG23B 277V 0.76m Jumper Cord	P9B75A
HPE SDG23A-SDG23B 277V 0.76m Jumper Cord	P9B75A

Step 10: Select Rack Options

Rack Options (max 1)

HPE 4U Server Rail Kit	878571-B21
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Step 11: Select Operating Systems

Red Hat HPC Operating Systems (max 99)

HPE Performance Cluster Manager FIO Software	Q9V61A
Red Hat Enterprise Linux for HPC Head Node 1yr Subscription 24x7 Support E-LTU	R1P34AAE
Red Hat Enterprise Linux for HPC Head Node 3yr Subscription 24x7 Support E-LTU	R1P35AAE
Red Hat Enterprise Linux for HPC Head Node 5yr Subscription 24x7 Support E-LTU	R1P36AAE
Red Hat Enterprise Linux for HPC Head Node 1yr Subscription 9x5 Support E-LTU	R1P37AAE
Red Hat Enterprise Linux for HPC Head Node 3yr Subscription 9x5 Support E-LTU	R1P38AAE
Red Hat Enterprise Linux for HPC Head Node 5yr Subscription 9x5 Support E-LTU	R1P39AAE
Red Hat Enterprise Linux for HPC Compute Node 1yr Subscription E-LTU	R1P40AAE
Red Hat Enterprise Linux for HPC Compute Node 3yr Subscription E-LTU	R1P41AAE
Red Hat Enterprise Linux for HPC Compute Node 5yr Subscription E-LTU	R1P42AAE

Red Hat Operating Systems (max 99)

Red Hat Enterprise Linux Server 2 Sockets or 2 Guests 1 Year Subscription 24x7 Support E-LTU	G3J28AAE
Red Hat Enterprise Linux Server 2 Sockets or 2 Guests 1 Year Subscription 9x5 Support E-LTU	G3J29AAE
Red Hat Enterprise Linux Server 2 Sockets or 2 Guests 3 Year Subscription 24x7 Support E-LTU	G3J30AAE
Red Hat Enterprise Linux Server 2 Sockets or 2 Guests 3 Year Subscription 9x5 Support E-LTU	G3J31AAE
Red Hat Enterprise Linux Server 2 Sockets or 2 Guests 5 Year Subscription 24x7 Support E-LTU	G3J32AAE

Configuration Information

Red Hat Enterprise Linux Server 2 Sockets or Guests 5 Year Subscription 9x5 Support E-LTU G3J33AAE

Red Hat Enterprise Linux 8 FIO Software R4T04A

HPE Performance Cluster Manager

For additional information, please visit HPE Performance Cluster Manager QuickSpecs [here](#)

Description

SKU

HPE Performance Cluster Manager 1 Node 3yr 24x7 Support Perpetual E-LTU Q9V60AAE

Notes:

- One license per node
- Includes three years of support
- This is an electronic license
- This is a perpetual license. The Software will continue working even when the support term ends

HPE Performance Cluster Manager 1 Node 3yr 24x7 Support Perpetual LTU Q9V60A

Notes:

- One license per node.
- Includes three years of support.
- This is a perpetual license. The software will continue working even when the support term ends.

HPE Performance Cluster Manager FIO Software Q9V61A

Notes:

- This SKU does not include the license. Please order Q9V60AAE.
- Order one per node

HPE Performance Cluster Manager Media Kit Q9V62A

Notes: One media kit per solution.

HPE Power Distribution Units

Power Distribution Units (PDUs) are an integral piece to this data center solution and HPE offers several types. Basic PDUs provide reliable power with 0U or 1U installation options. Metered PDUs have added intelligence to precisely track power usage and switched PDUs provide both local and remote power management. There are additional metered PDUs that are recommended for this solution that are not part of the mainstream PDU product offering. They are as follows:

HPE Switched 3-phase 66.5kVA/60309 5-wire 100A/277V 21-breaker Vertical NA PDU	R8P19A
HPE Metered 3Ph 66.5kVA/60309 100A 5-wire 480/277V Outlets (21) SDG23/Vertical NA PDU	879034-B21
HPE Metered 3Ph 39.9kVA/60309 60A 5-wire 480/277V Outlets (21) SDG23/Vertical NA PDU	880459-B21
HPE Metered 3Ph 57.6kVA/60309 100A 5-wire 80A/230V Outlets (3) C13 (18) C19/Vertical NA PDU	880460-B21
HPE Metered 3Ph 34.5kVA/60309 60A 5-wire 48A/230V Outlets (3) C13 (18) C19/Vertical NA FIO PDU	880461-B21
HPE Cray Supercomputer 60A 415V 3 Phase 24 CX PDU	R4N30A
HPE Mtrd 3P 69.1kVA 125A 96A230V FIO PDU	880462-B21
HPE Metered 3Ph 45.1kVA/60309 63A 5-wire 63A/230V Outlets (3) C13 (18) C19/Vertical INTL FIO PDU	880463-B21
HPE Cray Supercomputer 63A 400V 3 Phase 24 CX PDU	R4N29A
HPE G2 Metered/Switched 3Ph 17.3kVA/60309 4-wire 48A/208V Out (12) C13 (12) C19/Vertical NA/JP PDU	P9S22A
HPE G2 Metered 3Ph 17.3kVA/60309 60A 4-wire 48A/208V Outlets (12) C13 (12) C19/Vertical NA/JP PDU	P9R86A
HPE G2 Metered Modular 3Ph 17.3kVA/60309 60A 4-wire 48A/208V Outlets (6) C19/1U Horizontal NA/JP PDU	P9R80A
HPE G2 Metered/Switched 3Ph 22kVA/60309 5-wire 32A/230V Out (12) C13 (12) C19/Vertical INTL PDU	P9S24A
HPE G2 Metered 3Ph 22kVA/60309 5-wire 32A/230V Outlets (12) C13 (12) C19/Vertical INTL PDU	P9R87A
HPE G2 Metered Modular 3Ph 22kVA/60309 5-wire 32A/230V Outlets (6) C19/1U Horizontal INTL PDU	P9R81A

Technical Specifications

HPE Cray XD665 System Chassis / Server		
Dimensions	Height	7.00 in (17.8 cm) – 4U
	Width	19.17 in (48.7 cm) - includes ears
	Depth	37.20 in (94.5 cm)
Shipping Dimensions	Height	11 in (27.94 cm)
	Width	23.63 in (60 cm)
	Depth	41.37 in (105.08 cm)
Weight (approximate)	Minimum	145 lbs. (66.0 kg)
Weight (approximate)	Maximum	155 lbs. (70.5 kg)
System Inlet Temperature Standard Operating Support	10° to 30°C (50° to 86°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. The 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.
Extended Ambient Operating Support	35° to 45°C (95° to 104°F)	System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F). For Direct Liquid Cooling configurations, the supported system inlet range is extended to be 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 https://www.hpe.com/support/ASHRAEGen11 For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). System performance may be reduced if operating in the extended ambient operating range or with a fan fault.
	-30° to 60°C (-22° to 140°F).	The 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. The maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Non-operating	9144 m (30,000 ft).	The maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Thermal limitations

For a full list of thermal limitations please see the HPE Cray XD665 System thermal guidelines.

<https://www.hpe.com/support/xd665-thermal>

Summary of Changes

Date	Version History	Action	Description of Change
02-Dec-2024	Version 11	Changed	Overview section was updated
04-Nov-2024	Version 10	Changed	TCO section was removed
21-Oct-2024	Version 9	Changed	Standard Features section was updated
03-Jun-2024	Version 8	Changed	Configuration Information section was updated
06-May-2024	Version 7	Changed	Series name was updated. Configuration Information section was updated
01-Apr-2024	Version 6	Changed	Standard Features and Configuration Information sections were updated
08-Jan-2024	Version 5	Changed	Overview and Standard Features sections were updated
04-Dec-2023	Version 4	Changed	Added Cooling Options (Air & DLC), Thermal Tables for CPU, Memory
20-Nov-2023	Version 3	Changed	Configuration Information section was updated
16-Oct-2023	Version 2	Changed	Technical Specifications section was updated
05-Sep-2023	Version 1	New	New QuickSpecs Draft – HPE Cray Supercomputing XD665 System



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a50007004enw - 17114 - Worldwide - V11 - 02-December-2024