Dell EMC PowerEdge C6525

Technical Guide

D∕ELLEMC

Notes, cautions, and warnings

(i) **NOTE:** A NOTE indicates important information that helps you make better use of your product.

⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

Product overview

Topics:

- Introduction
- Featured technologies

Introduction

The Dell EMC PowerEdge C6525 is the latest 2U four node server designed to run high-performance computing and hyperscale workloads using high core counts, flexible I/O options, and low latency network options. The PowerEdge C6525 feature 2nd Generation and 3rd Generation AMD EPYC processors, up to 16 DIMMs per node, PCI Express 4.0, and a choice of network interface technologies to cover networking options. The PowerEdge C6525 is a compute centric platform capable of handling demanding workloads and applications such as hyperscale or webtech and high-performance computing, including research and digital manufacturing.

Featured technologies

The following table lists the featured technologies available on the PowerEdge C6525:

Table 1. PowerEdge C6525 featured technologies

Featured technologies	Description
2nd Generation and 3rd Generation AMD EPYC High performance Based server SOCs.	See the Processor section for specific details. ● 7 nm processor technology ● AMD Socket to Socket Global Memory Interface (xGMI and xGMI2) links. ● Up to 64 cores per socket ● 1.4 GHz base, 64C_128T for socket up to 2.6 GHz ● Max TDP: 280 W ● Mismatched SKUs in a 2S configuration not allowed
3200 MT/s DDR4 Memory	Select SKUs of the 2nd Generation and 3rd Generation AMD EPYC processors support 3200 MT/s memory. The PowerEdge C6525 supports one DIMM per channel at 3200 MT/s with these processors. See the Memory section for additional speed or population details. ● 8x DDR4 channels per socket, one DIMM per channel ● Up to 3200 MT/s—depending on the configuration ● RDIMMs up to 64 GB and LRDIMMs up to 128GB with 2666MT/s
OCP 3.0 card	Standard OCP 3.0 SFF with PCIe Gen4 X16.
PCI Express 4.0	Up to PCIe Gen 4 X16.
TPM	TPM 2.0

System features

Topics:

*   Product comparison

Product comparison

Table 2. Product comparison table

Feature	PowerEdge C6420	PowerEdge C6525
Processor	Intel Xeon Scalable Processor	2nd Generation and 3rd Generation AMD EPYC processors
Number of processors	2	2
Number of cores	Up to 28 cores	Up to 64 cores
Servers per chassis	Up to four 1U, dual socket servers	Up to four 1U, dual socket servers
Form factor	1U half-width sled for 6400 chassis	1U half-width sled for 6400 chassis
Memory	16 x DDR4 - RDIMM, LRDIMM - Min: 8 GB - Max: 2 TB	16 x DDR4 - RDIMM, LRDIMM - Min: 8 GB - Max: 2 TB
RAID Controller	- PERC H730P - PERC H330	- PERC H745 - PERC H345 - HBA345 - HBA355i
Chipset	Intel C621 Lewisburg-1G	System on Chip (SoC) design
Hard Drive	- SAS - SATA - NVMe	- SAS - SATA - NVMe
Hard Drive bays	- PowerEdge C6400 chassis supports up to 12 x 3.5-in HDDs-SAS/SATA. - PowerEdge C6400 chassis supports up to 24 x 2.5-in HDDs-SAS/SATA/NVMe.	- PowerEdge C6400 chassis supports up to 12 x 3.5-in HDDs-SAS/SATA. - PowerEdge C6400 chassis supports up to 24 x 2.5-in HDDs-SAS/SATA/NVMe.
Onboard Hard Drive controllers	S140	S150
BOOT Drive options	2 x M.2 card SATA interface module	M.2 card SATA interface module
External I/O	1 x16 main PCIe riser 1 x8 DCS Mezzanine slot 1 x16 OCP Mezzanine slot 1 x16 PCIe buried riser	1x16 PCIe Riser1A 1x16 PCIe Riser2A 1 x 8 PCIe SATA M.2 Riser on slot4 or BOSS adapter card 3.0 OCP Mezzanine slot
Management LAN	One RJ45 as shared LOM for host access and iDRAC dedicated management port.	One RJ45 as shared LOM for host access and iDRAC dedicated management port.
Server Management	Remote management: iDRAC9 Enterprise with Lifecycle Controller 3.0	Remote management: iDRAC9 Enterprise with Lifecycle Controller 3.0

Table 2. Product comparison table (continued)

Feature	PowerEdge C6420	PowerEdge C6525
	● Systems management: IPMI 2.0 compliant Dell Open Manage Essentials Dell Open Manage Mobile	● Systems management: IPMI 2.0 compliant Dell Open Manage Essentials Dell Open Manage Mobile
Embedded NIC	● Intel I350-One port 1 GBe—RJ45/1GBaseT	● Broadcom BCM5720 Gigabit Ethernet controller
USB	2 x External USB 3.0	1 x External USB 3.0
Power supplies	Dual hot-plug redundant high-efficiency 1600 W, 2000 W, and 2400 W	Dual hot-plug redundant high-efficiency 1600W, 2000W Mix Mode, 2400W, and 2600W PSU
Fans	4 x 60 mm dual rotor fans. Fans are not hot-plug redundant capable.	4 x 60 mm dual rotor fans. Fans are not hot-plug redundant capable.
Chassis	2U rack mounted	2U rack mounted

Chassis views and features

Topics:

Front view of the Dell EMC PowerEdge C6525
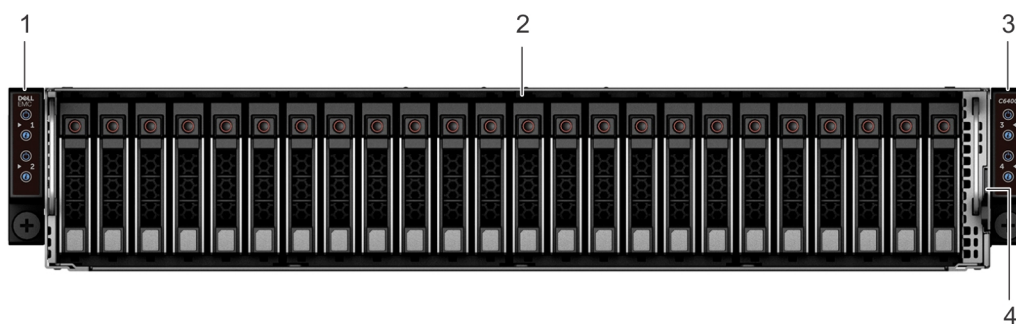
Figure 1. Front view of the chassis with 24 x 2.5-inch drives

1. Left control panel
2. Drive bay
3. Right control panel
4. Information tag
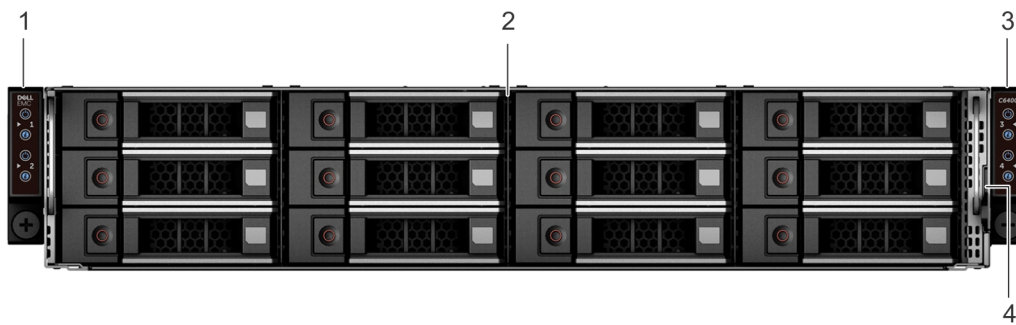
Figure 2. Front view of the chassis with 12 x 3.5-inch drives

1. Left control panel
2. Drive bay
3. Right control panel
4. Information tag

Rear view of the Dell EMC PowerEdge C6525
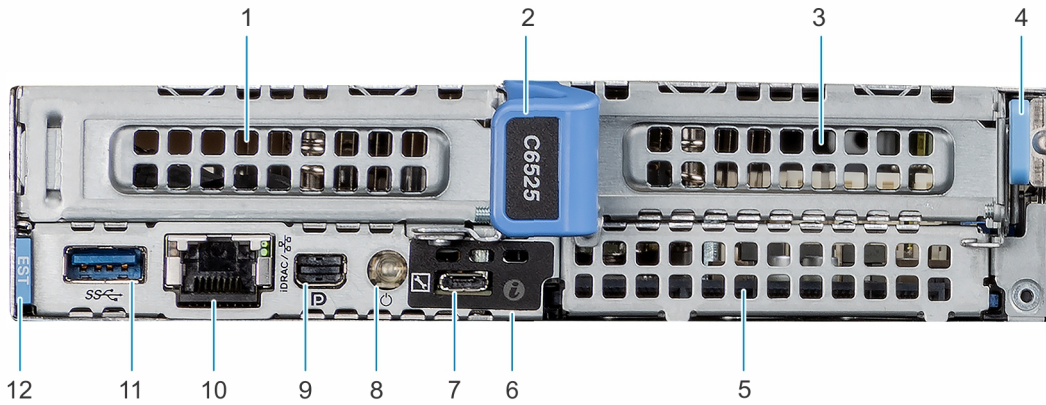
Figure 3. Rear view of the C6525

1. PCIe expansion card riser 1
2. Sled release handle
3. PCIe expansion card riser 2
4. Sled release lock
5. OCP 3.0 SFF card slot
6. System identification LED
7. iDRAC Direct micro USB port
8. Sled power button
9. Mini display port
10. iDRAC or NIC port
11. USB 3.0 port
12. Information tag

Inside view of the sled

The inside view of the PowerEdge C6525 sled:
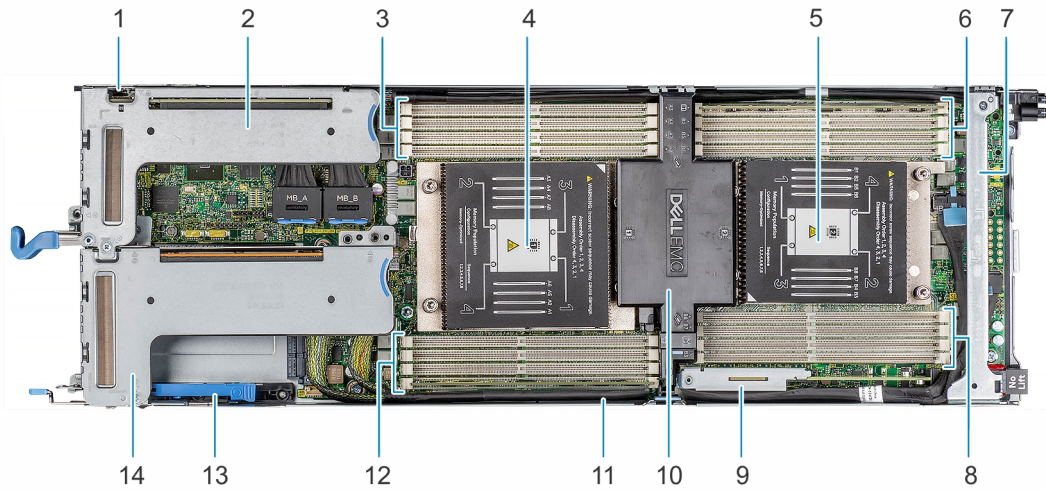
Figure 4. Inside view of the PowerEdge C6525 sled

1. uSD card slot
2. Expansion card riser 1
3. Memory module sockets for processor 1
4. Processor socket 1
5. Processor socket 2
6. Memory module sockets for processor 2
7. Support bracket
8. Memory module sockets for processor 2
9. M.2 riser
10. Air shroud

> (i) **NOTE:** Supports M.2 SATA riser / BOSS card S1V5

11. Riser 2 cable
12. Memory module sockets for processor 1
13. OCP card retention latch
14. Expansion card riser 2

Processor

AMD

Topics:

- Processor features
- Supported processors

Processor features
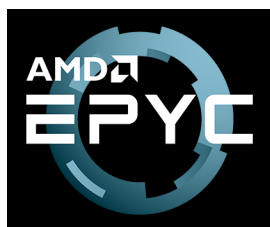
The following list lists the features of the 2nd Generation and 3rd Generation AMD EPYC processors:

- Compute:
  - Up to 64 AMD x86 cores—128 threads
  - 512 KB L2 cache per core—32 MB total L2 cache
  - 256 MB total L3 cache
  - Platform processor
    - Secure Boot
    - Crypto Coprocessor
- Memory:
  - Eight channel DDR4 with ECC up to 3200 MT/s
  - RDIMM and LRDIMM
  - One DIMM per channel
  - Memory capacity 128 GB per channel
- Integrated I/O:
  - Coherent links for 2-socket configurations
  - Links can be reconfigured as 64 lanes of PCIe in one-socket configuration.
  - Up to 128 lanes of PCI Express Gen 4
- 16 lanes switchable with SATA
- Server Controller Hub—USB, UART, SPI, LPC, and I2C

The following tables list the processor configurations available for the PowerEdge C6525:

Table 3. Single socket configuration

Configuration	Single processor
Processor	1 x 2nd Generation and 3rd Generation AMD EPYC processors per node—support for up to 1 x 225 W processors.
Memory	DDR4: Up to 8 x RDIMMs, LRDIMMs
Disk drives	- Front disk drives options: 2.5-inch hard drive backplane

Table 3. Single socket configuration (continued)

Configuration	Single processor
	○ 3.5-inch hard drive backplane ○ 2.5-inch NVMe hard drive backplane (Supports up to PCIe Gen3 speed) ● Internal disk drive options: ○ Micro SD slot—riser 1A support only, M.2 boot.
Storage controllers	● Hardware RAID: PERC 10.5 port for H745, H345, HBA345, and HBA355i ● Chipset SATA or software RAID is supported.
PCIe SSD	Supported

Table 4. Dual socket configuration

Configuration	Dual processor
Processor	2 x 2nd Generation and 3rd Generation AMD EPYC processors—support for up to 2 x 280W processors.
Memory	DDR4: Up to 16 x RDIMMs, LRDIMMs
Disk drives	● Front disk drives options: ○ 2.5-inch hard drive backplane ○ 3.5-inch hard drive backplane ○ 2.5-inch NVMe hard drive backplane ● Internal disk drive option: ○ Micro SD slot—riser 1A support only, M.2 boot.
Storage controllers	● Hardware RAID: PERC 10.5 port for H745, H345, HBA345, and HBA355i ● Chipset SATA or software RAID is supported.
PCIe SSD	Supported

Supported processors

Table 5. Supported Processors for C6525

Processor model	Speed (GHz)	Cache (MB)	TDP(W)	Stepping	Cores	Threads	Max Memory Speed(MT/s)
7773X	3.50	768	280	B2	64	128	3200
7573X	3.60	768	280	B2	32	64	3200
7373X	3.80	768	240	B2	16	32	3200
7713P	2.0	256	225	B1	64	128	3200
7513	2.6	128	200	B1	32	64	3200
7543P	2.8	256	225	B1	32	64	3200
7443	2.75	128	200	B1	24	48	3200
7443P	2.75	128	200	B1	24	48	3200
74F3	3.2	256	240	B1	24	48	3200
7313P	3.0	128	155	B1	16	32	3200
7413	2.65	128	180	B1	24	48	3200
7313	3.0	128	155	B1	16	32	3200

Table 5. Supported Processors for C6525 (continued)

Processor model	Speed (GHz)	Cache (MB)	TDP(W)	Stepping	Cores	Threads	Max Memory Speed(MT/s)
7H12	2.6	256	280	B0	64	128	3200
7742	2.25	256	225	B0	64	128	3200
7702	2.0	256	200	B0	64	128	3200
7502	2.5	128	180	B0	32	64	3200
7402	2.8	128	180	B0	24	48	3200
7452	2.2	128	155	B0	32	64	3200
7302	3 .0	128	155	B0	16	32	3200
7262	3.2	128	155	B0	8	16	3200
7542	2.9	128	225	B0	32	64	3200
7352	2.3	128	155	B0	24	48	3200
7642	2.3	256	225	B0	48	96	3200
7643	2.3	256	225	B0	48	96	3200
7552	2.2	192	200	B0	48	96	3200
7282	2.8	64	120	B0	16	32	3200
7252	3.1	64	120	B0	8	16	3200
7272	2.9	64	120	B0	12	24	3200
72F3	3.7	256	180	B0	8	16	3200
7702P	2.0	256	200	B0	64	128	3200
7502P	2.5	128	180	B0	32	64	3200
7402P	2.8	128	180	B0	24	48	3200
7302P	3.0	128	155	B0	16	32	3200
7232P	3.1	32	120	B0	8	16	3200
7662	2.0	256	225	B0	64	128	3200
7663	2.0	256	240	B0	56	112	3200
7532	2.4	256	200	B0	32	64	3200
7F72	3.2	192	240	B0	24	48	3200
7F52	3.5	256	240	B0	16	32	3200
7F32	3.7	128	180	B0	8	16	3200
7713	2.0	256	225	B1	64	128	3200
7543	2.8	256	225	B1	32	64	3200
7763	2.45	256	280	B1	64	128	3200

Memory

The PowerEdge C6525 supports memory speeds of 3200 MT/s, 2933 MT/s, 2666 MT/s, 2400 MT/s, 2133 MT/s, and 1866 MT/s depending on the type of DIMM and the configuration. All memory on all processors and channels runs at the same speed and voltage. By default, this speed is the highest speed that is supported by the processor and the DIMMs. For example, both DIMMs and processors must be capable of running at 3200 MT/s for the memory to run at 3200 MT/s—specific processor and DIMM configuration required. The operating speed of the memory is also determined by the maximum speed that is supported by the processor, the speed settings in the BIOS, and the operating voltage of the system.

Topics:

- Supported memory
- Memory speed

Supported memory

The PowerEdge C6525 system supports DDR4 registered DIMMs (RDIMMs), load reduced DIMMs (LRDIMMs) and 3DS load reduced DIMMs (3DS LRDIMMs). System memory holds the instructions that are executed by the processor. The table below lists the supported DIMMs for the PowerEdge C6525:

Table 6. Supported DIMMs

DIMM speed (MHz)	DIMM type	DIMM capacity (GB)	Ranks per DIMM	Data width	DIMM volts (V)
3200	RDIMM	8	1	x8	1.2
3200	RDIMM	16	2	x8	1.2
3200	RDIMM	32	2	x4	1.2
				x8	
3200	RDIMM	64	2	x4	1.2
2666	LRDIMM	128	8	x4	1.2

ⓘ **NOTE:** The older 32 GB capacity RDIMM memory with x4 data width and 8Gb DRAM density cannot be mixed with the newer 32 GB capacity RDIMM memory with x8 data width and 16Gb DRAM density in the same AMD EPYC™ processor unit.

ⓘ **NOTE:** The older 128 GB capacity LRDIMM memory at 2666 MT/s speed cannot be mixed with the new 128 GB capacity LRDIMM memory at 3200 MT/s speed.

Memory speed

The PowerEdge C6525 supports memory speeds of 3200 MT/s, 2933 MT/s, 2667 MT/s, 2400 MT/s, 2133 MT/s, and 1866MT/s depending on the DIMM types installed and the configuration. All memory on all processors and channels runs at the same speed and voltage. By default, this speed is the highest speed that is supported by the processor and the DIMMs. For example, both DIMMs and processors must be capable of running at 3200 MT/s for the memory to run at 3200 MT/s—specific processor or DIMM configuration required. The operating speed of the memory is also determined by the maximum speed supported by the processor, the speed settings in the BIOS, and the operating voltage of the system.

Table 7. Memory configuration and performance details

DIMM type	DIMM ranking	Capacity (GB)	DIMM rated voltage, Speed	2nd Generation and 3rd Generation AMD EPYC processors
				1 DPC
RDIMM	1 R / 2 R	8 GB, 16 GB, 32 GB, 64 GB	DDR4 (1.2 V), 3200 MHz	D: 3200
LRDIMM	2S4R	128 GB	DDR4 (1.2 V), 2666 MHz	D: 2666

Storage

The PowerEdge C6525 supports multiple storage configurations for numerous type of workloads. The C6400 chassis supports the following configuration types:

- No hard drives in a no-backplane configuration.
- 24 x 2.5-inch direct backplane configuration with up to six SAS/SATA drives for each PowerEdge C6525 node.
- 24 x 2.5-inch NVMe backplane configuration with up to six drives for each PowerEdge C6525 node out of which 2 drives can be NVMe drives. Both the drives can support up to Gen3 speed.
- 12 x 3.5-inch direct backplane configuration with up to 3 SAS/SATA drives for each PowerEdge C6525 node.

Topics:

- Supported drives
- Storage controllers
- Optical drives

Supported drives

The following table lists the supported drives by the PowerEdge C6525:

Table 8. Supported hard drives

Form factor	Interface	Speed	Capacities
2.5-inch	SATA SSD	6 GB	240 GB, 480 GB, 960 GB, 1.92 TB, 3.84 TB, 7.68 TB
	SAS SSD	12 GB	400 GB, 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.6 TB, 15.36 TB
3.5-inch	SATA hard drive	6 GB	2 TB, 4 TB, 8 TB
	SAS hard drive	12 GB	2 TB, 4 TB, 8 TB

Storage controllers

The PowerEdge C6525 supports the onboard chipset SATA controller and a range of PERC storage controllers. The PERC H345, H745, and HBA345 are available in PCIe form factor.

Table 9. Supported storage controllers

Controllers	Models
Storage controllers	PERC H345, PERC H745, HBA345, HBA355i
Integrated storage controllers	S150

Optical drives

The PowerEdge C6400 chassis does not support optical drives. If needed, any external USB 3.0 compliant drive can be used, although no specific vendors have been qualified.

Networking and PCIe

The PowerEdge C6525 is installed with one Broadcom BCM54210S-Gigabit Ethernet controller as an independent Ethernet interface device.

The following table lists the supported OCP 3.0 network adapter cards for the PowerEdge C6525:

Table 10. Supported PCIe cards

Form factor	Type	Speed	Vendor
PCIe LP	NIC	1 GbE	Intel
PCIe LP	NIC	10 GbE	Intel
PCIe LP	NIC	25 GbE	Intel
PCIe LP	NIC	100 GbE	Intel
PCIe LP	NIC	1 GbE	Broadcom
PCIe LP	NIC	25 GbE	Broadcom
PCIe LP	NIC	10 GbE	Broadcom
PCIe LP	NIC	10 GBASE-T	Broadcom
PCIe LP	NIC	10 GbE	QLogic
PCIe LP	NIC	25 GbE	QLogic
PCIe LP	NIC	HDR100 VPI	Mellanox
PCIe LP	NIC	25 GbE	Mellanox
PCIe LP	NIC	25 GbE	SolarFare

The following table lists the supported OCP 3.0 network adapter cards for the PowerEdge C6525:

Table 11. Supported OCP 3.0 NIC cards

Form factor	Type	Speed	Vendor
SFF	NIC	10 GbE	Broadcom
SFF	NIC	1 GbE	Broadcom
SFF	NIC	10 GbE	Broadcom
SFF	NIC	25 GbE	Broadcom
SFF	NIC	25 GbE	Broadcom
SFF	NIC	10 GbE	QLogic
SFF	NIC	10 GbE	QLogic
SFF	NIC	25 GbE	QLogic
SFF	NIC	10 GbE	QLogic
SFF	NIC	10 GbE	QLogic
SFF	NIC	10 GbE	Mellanox
SFF	NIC	25 GbE	Mellanox
SFF	NIC	10 GbE	Intel

Table 11. Supported OCP 3.0 NIC cards (continued)

Form factor	Type	Speed	Vendor
SFF	NIC	1 GbE	Intel
SFF	NIC	10 GbE	Intel
SFF	NIC	25 GbE	Intel

Direct contact liquid cooling sled

Thermal management helps deliver high performance cooling to components, while maintaining the lowest fan speeds possible. This is done across a wide range of ambient temperatures ranging from 20°C to 35°C—68°F to 95°F. For extended ambient temperature ranges, see the Environmental Specifications section. The benefits are lower fan power consumption—lower server system power and data center power consumption, and greater acoustical versatility. The platform is quiet enough to be used in an office environment with the standard and minimum configurations.

Direct contact liquid cooling offers multiple advantages over air cooling:

- Improves overall data center Power Utilization Efficiency.
- Improves power efficiency of servers and eliminates need for costly cooling infrastructure such as chillers and CRAC units, thus lowering overall cost and improving TCO.
- Improves life of the IT infrastructure.

Liquid cooled sled

The PowerEdge C6525 sled can be configured from the factory to use liquid cooling instead of air cooling. Processor Thermal Configuration Option can be configured in the ordering tools to select Direct Liquid Cooling. CPU cold plates are installed in the factory and the system is shipped with cold plates that are installed in each sled with each sled placed in the chassis. Dell EMC provides support and warranty for cold plates.

The CoolIT Systems cold plates, which are designed for use with AMD processors, are passive CPU cooling solutions that are managed by centralized pumping architectures. These passive cold plate assemblies replace heat sinks and are designed to accommodate the PowerEdge C6525 compute sleds. For PowerEdge C6525 DCLC solution, the cold plates are sold and supported by Dell EMC.

Rack manifolds

Coolant tubes come out of each sled and connects to a manifold unit. Made with reliable stainless steel and 100% nondrip quick disconnects, rack manifolds can be arranged horizontally or vertically for a manual connection at the front or back of the rack. For the PowerEdge C6525 DCLC solution, the manifolds are sold and supported by CoolIT or authorized service provider.

CoolIT Systems reliable stainless steel manifolds provide dry-break and quick disconnect technology in a horizontal or a vertical chassis. Key benefits include:

- Easy installation
- Simple connection and disconnection
- Servers are hot swappable
- 100% dry-break quick disconnects
- Flexible in size and orientation
- Color coded for hot—red and cold—blue

Rack manifolds for liquid cooled solutions can be ordered over S&P. Usually a custom SKU is offered by CoolIT to support the customer requirements.

Heat exchangers

While server modules and manifold modules are installed with each system and are local to the rack, the appropriate heat rejection method may vary. CoolIT Systems Rack DCLC product line offers various heat exchange modules depending on load requirements and availability of liquid facilities, including CHx—liquid to liquid, AHx—liquid to air and custom options.

For the PowerEdge C6525 DCLC solution, the heat exchangers are sold and supported by CoolIT or authorized service provider. CoolIT has multiple options for heat exchangers that can be ordered over S&P.

- CHx20—Top of the rack, air to liquid exchanger. Supports about 20 kW of cooling capacity per rack—not validated by Dell EMC. Custom solutions support with CoolIT.
- CHx40—2U rackmount solution which manages a single rack. Supports 40 kW cooling capacity per rack.
- CHx80—4U rackmount solution which manages a single rack. Supports up to 100 kW cooling capacity per rack.
- CHx650—Stand-alone solution which manages a network of rack servers. Supports 40 kW+ cooling capacity.

Besides providing cooling solutions for multiple racks, the CHx650 also minimizes cooling liquids required, hence simplifying overall data center design and lowering data center cost.

CoolIT services and support

CoolIT offers consulting, installation, and support services for the DCLC solutions. Support, warranty, and installation service will directly be quoted by CoolIT on manifolds and heat exchangers. Contact CoolIT to get quotes on their services and warranty. CoolIT sales support email address is dell_salessupport@coolitsystems.com.

Power supplies, thermal, and acoustics

Topics:

*   Power supplies
*   Thermal
*   Acoustics

Power supplies

Energy Smart power supplies provide features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. It also provide enhanced power consumption reduction technologies, such as high efficiency power conversion and advanced thermal management techniques, and embedded power management features, including high accuracy power monitoring.

The following table lists the supported power supplies for the PowerEdge C6525:

Table 12. Supported power supplies

Wattage	Frequency	Voltage	Class
1600 W	50/60	100~240	Platinum
1600 W HLAC	50/60	200~240	Titanium
2000 W	50/60	100~240	Platinum
2400 W	50/60	100~240	Platinum
2600 W	50/60	100~240	Platinum
2600 W HLAC	50/60	200~240	Titanium

The following table lists the highline and lowline ratings of the power supplies:

Table 13. Highline and lowline ratings of the power supplies

Feature	1600 W AC	1600 W HLAC	2000 W Mix Mode	2000 W Mix Mode	2400 W AC	2600 W AC	2600 W HLAC
Peak Power —highline	264 V— 1600 W		264 V— 2000 W	288 V— 2000 W	264 V— 2400 W	264 V—2600 W	
Highline	180 V—1600 W		180 V— 2000 W	180 V— 2000 W	180 V— 2400 W	198 V—2600 W 192 V - N/A	
Peak Power —lowline	169 V—800 W		169 V—1000 W	NA	168 V—1400 W	140 V—1400 W	
Lowline	90 V—800 W		90 V—1000 W	NA	90 V—1400 W	90 V—1400 W	
Highline 240 VDC	NA		NA	Support	NA	240 V—N/A	

Thermal

(i) **NOTE:**
1. Not available: Indicates that the configuration is not offered by Dell EMC.
2. Not supported: Indicates that the configuration is not thermally supported.

(i) **NOTE:** All components including the DIMMs, communication cards, M.2 SATA, and PERC cards can be supported with sufficient thermal margin if the ambient temperature is equal to or below the maximum continuous operating temperature listed in these tables.

Table 14. Standard operating temperature specifications

Standard operating temperature	Allowable Operation
Temperature Ranges (For Altitude ≤900 meters or 2953 feet)	5 to 40°C (41 to 104°F) with no direct sunlight on the platform
	Excursion Limited Operation
	5 to 35°C (41 to 95°F) Continuous Operation 35 to 40°C (95 to 104°F) 10% Annual Runtime
Humidity Percent Ranges	8%RH with -12°C minimum dew point to 85%RH with 24°C (75.2°F) maximum dew point
Operational Altitude De-Rating	Maximum temperature is reduced by 1°C/175 meters (1.8°F/574 feet) above 900 meters (2,953 feet)

(i) **NOTE:** Some configurations require a lower ambient temperature. For more information, see the following tables.

The following tables list key restrictions on ambient temperature based on which CPU is configured in the system. All inlet temperatures that are provided below are in continuous degrees centigrade.

Table 15. Maximum continuous operating temperature for dual processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported	Not supported	Not supported
7513	200	32	20	20	25	25	30
7443	200	24	20	20	25	25	30
7413	180	24	20	20	25	25	30 (-2)
7313	155	16	25	25	25	25	30
7662	225	64	Not supported	Not supported	Not supported	Not supported	20
7713	225	64	Not supported	Not supported	Not supported	Not supported	20
7543	225	32	Not supported	Not supported	Not supported	Not supported	20
7763	280	64	Not supported	Not supported	Not supported	Not supported	Not supported

Table 15. Maximum continuous operating temperature for dual processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7H12	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7742	225	64	Not supported	Not supported	Not supported	Not supported	20
7642	225	48	Not supported	Not supported	Not supported	Not supported	20
7542	225	32	Not supported	Not supported	Not supported	Not supported	20
7702	200	64	20	20	25	25	30
7552	200	48	20	20	25	25	30
7532	200	32	20	20	25	25	30
7502	180	32	20	20	25	25	30
7402	180	24	20	20	25	25	30
7452	155	32	25	25	25	25	30
7352	155	24	25	25	25	25	30
7302	155	16	25	25	25	25	30
7262	155	8	25	25	25	25	30
7282	120	16	30	30	30	35	35
7272	120	12	30	30	30	35	35
7252	120	8	30	30	30	35	35
7F72	240	24	Not supported	Not supported	Not supported	Not supported	20
7F52	240	16	Not supported	Not supported	Not supported	Not supported	Not supported
7F32	180	8	20	20	25	25	30

(i) **NOTE:** Thermal corner case is when the system is working at CPU intensive workload. From the above table, (-2) represents the thermal impact at thermal corner case.

(i) **NOTE:** H745 is Not supported for CPU TDP ≥ 180 Watts.

(i) **NOTE:**
- 85C Optics Transceiver is required for OCP cards.
- Additional thermal restrictions are required for 128GB LRDIMM and GPU configuration.

Table 16. Maximum continuous operating temperature for dual processor with 3.5-inch Direct drive configuration - Air cooled

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7773X	280	64	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported
7513	200	32	Not supported	Not supported	Not supported

Table 16. Maximum continuous operating temperature for dual processor with 3.5-inch Direct drive configuration - Air cooled (continued)

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7443	200	24	Not supported	Not supported	Not supported
7413	180	24	Not supported	Not supported	Not supported
7313	155	16	Not supported	Not supported	Not supported
7662	225	64	Not supported	Not supported	Not supported
7713	225	64	Not supported	Not supported	Not supported
7543	225	32	Not supported	Not supported	Not supported
7763	280	64	Not supported	Not supported	Not supported
7H12	280	64	Not supported	Not supported	Not supported
7742	225	64	Not supported	Not supported	Not supported
7642	225	48	Not supported	Not supported	Not supported
7542	225	32	Not supported	Not supported	Not supported
7702	200	64	Not supported	Not supported	Not supported
7552	200	48	Not supported	Not supported	Not supported
7532	200	32	Not supported	Not supported	Not supported
7502	180	32	Not supported	Not supported	Not supported
7402	180	24	Not supported	Not supported	Not supported
7452	155	32	Not supported	Not supported	Not supported
7352	155	24	Not supported	Not supported	Not supported
7302	155	16	Not supported	Not supported	Not supported
7262	155	8	Not supported	Not supported	Not supported
7282	120	16	20	20	20
7272	120	12	20	20	20
7252	120	8	20	20	20
7F72	240	24	Not supported	Not supported	Not supported
7F52	240	16	Not supported	Not supported	Not supported
7F32	180	8	Not supported	Not supported	Not supported

ⓘ **NOTE:**
- 85C Optics Transceiver is required for OCP cards
- Additional thermal restrictions are required for 128GB LRDIMM and GPU configuration

Table 17. Maximum continuous operating temperature for dual processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Liquid cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	N/A	N/A	N/A	N/A	N/A
7573X	280	32	N/A	N/A	N/A	N/A	N/A
7473X	280	24	N/A	N/A	N/A	N/A	N/A
7373X	280	16	N/A	N/A	N/A	N/A	N/A
7513	200	32	35	35	35	35	35

Table 17. Maximum continuous operating temperature for dual processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Liquid cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7443	200	24	35	35	35	35	35
7413	180	24	35	35	35	35	35
7313	155	16	35	35	35	35	35
7662	225	64	35	35	35	35	35
7713	225	64	35	35	35	35	35
7543	225	32	35	35	35	35	35
7763	280	64	35	35	35	35	35
7H12	280	64	35	35	35	35	35
7742	225	64	35	35	35	35	35
7642	225	48	35	35	35	35	35
7542	225	32	35	35	35	35	35
7702	200	64	35	35	35	35	35
7552	200	48	35	35	35	35	35
7532	200	32	35	35	35	35	35
7502	180	32	35	35	35	35	35
7402	180	24	35	35	35	35	35
7452	155	32	35	35	35	35	35
7352	155	24	35	35	35	35	35
7302	155	16	35	35	35	35	35
7262	155	8	35	35	35	35	35
7282	120	16	35	35	35	35	35
7272	120	12	35	35	35	35	35
7252	120	8	35	35	35	35	35
7F72	240	24	35	35	35	35	35
7F52	240	16	35	35	35	35	35
7F32	180	8	35	35	35	35	35

Table 18. Maximum continuous operating temperature for dual processor with 3.5-inch Direct drive configuration - Liquid cooled

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7773X	280	64	78.1	N/A	N/A
7573X	280	32	81.0	N/A	N/A
7473X	280	24	88.0	N/A	N/A
7373X	280	16	89.0	N/A	N/A
7513	200	32	35	35	35
7443	200	24	35	35	35
7413	180	24	35	35	35
7313	155	16	35	35	35

Table 18. Maximum continuous operating temperature for dual processor with 3.5-inch Direct drive configuration - Liquid cooled (continued)

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7662	225	64	35	35	35
7713	225	64	35	35	35
7543	225	32	35	35	35
7763	280	64	35	35	35
7H12	280	64	35	35	35
7742	225	64	35	35	35
7642	225	48	35	35	35
7542	225	32	35	35	35
7702	200	64	35	35	35
7552	200	48	35	35	35
7532	200	32	35	35	35
7502	180	32	35	35	35
7402	180	24	35	35	35
7452	155	32	35	35	35
7352	155	24	35	35	35
7302	155	16	35	35	35
7262	155	8	35	35	35
7282	120	16	35	35	35
7272	120	12	35	35	35
7252	120	8	35	35	35
7F72	240	24	35	35	35
7F52	240	16	35	35	35
7F32	180	8	35	35	35

(i) **NOTE:** Additional thermal restrictions are required for 128GB LRDIMM and GPU configuration

(i) **NOTE:** Additional thermal restrictions are required for 128GB LRDIMM and GPU configuration

Table 19. Maximum continuous operating temperature for single processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported	Not supported	Not supported
7713P	225	64	30	30	30	35	35

Table 19. Maximum continuous operating temperature for single processor with 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7513	200	32	35	35	35	35	35
7543P	225	32	30	30	30	35	35
7443	200	24	35	35	35	35	35
7443P	200	24	35	35	35	35	35
7313P	155	16	35	35	35	35	35
7413	180	24	35	35	35	35	35
7313	155	16	35	35	35	35	35
7662	225	64	30	30	30	35	35
7713	225	64	30	30	30	35	35
7543	225	32	30	30	30	35	35
7763	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7H12	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7742	225	64	30	30	30	35	35
7642	225	48	30	30	30	35	35
7542	225	32	30	30	30	35	35
7702	200	64	35	35	35	35	35
7702P	200	64	35	35	35	35	35
7552	200	48	35	35	35	35	35
7532	200	32	35	35	35	35	35
7502	180	32	35	35	35	35	35
7502P	180	32	35	35	35	35	35
7402	180	24	35	35	35	35	35
7402P	180	24	35	35	35	35	35
7452	155	32	35	35	35	35	35
7352	155	24	35	35	35	35	35
7302	155	16	35	35	35	35	35
7302P	155	16	35	35	35	35	35
7262	155	8	35	35	35	35	35
7282	120	16	35	35	35	35	35
7272	120	12	35	35	35	35	35
7252	120	8	35	35	35	35	35
7232P	120	12	35	35	35	35	35
7F72	240	24	30	30	30	35	35
7F52	240	16	30	30	30	35	35
7F32	180	8	35	35	35	35	35

(i) **NOTE:** Additional thermal restrictions are required for 128GB LRDIMM and GPU configuration

Table 20. Maximum continuous operating temperature for single processor with 3.5-inch Direct drive configuration - Air cooled

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7773X	280	64	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported
7713P	225	64	20	25	25
7513	200	32	25	35	35
7543P	225	32	20	25	25
7443	200	24	25	35	35
7443P	200	24	25	35	35
7313P	155	16	30	35	35
7413	180	24	25	35	35
7313	155	16	30	35	35
7662	225	64	20	25	25
7713	225	64	20	25	25
7543	225	32	20	25	25
7763	280	64	Not supported	Not supported	Not supported
7H12	280	64	Not supported	Not supported	Not supported
7742	225	64	20	25	25
7642	225	48	20	25	25
7542	225	32	20	25	25
7702	200	64	25	35	35
7702P	200	64	25	35	35
7552	200	48	25	35	35
7532	200	32	25	35	35
7502	180	32	25	35	35
7502P	180	32	25	35	35
7402	180	24	25	35	35
7402P	180	24	25	35	35
7452	155	32	30	35	35
7352	155	24	30	35	35
7302	155	16	30	35	35
7302P	155	16	30	35	35
7262	155	8	30	35	35
7282	120	16	35	35	35
7272	120	12	35	35	35

CPU	TDP	Cores	12 x drives	8 x drives	4 x drives
7252	120	8	35	35	35
7232P	120	12	35	35	35
7F72	240	24	20	25	25
7F52	240	16	20	25	25
7F32	180	8	25	35	35

Other thermal restrictions for 280W CPU

- 128GB LRDIMM is Not supported.
- Limits 280W CPU enabled with GPU.
- Does not support PSU redundant mode(1+1).
- Supports PSU Non-Redundant mode (2+0) configuration mode.

T4 GPU card restrictions

Table 21. Maximum continuous operating temperature for dual processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	Not supported				Not supported
7573X	280	32	Not supported				Not supported
7473X	280	24	Not supported				Not supported
7373X	280	16	Not supported				Not supported
7513	200	32	Not supported				25
7443	200	24	Not supported				25
7413	180	24	Not supported				25
7313	155	16	Not supported				25
7662	225	64	Not supported				
7713	225	64	Not supported				
7543	225	32	Not supported				
7763	280	64	Not supported				
7H12	280	64	Not supported				
7F72	240	24	Not supported				
7F52	240	16	Not supported				
7742	225	64	Not supported				
7642	225	48					
7542	225	32					
7702	200	64	Not supported				25
7552	200	48					25
7532	200	32					25

Table 21. Maximum continuous operating temperature for dual processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7502	180	32					25
7402	180	24					25
7F32	180	8					25
7452	155	32					25
7352	155	24		Not supported			25
7302	155	16					25
7262	155	8					25
7282	120	16		Not supported	25	25	30
7272	120	12			25	25	30
7252	120	8			25	25	30

ⓘ **NOTE:**
- 3.5" chassis (Air cooled) is not able to support GPU card.
- 128GB LRDIMM is Not supported.
- 1x GPU card + OCP card is supported. Slot #2 is first priority for T4 GPU.
- 1x GPU card + PCIe card is supported. Slot #2 is first priority for T4 GPU.

Table 22. Maximum continuous operating temperature for dual processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Liquid cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	N/A	N/A	N/A	N/A	N/A
7573X	280	32	N/A	N/A	N/A	N/A	N/A
7473X	280	24	N/A	N/A	N/A	N/A	N/A
7373X	280	16	N/A	N/A	N/A	N/A	N/A
7513	200	32	30	30	30	30	30
7443	200	24	30	30	30	30	30
7413	180	24	30	30	30	30	30
7313	155	16	30	30	30	30	30
7662	225	64	30	30	30	30	30
7713	225	64	30	30	30	30	30
7543	225	32	30	30	30	30	30
7763	280	64	30	30	30	30	30
7H12	280	64	30	30	30	30	30
7F72	240	24	30	30	30	30	30
7F52	240	16	30	30	30	30	30
7742	225	64	30	30	30	30	30
7642	225	48	30	30	30	30	30
7542	225	32	30	30	30	30	30
7702	200	64	30	30	30	30	30

Table 22. Maximum continuous operating temperature for dual processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Liquid cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7532	200	32	30	30	30	30	30
7502	180	32	30	30	30	30	30
7402	180	24	30	30	30	30	30
7F32	180	8	30	30	30	30	30
7452	155	32	30	30	30	30	30
7352	155	24	30	30	30	30	30
7302	155	16	30	30	30	30	30
7262	155	8	30	30	30	30	30
7282	120	16	30	30	30	30	30
7272	120	12	30	30	30	30	30
7252	120	8	30	30	30	30	30

ⓘ **NOTE:**

1. 128GB LRDIMM is not supported.
2. 3.5" chassis is not supported

Table 23. Maximum continuous operating temperature for single processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported	Not supported	Not supported
7713P	225	64	20	20	20	20	25
7513	200	32	20	25	25	25	30
7543P	225	32	20	20	20	20	25
7443	200	24	20	25	25	25	30
7443P	200	24	20	25	25	25	30
7313P	155	16	20	25	25	25	35
7413	180	24	20	25	25	25	30
7313	155	16	20	25	25	25	35
7662	225	64	20	20	20	20	25
7713	225	64	20	20	20	20	25
7543	225	32	20	20	20	20	25
7763	280	64	Not supported	Not supported	Not supported	Not supported	Not supported

Table 23. Maximum continuous operating temperature for single processor with 1x T4 GPU card for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7H12	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7F72	240	24	20	20	20	20	25
7F52	240	16	20	20	20	20	25
7742	225	64	20	20	20	20	25
7642	225	48	20	20	20	20	25
7542	225	32	20	20	20	20	25
7702	200	64	20	25	25	25	30
7702P	200	64	20	25	25	25	30
7532	200	32	20	25	25	25	30
7502	180	32	20	25	25	25	30
7502P	180	32	20	25	25	25	30
7402	180	24	20	25	25	25	30
7402P	180	24	20	25	25	25	30
7452	155	32	20	25	25	25	35
7352	155	24	20	25	25	25	35
7302	155	16	20	25	25	25	35
7302P	155	16	20	25	25	25	35
7262	155	8	20	25	25	25	35
7282	120	16	25	25	25	30	35
7272	120	12	25	25	25	30	35
7252	120	8	25	25	25	30	35
7232P	120	12	25	25	25	30	35

ⓘ **NOTE:**
- 3.5" chassis (Air cooled) is not able to support GPU card.
- 128GB LRDIMM is Not supported.
- OCP card is supported.

Table 24. Maximum continuous operating temperature for dual processor with 128GB LRDIMM for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7573X	280	32	Not supported	Not supported	Not supported	Not supported	Not supported
7473X	280	24	Not supported	Not supported	Not supported	Not supported	Not supported
7373X	280	16	Not supported	Not supported	Not supported	Not supported	Not supported
7513	200	32	20	20	25	25	25

Table 24. Maximum continuous operating temperature for dual processor with 128GB LRDIMM for 2.5-inch direct / 2.5-inch NVMe drive configuration - Air cooled (continued)

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7443	200	24	20	20	25	25	25
7413	180	24	20	20	25	25	25
7313	155	16	20	20	25	25	30
7662	225	64	Not supported	Not supported	Not supported	Not supported	20
7713	225	64	Not supported	Not supported	Not supported	Not supported	20
7543	225	32	Not supported	Not supported	Not supported	Not supported	20
7763	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7H12	280	64	Not supported	Not supported	Not supported	Not supported	Not supported
7742	225	64	Not supported	Not supported	Not supported	Not supported	20
7642	225	48	Not supported	Not supported	Not supported	Not supported	20
7542	225	32	Not supported	Not supported	Not supported	Not supported	20
7702	200	64	20	20	25	25	25
7532	200	32	20	20	25	25	25
7502	180	32	20	20	25	25	25
7402	180	24	20	20	25	25	25
7452	155	32	20	20	25	25	30
7352	155	24	20	20	25	25	30
7302	155	16	20	20	25	25	30
7262	155	8	20	20	25	25	30
7F72	240	24	Not supported	Not supported	Not supported	Not supported	20
7F52	240	16	Not supported	Not supported	Not supported	Not supported	Not supported
7282	120	16	20	20	25	30	30
7272	120	12	20	20	25	30	30
7252	120	8	20	20	25	30	30

ⓘ **NOTE:** H745 is Not supported for CPU TDP ≥ 180 Watts.

ⓘ **NOTE:**
- 128GB LRDIMM is Not supported on 3.5" chassis.
- 128GB LRDIMM is Not supported on liquid cooled chassis.
- T4 GPU card is Not supported with 128GB LRDIMM.

Table 25. Maximum continuous operating temperature for dual processor with 128GB LRDIMM for 2.5-inch direct / 2.5-inch NVMe drive configuration - Liquid cooled

CPU	TDP	Cores	24 x drives	16 x drives	8 x drives	4 x drives	No BP
7773X	280	64	N/A	N/A	N/A	N/A	N/A
7573X	280	32	N/A	N/A	N/A	N/A	N/A
7473X	280	24	N/A	N/A	N/A	N/A	N/A
7373X	280	16	N/A	N/A	N/A	N/A	N/A
7513	200	32	30	30	30	30	30
7443	200	24	30	30	30	30	30
7413	180	24	30	30	30	30	30
7313	155	16	30	30	30	30	30
7662	225	64	30	30	30	30	30
7713	225	64	30	30	30	30	30
7543	225	32	30	30	30	30	30
7763	280	64	30	30	30	30	30
7H12	280	64	30	30	30	30	30
7F72	240	24	30	30	30	30	30
7F52	240	16	30	30	30	30	30
7742	225	64	30	30	30	30	30
7642	225	48	30	30	30	30	30
7542	225	32	30	30	30	30	30
7702	200	64	30	30	30	30	30
7532	200	32	30	30	30	30	30
7502	180	32	30	30	30	30	30
7402	180	24	30	30	30	30	30
7F32	180	8	30	30	30	30	30
7452	155	32	30	30	30	30	30
7352	155	24	30	30	30	30	30
7302	155	16	30	30	30	30	30
7262	155	8	30	30	30	30	30
7282	120	16	30	30	30	30	30
7272	120	12	30	30	30	30	30
7252	120	8	30	30	30	30	30

(i) **NOTE:**
- T4 GPU card is not supported with 128GB LRDIMM.
- 128GB LRDIMM is not supported on 3.5" chassis.

Acoustics

The PowerEdge C6525 is required to adhere to the acoustical category 5 through category 6. Hardware configurations that correspond to the categories will be specified in C6400 chassis. The following documents outline Dell EMC acoustical engineering testing procedures and general acoustical requirements:

- Dell enterprise acoustical specifications and test procedures, AC0142—Rev.A06, AC0158—Rev.A02, & AC0159—Rev.A01
- Configuration Specification Document—DELL P/N: ENG0019829
- Fan Part Specifications—SPEC, FAN, THRM, ELEC, ACTC, C6400, 60x56mm, Rev.X03
- PTAVS—PSU Thermal Acoustical and Vibration Specification for the PSU
- 2N563—Rev.A06, fan qualification process
- M7506—Rev.A01 fan stand-alone test procedure
- P8832—Rev.A03 PSU stand-alone test procedure

Category 5 unattended data center—A data center with tens to thousands of enterprise products deployed together with its own heating and cooling systems. The data center engineers enter only to deploy, service, or decommission equipments. Hearing protection or hearing monitoring programs may be expected—per government or company guidelines. Examples products for this category include monolithic rack products.

Category 6 data center modular/modular enclosure—Applies to blade servers or blade enclosure. One underlying assumption is that blade enclosures are deployed in unattended data centers—see description in Category 5. To determine the type of acoustical category for a more restrictive acoustical environment, specific configurations, capabilities, and methods of shipment must be requested to ensure the category complies to the environment.

Supported Operating systems

The following is the list of supported operating systems for the PowerEdge C6525:

- Canonical Ubuntu Server LTS
- Microsoft Windows Server with Hyper-V
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi

For more information, see www.dell.com/ossupport.

Dell EMC OpenManage systems management

Whether your IT environment consists of a few servers or a few thousand servers, Dell EMC OpenManage systems management solutions provide comprehensive management features for evolving IT environments. OpenManage is based on open standards, and provides both agent-based and agent-free server life-cycle management functionality for Dell EMC PowerEdge servers. OpenManage solutions help you automate and streamline essential hardware management tasks.

Start with a firm foundation for efficient hardware management using OpenManage tools, utilities, and management consoles. OpenManage systems management solutions consist of a combination of embedded management features and software products that help you automate and simplify the entire server life cycle: deploy, update, monitor, and maintain. OpenManage solutions are innovatively designed for simplicity and ease of use to help you reduce complexity, save time, achieve efficiency, control costs, and empower productivity. OpenManage centers on efficient management of server life cycle.
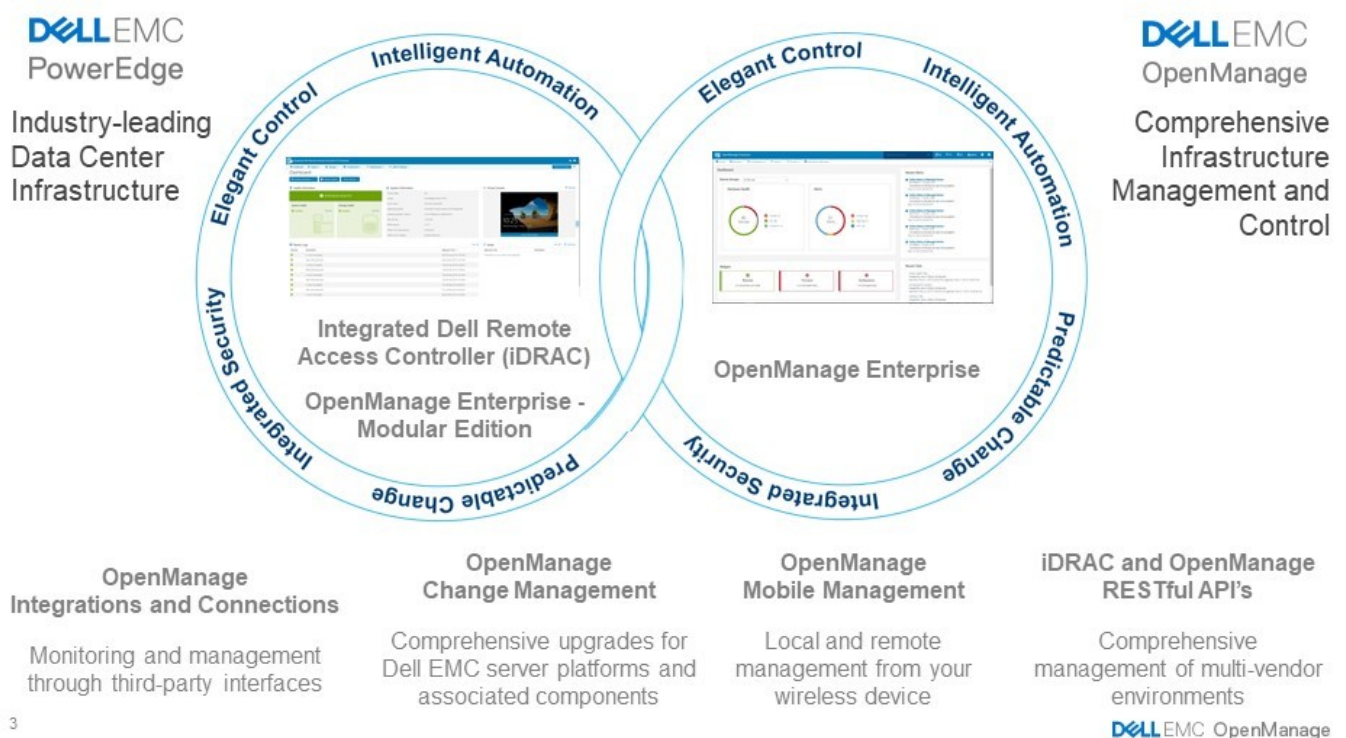
Figure 5. Server lifecycle management operations

Topics:

- iDRAC9 with Lifecycle Controller
- Agent-free management
- Agent-based management
- Dell EMC consoles
- Dell EMC OpenManage systems management tools, utilities, and protocols
- Integration with third-party consoles
- OpenManage connections with third-party consoles

iDRAC9 with Lifecycle Controller

The Integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller, the embedded intelligence of every Dell EMC PowerEdge new generation server, helps you manage Dell EMC servers agent-free or with a systems management agent, within physical, virtual, local, and remote environments. iDRAC9 alerts you of server issues, enables remote server management, and reduces the need to physically go to the server. iDRAC9 with Lifecycle Controller is part of Dell EMC comprehensive OpenManage portfolio and works as a stand-alone or with other components such as OpenManage Essentials, OpenManage Mobile, OpenManage Power Center, Chassis Management Controller, and OpenManage Integrations for Microsoft, VMware, and BMC consoles to simplify, automate, and streamline IT operations.

Dell EMC BMC and iDRAC9 feature comparison

iDRAC9 Enterprise is available for the system. Dell EMC also offers BMC. A detailed feature comparison for Dell EMC BMC and iDRAC9 Enterprise is shown in the following table.

Table 26. Feature comparison for Dell EMC BMC and iDRAC9 Enterprise

Feature	Dell EMC BMC	iDRAC9 Enterprise
Interfaces/Standards		
IPMI 2.0	Yes	Yes
DCMI 1.5	Yes	Yes
Web-based UI	Yes	Yes
Racadm command line (local and remote)	Yes	Yes
SMASH-CLP (SSH-only)	Yes	Yes
Telnet	Yes	Yes
SSH	Yes	Yes
WSMAN	Yes	Yes
RedFish API	Yes	Yes
Network Time Protocol	Yes	Yes
Connectivity		
Shared NIC	Yes	Yes
Dedicated NIC (with Ports card)	Yes	Yes
VLAN tagging	Yes	Yes
IPv4	Yes	Yes
IPv6	Yes	Yes
DHCP	Yes	Yes
Dynamic DNS	Yes	Yes
Operating system pass-through	Yes	Yes
Security		
Role-based authority	Yes	Yes
Local users	Yes	Yes
SSL encryption	Yes	Yes
IP blocking	Yes	Yes
Directory services (AD and LDAP)	No	Yes
Two-factor authentication	No	Yes

Feature	Dell EMC BMC	iDRAC9 Enterprise
Single sign-on	No	Yes
PK authentication	Yes	Yes
New generation: Configuration Lockdown	No	Yes
New generation: System Erase of internal storage devices	Yes	Yes
Remote presence		
Power control	Yes	Yes
Boot control	Yes	Yes
Serial-over-LAN	Yes	Yes
Virtual media	Yes	Yes
Virtual folders	No	Yes
Remote file share	No	Yes
Virtual console	Yes for single user	Yes
VNC connection to operating system	No	Yes
Quality/bandwidth control	No	Yes
Virtual console collaboration (6 users)	No	Yes
Virtual console chat	No	Yes
Power and thermal		
Real-time power meter	Yes	Yes
Power thresholds and alerts	Yes	Yes
Real-time power graphing	Yes	Yes
Historical power counters	Yes	Yes
Power capping	Yes	Yes
Power Center integration	Yes	Yes
Temperature monitoring	Yes	Yes
Temperature graphing	Yes	Yes
Health monitoring		
Full agent-free monitoring	Yes	Yes
Predictive failure monitoring	Yes	Yes
SNMPv1, v2, and v3 traps and gets	Yes	Yes
Email Alerting	Yes	Yes
Configurable thresholds	Yes	Yes
Fan monitoring	Yes	Yes
Power supply monitoring	Yes	Yes
Memory monitoring	Yes	Yes
CPU monitoring	Yes	Yes
RAID monitoring for PERC	Yes	Yes

Table 26. Feature comparison for Dell EMC BMC and iDRAC9 Enterprise (continued)

Feature	Dell EMC BMC	iDRAC9 Enterprise
NIC monitoring	Yes	Yes
HD monitoring including JBOD enclosure	Yes	Yes
Out of band performance monitoring	No	Yes
Update		
Remote agent-free update	Yes	Yes
Embedded update tools	No	Yes
Sync with repository for scheduled updates	No	Yes
Autoupdate	No	Yes
Deployment and configuration		
Embedded operating deployment tools	No	Yes
Embedded configuration tools	No	Yes
AutoDiscovery	No	Yes
Remote operating system deployment for vMedia	No	Yes
Embedded driver pack	Yes	Yes
Full configuration inventory	Yes	Yes
Inventory export	Yes	Yes
Remote configuration	Yes	Yes
Zero touch configuration	No	Yes
System retire and repurpose	Yes	Yes
New generation: iDRAC Connection View	No	Yes
New generation: BIOS configuration page in iDRAC UI	Yes	Yes
Diagnostics, service, and logging		
Embedded diagnostic tools	Yes	Yes
Part replacement	No	Yes
Server configuration backup	Yes	Yes
Server configuration restore	Yes	Yes
Easy restore for system configuration, including USB and rSPI	Yes	Yes
Health LED only	Yes	Yes
New generation: Quick Sync 2.0	No	NA
New generation: iDRAC Direct 2.0 with micro USB port on rear	Yes	Yes
iDRAC Service Module (iSM)	Yes	Yes
Embedded Tech Support Report	Yes	Yes
Crash screen capture	No	Yes
Crash video capture, requires iSM or OMSA	No	Yes

Table 26. Feature comparison for Dell EMC BMC and iDRAC9 Enterprise (continued)

Feature	Dell EMC BMC	iDRAC9 Enterprise
Boot capture	No	Yes
Manual reset for iDRAC	Yes	Yes
Virtual NMI	Yes	Yes
Operating system watchdog (requires iSM or OMSA)	Yes	Yes
System event log	Yes	Yes
Lifecycle log	Yes	Yes
Work notes	Yes	Yes
Remote syslog	No	Yes
License management	Yes	Yes

Agent-free management

As Dell EMC PowerEdge servers have embedded server life-cycle management, often, there is no need to install an OpenManage systems management software agent into the operating system of a Dell EMC PowerEdge server. This greatly simplifies and streamlines the management footprint.

Agent-based management

Most systems management solutions require pieces of software, called agents, to be installed on each node to be managed within the IT environment. Also, the same agent is often used as a local interface into hardware health. It may be accessed remotely as a management interface, typically referred to as a one-to-one interface. For customers that continue to use agent-based solutions, Dell EMC provides OpenManage Server Administrator.

Dell EMC consoles

The central console in a systems management solution is often referred to as the one-to-many console. The central console provides a rapid view and insight into the overall health of all systems in the IT environment. The Dell EMC systems management portfolio includes several powerful consoles from which to choose depending on your requirements, including the following:

Dell EMC OpenManage Enterprise

Dell EMC OpenManage Enterprise is an intuitive infrastructure management console. Designed to take the complexity out of IT infrastructure management, it delivers better results with less time and fewer steps. OpenManage Enterprise helps IT professionals balance time and energy between complex IT infrastructure and business goals.

Simplify

- Robust, intuitive management capabilities regardless of form factor
- OpenManage Enterprise reduces learning time with a HTML5 UI that includes an elastic search engine. It goes to critical information and tasks easier and quicker. The automatable processes, templates, and policies can be created and edited using a simple menu-driven interface.

Unify

- One-to-many management from a single console—Built for scale
- OpenManage Enterprise supports up to 8,000 devices regardless of form factors. It supports Dell EMC PowerEdge racks, towers, and modular servers. It also monitors and creates alerts for third-party devices or PowerVault MD and ME Storage systems.

Automated

- Automated IT processes for greater efficiency

- From discovery to retirement, activities can be managed in the same console. In minutes, devices can be deployed automatically with templates based on service tags or node IDs.

Secure

- Designed for security throughout the infrastructure life cycle
- Security is always the top priority. To protect your infrastructure, OpenManage Enterprise detects drift from a user-defined configuration template, alerts users, and remediates misconfigurations based on presetup policies.

For more information, see the Dell OpenManage Enterprise page.

OpenManage Mobile

OpenManage Mobile (OMM) is a software application that enables secure monitoring and management of PowerEdge servers remotely or at-the-server. With OpenManage Mobile, IT Administrators can securely perform several data center monitoring and remediation tasks using an Android or iOS mobile device. The OpenManage Mobile app is available as a free software download from the Apple Store and the Google Play Store.

OMM can also monitor and manage PowerEdge servers through an OpenManage Essentials console or by directly accessing the server's iDRAC.

The OpenManage Essentials console can be accessed through OpenManage Mobile over a secure IP network. This allows you to monitor all devices that are managed by OpenManage Essentials such as Dell EMC servers, storage, networking, firewall, and supported third party devices.

Key features of OpenManage Mobile when connected through OpenManage Essentials console:

- Connect to multiple servers which have OME installed, from a single mobile device.
- Connect to multiple servers individually through the iDRAC interface.
- Receive critical alert notifications on your mobile device as they arrive into your OpenManage Essentials management console.
- Acknowledge, forward, and delete alerts from your mobile device.
- Browse through device details, firmware inventory, and event logs of individual systems.
- Perform several server management functions such as power-on, power cycle, reboot, and shutdown from the mobile application.

Key Features of OpenManage Mobile when connected through iDRAC:

- Connect to any previous generation PowerEdge servers remotely.
- Assign IP address, change credentials, and update common BIOS attributes for bare metal configuration.
- Configure one server manually, or multiple servers simultaneously through a template.
- Browse server details, health status, hardware and firmware inventory, networking details, and system event or LC logs. Share this information easily with other IT Administrators.
- Access SupportAssist reports, Last Crash screen and video for both previous and current generation PowerEdge servers.
- Access virtual console and reduce the need for crash carts.
- Power on, shut down, or reboot your server from anywhere.
- Run any RACADM command.

OpenManage Enterprise Power Manager

OpenManage Enterprise Power Manager is a plugin for OpenManage Enterprise V3.2 and later. Power Manager provides monitoring and management at a one to many levels of server power and thermal. The features of Power Manager are:

- Measure and manage power consumption and monitors thermal readings—OME Power Manager provides greater insight into a data center's energy usage through detailed measurement of energy consumption throughout a data center. Power Manager gives administrators the ability to measure and manage the power consumption of up to 3,000 servers and track both short-term and long-term historical data.

- Create and implement multiple usage policies—Power Managers simplifies implementation of power policies across a data center. When it is used with the previous generation or later versions of the PowerEdge servers, OpenManage Enterprise Advanced license, and an iDRAC Enterprise license, administrators can control power consumption to each row, rack, or group of PE servers. Also, administrators can create reports on energy usage and thermal readings on a group-by-group basis.

- Reduce consumption during low-load hours—Power Manager helps administrators to save power by allowing management of a server room according to business needs. Power Manager allows administrators to implement policies that reduce the power consumption when the demand on the systems is lower. It can also assign maximum power to the servers that run the most important applications.

For more information, see OpenManage Enterprise Power Manager User's Guide.

Dell EMC OpenManage systems management tools, utilities, and protocols

Dell EMC OpenManage systems management tools and utilities consist of the following:

Dell EMC Repository Manager

Dell EMC Repository Manager (DRM) is an application that helps you to:

- Identify the updates that are relevant to the systems in your data center
- Identify and notify you when updates are available
- Package the updates into different deployment formats

To automate the creation of baseline repositories, DRM provides advanced integration capabilities with iDRAC/Lifecycle controller, OpenManage Essentials, Chassis Management Controller, OpenManage Integration for VMware vCenter and OpenManage Integration for Microsoft System Center (OMIMSSC). Also, DRM packages updates into custom catalogs that can be used for deployment.

Dell EMC Repository Manager can create the following deployment tools:

- Custom catalogs
- Lightweight deployment pack
- Bootable Linux ISO
- Custom Server Update Utility (SUU)

For more information, see Dell EMC Repository Manager user's guide available at Dell.com/support/manuals.

Dell Update Packages

Dell Update Packages (DUPs) are self-contained executables supported by Microsoft Windows or Linux that update a component on a server and applications like OMSA, iSM, and DSET.

DUPs can be executed in UI or in CLI mode.

For more information, see the Dell EMC Update Packages user's guide available at www.delltechcenter.com/DSU.

Dell Remote Access Controller Administration (RACADM) CLI

The RACADM command-line utility provides a scriptable interface to perform inventory, configuration, update, and health status check of PowerEdge servers. RACADM operates in multiple modes.

- Local—supports running RACADM commands from the managed server's operating system
- SSH or Telnet—known as Firmware RACADM; is accessible by logging in to iDRAC using SSH or Telnet
- Remote—supports running RACADM commands from a remote management station such as a laptop or desktop

RACADM is supported by the iDRAC with Lifecycle Controller and by the Chassis Management Controller of the M1000e, VRTX and FX2 modular systems. Local and Remote RACADM is supported on Windows Server, Windows clients, and on Red Hat, SuSe, and Ubuntu Linux.

For more information, see the RACADM Command Line reference guide for iDRAC and CMC available at Dell.com/support/manuals.

iDRAC with Lifecycle Controller Embedded Management APIs

iDRAC with Lifecycle Controller provides a range of standards-based applications programming interfaces (APIs) that enable scalable and automated management of PowerEdge servers. Standard systems management APIs have been developed by organizations such as the Institute of Electrical and Electronics Engineers (IEEE) and Distributed Management Task Force (DMTF). These APIs are widely used by commercial systems management products and by custom programs and scripts developed by IT staff to automate management functions such as discovery, inventory, health status checking, configuration, update, and power management. The APIs supported by iDRAC with Lifecycle Controller include:

- **Redfish**—In 2015, the DMTF Scalable Platforms Management Forum (SPMF) published Redfish, an open industry-standard specification and schema designed to meet the needs of IT administrators for simple, modern, and secure management of scalable platform hardware. Dell is a key contributor to the Redfish standard, acting as co-chair of the SPMF, promoting the benefits of Redfish, and working to deliver those benefits within industry-leading systems management solutions. Redfish is a next-generation management standard using a data model representation inside a hypermedia RESTful interface. The data model is defined in terms of a standard, machine-readable schema, with the payload of the messages expressed in JSON and the OData v4 protocol.
- **WSMan**—The Web Services For Management (WSMan) API, first published by the DMTF in 2008, is the most mature and robust API provided by iDRAC with Lifecycle Controller. WSMan uses a Simple Object Access Protocol (SOAP) with

data modeled using the Common Information Model. WSMan provides interoperability between management applications and managed resources, and identifies a core set of web service specifications and usage requirements that expose a common set of operations central to all systems management.

- **IPMI**—The Intelligent Platform Management Interface (IPMI) is a message-based, hardware-level interface specification that can operate over both LAN and serial interfaces. IPMI is supported broadly by server vendors, systems management solutions, and open source software.
- **SNMP**—The Simple Network Management Protocol (SNMP) helps in standardizing the management of network devices. SNMP allows commercial management consoles created for monitoring network switches and routers to also monitor X86 severs. SNMP is primarily used to deliver event messages to alert administrators of problems on their systems but can also be used to discover, inventory and configure servers.

To assist automating system management tasks and simplify API integration, Dell provides PowerShell and Python libraries and script examples using the WSMan interface. The iDRAC with Lifecycle Controller pages of Dell Techcenter offer a library of technical white papers detailing the use of the embedded management APIs. For more information, see delltechcenter.com/iDRAC and delltechcenter.com/LC.

Integration with third-party consoles

Dell EMC OpenManage provides integration with several leading third-party consoles, including:

OpenManage Integration Suite for Microsoft System Center

The combination of Dell OpenManage Integration Suite and Microsoft System Center simplifies and enhances deployment, configuration, monitoring and updating of Dell servers and storage in physical and virtual environments. Our agent-free and agent-based plug-ins deliver a unique level of integration and efficiency when managing Dell hardware within a System Center environment.

The OpenManage Integration Suite for Microsoft System Center includes: Dell Server and Storage Management Packs for System Center Operations Manager (SCOM), Dell Server Deployment Packs and Update Catalogs for System Center Configuration Manager (SCCM), and tools for optimizing management of Dell PowerEdge servers in virtual environments using System Center Virtual Machine Manager (SCVMM).

OpenManage Integration for VMware vCenter

The OpenManage Integration for VMware vCenter (OMIVV) allows you to monitor, provision, and manage PowerEdge server hardware and firmware. You can perform these tasks through a dedicated Dell menu that can be accessed directly through the VMware vCenter console. OMIVV also allows granular control and reporting for the hardware environment using the same role-based access control model as vCenter. The OpenManage Management Pack for vRealize Operations Manager is available with OMIVV version 4.0 and later. This helps to checking hardware health and alerting into vRealize operations, which also includes dashboard and reporting on the server environment.

Use the following features to manage and monitor Dell hardware within the virtualized environment:

- Alerting and monitoring environment for servers and chassis
- Monitoring and reporting for servers and chassis
- Updating firmware on servers
- Deploying enhanced options

For more information, see delltechcenter.com/omivv.

(i) **NOTE:** The Dell EMC Repository Manager integrates with OpenManage Integration for VMware vCenter. The Dell EMC Repository Manager provides advanced functionality, simplifies the discovery, and deployment of new updates.

BMC Software

Dell EMC and BMC Software work together to simplify IT by ensuring tight integration between Dell EMC server, storage, and network management functionality and the BMC Software process and data center automation products.

OpenManage connections with third-party consoles

Dell EMC OpenManage Connections simplifies adding support for third-party devices, so you can continue to use your existing management tools while easily adding Dell EMC server systems to your IT environment. Integrate new systems at your own pace. Manage new Dell EMC servers and storage with your legacy management tools, while extending the useful life of your existing resources. With OpenManage Connections you can add monitoring and troubleshooting of Dell EMC assets to your IT infrastructure.

- OpenManage Connection for Nagios Core and Nagios XI

- OpenManage Connection for HPE Operations Manager i (OMi)

For more information on these OpenManage Connections, visit Dell.com/openmanage.

Dell Technologies Services

Dell Technologies Services include a wide, customizable range of service choices to simplify the assessment, design, implementation, management and maintenance of IT environments and to help you transition from platform to platform. Depending on your current business requirements and the level of service right for you, we provide factory, on-site, remote, modular, and specialized services that fit your needs and budget. We'll help with a little or a lot—your choice—and provide access to our global resources.

For more information, see DellEMC.com/Services.

Topics:

- Dell EMC ProDeploy Enterprise Suite
- Dell EMC Remote Consulting Services
- Dell EMC Data Migration Service
- Dell EMC ProSupport Enterprise Suite
- Dell EMC ProSupport Plus for Enterprise
- Dell EMC ProSupport for Enterprise
- Dell EMC ProSupport One for Data Center
- ProSupport for HPC
- Support Technologies
- Dell Technologies Education Services
- Dell Technologies Consulting Services
- Dell EMC Managed Services

Dell EMC ProDeploy Enterprise Suite

ProDeploy Enterprise Suite gets your server out of the box and into optimized production—fast. Our elite deployment engineers with broad and deep experience utilizing best-in-class processes along with our established global scale can help you around the clock and around the globe. From simple to the most complex server installations and software integration, we take the guess work and risk out of deploying your new server technology.

		Basic Deployment	ProDeploy	ProDeploy Plus
Pre-deployment	Single point of contact for project management	-	●	In-region
	Site readiness review	-	●	●
	Implementation planning	-	●	●
	SAM engagement for ProSupport Plus entitled devices	-	-	●
Deployment	Deployment service hours	Business hours	24x7	24x7
	Remote guidance for hardware installation or Onsite hardware installation and packaging material removal	Onsite	Remote or Onsite	Onsite
	Install and configure system software	-	Remote	Onsite
	Install support software and connect with Dell Technologies	-	●	●
	Project documentation with knowledge transfer	-	●	●
Post-deployment	Deployment verification	-	●	●
	Configuration data transfer to Dell EMC technical support	-	●	●
	30-days of post-deployment configuration assistance	-	-	●
	Training credits for Dell EMC Education Services	-	-	●

Figure 6. ProDeploy Enterprise Suite capabilities

ⓘ **NOTE:** Hardware installation not applicable on selected software products.

Dell EMC ProDeploy Plus

From beginning to end, ProDeploy Plus provides the skill and scale needed to successfully execute demanding deployments in today's complex IT environments. Certified Dell EMC experts start with extensive environmental assessments and detailed migration planning and recommendations. Software installation includes set up of most versions of Dell EMC SupportAssist and OpenManage system management utilities. Post-deployment configuration assistance, testing, and product orientation services are also available.

Dell EMC ProDeploy

ProDeploy provides full service installation and configuration of both server hardware and system software by certified deployment engineers including set up of leading operating systems and hypervisors as well as most versions of Dell EMC SupportAssist and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning exercise. System testing, validation, and full project documentation with knowledge transfer complete the process.

Basic Deployment

Basic Deployment delivers worry-free professional installation by experienced technicians who know Dell EMC servers inside and out.

Dell EMC Server Configuration Services

With Dell EMC Rack Integration and other Dell EMC PowerEdge Server Configuration Services, you save time by receiving your systems racked, cabled, tested, and ready to integrate into the data center. Dell EMC staff pre-configure RAID, BIOS and iDRAC settings, install system images, and even install third-party hardware and software.

For more information, see Server Configuration Services.

Dell EMC Residency Services

Residency Services helps customers transition to new capabilities quickly with the assistance of on-site or remote Dell EMC experts whose priorities and time you control. Residency experts can provide post implementation management and knowledge transfer related to a new technology acquisition or day-to-day operational management of the IT infrastructure.

Dell EMC Remote Consulting Services

When you are in the final stages of your PowerEdge server implementation, you can rely on Dell EMC Remote Consulting Services and our certified technical experts to help you optimize your configuration with best practices for your software, virtualization, server, storage, networking, and systems management.

Dell EMC Data Migration Service

Protect your business and data with our single point of contact to manage your data migration project. Your project manager will work with our experienced team of experts to create a plan using industry-leading tools and proven processes based on global best practices to migrate your existing files and data so your business system get up and running quickly and smoothly.

Dell EMC ProSupport Enterprise Suite

With the ProSupport Enterprise Suite, we help keep your IT systems running smoothly, so you can focus on running your business. We will help maintain peak performance and availability of your most essential workloads. ProSupport Enterprise Suite is a suite of support services that enable you to build the solution that is right for your organization.

Choose support models based on how you use technology and where you want to allocate resources. From the desktop to the data center, address everyday IT challenges, such as unplanned downtime, mission-critical needs, data and asset protection, support planning, resource allocation, software application management and more. Optimize IT resources by choosing the right support model.
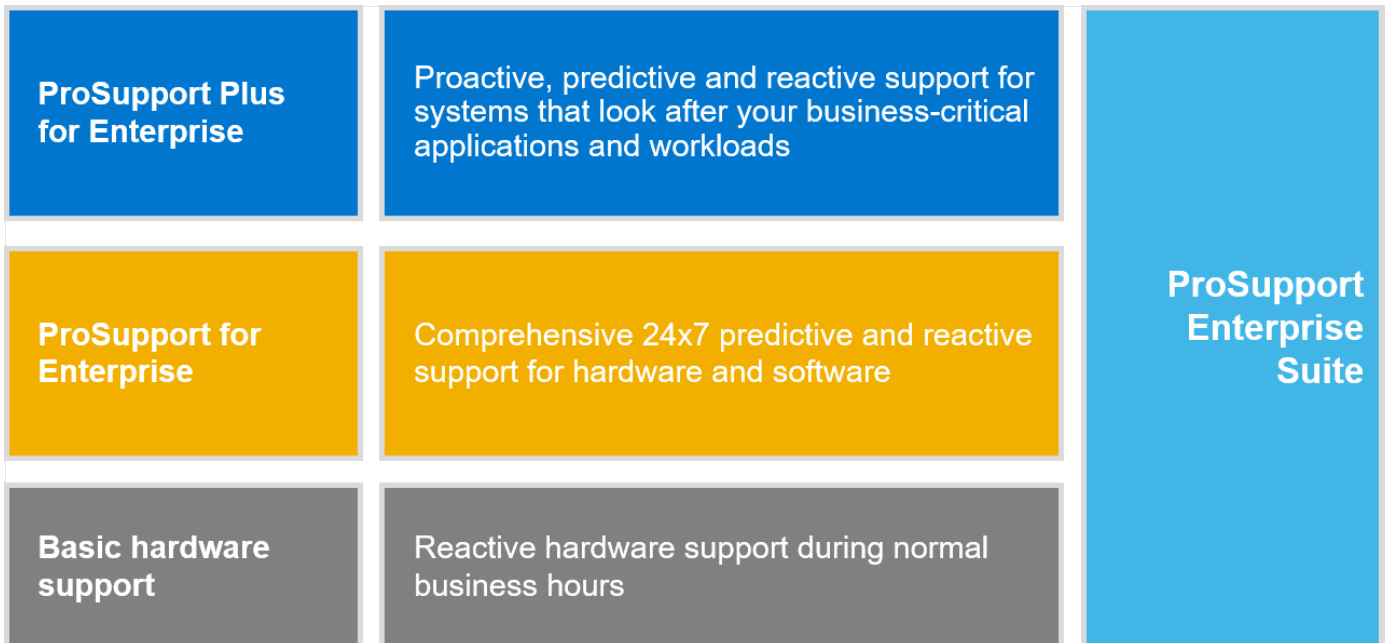

Figure 7. Dell EMC ProSupport Enterprise Suite

Dell EMC ProSupport Plus for Enterprise

When you purchase your PowerEdge server, we recommend ProSupport Plus, our proactive and preventative support service for your business-critical systems. ProSupport Plus provides you with all the benefits of ProSupport, plus the following:

- An assigned Services Account Manager who knows your business and your environment
- Immediate advanced troubleshooting from an engineer who understands your PowerEdge server
- Personalized, preventive recommendations based on analysis of support trends and best practices from across the Dell Technologies infrastructure solutions customer base to reduce support issues and improve performance
- Predictive analysis for issue prevention and optimization enabled by SupportAssist
- Proactive monitoring, issue detection, notification, and automated case creation for accelerated issue resolution enabled by SupportAssist
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect

Dell EMC ProSupport for Enterprise

Our ProSupport service offers highly trained experts around the clock and around the globe to address your IT needs. We help minimize disruptions and maximize availability of PowerEdge server workloads with:

- 24x7 support through phone, chat and online
- Predictive, automated tools and innovative technology
- A central point of accountability for all hardware and software issues
- Collaborative 3rd party support
- Hypervisor, operating system and application support
- Consistent experience regardless of where you are located or what language you speak
- Optional onsite parts and labor response options including next business day or four-hour mission critical
  - ⓘ **NOTE:** Subject to service offer country availability.

Enterprise Support Services
Feature Comparison

	Basic	ProSupport	ProSupport Plus
Remote technical support	9x5	24x7	24x7
Covered products	Hardware	Hardware Software	Hardware Software
Onsite hardware support	Next business day	Next business day or 4hr mission critical	Next business day or 4 hr mission critical
3rd party collaborative assistance		●	●
Automated issue detection & proactive case creation		●	●
Self-service case initiation and management		●	●
Access to software updates		●	●
Priority access to specialized support experts			●
3rd party software support			●
Assigned Services Account Manager			●
Personalized assessments and recommendations			●
Semiannual systems maintenance			●

Availability and terms of Dell Technologies services vary by region and by product. For more information, please view our Service Descriptions available on Dell.com

Figure 8. Dell EMC Enterprise Support model

Dell EMC ProSupport One for Data Center

ProSupport One for Data Center offers flexible site-wide support for large and distributed data centers with more than 1,000 assets. This offering is built on standard ProSupport components that leverage our global scale but are tailored to your company's needs. While not for everyone, this service option offers a truly unique solution for Dell Technologies largest customers with the most complex environments.

● Team of assigned Services Account Managers with remote, on-site options
● Assigned ProSupport One technical and field engineers who are trained on your environment and configurations
● On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect
● Flexible on-site support and parts options that fit your operational model
● A tailored support plan and training for your operations staff

ProSupport for HPC

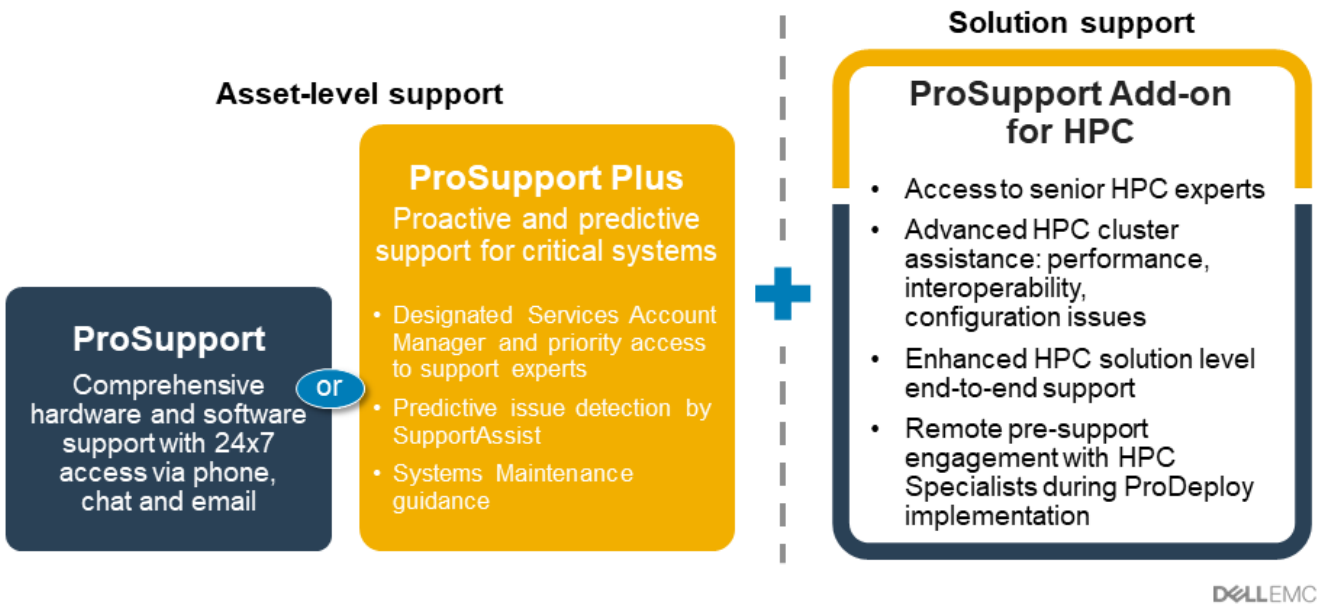The ProSupport for HPC provides solution-aware support including:
● Access to senior HPC experts
● Advanced HPC cluster assistance: performance, interoperability & configuration
● Enhanced HPC solution level end-to-end support
● Remote pre-support engagement with HPC Specialists during ProDeploy implementation

Learn more at DellEMC.com/HPC-Services.

Figure 9. ProSupport for HPC

Support Technologies

Powering your support experience with predictive, data-driven technologies.

Dell EMC SupportAssist

The best time to solve a problem is before it happens. The automated proactive and predictive technology SupportAssist helps reduce steps and time to resolution, often detecting issues before they become a crisis. Benefits include:

- Value—SupportAssist is available to all customers at no additional charge
- Improve productivity—replace manual, high-effort routines with automated support
- Accelerate time to resolution—receive issue alerts, automatic case creation, and proactive contact from Dell EMC experts
- Gain insight and control—optimize enterprise devices with on-demand ProSupport Plus reporting in TechDirect, and get predictive issue detection before the problem starts

ⓘ **NOTE:** SupportAssist is included with all support plans, but features vary based on service level agreement.

	Basic Hardware Warranty	ProSupport	ProSupport Plus
Automated issue detection and system state information collection	●	●	●
Proactive, automated case creation and notification		●	●
Predictive issue detection for failure prevention			●
Recommendation reporting available on-demand in TechDirect			●

Figure 10. SupportAssist model

Get started at Dell.com/SupportAssist

Dell EMC TechDirect

Boost IT team productivity when supporting Dell EMC systems. With over 1.4 million self-dispatches processed each year, TechDirect has proven its effectiveness as a support tool. You can:

- Self-dispatch replacement parts
- Request technical support
- Integrate APIs into your help desk

Or, access all your Dell EMC certification and authorization requirements. Train your staff on Dell EMC products, as TechDirect allows you to:

- Download study guides
- Schedule certification and authorization exams
- View transcripts of completed courses and exams

Register at techdirect.dell.

Dell Technologies Education Services

Build the IT skills required to influence the transformational outcomes of the business. Enable talent and empower teams with the right skills to lead and execute transformational strategy that drives competitive advantage. Leverage the training and certification required for real transformation.

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Our expert consultants help you transform faster, and quickly achieve business outcomes for the high value workloads Dell EMC PowerEdge systems can handle.

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We use prescriptive approaches and proven methodologies combined with Dell Technologies' portfolio and partner ecosystem to help you achieve real business outcomes. From multi-cloud, applications, DevOps, and infrastructure transformations, to business resiliency, data center modernization, analytics, workforce collaboration, and user experiences—we're here to help.

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Reduce the cost, complexity, and risk of managing IT. Focus your resources on digital innovation and transformation while our experts help optimize your IT operations and investment with managed services backed by guaranteed service levels.

Appendix A. Additional specifications

Topics:

- Chassis dimension
- Chassis weight
- Video specifications
- Environmental specifications

Chassis dimension

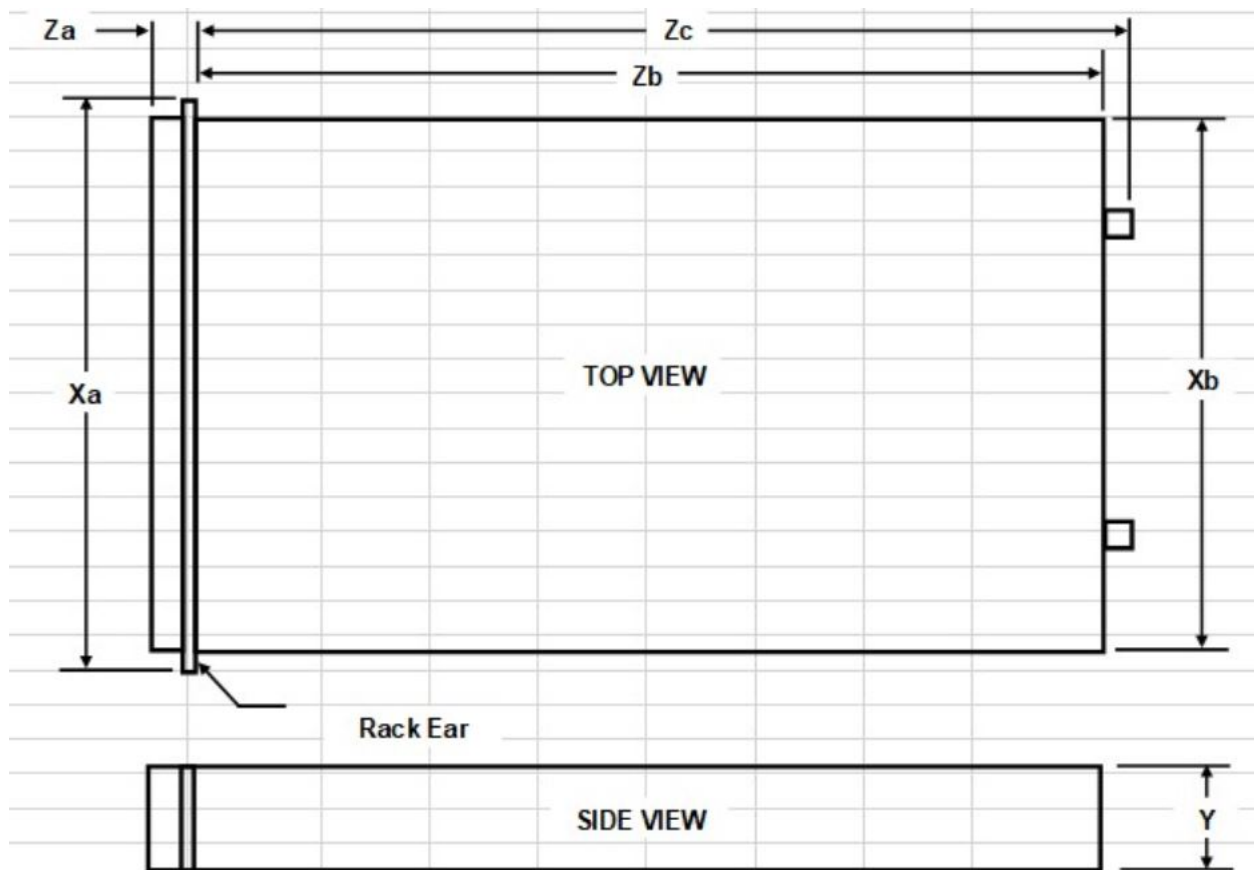This section describes the physical dimensions of the system.

Figure 11. Chassis dimension

Table 27. Chassis dimension descriptions

Chassis	Xa	Xb	Y	Za	Zb	Zc	Chassis
C6400	482.6 mm	448 mm	86.8 mm	26.8 mm	763.2 mm	802.7 mm	2U

Chassis weight

The following list the system weight for the PowerEdge C6525:

- 3.5-inch hard drive max weight = 45.53 kg
- 2.5-inch hard drive max weight = 41.5 kg
- No backplane max weight = 35.15 kg

Video specifications

The PowerEdge C6525 supports the following video resolution and refresh rates:

Table 28. Video resolution and refresh rates

Resolution	Refresh Rate	Horizontal Freq.	Pixel Clock	DVO DisplayPort
1024 x 768	60 Hz	48.4 kHz	65.0 MHz	Yes
1280 x 800	60 Hz	49.7 kHz	83.5 MHz	Yes
1280 x 1024	60 Hz	64.0 kH	108.0 MHz	Yes
1360 x 768	60 Hz	47.71 kHz	85.5 MHz	Yes
1440 x 900	60 Hz	55.9 kHz	106.5 MHz	Yes
1600 x 900	60 Hz	55.54 kHz	97.75 MHz	Yes
1600 x 1200	60 Hz	75.0 kHz	162.0 MHz	Yes
1680 x 1050	60 Hz	64.7 kHz	119.0 MHz	Yes
1920 x 1080	60 Hz (RB)	67.158 kHz	173.0 MHz	No
1920 x 1200	60 Hz (RB)	74.556 kHz	193.25 MHz	No

NOTE:

- DVO DisplayPort is for investigation only, and is dependent on Nuvoton DVO capabilities to support up to 165MHz. Rear panel performance is TBD subject to final board design of the rear VGA connector.
- RB—Reduced Blanking for Digital Displays requiring less blank time. This was introduced for signal integrity improvements by reducing pixel clock rates for VGA analog input devices.

Environmental specifications

Temperature specifications

The following table lists the environmental specifications for the PowerEdge C6525. For additional information see dell.com/environmental_datasheets

Table 29. Temperature specifications

Temperature	Specifications
Storage	-40°C to 65°C (-40°F to 149°F)
Continuous operation(for altitude less than 950m or 3117ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment **NOTE:** Certain system configurations may require reductions in the upper temperature limits.

Table 29. Temperature specifications (continued)

Temperature	Specifications
	ⓘ **NOTE:** The performance of the system may be impacted when operating above the upper temperature limit or with a faulty fan.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 30. Relative humidity

Relative Humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non condensing at all times.
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Detailed specifications for humidity, vibration, shock, altitude, temperature de-rating, particulate and gaseous contamination, standard and extended operating specifications can be found in the C6525 Installation and Service Manual.

Fresh Air Operation

Table 31. Fresh Air operation restrictions

Liquid cooled	Air Cooled
• NVMe SSD is not supported. • LRDIMM is not supported. • PCIe cards greater than 25W are not supported. • GPU card is not supported. • 3.5-inch drive configuration is not supported.	• NVMe SSD is not supported. • LRDIMM is not supported. • PCIe cards greater than 25W are not supported. • GPU card is not supported. • 3.5-inch drive configuration is not supported. • The 2.5-inch, no backplane configuration supports a maximum processor TDP of 200 Watts only. • Supports single processor configuration only. No support for dual processor configuration.

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 32. Industry standard documents

Standard	URL for information and specifications
ACPIAdvance Configuration and Power Interface Specification, v2.0c	https://uefi.org/specsandtesttools
Ethernet IEEE 802.3-2005	https://standards.ieee.org/
HDGHardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR4 Memory DDR4 SDRAM Specification	jedec.org/standards-documents/docs/jesd79-4.pdf
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_I_Rev_1-1_20070205.pdf
SAS Serial Attached SCSI, v1.1	http://www.t10.org/
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	sata-io.org
SMBIOS System Management BIOS Reference Specification, v2.7	dmtf.org/standards/smbios
TPM Trusted Platform Module Specification, v1.2 and v2.0	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/specifications
USB Universal Serial Bus Specification, Rev. 2.7	usb.org/developers/docs

Appendix C Additional resources

Table 33. Additional resources

Resource	Description of contents	Location
Installation and Service Manual	This manual, available in PDF format, provides the following information: ● Chassis features ● System Setup program ● System messages ● System codes and indicators ● System BIOS ● Remove and replace procedures ● Troubleshooting ● Diagnostics ● Jumpers and connectors	Dell.com/Support/Manuals
Getting Started Guide	This guide ships with the system, and is also available in PDF format. This guide provides the following information: ● Initial setup steps ● Key system features ● Technical specifications	Dell.com/Support/Manuals
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	Dell.com/Support/Manuals
Information Update	This document ships with the system, is also available in PDF format online, and provides information on system updates.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Inside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information, and Dell EMC contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell EMC online ESSA enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use ESSA to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc