Dell EMC PowerEdge T640

Technical Specifications Guide

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DELL Technologies

Notes, cautions, and warnings

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.

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Technical specifications

The technical and environmental specifications of your system are outlined in this section.

Topics:

Chassis dimensions

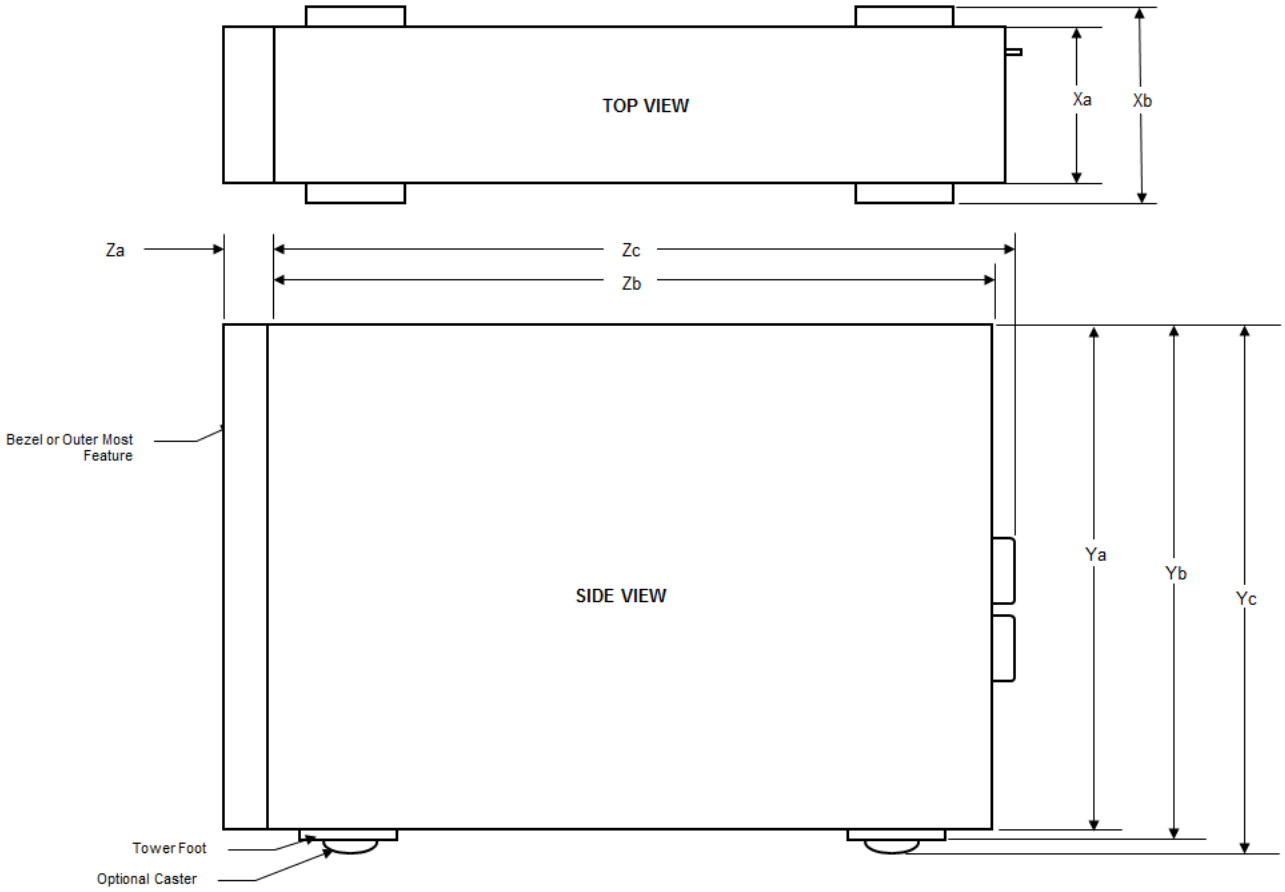

Figure 1. Dimensions of the Dell PowerEdge T640 system

Table 1. The dimensions of the Dell Technologies PowerEdge T640 system

Xa	Xb	Ya	Yb	Yc	Za (with bezel)	Zb	Zc (Zb + PSU handle)
217.9 mm (8.57 inches)	304.5 mm (11.99 inches)	434.5 mm (17.10 inches)	443.5 mm (17.46 inches)	471.5 mm (18.56 inches)	15.9 mm (0.62 inches)	659.9 mm (25.98 inches)	692.8 mm (27.27 inches)

NOTE: Zb is the nominal rear wall external surface where the system board I/O connectors reside.

Chassis weight

Table 2. Chassis weight

System	Maximum weight (with all hard drives/SSDs)
32 x 2.5-inch	42.36 Kg (93.38 lb)
18 x 3.5-inch	49.65 Kg (109.45 lb)

Processor specifications

The Dell Technologies PowerEdge T640 system supports up to two Intel Xeon Scalable processors, up to 28 cores per processor.

Supported operating systems

The PowerEdge T640 system supports the following operating systems:

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

For more information, go to OS support.

Cooling fan specifications

The cooling fans are integrated into the system to dissipate the heat generated by the functioning of the system. These fans provide cooling for the processors, expansion cards, and memory modules.

Your system supports a total of eight fans, including six hot-swappable fans and two external fans. Two hot-swappable fans are mounted in rear side of the air shroud. The other four hot-swappable (middle) fans are mounted in the fan assembly that is located in the chassis between the hard drive bay and the processors. The two external fans are mounted on the outside of the chassis for GPU configurations. There are two additional fans integrated in the power supplies to cool the power supplies and provide additional cooling for the whole system.

The below listed configurations, features, and the PCIe expansion cards are supported only with the four hot-swappable (middle) fans installed:

- Fan redundancy
- Fresh air condition
- NVMe/PCIe SSD
- 3.5 inch x 18 hard drives chassis
- Mellanox CX4 DP 100 Gb QSFP NIC (0272F)
- Mellanox CX4 DP 100 Gb NIC (068F2)
- Mellanox CX4 SP 100 Gb NIC (6W1HY)
- Mellanox DP 40 Gb QSFP NIC (C8Y42)
- Intel QP 10 Gb Base-T NIC (K5V44)
- Solarflare Sunspot DP 10Gb NIC (NPHCM)
- Solarflare Nova DP 10Gb NIC (WY7T5)
- Qlogic DP 10Gb V1 NIC (VCXN5)

Listed below are the restrictions for fan redundancy:

- GPGPU configurations are not supported at 35deg. C of ambient or above.
- Mellanox 100G NICs are not supported.

For information on the restriction for fresh air condition, see the PowerEdge T640 Technical Specs at www.dell.com/poweredgemanuals

PSU specifications

The Dell Technologies PowerEdge T640 system supports up to two AC or DC redundant power supply units (PSUs).

Table 3. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	Current
495 W AC	Platinum	1908 BTU/hr	50/60 Hz	100–240 V AC, autoranging	6.5 A–3 A
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging	10 A–5 A
750 W AC	Titanium	2843 BTU/hr	50/60 Hz	200–240 V AC, autoranging	5 A
750 W Mixed Mode HVDC (for China only)	Platinum	2891 BTU/hr	50/60 Hz	100-200 V AC, autoranging	10 A–5 A
	Platinum	2891 BTU/hr	NA	240 V DC, autoranging	4.5 A
750 W Mixed Mode	Platinum	2891 BTU/hr	50/60 Hz	100-200 V AC, autoranging	10 A–5 A
	Platinum(For China only)	2891 BTU/hr	NA	240 V DC, autoranging	5 A
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging	12 A–6.5 A
1100 W DC	Gold	4416 BTU/hr	-	(-48 V to –60 V) DC, autoranging	32 A
1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	10 A
2000 W Mix Mode	Platinum	7500 BTU/hr	50/60 Hz	100–200 V AC, autoranging	11.5 A
2000 W Mix Mode	Platinum	7500 BTU/hr	50/60 Hz	240 V AC, autoranging	11.8 A
2400 W AC	Platinum	9000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	16 A

NOTE: Heat dissipation is calculated using the PSU wattage rating.

NOTE: This system is also designed to connect to the IT power systems with a phase-to-phase voltage not exceeding 240 V.

NOTE: If a system with 2400 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 1400 W.

NOTE: If a system with 2000 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 1000 W.

NOTE: If a system with 1600 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 800 W.

NOTE: If a system with 1100 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 1050 W.

System battery specifications

The Dell Technologies PowerEdge T640 system supports CR 2032 3.0-V lithium coin cell system battery.

Expansion bus specifications

The Dell Technologies PowerEdge T640 system supports PCI express (PCIe) generation 3 and 2 expansion cards. The following table describes the supported expansion cards:

Table 4. Supported PCI express generation 3 expansion cards

PCIe Slot	Processor Connection	Height	Length	Link Width	Slot Width
0 (Internal PERC/HBA Slot)	Processor 1	Full Height	Half Length	x8	x8
1 (Gen3)	Processor 1	Full Height	Full Length	x16	x16
2 (Gen3)	Processor 1	Full Height	Full Length	x4	x8
3 (Gen3)	Processor 1	Full Height	Full Length	x16	x16
4 (Gen3)	Processor 2	Full Height	Half Length	x8	x8
5 (Gen3)	Processor 2	Full Height	Full Length	x4	x8
6 (Gen3)	Processor 2	Full Height	Full Length	x16	x16
7 (Gen3)	Processor 2	Full Height	Full Length	x8	x8
8 (Gen3)	Processor 2	Full Height	Full Length	x16	x16

NOTE: To use PCIe slots 4, 5, 6, 7, and 8 both the processors must be installed.

NOTE: The expansion card slots are not hot-swappable.

Memory specifications

Table 5. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
RDIMM	Single rank	8 GB	8 GB	96 GB	16 GB	192 GB
	Single rank	16 GB	16 GB	192 GB	32 GB	384 GB
	Dual rank	32 GB / 64 GB	32 GB	384 GB	64 GB	768 GB
LRDIMM	Quad rank	64 GB	64 GB	768 GB	128 GB	1536 GB
	Octal rank	128 GB	128 GB	1536 GB	256 GB	3072 GB
NVDIMM-N	Single rank	16 GB	Not supported with single processor	Not supported with single processor	RDIMM: 192 GB NVDIMM-N: 16 GB	RDIMM: 384 GB NVDIMM-N: 192 GB

NOTE: 8 GB RDIMMs and NVDIMM-N must not be mixed.

NOTE: A minimum of two processors are required for any configuration that supports NVDIMM-N DIMMs.

Storage controller specifications

The Dell Technologies PowerEdge T640 system supports:

- **Internal storage controller cards**: PowerEdge RAID Controller (PERC) H330, H730P, H740P, Software RAID (SWRAID) S140, H750
- **External PERC (RAID)**: H840
- **12 Gbps SAS HBA (non-RAID)**:
  - **Interal**: HBA330 (non-RAID), HBA350i (non-RAID)
  - **External**: 12 Gbps SAS HBA, HBA355e (non-RAID)

- **Boot Optimized Storage Subsystem**: HWRAID 2 x M.2 SSDs 120GB or 240GB

NOTE:

- Configuration excludes any mixed configurations of HBA330 and HBA350i.
- Configuration excludes any mixed configurations of (H330/H730P/H740P) and H750.

Drive specifications

Hard drives

The Dell Technologies PowerEdge T640 system supports:

Backplane configuration options:

- 8 x 3.5-inch SAS, SATA, Near-Line SAS, SSD
- 16 x 2.5-inch SAS, SATA, Near-Line SAS, SSD, NVMe drives
- 18 x 3.5-inch SAS, SATA, Near-Line SAS, SSD
- 32 x 2.5-inch SAS, SATA, Near-Line SAS, SSD
- SW RAID on 3.5-inch SAS, SATA, Near-Line SAS, SSD
- 8 x NVMe drive

Internal hard drive bay and hot-plug backplane:

- Up to 8 x 3.5-inch SAS, SATA, Near-Line SAS, SSD drives
- Up to 16 x 2.5-inch SAS, SATA, Near-Line SAS, SSD, NVMe drives with optional flex bay
- Up to 18 x 3.5-inch SAS, SATA, Near-Line SAS, SSD drives without optional flex bay
- Up to 32 x 2.5-inch SAS, SATA, Near-Line SAS, SSD drives with optional flex bay

Optical drive

The Dell Technologies PowerEdge T640 system supports one optional slim SATA DVD-ROM drive or DVD +/-RW drive.

Ports and connectors specifications

USB ports

The Dell Technologies PowerEdge T640 system supports the following USBs.

Table 6. USB specifications

System	Front panel	Back panel	Internal
PowerEdge T640	• One USB 2.0 compliant port and one USB 3.0 compliant port • One iDRAC USB MGMT port (USB 2.0)	Six USB ports • Four USB 3.0 compliant ports • Two USB 2.0 compliant ports	One USB 3.0 compliant port

NIC ports

The Dell Technologies PowerEdge T640 system supports two onboard Network Interface Controller (NIC) ports on the back panel, which is available in the following NIC configurations:

- Two 10 Gbps

NOTE: The LOM (Broadcom 57416) is compatible with 10GBASE-T IEEE 802.3an and 1000 BASE-T IEEE 802.3ab.

VGA ports

The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The Dell Technologies PowerEdge T640 system supports two 15-pin VGA ports on the front and back panels.

NOTE: The front VGA port is available only with the rack configuration.

Serial connector

The Dell Technologies PowerEdge T640 system supports one serial connector on the back panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

Internal Dual SD Module with vFlash card

The Dell Technologies PowerEdge T640 system supports Internal Dual SD module (IDSDM) and vFlash card. In 14th generation of PowerEdge servers, IDSDM and vFlash card are combined into a single card module, and are available in anyone of these configurations:

- vFlash
- vFlash and IDSDM

The IDSDM/vFlash module sits in the back of the system, in a Dell-proprietary slot. The IDSDM/vFlash module supports three micro SD cards (two cards for IDSDM and one card for vFlash). The micro SD cards capacity for IDSDM are 16/32/64 GB while for vFlash the microSD card capacity is 16 GB.

NOTE: The write-protect switch is on the IDSDM or vFlash module.

NOTE: The IDSDM supports only Micro SD cards.

Video specifications

The Dell Technologies PowerEdge T640 system supports integrated Matrox G200eW3 graphics controller with 16 MB of video frame buffer.

Table 7. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

NOTE: 1920 x 1080 and 1920 x 1200 resolutions are only supported in reduced blanking mode.

Environmental specifications

NOTE: For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on PowerEdge manuals

Table 8. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.
Fresh air	For information about fresh air, see Expanded Operating Temperature section.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 9. Relative humidity specifications

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.

Table 10. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all operation orientations).
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Table 11. Maximum shock specifications

Maximum vibration	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71 G for up to 2 ms.

Table 12. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)

Table 13. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).
35°C to 40°C (95°F to 104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft) above 950 m (3,117 ft).
40°C to 45°C (104°F to 113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

Standard operating temperature

Table 14. Standard operating temperature specifications

Standard operating temperature	Specifications
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.

Expanded operating temperature

Table 15. Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	5°C to 40°C at 5% to 85% RH with 29°C dew point. **NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate continuously in temperatures as low as 5°C and as high as 40°C. For temperatures between 35°C and 40°C, de-rate maximum allowable temperature by 1°C per 175 m above 950 m (1°F per 319 ft).
≤ 1% of annual operating hours	–5°C to 45°C at 5% to 90% RH with 29°C dew point. **NOTE:** Outside the standard operating temperature (10°C to 35°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours. For temperatures between 40°C and 45°C,de-rate maximum allowable temperature by 1°C per 125 m above 950 m (1°F per 228 ft).

NOTE: When operating in the expanded temperature range, system performance may be impacted.

NOTE: When operating in the expanded temperature range, ambient temperature warnings maybe reported in the System Event Log.

Expanded operating temperature restrictions and Fresh Air restrictions

- Six hot swappable fans (standard fans) are required.
- Two PSUs in redundancy mode are required, but PSU failure is not supported.
- 3.5-inch x 18 hard drives is not supported.
- NVMe or PCIe SSD is not supported.
- GPGPU is not supported.
- Processor > 165 W is not supported.
- Internal TBU (tape backup drive) is not supported.
- Non-Dell qualified peripheral cards are not supported.
- Peripheral cards consuming greater than 25 W are not supported.
- 128 GB LRDIMM is supported.
- NVDIMM is not supported.
- Mellanox 100 GB, Mellanox Navi DP/SP, Intel FortPond Solarflare Nova, Solarflare Sunspot are not supported.

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any equipment damage or failure from particulate and gaseous contamination. If the levels of particulate or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 16. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **NOTE:** The ISO Class 8 condition applies to data center environments only. This air filtration requirement does not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. **NOTE:** Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles. **NOTE:** This condition applies to data center and non-data center environments.
Corrosive dust	• Air must be free of corrosive dust. • Residual dust present in the air must have a deliquescent point less than 60% relative humidity. **NOTE:** This condition applies to data center and non-data center environments.

Table 17. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-2013.
Silver coupon corrosion rate	<200 Å/month as defined by ANSI/ISA71.04-2013.

NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.