

# Dell EMC PowerEdge R540

## Technical Specifications

## 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

## Topics:

- System dimensions
- Chassis weight
- Processor specifications
- Supported operating systems
- Cooling fans specifications
- PSU specifications
- System battery
- Expansion bus specifications
- Memory specifications
- Storage controller specifications
- Drive specifications
- Ports and connectors specifications
- Video specifications
- Environmental specifications

## System dimensions

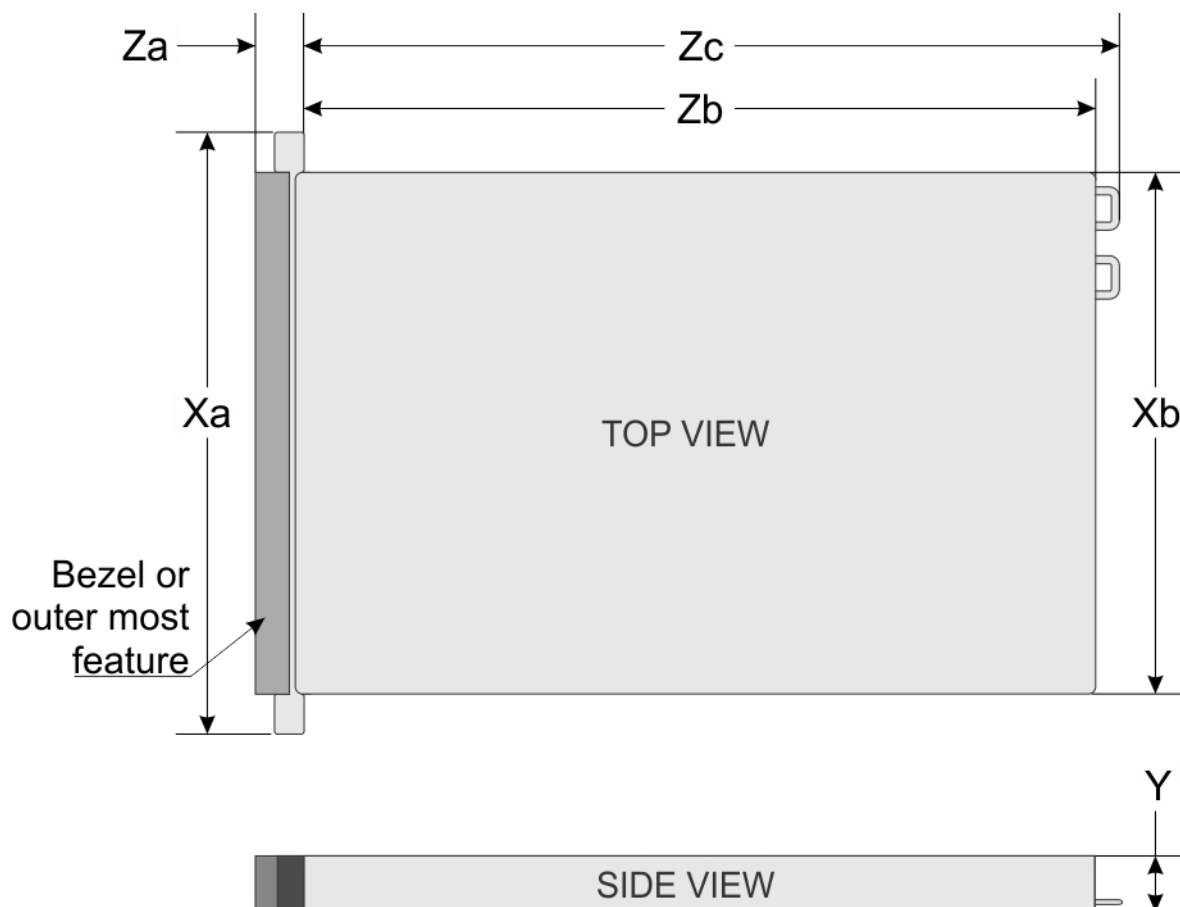


Figure 1. Dimensions of the Dell EMC PowerEdge R540 system

**Table 1. Dimensions of the Dell EMC R540 system**

Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb	Zc
482.0 mm (18.97 inches)	434.0 mm (17.08 inches)	86.8 mm (3.41 inches)	35.84 mm (1.41 inches)	22 mm (0.87 inches)	647.07 mm (25.47 inches)	681.755 mm (26.84 inches)

## Chassis weight

**Table 2. Chassis weight**

System	Maximum weight (with all drives/SSDs)
8 x 3.5 inch	25.4 kg (55.99 lb)
12 x 3.5 inch	29.68 kg (65.43 lb)

## Processor specifications

The Dell EMC PowerEdge R540 System supports up to two Intel Xeon Scalable processors, up to 20 cores per processor.

## Supported operating systems

The Dell EMC PowerEdgeR540 supports the following operating systems:

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

**i** **NOTE:** For more information, go to [www.dell.com/ossupport](http://www.dell.com/ossupport)

## Cooling fans specifications

Your system supports up to six standard or high performance cabled cooling fans.

**Table 3. Fan support matrix for Dell EMC PowerEdge R540 System**

Front Storage	PSU type	CPU count	Fan1	Fan2	Fan3	Fan4	Fan5	Fan6
8 x 3.5-inch	Cable PSU or Redundant PSU	1	Not required	Required	Required	Required	Required	Not required
	Redundant PSU	2	Not required	Required	Required	Required	Required	Required
12 x 3.5-inch	Redundant PSU only	1	Required	Required	Required	Required	Required	Not required
		2	Required	Required	Required	Required	Required	Required

**i** **NOTE:** The high performance fans are required for 12 x 3.5-inch drive + 2 x 3.5-inch rear drive system. For more information, see the Thermal restriction matrix topic in the Technical specifications section.

# PSU specifications

The Dell EMC PowerEdge R540 system supports the following AC or DC power supply units (PSU).

**Table 4. PSU specifications**

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1100 W Mixed Mode HVDC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1100 W Mixed Mode HVDC(For China and Japan only)	Platinum	4100 BTU/hr		200–380 V DC, autoranging
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W Mixed Mode	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W Mixed Mode (For China only)	Platinum	2891 BTU/hr		240 V DC
750 W Mixed Mode HVDC (For China only)	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
				240 V DC
495 W AC	Platinum	1908 BTU/hr	50/60 Hz	100–240 V AC, autoranging
450 W AC (no longer offering)	Bronze	1871 BTU/hr	50/60 Hz	100–240 V AC, autoranging

**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 230 V.

## System battery

The Dell EMC PowerEdge R540 system supports CR 2032 3.0-V lithium coin cell system battery.

## Expansion bus specifications

The Dell EMC PowerEdge R540 system supports PCI express (PCIe) generation three expansion cards, which must be installed on the system board using expansion card risers.

**Table 5. Expansion bus specifications**

Expansion card riser	PCIe slots on the riser	Height	Length	Link
LOM riser	Slot 1	Mezz type	Mezz type	x8
Right riser	Slot 2	Low profile	Half length	x16
Right riser	Slot 2	Half height	Half length	x16
Internal riser	Slot integrated	Low profile	Half length	x8
Butterfly riser	Slot 2	Full height	Half length	x8
Butterfly riser	Slot 3	Low profile	Half length	x8
Left riser	Slot 3	Low profile	Half length	x16

# Memory specifications

**Table 6. 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	80 GB	16 GB	128 GB
RDIMM	Dual rank	16 GB	16 GB	160 GB	32 GB	256 GB
RDIMM	Dual rank	32 GB	32 GB	320 GB	64 GB	512 GB
LRDIMM	Quad rank	64 GB	64 GB	640 GB	128 GB	1024 GB

# Storage controller specifications

The Dell EMC PowerEdge R540 system supports:

- **Software RAID:** S140
- **Internal controllers:** H750, H350, H740p, H730p, H330
- **Boot Optimized Storage Subsystem (BOSS):** HWRAID 2 x M.2 SSDs 120 GB, 240 GB with 6 Gb/s
  - x8 connector using PCIe Gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.
- **External controller:** HBA355e, H840, 12 Gbps Ext SAS HBA
- **SAS Hot Bus Adapters:** HBA350i, HBA330

**NOTE:** The new generation PERC 11 H750, H350, and HBA350i adapters cannot be mixed with the PERC H740P, H730P, H330, HBA330 adapters of the previous generations in one system.

# Drive specifications

## Drives

The PowerEdge R540 system supports:

- Up to 12 x 3.5 inch drives or 2.5 inch drives with drive adapter, internal, hot swappable SAS, SATA, or Nearline SAS drives or
- Up to 8 x 3.5 inch drives or 2.5 inch drives with drive adapter, internal, hot swappable SAS, SATA or Nearline SAS drives

## Optical drives

The Dell EMC PowerEdge R540 system supports one optional slim SATA DVD-ROM drive or DVD +/-RW drive.

## Tape Drives

The Dell EMC PowerEdge R540 system supports external tape backup devices.

**NOTE:** The Dell EMC PowerEdge R540 system does not support internal tape drives.

Supported external tape drives:

- External RD1000 USB
- External LTO-5, LTO-6, LTO-7 and 6 Gb SAS tape drives
- 114X rack mount chassis with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL1000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL2000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL2000 with LTO-5, LTO-6, and LTO-7 8Gb FC tape drives

- TL4000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL4000 with LTO-5, LTO-6, and LTO-7 8Gb FC tape drives
- ML6000 with LTO-5, LTO-6, 6 Gb SAS tape drives
- ML6000 with LTO-5, LTO-6, LTO-7 8Gb FC tape drives

## Ports and connectors specifications

### USB ports

The Dell EMC PowerEdge R540 system supports:

**Table 7. USB specifications**

Front panel	Back panel	Internal USB
<ul style="list-style-type: none"> <li>• Two USB 2.0-compliant port</li> <li>• One iDRAC Direct (Micro-AB USB) port</li> </ul>	<ul style="list-style-type: none"> <li>• Two USB 3.0-compliant port</li> </ul>	<ul style="list-style-type: none"> <li>• One internal USB 3.0 port</li> </ul>

### NIC ports

The Dell EMC PowerEdge R540 system supports two Network Interface Controller (NIC) ports on the back panel, which have two 1 Gbps configuration.

 **NOTE:** You can install up to six PCIe NIC cards (five PCIe AIC cards, one OCP card).

### VGA ports


The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The Dell EMC PowerEdge R540 system supports two 15-pin VGA ports.

### Serial connector

The serial connector connects a serial device to the system. The Dell EMC PowerEdge R540 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

The Dell EMC PowerEdge R540 system supports two optional flash memory card slots with an internal dual MicroSD module.

 **NOTE:** One card slot is dedicated for redundancy.

## Video specifications

The PowerEdge Dell EMC PowerEdge R540 system supports Matrox G200eW3 graphics card with 16 MB capacity.

**Table 8. 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



**Table 8. Supported video resolution options (continued)**

Resolution	Refresh rate (Hz)	Color depth (bits)
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

## Environmental specifications

**NOTE:** For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on [www.dell.com/poweredge/manuals](http://www.dell.com/poweredge/manuals)

**Table 9. 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 the Expanded Operating Temperature section.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

**Table 10. 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 11. Maximum vibration specifications**

Maximum vibration	Specifications
Operating	0.26 G <sub>rms</sub> at 5 Hz to 350 Hz (all operation orientations).
Storage	1.88 G <sub>rms</sub> at 10 Hz to 500 Hz for 15 min (all six sides tested).

**Table 12. Maximum shock specifications**

Maximum shock	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.
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 13. Maximum altitude specifications**

Maximum altitude	Specifications
Operating	30482000 m (10,0006560 ft)
Storage	12,000 m (39,370 ft)

**Table 14. Operating temperature derating specifications**

Operating temperature derating	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 15. 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 16. Expanded operating temperature specifications**

Expanded operating temperature	Specifications
Continuous operation	<p>5°C to 40°C at 5% to 85% RH with 29°C dew point.</p> <p><b>i</b> <b>NOTE:</b> Outside the standard operating temperature (10°C to 40°C), the system can operate continuously in temperatures as low as 5°C and as high as 40°C.</p> <p>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).</p>
≤ 1% of annual operating hours	<p>–5°C to 45°C at 5% to 90% RH with 29°C dew point.</p> <p><b>i</b> <b>NOTE:</b> Outside the standard operating temperature (10°C to 40°C), the system can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours.</p> <p>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).</p>

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

**i** **NOTE:** When operating in the expanded temperature range, ambient temperature warnings may be reported on the bezel's LCD panel and in the System Event Log.

## Expanded operating temperature restrictions

- Do not perform a cold startup below 5°C.

- The operating temperature specified is for a maximum altitude of 3050 m (10,000 ft).
- Redundant power supply configuration is required.
- AEP DIMM is not supported.
- GPGPU card is not supported.
- Rear drive configuration is not supported.
- 12 x 3.5 inch SM configuration with CPU 125 W/115 W/105 W\_4C is not supported.
- LRDIMM is not supported.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- Tape backup unit (TBU) is not supported.

## Thermal restriction matrix

**Table 17. Thermal restriction matrix for R540**

Storage configuration		Front	8 drive	12 drive		12 drive
		Rear	NA	NA		2 drive
Fan type			Standard fan	Standard fan		High-performance fan
CPU heat sink type			1.5U heat sink	1.5U heat sink		1U heat sink
Processor number	TDP (W)	Core count	Ambient = 35°C	Ambient = 35°C	Ambient = 30°C	Ambient = 30°C
Intel Xenon Gold 6230	125	20	Yes	Yes	Yes	Yes
Intel Xenon Gold 6226	125	12	Yes	Yes	Yes	Yes
Intel Xenon Gold 6222V	115	20	Yes	Yes	Yes	Yes
Intel Xenon Gold 6209U	125	20	Yes	Yes	Yes	Yes
Intel Xenon Gold 6130	125	16	Yes	Yes	Yes	Yes
Intel Xenon Gold 5222	105	4	Yes	No	Yes	Yes
Intel Xenon Gold 5220	125	18	Yes	No	Yes	Yes
Intel Xenon Gold 5218R	125	20	Yes	No	Yes	Yes
Intel Xenon Gold 5218	125	16	Yes	No	Yes	Yes
Intel Xenon Gold 5217	115	8	Yes	No	Yes	Yes
Intel Xenon Gold 5120	105	14	Yes	No	Yes	Yes
Intel Xenon Gold 5118	105	12	Yes	No	Yes	Yes
Intel Xenon Silver 4216	100	16	Yes	Yes	Yes	Yes
Intel Xenon Silver 4215	85	8	Yes	Yes	Yes	Yes

**Table 17. Thermal restriction matrix for R540 (continued)**

Storage configuration		Front	8 drive	12 drive		12 drive
Intel Xenon Silver 4214R	100	12	Yes	Yes	Yes	Yes
Intel Xenon Silver 4214	85	12	Yes	Yes	Yes	Yes
Intel Xenon Silver 4210R	100	10	Yes	Yes	Yes	Yes
Intel Xenon Silver 4210	85	10	Yes	Yes	Yes	Yes
Intel Xenon Silver 4208	85	8	Yes	Yes	Yes	Yes
Intel Xenon Silver 4114	85	10	Yes	Yes	Yes	Yes
Intel Xenon Silver 4112	85	4	Yes	Yes	Yes	Yes
Intel Xenon Silver 4110	85	8	Yes	Yes	Yes	Yes
Intel Xenon Bronze 3206R	85	6	Yes	Yes	Yes	Yes
Intel Xenon Bronze 3204	85	6	Yes	Yes	Yes	Yes

## Particulate and gaseous contamination specifications


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

**Table 18. Particulate contamination specifications**

Particulate contamination	Specifications
Air filtration	<p>Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit.</p> <p><b>i</b> <b>NOTE:</b> This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.</p> <p><b>i</b> <b>NOTE:</b> Air entering the data center must have MERV11 or MERV13 filtration.</p>
Conductive dust	<p>Air must be free of conductive dust, zinc whiskers, or other conductive particles.</p> <p><b>i</b> <b>NOTE:</b> This condition applies to data center and non-data center environments.</p>
Corrosive dust	<ul style="list-style-type: none"> <li>Air must be free of corrosive dust.</li> <li>Residual dust present in the air must have a deliquescent point less than 60% relative humidity.</li> </ul> <p><b>i</b> <b>NOTE:</b> This condition applies to data center and non-data center environments.</p>

**Table 19. Gaseous contamination specifications**

<b>Gaseous contamination</b>	<b>Specifications</b>
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

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