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. |
| MARNING: A WARNING indicates a potential for property damage, personal injury, or death. |
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Dell EMC PowerEdge R540 overview

The Dell EMC PowerEdge R540 system is a 2U, dual socket rack system that supports up to:

- Two Intel Xeon Scalable Processors
- 16 DIMM slots
- Two AC and DC redundant power supply units (PSU) or single cabled PSU
- 14 drives or solid-state drives

(i) NOTE: All instances of SAS, SATA hard drives and SSDs are referred to as drives in this document, unless specified otherwise.

Technical specifications

System dimensions

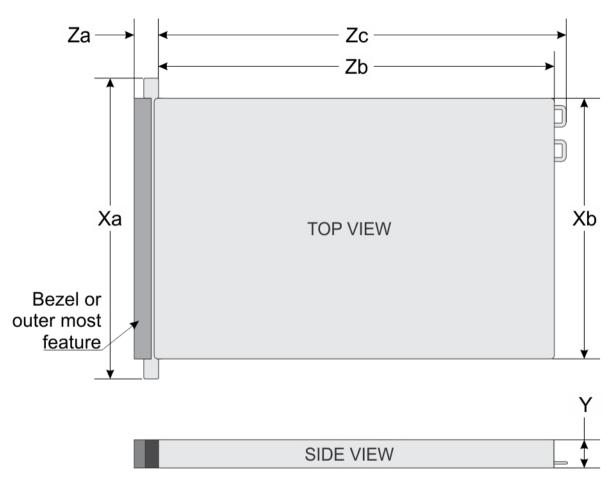


Figure 1. Dimensions of the Dell EMCPowerEdge R540 system

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

NOTE: For more information about the specific versions and additions, go to Dell.com/support/home/Drivers/SupportedOS/poweredge-R540.

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 | |
| | PSU only | 2 | Required | Required | Required | Required | Required | Required |

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 DC | Platinum | 4416 BTU/hr | 50/60 Hz | 200–380 V DC, autoranging |
| 750 W AC | Platinum | 2891 BTU/hr | 50/60 Hz | 100–240 V AC, autoranging |
| 750 W DC | Platinum | 2902 BTU/hr | 50/60 Hz | 240 V DC |
| 495 W AC | Platinum | 1908 BTU/hr | 50/60 Hz | 100–240 V AC, autoranging |
| 450 W AC | Bronze | 1871 BTU/hr | 50/60 Hz | 100–240 V AC, autoranging |

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

1 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

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. The R540 system supports three types of expansion card risers.

Memory specifications

Table 5. Memory specifications

| DIMM tumo | DIMM rank | DIMM | Single | Single processor | | processors | |
|------------------------------|-------------|-------------|-------------|------------------|--------|------------|--|
| DIMM type DIMM rank capacity | 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:

- · Internal controllers: PowerEdge RAID Controller (PERC) H330, H730p, H740p, HBA330, Software RAID (SWRAID) S140
- Boot Optimized Subsystem: HWRAID 2 x M.2 SSDs 120GB, 240 GB.
- External controller: 12 Gbps SAS HBA.

Drive specifications

Drives

The PowerEdge R540 system supports:

- Up to 14 x 3.5 inch drives or 2.5 inch drives with drive adapter, internal, hot swappable SAS, SATA, or Nearline SAS drives
- · Up to 8 x 3.5 inch drives or 2.5 inch drives with drive adapter, internal, hot swappable SATA SSDs

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.

(i) 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 6. USB specifications

| Front panel | Back panel | Internal USB |
|--|----------------------------|---------------------------|
| Two USB 2.0-compliant port One iDRAC Direct (Micro-AB USB) port | Two USB 3.0-compliant port | One internal USB 3.0 port |

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.

(i) NOTE: You can install up to six PCle add-on NIC cards.

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.

i NOTE: One card slot is dedicated for redundancy.

Video specifications

The PowerEdge Dell EMC PowerEdge R540 system supports Matrox G200eR2 graphics card with 16 MB capacity.

Table 7. Supported video resolution options

| Resolution | Refresh rate (Hz) | Color depth (bits) | |
|------------|-------------------|--------------------|--|
| 640x480 | 60,70 | 8, 16, 32 | |
| 800x600 | 60,75, 85 | 8, 16, 32 | |
| 1024x768 | 60,75, 85 | 8, 16, 32 | |
| 1152x864 | 60,75, 85 | 8, 16, 32 | |
| 1280×1024 | 60,75 | 8, 16, 32 | |
| 1440×900 | 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 Dell.com/poweredgemanuals

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 the Expanded Operating Temperature section. |

| Temperature | Specifications | |
|---|--|--|
| 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 $33^{\rm o}{\rm C}$ (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 $\rm G_{\rm rms}$ at 10 Hz to 500 Hz for 15 min (all six sides tested). | |
| Table 11. 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 12. Maximum altitude specifications | | |
| Maximum altitude | Specifications | |
| Operating | 3048 m (10,000 ft) | |
| Storage | 12,000 m (39,370 ft) | |
| Table 13. 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 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. | |
| | (i) NOTE: 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. | |
| | 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 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. | |
| | 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). | |

- (i) NOTE: When operating in the expanded temperature range, system performance may be impacted.
- 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 140 W/130 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 16. Thermal restriction matrix for R540

| Storage configura | ition | 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 6138 | 125 | 20 | Yes | Yes | Yes | Yes |
| Intel Xenon Gold 6130 | 125 | 16 | Yes | Yes | Yes | Yes |
| Intel Xenon Gold 6126 | 125 | 12 | Yes | Yes | Yes | Yes |
| Intel Xenon Gold 6128 | 115 | 6 | Yes | No | Yes | Yes |
| Intel Xenon Gold 5122 | 105 | 4 | Yes | No | Yes | Yes |
| Intel Xenon Gold 5115 | 85 | 10 | Yes | Yes | Yes | Yes |
| Intel Xenon Silver 4116 | 85 | 12 | Yes | Yes | Yes | Yes |
| Intel Xenon Silver 4114 | 85 | 10 | Yes | Yes | Yes | Yes |
| Intel Xenon Silver 4110 | 85 | 8 | Yes | Yes | Yes | Yes |
| Intel Xenon Bronze 3106 | 85 | 8 | Yes | Yes | Yes | Yes |
| Intel Xenon Bronze 3104 | 85 | 6 | Yes | Yes | Yes | Yes |
| Intel Xenon Silver 4112 | 85 | 4 | 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 17. 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: 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. | |
| | 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 18. Gaseous contamination specifications

| Gaseous contamination | Specifications | |
|------------------------------|---|--|
| 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. | |

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

Documentation resources

This section provides information about the documentation resources for your system.

To view the document that is listed in the documentation resources table:

- · From the Dell EMC support site:
 - a Click the documentation link that is provided in the Location column in the table.
 - b Click the required product or product version.
 - NOTE: To locate the product name and model, see the front of your system.
 - c On the Product Support page, click **Manuals & documents**.
- Using search engines:
 - Type the name and version of the document in the search box.

Table 19. Additional documentation resources for your system

| Task | Document | Location |
|-------------------------|---|---------------------------------|
| Setting up your system | For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution. For information about setting up your system, see the Getting Started Guide document that is shipped with your system. | Dell.com/poweredgemanuals |
| Configuring your system | For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide. For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC. For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide. | Dell.com/poweredgemanuals |
| | For information about earlier versions of the iDRAC documents. To identify the version of iDRAC available on your system, on the iDRAC web interface, click ? > About. | Dell.com/idracmanuals |
| | For information about installing the operating system, see the operating system documentation. | Dell.com/operatingsystemmanuals |

| Task | Document | Location |
|---|--|---|
| | For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document. | Dell.com/support/drivers |
| Managing your system | For information about systems management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide. | Dell.com/poweredgemanuals |
| | For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide. | Dell.com/openmanagemanuals > OpenManage Server Administrator |
| | For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide. | Dell.com/openmanagemanuals > OpenManage Essentials |
| | For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide. | Dell.com/serviceabilitytools |
| | For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents. | Dell.com/openmanagemanuals |
| Working with the Dell PowerEdge RAID controllers | For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation. | Dell.com/storagecontrollermanuals |
| Understanding event and error messages | For information about the event and error messages generated by the system firmware and agents that monitor system components, see the Error Code Lookup. | Dell.com/qrl |
| Troubleshooting your system | For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide. | Dell.com/poweredgemanuals |

Getting help

Topics:

- · Contacting Dell EMC
- Documentation feedback
- · Accessing system information by using QRL
- · Receiving automated support with SupportAssist
- · Recycling or End-of-Life service information

Contacting Dell EMC

Dell EMC provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell EMC product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical assistance, or customer service issues:

- 1 Go to Dell.com/support/home.
- 2 Select your country from the drop-down menu on the lower right corner of the page.
- 3 For customized support:
 - a Enter your system Service Tag in the Enter your Service Tag field.
 - b Click Submit.

The support page that lists the various support categories is displayed.

- 4 For general support:
 - a Select your product category.
 - b Select your product segment.
 - c Select your product.

The support page that lists the various support categories is displayed.

- 5 For contact details of Dell EMC Global Technical Support:
 - a Click Global Technical Support.
 - b The Contact Technical Support page is displayed with details to call, chat, or e-mail the Dell EMC Global Technical Support feam

Documentation feedback

You can rate the documentation or write your feedback on any of our Dell EMC documentation pages and click **Send Feedback** to send your feedback.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the R540, to access the information about the Dell EMC PowerEdge R540.

Ensure that your smartphone or tablet has the QR code scanner installed.

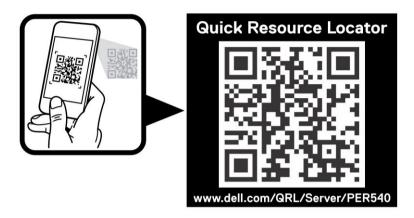
The QRL includes the following information about your system:

· How-to videos

- · Reference materials, including the Installtion and Service Manual, LCD diagnostics, and mechanical overview
- · Your system service tag to quickly access your specific hardware configuration and warranty information
- · A direct link to Dell to contact technical assistance and sales teams
- 1 Go to Dell.com/grl and navigate to your specific product or
- 2 Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for R540

Quick Resource Locator for PowerEdge R540



Receiving automated support with SupportAssist

Dell EMC SupportAssist is an optional Dell EMC Services offering that automates technical support for your Dell EMC server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- Automated issue detection SupportAssist monitors your Dell EMC devices and automatically detects hardware issues, both
 proactively and predictively.
- Automated case creation When an issue is detected, SupportAssist automatically opens a support case with Dell EMC Technical Support.
- Automated diagnostic collection SupportAssist automatically collects system state information from your devices and uploads it securely to Dell EMC. This information is used by Dell EMC Technical Support to troubleshoot the issue.
- · Proactive contact A Dell EMC Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell EMC Service entitlement purchased for your device. For more information about SupportAssist, go to Dell.com/supportassist.

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries. If you want to dispose of system components, visit Dell.com/recyclingworldwide and select the relevant country.