Dell EMC PowerEdge R540

Technical Specifications

DELLEMC

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

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

ⓘ **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
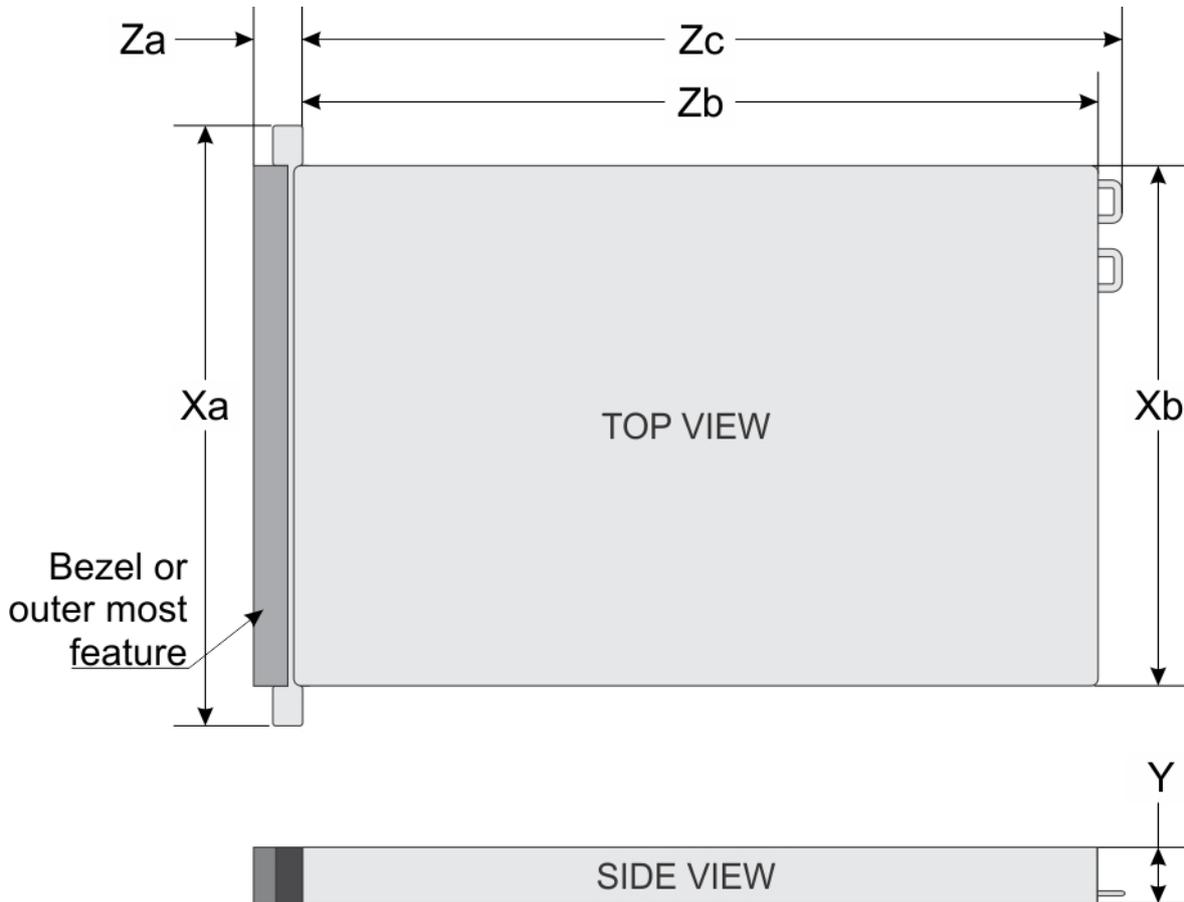
Figure 1. Dimensions of the Dell EMCPowerEdge R540 system

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

(i) **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
		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 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 AC (Mixed Mode)	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W DC (For China Only)	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

 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

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 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:

· **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
  or
· 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.

 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.

ⓘ **NOTE: You can install up to six PCIe 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.

ⓘ **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 7. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
640x480	60,70	8, 16, 32

Resolution	Refresh rate (Hz)	Color depth (bits)
800x600	60,75, 85	8, 16, 32
1024x768	60,75, 85	8, 16, 32
1152x864	60,75, 85	8, 16, 32
1280x1024	60,75	8, 16, 32
1440x900	60	8, 16, 32
1920x1200	60	8, 16, 32

Environmental specifications

(i) **NOTE: For additional information about environmental certifications, please refer to the Product Environmental Datasheet located with the Manuals & Documents on www.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.
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 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	30482000 m (10,0006560 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. ⓘ **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).

ⓘ **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 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 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 5222	105	4	Yes	No	Yes	Yes
Intel Xenon Gold 5220	125	18	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 5215	85	10	Yes	No	Yes	Yes
Intel Xenon Gold 5122	105	4	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 Gold 5117	105	14	Yes	No	Yes	Yes
Intel Xenon Silver 4216	100	16	Yes	Yes	Yes	Yes
Intel Xenon Silver 4215	85	8	Yes	Yes	Yes	Yes

Storage configuration		Front	8 drive	12 drive		12 drive
Intel Xenon Silver 4214	85	12	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 4116	85	12	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 Silver 4108	85	8	Yes	Yes	Yes	Yes
Intel Xenon Bronze 3204	85	6	Yes	Yes	Yes	Yes
Intel Xenon Bronze 3104	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 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.

ⓘ **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:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.

     (i) **NOTE: To locate the product name and model, see the front of your system.**
  3. 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.	www.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 are implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide.	www.dell.com/poweredgemanuals
	For information about earlier versions of the iDRAC documents, see the iDRAC documentation. To identify the version of iDRAC available on your system, on the iDRAC web interface, click **?** > **About**.	www.dell.com/idracmanuals
	For information about installing the operating system, see the operating system documentation.	www.dell.com/operatingsystemmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	www.dell.com/support/drivers
Managing your system	For information about systems management software offered by Dell, see the Dell	www.dell.com/poweredgemanuals

Task	Document	Location
	OpenManage Systems Management Overview Guide.	
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	www.dell.com/openmanagemanuals > OpenManage Server Administrator
	For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	www.dell.com/openmanagemanuals > OpenManage Essentials
	For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.	www.dell.com/openmanagemanuals > OpenManage Enterprise
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	www.dell.com/serviceabilitytools
	For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.	www.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.	www.dell.com/storagecontrollermanuals
Understanding event and error messages	For information about the event and error messages that are generated by the system firmware and agents that monitor system components, see the Error Code Lookup.	www.dell.com/qrl
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	www.dell.com/poweredgemanuals

Getting help

Topics:

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 www.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 team.

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 www.dell.com/qrl 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 www.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 www.dell.com/recyclingworldwide and select the relevant country.