Dell PowerEdge R640

Technical Specifications

Regulatory Model: E39S Series
Regulatory Type: E39S001

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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PowerEdge R640 system overview

The PowerEdge R640 is a 1U rack server that supports up to:

- Two Intel Xeon Processor Scalable Family processors
- 8 x 2.5 inch hard drives or 4 x 3.5 inch hard drives on the front panel, or 10 x 2.5 inch hard drives on the front panel with optional support for 2 X 2.5 inch hard drives on the back panel
- 24 DIMM slots
- Two AC or DC redundant power supply units

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Technical specifications

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

Topics:

System dimensions

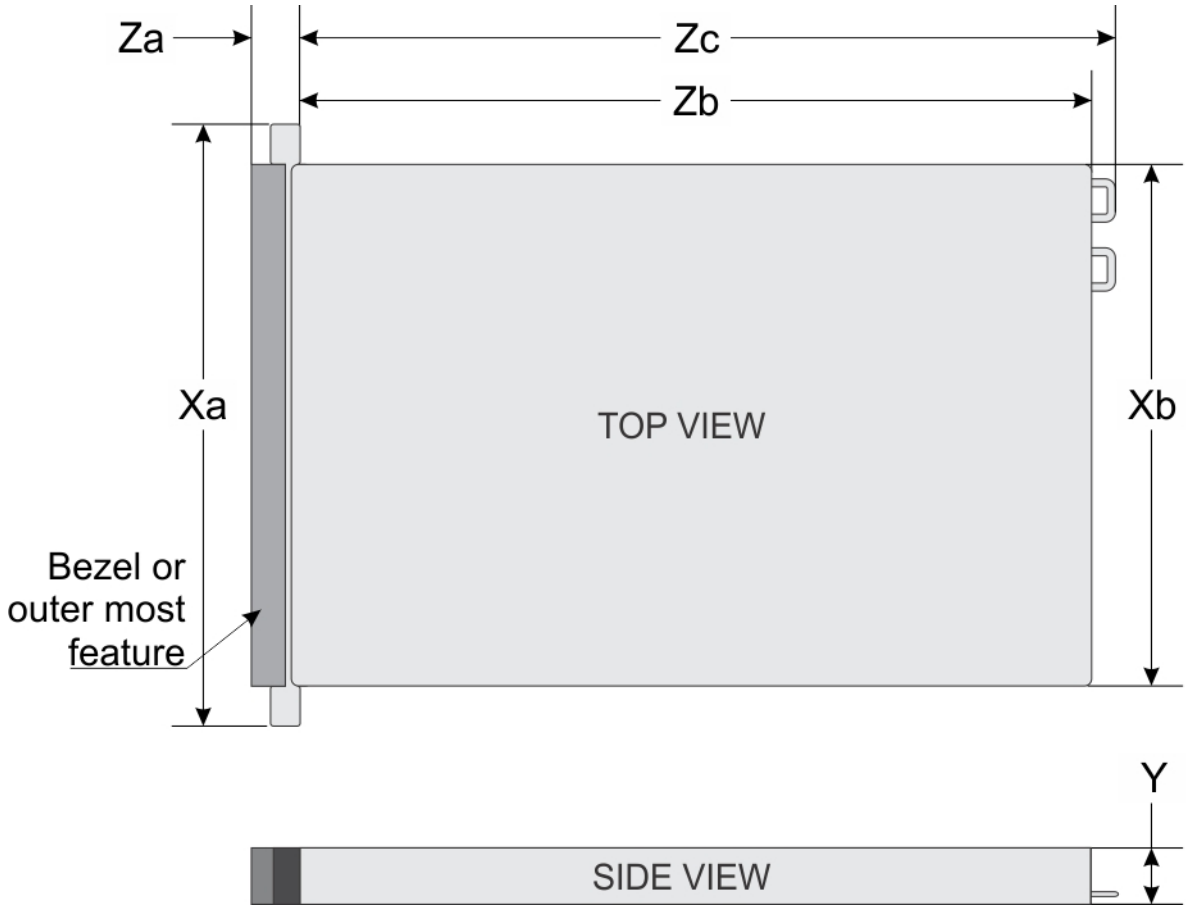

Figure 1. System dimensions

Table 1. Dimensions

System	Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb*	Zc
4 x 3.5 inch or 10 x 2.5 inches	482.0 mm (18.97 inches)	434.0 mm (17.08 inches)	42.8 mm (1.68 inches)	35.84 mm (1.41 inches)	22.0 mm (0.87 inches)	733.82 mm (29.61 inches)	772.67 mm (30.42 inches)
8 x 2.5 inch	482.0 mm (18.97 inches)	434.0 mm (17.08 inches)	42.8 mm (1.68 inches)	35.84 mm (1.41 inches)	22.0 mm (0.87 inches)	683.05 mm (26.89 inches)	721.91 (28.42 inches)

Chassis weight

Table 2. Chassis weight

System	Maximum weight (with all hard drives/SSDs)
PowerEdge R640	21.9 kg

System	Maximum weight (with all hard drives/SSDs)
	(48.28 lbs)

Processor specifications

The PowerEdge R640 system supports two Intel Xeon Processor Scalable Family processors.

PSU specifications

The PowerEdge R640 system supports up to two AC or DC power supply units (PSUs).

Table 3. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage
495 W AC	Platinum	1908 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging
750 W AC	Titanium	2843 BTU/hr	50/60 Hz	200–240 V AC, autoranging
750 W Mixed Mode HVDC (for China only)		2891 BTU/hr	50/60 Hz	100–240 V AC and 240 V DC
1100 W DC	Gold	4416 BTU/hr	50/60 Hz	–(48–60) V DC
1100 W Mixed Mode HVDC (for China and Japan only)	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC and 200–380 V DC
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging
1600 W AC		6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging

NOTE: If a system with 1100W AC or HVDC PSU operates from 100 to 120V, the power rating per PSU is derated to 1050W.

NOTE: If a system with 1600 W PSUs operates from 100 to 120 V, then the power rating per PSU is derated to 800 W.

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 specifications

The PowerEdge R640 system supports CR 2032 lithium coin cell system battery.

Expansion bus specifications

The PowerEdge R640 system supports PCI express (PCIe) generation 3 expansion cards, which are installed on the system, using expansion card risers. This system supports 1A, 2A, 1B, and 2B expansion card risers.

Memory specifications

Table 4. Memory specifications

Memory module sockets	Architecture	Memory capacity	Minimum RAM	Maximum RAM
Twenty four 288-pins	2667 MT/s DDR4 RDIMMs and LRDIMMs with support for memory optimized operation	64 GB quad rank (LRDIMMs)	32 GB (minimum LRDIMM size) with single processor	LRDIMM: up to 786 GB with single processor
		8 GB single rank (RDIMMs)	8 GB with dual processors (minimum one memory module per processor)	LRDIMM: up to 1536 GB with dual processors
		16 GB or 32 GB dual rank (RDIMMs)		RDIMM: up to 384 GB with single processor
				RDIMM: up to 786 GB with dual processors
		16 GB (NVDIMM-N)	Not supported with single processor	Not supported with single processor
		208 GB with dual processors	576 GB with dual processors	

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

NOTE: Minimum of two CPUs are required for any configuration that supports NVDIMM-N.

Storage controller specifications

The PowerEdge R640 system supports:

- Internal storage controller cards: PowerEdge RAID Controller (PERC) H330, PERC H730P, PERC H740P, HBA330, S140, and Boot Optimized Server Storage (BOSS-S1).
- External storage controller cards: PERC H840 and 12Gbps SAS HBA.

Drive specifications

The PowerEdge R640 supports SAS, SATA, Nearline SAS hard drives and an optional optical drive.

Hard drives

The PowerEdge R640 system supports SAS, SATA, Nearline SAS hard drives or SSDs.

Table 5. Supported hard drive options for the PowerEdge R640 system

Ten hard drive systems with two rear hard drives	Up to ten 2.5 inch, hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives with up to 2 x 2.5 inch hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives supported at the back of the system.
Eight hard drive systems	Up to eight 2.5 inch, hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives
Four hard drive systems with two rear hard drives	Up to four 3.5 inch, hot swappable hard drives with up to 2 x 2.5 inch hot swappable SAS, SATA, SAS/SATA SSD, or Nearline SAS hard drives supported at the back of the system.

Optical drive

Certain configurations of the system support one optional SATA DVD-ROM drive or DVD+/-RW drive.

NOTE: The optical drive is supported in both 4 x 3.5 and 8 x 2.5 inch hard drive systems.

Ports and connectors specifications

The PowerEdge R640 supports USB ports, NIC ports, VGA ports, serial connector, and an IDSDM/vFlash card that supports an optional flash memory card and one internal dual SD module.

USB ports

The PowerEdge R640 system supports:

- USB 2.0-compliant port on the front panel
- Micro USB 2.0-compliant port in the front panel

  NOTE: The micro USB 2.0-compliant port on the front panel can only be used as an iDRAC Direct or a management port.
- USB 3.0-compliant ports on the back panel

  NOTE: One optional USB 3.0-compliant port on the front panel for 4 x 3.5 and 8 x 2.5 inch hard drive systems.
- Internal USB 3.0-compliant port

The following table provides more information about the USB specifications:

Table 6. USB specifications

System	Front panel	Back panel	Internal
Four hard drive systems	One 4-pin, USB 2.0-compliant ports	Two 9-pin, USB 3.0-compliant ports	N/A
	One 5-pin micro USB 2.0 management port	N/A	N/A
Eight hard drive systems	One 4-pin, USB 2.0-compliant ports	Two 9-pin, USB 3.0-compliant ports	N/A
	One 5-pin micro USB 2.0 management port	N/A	N/A

System	Front panel	Back panel	Internal
Ten hard drive systems	One 4-pins, USB 2.0-compliant port	Two 9-pin, USB 3.0-compliant ports	One 9-pin, USB 3.0-compliant ports
	One 5-pin micro USB 2.0 management port	N/A	N/A

NIC ports

The PowerEdge R640 system supports four Network Interface Controller (NIC) ports on the back panel, which are available in the following configurations:

- Four RJ-45 ports that support 10, 100 and 1000 Mbps
- Four RJ-45 ports that support 100 M, 1 G and 10 Gbps
- Four RJ-45 ports, where two ports support maximum of 10 G and the other two ports maximum of 1 Gbps
- Two RJ-45 ports that support up to 1 Gbps and 2 SFP+ ports that support up to 10 Gbps
- Four SFP+ ports that support up to 10 Gbps
- Two SFP28 ports that support up to 25 Gbps

NOTE: You can install up to three PCIe add-on NIC cards.

Serial port

The PowerEdge R640 system supports one serial port on the back panel. This port is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

VGA ports

The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The PowerEdge R640 system supports one 15-pin VGA port on the front and back of system.

Video specifications

The PowerEdge R640 system supports integrated VGA controller with 4 MB SPI capacity.

Table 7. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
640 x 480	60, 70	8, 16, 32
800 x 600	60, 75, 85	8, 16, 32
1024 x 768	60, 75, 85	8, 16, 32
1152 x 864	60, 75, 85	8, 16, 32
1280 x 1024	60, 75	8, 16, 32
1440 x 900	60	8, 16, 32
1920 x 1200	60	8, 16, 32

IDSDM/vFlash card

The PowerEdge R640 system supports Internal Dual SD module (IDSDM) and vFlash card. In the 14th generation of PowerEdge servers, IDSDM and vFlash card are combined into a single module, and are available in the following options:

- vFlash or
- vFlash and IDSDM

The IDSDM/vFlash card can be connected in a Dell-proprietary PCIe x1 slot using a USB 3.0 interface to host. IDSDM/vFlash module supports two micro SD cards for IDSDM and one card for vFlash. Micro SD cards capacity for IDSDM are 16, 32, or 64 GB, while for vFlash the microSD card capacity is 16 GB.

NOTE: One IDSDM card slot is dedicated for redundancy.

NOTE: It is recommended to use Dell branded micro SD cards associated with the IDSDM/vFlash configured systems.

Environmental specifications

NOTE: For additional information about environmental measurements for specific system configurations, see Dell.com/environmental_datasheets.

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. **NOTE: Maximum of 205 W, 28 core processor is supported in systems with eight 2.5 inch processor direct attached PCIe SSD drives, and three PCIe slot chassis.** **NOTE: Certain configurations may have ambient temperature restrictions. For more information see the Ambient temperature limitations section.**
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 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 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–40°C at 5% to 85% RH with 29°C dew point.

Expanded operating temperature	Specifications
	NOTE: Outside the standard operating temperature (10°C–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–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–45°C at 5% to 90% RH with 29°C dew point. **NOTE: Outside the standard operating temperature (10°C–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 may be reported on the 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).
- 155 W/8 C, 165 W/12 C and higher wattage processor(TDP>165 W) are not supported.
- Redundant power supply unit is required.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- PCIe SSD is not supported.
- 3DX Point DIMMs and NVDIMMs-N are not supported.
- Rear installed drives are not supported
- Tape backup unit is not supported.

Thermal restrictions

The following table lists the configurations required for efficient cooling.

Table 16. Thermal restrictions configuration

Configuration	Number of processors	Heatsink	Processor/ DIMM blank	DIMM blanks	Maximum number of DIMM blanks	Fan
PowerEdge R640 (2.5 inch hard drives x 10)	1	One 1U standard heat sink for CPU ≤ 165 W	Not required	Required for processor 1	11 blanks	Five standard fans
		One 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*	Required			Eight high performance fans
	2	Two 1U standard heat sink for CPU ≤ 165 W	Not required			Eight standard fans

Configuration	Number of processors	Heatsink	Processor/ DIMM blank	DIMM blanks	Maximum number of DIMM blanks	Fan
		Two 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*		Required	22 blanks	Eight high performance fans
PowerEdge R640 (2.5 inch hard drives x 10 with NVMe drives)	2	Two 1U standard heat sink for CPU ≤ 165 W	Not required	Required	22 blanks	Eight high performance fans
		Two 1U 2-pipe heat sink for CPU=200/205 W and 150 W/165 W FO*				
PowerEdge R640 (2.5 inch hard drives x 8) (3.5 inch hard drives x 4)	1	One 1U standard heat sink for CPU ≤ 165 W	No	Required for processor 1	11 blanks	Five standard fans
		One 1U 2-pipe heat sink for CPU=150 W/165 W FO*				
		One 1U 2-pipe heat sink for CPU=200/205 W				
	2	Two 1U standard heat sink for CPU ≤ 165 W				
		Two 1U 2-pipe heat sink for CPU=150 W/165 W	Yes			Eight high performance fans
		Two 1U 2-pipe heat sink for CPU=200/205 W	No	Required	22 blanks	Eight standard fans
						Eight high performance fans
Two 1U 2-pipe heat sink for CPU=200/205 W and 155 W/165 W FO*						

NOTE: *165 W and 150 W FO includes Intel Xeon Gold 6146 and 6144 processors.

Ambient temperature limitations

The following table lists configurations that require ambient temperature less than 35°C.

NOTE: The ambient temperature limit must be adhered to ensure proper cooling and to avoid excess processor throttling, which may impact system performance.

Table 17. Configuration based ambient temperature restrictions

System	Front Backplane	Processor Thermal Design Power	Processor Heat Sink	Fan Type	Ambient Restriction
PowerEdge R640	10 x 2.5 inch SAS/ SATA hard drives	200 W, 205 W	2 pipe 1U high performance	High performance fan	30°C
	8 x 2.5 inch SAS/SATA hard drives				

System	Front Backplane	Processor Thermal Design Power	Processor Heat Sink	Fan Type	Ambient Restriction
	4 x 3.5 inch SAS/SATA hard drives				
	10 x 2.5 inch SAS/SATA and NVMe drives(4, 8, or 10) 4 x 3.5 inch SAS/SATA and NVMe drives	165 W, 200 W, 205 W	2 pipe 1U high performance	High performance fan	30°C

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 18. 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 the 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 19. 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.

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Documentation resources

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

Table 20. 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 rack documentation included with your rack solution.	Dell.com/poweredgemanuals
	For information about setting up and turning on the 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.	Dell.com/idracmanuals
	For information about installing the operating system, see the operating system documentation.	Dell.com/operatingsystemmanuals
	For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM Command Line Reference Guide for iDRAC.	Dell.com/idracmanuals
	For information about updating drivers and firmware, see the Methods to download firmware and drivers section in this document.	To download drivers: 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/openmanagemanuals
	For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.	Dell.com/openmanagemanuals
	For information about installing, using, and troubleshooting Dell OpenManage Essentials, see the Dell OpenManage Essentials User's Guide.	Dell.com/openmanagemanuals
	For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.	Dell.com/serviceabilitytools
	For understanding the features of Dell Lifecycle Controller, see the Dell Lifecycle Controller User's Guide.	Dell.com/idracmanuals
	For information about partner programs enterprise systems management, see the OpenManage	Dell.com/openmanagemanuals

Task	Document	Location
	Connections Enterprise Systems Management documents.	
	For information about viewing inventory, performing configuration and monitoring tasks, remotely turning on or off servers, and enabling alerts for events on servers and components using the Dell Chassis Management Controller (CMC), see the CMC User's Guide.	Dell.com/esmmanuals
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 checking the event and error messages generated by the system firmware and agents that monitor system components, see the Dell Event and Error Messages Reference Guide.	Dell.com/openmanagemanuals > OpenManage software
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	Dell.com/poweredgemanuals

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Getting help

Topics:

Receiving automated support with SupportAssist

Dell SupportAssist is an optional Dell Services offering that automates technical support for your Dell 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 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 Technical Support.
- **Automated diagnostic collection** — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell. This information is used by Dell Technical Support to troubleshoot the issue.
- **Proactive contact** — A Dell Technical Support agent contacts you about the support case and helps you resolve the issue.

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

Contacting Dell

Dell 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 product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical assistance, or customer service issues:

1. Go to Dell.com/support.
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 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 Global Technical Support team.

Documentation feedback

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

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) to get immediate access to the information about your system.The QRL is located on the top of the system cover and provides access to generic information about your system. If a you want to access information specific to the system service tag, such as configuration and warranty, you can access QR code located on the system Information tag.

Prerequisites

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

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Owner's Manual, LCD diagnostics, and mechanical overview
- A direct link to Dell to contact technical assistance and sales teams

Steps

1 Go to **Dell.com/QRL** and navigate to your specific product or

2 Use your smart phone or tablet to scan the model-specific Quick Resource (QR) code on your PowerEdge system or in the Quick Resource Locator section.

Quick Resource Locator for R640

Figure 2. Quick Resource Locator for PowerEdge R640