Dell EMC PowerEdge R640

Technical Guide

Regulatory Model: E39S Series
Regulatory Type: E39S001
September 2021
Rev. A09

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.

© 2017 - 2021 Dell Inc. or its subsidiaries. All rights reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.

Contents

Chapter 1: Product overview..... 5
Introduction..... 5
New technologies..... 5

Chapter 2: System features..... 7
Product comparison..... 7
Technical specifications..... 8

Chapter 3: Chassis views and features..... 11
Front view and features..... 11
Back view of the system..... 11
Internal view of the system..... 12

Chapter 4: Security features..... 14

Chapter 5: Processors..... 15
Supported processors..... 15
Chipset..... 22

Chapter 6: Memory..... 23

Chapter 7: Storage..... 25
Storage controllers..... 26
Optical drives..... 26
Tape drives..... 26
IDSDM or vFlash card..... 26

Chapter 8: Networking and PCIe..... 28
PCIe riser and options..... 28

Chapter 9: Power, thermal and acoustics..... 29
Power consumption and energy efficiency..... 29
Thermal and Acoustics..... 30
Power supply units..... 30
Acoustical design..... 30

Chapter 10: Rack rails..... 31

Chapter 11: Supported operating system..... 33

Chapter 12: Dell EMC OpenManage systems management..... 34
Server and Chassis Managers..... 35
Dell EMC consoles..... 35

Automation Enablers..... 35
Integration with third-party consoles.....35
Connections for third-party consoles..... 35
Dell EMC Update Utilities.....35
Dell resources.....35

Chapter 13: Appendix A. Additional specifications.....37
Chassis dimensions..... 37
Video specifications.....40
USB.....40
Power supply specifications..... 40
Environmental specifications.....41

Chapter 14: Appendix B. Standards compliance..... 44

Chapter 15: Appendix C Additional resources.....45

Chapter 16: Appendix D. Support and deployment services.....46
Dell EMC ProDeploy Enterprise Suite 46
Dell EMC ProDeploy Plus.....47
Dell EMC ProDeploy.....47
Dell EMC Basic Deployment.....47
Dell EMC Residency Services.....47
Deployment services.....47
Dell EMC Remote Consulting Services..... 47
Dell EMC Data Migration Service..... 47
ProSupport Enterprise Suite.....47
ProSupport Plus.....48
ProSupport.....48
ProSupport One for Data Center..... 49
Support Technologies..... 49
Additional professional services.....50
Dell Education Services..... 50
Dell EMC Global Infrastructure Consulting Services.....50
Dell EMC Managed Services..... 50

1

Product overview

Topics:

- Introduction
- New technologies

Introduction

The PowerEdge R640 is a general purpose platform expandable up to 7.68TB of memory, up to twelve 2.5 inch drives, and flexible I/O options. The R640 can handle demanding workloads such as virtualization, dense private cloud, High Performance Computing (HPC) and software-defined storage.

The Dell EMC PowerEdge R640 is the ideal dual-socket, 1U platform for dense scale-out data center computing. The R640 combines density, performance and scalability to optimize application performance and data center density.

The PowerEdge R640 features:

- 2nd Generation Intel® Xeon® Scalable Processor product family (with up to 28 cores and two threads per core)
- Up to six DDR4 memory channels with two DIMMs per channel per CPU and 24 DIMMs (supports DDR4 RDIMM/LRDIMM/NVDIMM-N/PMem)
- PCI Express® (PCIe) 3.0 enabled expansion slots (with up to 48 lanes per CPU)
- Networking technologies, such as Ethernet, Infiniband, OCP, OPA

New technologies

The following are the new technologies featured on the PowerEdge R640

Table 1. New technologies featured on the PowerEdge R640

New technology	Detailed description
2nd Generation Intel® Xeon® Scalable Processor	The processor product family has embedded PCIe lanes for improved I/O performance. For details, see the Processor section.
Intel® C620 series chipset	The R640 system uses the Intel Lewisburg chip. It is a 2 chip platform - CPU and PCH.
2933 MT/s DDR4 memory	The Intel® Xeon® Scalable Processor product family that supports 2933 MT/s memory and twenty-four 288-pin DIMMs. The R640 system supports: ● Two DIMMs per channel for single - rank and/or dual - rank DIMMs ● One or two DIMMs per channel for quad - rank DIMMs For details, see the Memory section. See the Memory section for details.
Intel® Optane™ persistent memory	Up to 6 per CPU socket. Max 12 for 2S configuration. ● 256GB, 512GB per DIMM ● 1866, 2133, 2400, 2666 MT/s ● Up to 6.14TB max, (7.68TB max with PMem and LDRIMM)
iDRAC9 with Lifecycle Controller	The new embedded systems management solution for the Dell EMC systems features hardware and firmware inventory and alerting, data center level power monitoring, and faster performance. For details, see the Dell EMC OpenManage systems management section.
2.5-inch PCIe SSD	Supports up to ten CPU Direct Attach PCIe SSD

Table 1. New technologies featured on the PowerEdge R640 (continued)

New technology	Detailed description
LCD bezel	The PowerEdge R640 LCD control panel is embedded in the front bezel for easy access and management.

2

System features

Compared to previous generations, the PowerEdge R640 offers faster processing power and advanced system management.

The R640 system is a powerhouse 2S/1U rack system, which emphasizes performance and reliability in areas such as virtualization, power, thermal and systems management, and usability. It is designed for mid-size to large data centers that require high memory capacity and performance.

The R640 system consists of the planar subsystem with control panel, SAS backplane, storage card, riser card, VGA port, Storage Enclosure Processor (SEP) (4 x HDD back plane, 8x HDD backplane, 10x HDD backplane, 10x NVMe backplane and 2 x rear backplane). It is a two-chip platform (CPU and PCH) because this family of processors includes an Integrated Memory Controller (IMC) and Integrated I/O (IIO) (such as PCI Express and DMI3) on a single silicon die.

Topics:

- Product comparison
- Technical specifications

Product comparison

The following table shows the comparison between the R640 with the predecessor R630:

Table 2. Comparison of R640 with the predecessor R630

Feature	PowerEdge R640	PowerEdge R630
Processors	2nd Generation Intel® Xeon® Scalable Processor Family	Intel® Xeon® processor E5-2600 v3 or E5- 2600 v4
Chipset	Intel® C620	Intel® C610
Memory	• 24x DDR4 RDIMM/LR-DIMM 12x NVDIMM + 12 x RDIMM • 12 x PMem + 12 x RDIMM or 12 x LRDIMM	24x DDR4 RDIMM/LR-DIMM
Chassis	Storage design modularity • 4 Hard Drive Chassis • 8 Hard Drive Chassis • 10 Hard Drive Chassis • 10 NVMe Drive Chassis	Three individual chassis for three SKU • 8 Hard Drive Chassis • 1 Hard Drive Chassis • 24 Hard Drive Chassis
Disk Drives	Front drive bays: • Up to 10 x 2.5 -inch with up to 8 NVMe, SAS/SATA/SSD/NVMe, max 76.8TB , or up to 10 NVMe drives max 64TB. Or up to 4 x 3.5" SAS/SATA, max 64TB Rear drive bays: • Up to 2 x 2.5 -inch SAS/SATA/SSD/ NVMe, max 15.36TB	• 8 x 2.5 -inch SAS/SATA or SATA only • 10 x2. 5 -inch SAS/SATA or SAS/SATA/NVMe (NVMe up to 4) • 24 x 1.8 inch SATA (single PERC or dual PERCs)
PCIe SSD	Up to 10 CPU Direct Attach PCIe SSD	Up to 4x PCIe SSD from PCIe bridge card
Storage Controller	H330, H730P, H740P, H750 (adapter only), HBA350i (adapter only), H840P (external RAID), S140 HBA330 (non-RAID), 12Gbps SAS HBA (external, non-RAID), HBA355e (adapter only, non-RAID)	S130, H330, H730, H730P, H830 (External) Support for 2 internal RAID controllers for x24 SSD configuration only

Table 2. Comparison of R640 with the predecessor R630 (continued)

Feature	PowerEdge R640	PowerEdge R630
LCD Module	LCD module option in bezel	LCD by default in base x8 chassis, not available on x10 and x24 chassis.
Backplane	• 10 x 2.5 inch SATA/SAS/NVMe (up to 8 NVMes) • 10 x 2.5 inch NVMe • 8 x 2.5 inch SATA/SAS/NVMe • 4 x 3.5 inch SATA/SAS	• 8 x 2. 5 inch SAS/SATA • 10 x 2. 5 inch SAS/SATA • 10 x 2. 5 inch SAS/SATA/PCIeSSD • 24 x 1.8 inch SATA
Riser	Up to 2 riser connectors (left/right)	Up to 3 riser connectors (left/center/right)
PCIe Slots	Up to 3x PCIe Gen3 (x16/x16/x16)	Up to 3x PCIe Gen3 (x16/x8/x16)
Embedded NIC	• 4 x 1GbE • 2 x 10GbE + 2 x 1GbE • 4 x 10GbE • 2 x 25GbE	• Broadcom 5730 Base-T • Intel 1350 Base-T • Broadcom 57800 SFP+ • Broadcom 57800 Base-T • Intel X540 Base-T
Power supplies	• 495W Platinum • 750W Platinum • 750 W Mixed Mode AC Platinum • 750 W Mixed Mode DC Platinum (for China only) • 750W 240HVDC Platinum* (China only) • 1100W - 48VDC • 1100W Platinum • 1100W 380HVDC Platinum* (Available in China and Japan only) • 1600W Platinum • 750W Titanium	• 495 W AC • 750 W AC • 1100 W AC • 1100 W DC
Remote Management	iDRAC9	iDRAC8
TPM	TPM China, TPM1.2, TPM2.0	TPM China, TPM1.2, TPM2.0
USB 3.0 Hub board	Extra USB3.0 connector to front plane	None
iDRAC Direct front port	Micro USB	USB type A
Fan	Up to eight FAN support. (1X6 type)	Up to seven FAN support (2X3 type)
IDSDM Module	Internal Dual SD Module (IDSDM) and vFlash	Internal Dual SD Module (IDSDM)
BOSS Module	M.2 SATA interface	None
PERC	Mini-PERC 10	Mini-PERC 9
NVDIMM Battery	External 12 V power bank for NVDIMM used	None
ODD/TBU	ODD via NPIO	TBU and ODD via 7-pin connectors
On board PCH SATA Connectors	4x NPIOs	2x Mini SAS_HDs

Technical specifications

The following table shows the technical specifications of the PowerEdge R640:

Table 3. Technical specifications of PowerEdge R640

Features	Technical Specification
Form factor	1U rack
Processor	2nd Generation Intel® Xeon® Scalable Processors family
Internal interconnect	Up to 3 Intel Ultra Path Interconnect (Intel® UPI); up to 11.2 GT/s
Memory	DIMM speed: ● Up to 2933 MT/s Memory type: ● RDIMM ● LRDIMM ● NVDIMM ● PMem Memory module slots: ● 24 DDR4 DIMM slots (12 NVDIMM or 12 PMem only) ● Supports registered ECC DDR4 DIMMs only Maximum RAM: ● RDIMM 1.53TB ● LRDIMM 3TB ● NVDIMM 192GB ● PMem* 6.14TB (7.68TB with LDRDIMM)
I/O slots	Up to 3 x PCIeGen slots plus a dedicated PERC and rNDC slot
Storage controllers	● Internal controllers: PERC S140 (SW RAID SATA), PERC H330, PERC H730P, PERC H740P, PERC H750 (adapter only), PERC HBA350i (adapter only) ● Internal HBA (non-RAID): PERC HBA330 (non-RAID), HBA350i (adapter only, non-RAID) ● External HBA—non-RAID: 12 Gb/s SAS HBA, PERC HBA355e (adapter only, non-RAID)
Hard drives	● 10 x 2.5 -inch SATA/SAS/NVMe (up to 8 NVMes) ● 10 x 2.5 -inch NVMe ● 8 x 2.5 -inch SAS/SATA/NVMe ● 4 x 3.5 -inch SAS/SATA ● 8 x 2.5 -inch SATA
Accelerators	Up to 3 single-width GPU (NVIDIA T4) or up to 1 FPGA
Embedded NIC	● 4 x 1GbE ● 2 x 10GbE + 2 x 1GbE ● 4 x 10GbE ● 2 x 25GbE
Power supply	● 495W Platinum ● 750W Platinum ● 750W 240HVDC Platinum* (Available in China only) ● 750 W Mixed Mode AC Platinum ● 750 W Mixed Mode DC Platinum (for China only) ● 1100W - 48VDC ● 1100W Platinum ● 1100W 380HVDC Platinum* (Available in China and Japan only) ● 1600W Platinum ● 750W Titanium
Operating systems	● Canonical® Ubuntu® Server LTS ● Citrix® Hypervisor ● Microsoft® Windows Server® LTSC with Hyper-V

Table 3. Technical specifications of PowerEdge R640 (continued)

Features	Technical Specification
	• Oracle® Linux • Red Hat® Enterprise Linux • SUSE® Linux Enterprise Server For more information on the specific versions and additions, visit Dell.com/OSsupport
Systems management	• **Systems management:** IPMI 2.0 compliant; Dell OpenManage Enterprise; Dell EMC OpenManage Mobile; Dell EMC OpenManage Power Center • **Remote management:** iDRAC9; 8 GB vFlash media (upgrade), 16 GB vFlash media (upgrade) iDRAC Quick Sync • **Dell EMC OpenManage Integrations:** Microsoft® System Center, VMware® vCenter™, BMC Truesight, Red Hat Ansible Modules. • **Dell EMC OpenManage Connections:** IBM Tivoli® Netcool/OMNIbus, IBM Tivoli® Network Manager IP Edition, Micro Focus® Operations Manager I, Nagios® Core, Nagios® XI
Dimensions and weight	• Height: 42.8mm (1.69 -inch) • Width: 482.0mm (18.98 -inch) • Depth: 808.5mm (31.8 -inch) • Weight: 21.9kg (48.3 lbs) Dimensions include bezel
Recommended support	Dell EMC ProSupport Plus for critical systems or Dell EMC ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available. Contact your Dell EMC representative for more information. Availability and terms of Dell EMC Services vary by region. For more information, visit Dell EMC.com/ServiceDescriptions.

3

Chassis views and features

Topics:

- Front view and features
- Back view of the system
- Internal view of the system

Front view and features

The images below illustrates the front view of the PowerEdge R640 with the types of supported chassis options:



Figure 1. Front view 4 x 3.5-inch drive chassis



Figure 2. Front view 8 x 2.5-inch drive chassis



Figure 3. Front view 10 x 2.5-inch drive chassis

Back view of the system

The back panel of a PowerEdge system contains access to I/O connectors for both embedded and add-in devices, including networking, video, serial, USB, system ID, and system management access ports. Most add-in PCI cards are accessible through the back panel. It is also the default location for power supply units (PSU), including the points for AC/DC connections.

Depending on your system configuration, the drive backplanes supported in PowerEdge R640 are listed here:

- 2.5 inch (x8) SAS, SATA, or NVMe backplane
- 2.5 inch (x10) SAS, SATA, or NVMe backplane
- 2.5 inch (x10) SAS, SATA, or NVMe backplane and 2.5 inch (x2) SAS or SATA backplane (back)
- 3.5 inch (x4) SAS or SATA backplane

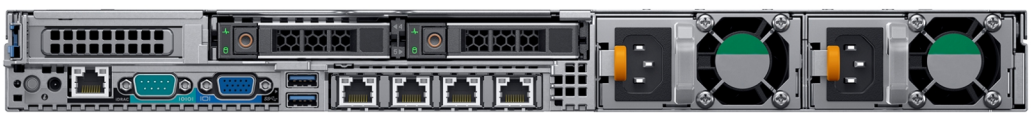

Figure 4. Back panel view of 2 x 2.5 inch hard drives with 1 PCIe expansion slot

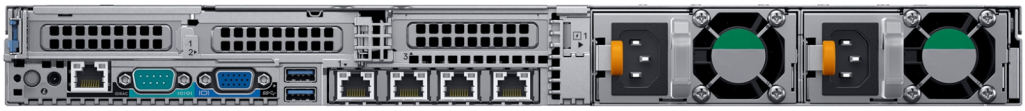

Figure 5. Back panel view of system with 3 PCIe expansion slots

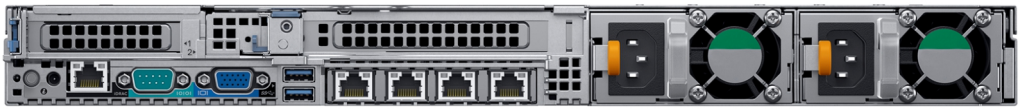

Figure 6. Back panel view of system with 2 PCIe expansion slots

Internal view of the system

The chassis design of the PowerEdge R640 is optimized for easy access to components and for efficient cooling. The PowerEdge R640 supports up to 24 DIMMs, two processors, hot-plug redundant fans, system board and hard drive bays, and many other components and features. For more system views, see the Dell EMC PowerEdge R640 Installation and Service Manual at Dell.com/Support/Manuals.¶

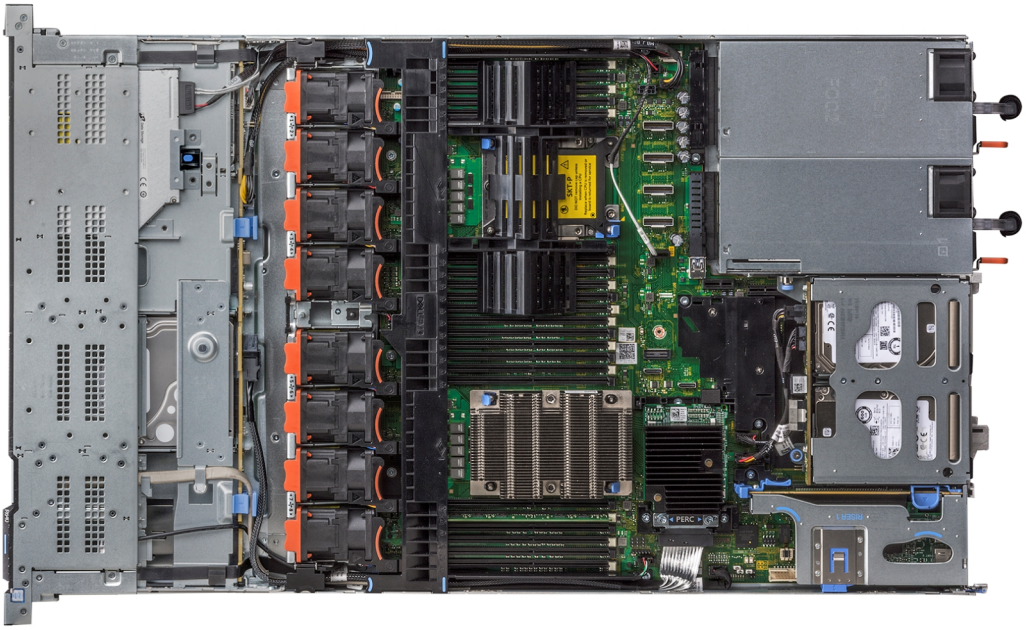

Figure 7. Inside the system with 1 PCIe expansion riser

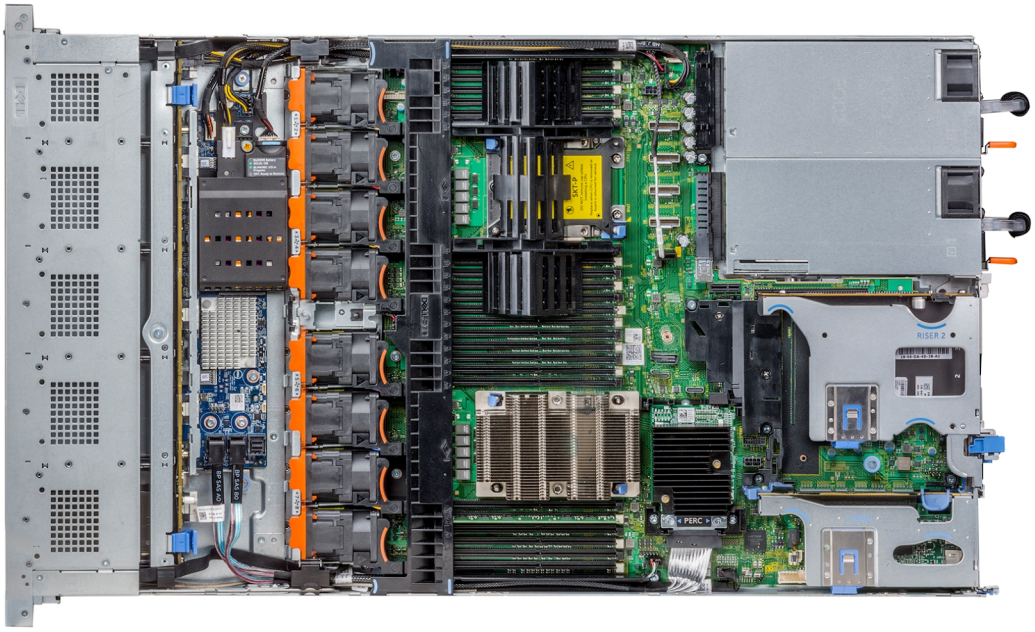

Figure 8. Inside the system with 2 PCIe expansion risers

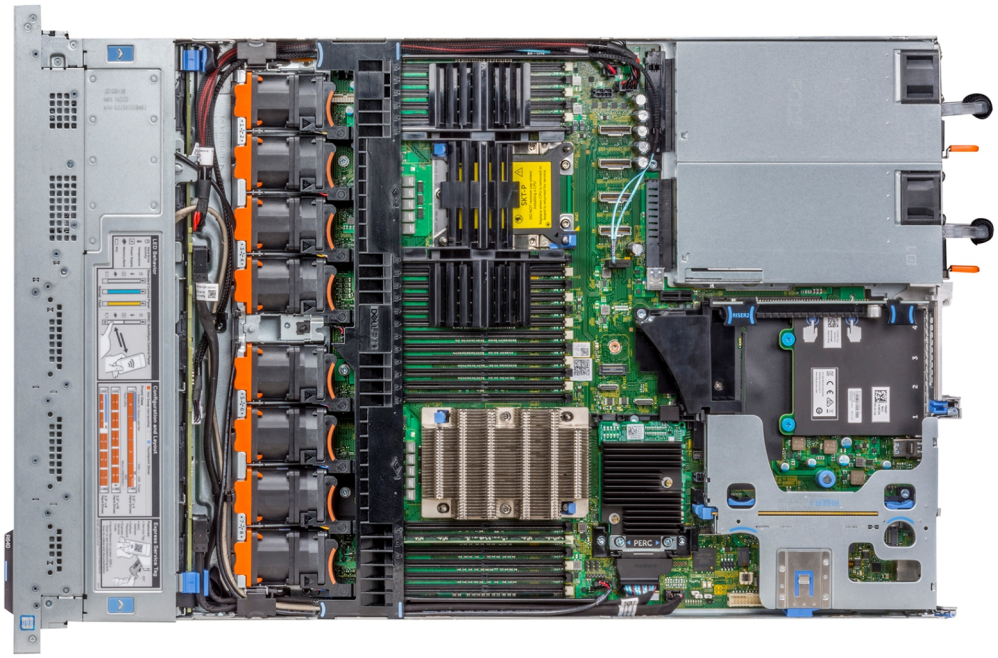

Figure 9. Inside the system with 3 PCIe expansion risers

4

Security features

The latest generation of PowerEdge servers has the features listed in the table to help ensure the security of your data center.

Table 4. Security Features

Security feature	Description
Cover latch	A tooled latch is integrated in the top cover to secure it to the system.
Bezel	A standard bezel is an optional metal bezel mounted to the chassis front. A lock on the bezel protects unauthorized access to hard drives. The QuickSync NFC bezel enables the iDRAC QuickSync management function for managing the server from the front using an NFC-capable device and the Dell EMC OpenManage Mobile App. Available only from the factory and not supported after point of sale.
TPM	The Trusted Platform Module (TPM) is used to generate/store, protect/authenticate password, and create/store digital certificates.
Power-off security	BIOS has the ability to disable the power button function.

5

Processors

The PowerEdge R640 server features the exceptional performance, value, and power efficiency of the 2nd Generation Intel Xeon Scalable Processor. These processors provide high performance no matter what your constraint—floor space, power, or budget—and on workloads that range from the most complicated scientific exploration to crucial web-serving and infrastructure applications. In addition to providing raw performance gains, improved I/O is also made possible with Intel Integrated I/O, which can reduce latency by adding more lanes and doubling bandwidth. This helps to reduce network and storage bottlenecks, which improves the processor performance capabilities.

The 2nd Generation Intel Xeon Processor Scalable Family provides the foundation for a powerful data center platform. It is the most advanced compute core featuring a new core micro architecture optimized to accelerate a wide range of compute workloads. The key features are as follows:

- **Higher Per-Core Performance**: Up to 28 cores (24 cores with R440), delivery high performance, and scalability for compute-intensive workloads across compute, storage, and network usages. The 2nd Generation Intel Xeon Scalable Processors can offer even greater core or frequencies, or both.
- **Greater Memory Bandwidth/Capacity**: 50% increased memory bandwidth and capacity. 6 memory channels vs. 4 memory channels of previous generation for memory intensive workloads.
- **Expanded I/O**: 48 lanes of PCIe 3.0 bandwidth and throughput for demanding I/O-intensive workloads.
- **Intel Ultra Path Interconnect (UPI)**: Up to three Intel UPI channels increase scalability of the platform to as many as eight sockets, and improves inter-CPU bandwidth for I/O intensive workloads.
- **Intel Advanced Vector Extensions 512 (Intel AVX-512)** with a single AVX512 fused multiply add (FMA) execution units. SKUs which support Advanced RAS enable a second FMA execution unit.
- **Security without Compromise**: Near-zero encryption overhead enables higher performance on all secure data transactions with enhanced hardware mitigation.
- **Intel Deep Learning Boost**: Accelerate data-intensive workloads within the CPU with inferencing capabilities.

Topics:

- Supported processors
- Chipset

Supported processors

The following table lists the 1st and 2nd Generation Intel® Xeon® Scalable supported processors for the PowerEdge R640:

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Intel Xeon Processor Scalable Family	8280L	Platinum	XCC	2.7	38.5	NA	2933	28	Turbo	205W
Intel Xeon Processor Scalable Family	8280M	Platinum	XCC	2.7	38.5	NA	2933	28	Turbo	205W
Intel Xeon Processor Scalable Family	8280	Platinum	XCC	2.7	38.5	NA	2933	28	Turbo	205W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Intel Xeon Processor Scalable Family	8276L	Platinum	XCC	2.2	NA	NA	2933	28	Turbo	165W
Intel Xeon Processor Scalable Family	8276M	Platinum	XCC	2.2	NA	NA	2933	28	Turbo	165W
Intel Xeon Processor Scalable Family	8276	Platinum	XCC	2.2	NA	NA	2933	28	Turbo	165W
Intel Xeon Processor Scalable Family	8270	Platinum	XCC	2.7	NA	NA	2933	26	Turbo	205W
Intel Xeon Processor Scalable Family	8268	Platinum	XCC	2.9	NA	NA	2933	24	Turbo	205W
Intel Xeon Processor Scalable Family	8260L	Platinum	XCC	2.4	NA	NA	2933	24	Turbo	165W
Intel Xeon Processor Scalable Family	8260M	Platinum	XCC	2.4	NA	NA	2933	24	Turbo	165W
Intel Xeon Processor Scalable Family	8260Y	Platinum	XCC	2.4	NA	NA	2933	24/20/16	Turbo	165W
Intel Xeon Processor Scalable Family	8260	Platinum	XCC	2.4	NA	NA	2933	24	Turbo	165W
Intel Xeon Processor Scalable Family	8253	Platinum	XCC	2.2	NA	NA	2933	16	Turbo	125W
Intel Xeon Processor Scalable Family	8180M	Platinum	XCC	2.5	38.5	10.4	2667	28	Turbo	205W
Intel Xeon Processor Scalable Family	8180	Platinum	XCC	2.5	38.5	10.4	2667	28	Turbo	205W
Intel Xeon Processor	8176M	Platinum	XCC	2.1	38	10.4	2667	28	Turbo	165W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Scalable Family										
Intel Xeon Processor Scalable Family	8176	Platinum	XCC	2.1	38	10.4	2667	28	Turbo	165W
Intel Xeon Processor Scalable Family	8170M	Platinum	XCC	2.1	36	10.4	2667	26	Turbo	165W
Intel Xeon Processor Scalable Family	8170	Platinum	XCC	2.1	36	10.4	2667	26	Turbo	165W
Intel Xeon Processor Scalable Family	8168	Platinum	XCC	2.7	33	10.4	2667	24	Turbo	205W
Intel Xeon Processor Scalable Family	8164	Platinum	XCC	2.7	33	10.4	2667	26	Turbo	205W
Intel Xeon Processor Scalable Family	8160M	Platinum	XCC	2.1	33	10.4	2667	24	Turbo	150W
Intel Xeon Processor Scalable Family	8160	Platinum	XCC	2.1	33	10.4	2667	24	Turbo	150W
Intel Xeon Processor Scalable Family	8158	Platinum	XCC	3	24.75	10.4	2667	12	Turbo	150W
Intel Xeon Processor Scalable Family	8156	Platinum	XCC	3.6	16.5	10.4	2667	4	Turbo	105W
Intel Xeon Processor Scalable Family	8153	Platinum	XCC	2.0	22	10.4	2667	16	Turbo	125W
Intel Xeon Processor Scalable Family	6258R	Gold	XCC	2.7	38.5	10.4	2933	28	Turbo	205 W
Intel Xeon Processor Scalable Family	6248R	Gold	XCC	3.0	35.75	10.4	2933	24	Turbo	205 W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Intel Xeon Processor Scalable Family	6246R	Gold	XCC	3.4	22	10.4	2933	16	Turbo	205 W
Intel Xeon Processor Scalable Family	6242R	Gold	XCC	3.1	27.5	10.4	2933	20	Turbo	205 W
Intel Xeon Processor Scalable Family	6240R	Gold	XCC	2.4	35.75	10.4	2933	24	Turbo	165 W
Intel Xeon Processor Scalable Family	6238R	Gold	XCC	2.2	38.5	10.4	2933	28	Turbo	165 W
Intel Xeon Processor Scalable Family	6230R	Gold	XCC	2.1	35.75	10.4	2933	26	Turbo	150 W
Intel Xeon Processor Scalable Family	6230	Gold	XCC	2.1	27.50	10.4	2933	20	Turbo	125 W
Intel Xeon Processor Scalable Family	6226R	Gold	XCC	2.9	22	10.4	2933	16	Turbo	150 W
Intel Xeon Processor Scalable Family	6209U	Gold	NA	2.1	27.50 MB	NA	2933	20	Turbo	125 W
Intel Xeon Processor Scalable Family	6208R	Gold	NA	2.9	22 MB	NA	2933	16	Turbo	150 W
Intel Xeon Processor Scalable Family	6222 V	Gold	NA	1.8	27.50 MB	NA	2400	20	Turbo	115 W
Intel Xeon Processor Scalable Family	6226	Gold	NA	2.7	19.25 MB	NA	2933	12	Turbo	125 W
Intel Xeon Processor Scalable Family	6208U	Gold	XCC	2.9	22	NA	2933	16	Turbo	150 W
Intel Xeon Processor	5222	Gold	XCC	3.9	16.50	10.4	2933	4	Turbo	105 W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Scalable Family										
Intel Xeon Processor Scalable Family	5220	Gold	XCC	2.2	24.75	10.4	2666	18	Turbo	125 W
Intel Xeon Processor Scalable Family	5220R	Gold	XCC	2.2	35.75	10.4	2667	24	Turbo	150 W
Intel Xeon Processor Scalable Family	5218R	Gold	XCC	2.1	27.5	10.4	2667	20	Turbo	125 W
Intel Xeon Processor Scalable Family	5218	Gold	XCC	2.3	22	10.4	2667	16	Turbo	125 W
Intel Xeon Processor Scalable Family	5217	Gold	HCC	3.0	11	10.4	2666	8	Turbo	125 W
Intel Xeon Processor Scalable Family	5215	Gold	HCC	2.5	13.75	10.4	2666	10	Turbo	85 W
Intel Xeon Processor Scalable Family	4216	Silver	HCC	2.5	22	9.6	2666	16	Turbo	100 W
Intel Xeon Processor Scalable Family	4215	Silver	HCC	2.5	11	9.6	2666	8	Turbo	85 W
Intel Xeon Processor Scalable Family	4215R	Silver	HCC	3.2	11	9.6	2400	8	Turbo	130 W
Intel Xeon Processor Scalable Family	4214	Silver	HCC	2.2	16.50	9.6	2666	12	Turbo	85 W
Intel Xeon Processor Scalable Family	4210	Silver	LCC	2.2	13.75	9.6	2400	10	Turbo	85 W
Intel Xeon Processor Scalable Family	4208	Silver	LCC	2.1	11	9.6	2666	8	Turbo	85 W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Intel Xeon Processor Scalable Family	3204	Silver	LCC	1.9	8.25	9.6	2666	6	Turbo	85 W
Intel Xeon Processor Scalable Family	6138	Gold	XCC	2	27.5	10.4	2666	20	Turbo	125 W
Intel Xeon Processor Scalable Family	6130	Gold	XCC	2.1	22	10.4	2666	16	Turbo	125 W
Intel Xeon Processor Scalable Family	6126	Gold	XCC	2.6	19.25	10.4	2666	12	Turbo	125 W
Intel Xeon Processor Scalable Family	5122	Gold	XCC	3.6	16.5	10.4	2400	4	Turbo	105 W
Intel Xeon Processor Scalable Family	5120	Gold	HCC	2.2	19.25	10.4	2400	14	Turbo	105 W
Intel Xeon Processor Scalable Family	5118	Gold	HCC	2.3	16.5	10.4	2400	12	Turbo	105 W
Intel Xeon Processor Scalable Family	5117	Gold	HCC	2.0	19.25	10.4	2400	10	Turbo	105 W
Intel Xeon Processor Scalable Family	4214R	Silver	HCC	2.4	16.5	9.6	2400	12	Turbo	100 W
Intel Xeon Processor Scalable Family	4210R	Silver	HCC	2.4	13.75	9.6	2400	10	Turbo	100 W
Intel Xeon Processor Scalable Family	4116	Silver	HCC	2.1	16	9.6	2400	12	Turbo	85 W
Intel Xeon Processor Scalable Family	4114	Silver	LCC	2.2	13.75	9.6	2400	10	Turbo	85 W
Intel Xeon Processor	4112	Silver	LCC	2.6	8.25	9.6	2400	4	Turbo	85 W

Table 5. 1st and 2nd Generation Intel® Xeon® Scalable supported processors (continued)

Model	Intel SKU	SKU type	Stepping	Speed(GHz)	Cache(MB)	UPI(GT/s)	Max Memory Speed(MT/s)	Cores	Turbo	TDP
Scalable Family										
Intel Xeon Processor Scalable Family	4110	Silver	LCC	2.1	11	9.6	2400	8	Turbo	85 W
Intel Xeon Processor Scalable Family	4108	Silver	LCC	1.8	11	9.6	2400	8	Turbo	85 W
Intel Xeon Processor Scalable Family	3206R	Bronze	LCC	1.9	11	9.6	2400	8	No Turbo	85W
Intel Xeon Processor Scalable Family	3104	Bronze	LCC	1.7	8.25	9.6	2133	6	No Turbo	85 W

Table 6. Speed Select Technology- Performance Profile (SST-PP) (-Y) offerings

Processor Model #	Frequency	Cores- Threads
8260Y	• 2.40 GHz • 2.50 GHz • 2.70 GHz	• 24–48 • 20–40 • 16–32
6240Y	• 2.60 GHz • 2.80 GHz • 3.10 GHz	• 18–36 • 14–28 • 8 -16
4214Y	• 2.20 GHz • 2.30 GHz • 2.40 GHz	• 12–24 • 10–20 • 8–16

Table 7. Search Optimized (-S) offerings

Processor Model #	Frequency	Cores- Threads
5220S	2.70 GHz	18–32

Table 8. Single Socket (-U) offerings

Processor Model #	Frequency	Cores- Threads
6212U	2.40 GHz	24–48
6210U	2.50 GHz	20–40
6209U	2.10 GHz	20–40

Table 9. VM Density Optimized (-V) offerings

Processor Model #	Frequency	Cores- Threads
6262V	1.90 GHz	24–48
6222V	1.80 GHz	20–40

NOTE: For the most up-to-date information on available processors, please visit https://www.dell.com/en-us/work/shop/povw/poweredge-r640 (view configurations) or talk to your Dell EMC representative.

Chipset

The following table shows the high level features supported by the chipset implemented on the PowerEdge R640:

- ACPI Power Management Logic Support, Revision 4.0a
- PCI Express Base Specification, Revision 3.0
- Integrated Serial ATA host controller, supports data transfer rates of up to 6 GB/s on all ports
- xHCI USB controller with SuperSpeed USB 3.0 ports
- Direct Media Interface
- Serial Peripheral Interface
- Enhanced Serial Peripheral Interface
- Flexible I/O - Allows some high-speed I/O signals to be configured as the PCIe root ports, the PCIe uplink for use with certain PCH, SATA (and sSATA), or USB 3.0.
- General Purpose Input Output (GPIO)
- Low Pin Count interface, interrupt controller, and timer functions
- System Management Bus Specification, Version 2.0
- Integrated Clock Controller, Real Time Clock Controller
- Intel High Definition Audio and Intel® Smart Sound Technology
- Integrated 10/1 Gb Ethernet
- Integrated 10/100/1000 Mbps Ethernet MAC
- Supports Intel Rapid Storage Technology Enterprise
- Supports Intel Active Management Technology and Server Platform Services
- Supports Intel Virtualization Technology for Directed I/O
- Supports Intel Trusted Execution Technology
- JTAG Boundary Scan support
- Intel Trace Hub for debug

For more information, visit Intel.com

6

Memory

The PowerEdge R640 support up to 24 DIMMs. Depending on the 2nd Generation Intel® Xeon Scalable processor CPU, memory speeds of up to 2933 MT/s with 1 DIMM per channel and 2666 MT/s with 2 DIMMs per channel are available. They support flexible memory configurations ranging from capacities of 8 GB minimum to 7.68TB maximum.

Each CPU has 12 memory DIMM slots. Those DIMMs are organized into 6 different channels so there are 2 DIMMs per channel. For best performance all memory channels should be populated with the same number of DIMMs, either 6 or 12 DIMMs per CPU.

There are 4 different types of DIMMs:

- RDIMM: Registered DIMM – Provides for higher capacity options and advanced RAS features. It is the most commonly used DIMM type, and offers the best mix of frequency, capacity, and rank structure choices.
- LRDIMM: Load Reduced DIMM – Provides maximum capacity beyond that of an RDIMM but at a higher power consumption. Uses a buffer to reduce memory loading to a single load on all DDR signals, allowing for greater density.
- PMem (also known as Intel Optane persistent memory): Provides a large memory capacity at an affordable price. Any application can take advantage of PMem in Memory Mode with a compatible operating system. Unlock more performance as well as persistency when using an application that supports App Direct Mode. PMem is used in conjunction with RDIMMs or LRDIMMs and a maximum number of 6 PMems can be used per CPU. This persistent memory technology does not require a battery.
- NVDIMM: Non-Volatile DIMM – Provides a persistent memory solution with NAND and DRAM that maintains data in power loss, system crash, or normal shutdown. This solution requires a battery as a power source for an AC loss condition. It can be used in conjunction with RDIMMs.

Intel® Optane™ persistent memory (PMem)

Intel® Optane™ persistent memory is a new memory technology that allows customers to reach a large memory capacity at an affordable price. Additionally, when operating the memory in “App Direct Mode” the memory is persistent.

PMem comes in 3 different memory sizes, 128GB, 256GB, and 512. RDIMMs and LRDIMMs are used in conjunction with Intel Optane persistent memory. Each channel will be populated with up to one DIMM of DRAM and one DIMM of PMem. That means that each CPU will have up to 6 DIMMs of DRAM and 6 DIMMs of PMem. For best performance it is recommended to have all 12 DIMMs slots per CPU populated

Intel Optane persistent memory operates in two modes, Memory Mode and Application Direct Mode.

Table 10. Intel Optane persistent memory modes

Trait	Memory Mode	App Direct Mode
Application support	Any application	Application must state that it supports "App Direct Mode"
DRAM	Used as cache and is not available as system memory	Both PMem and DRAM are available as system memory
Persistence	No	Yes

Memory Operating Modes

Performance Optimized or Optimizer Mode: prioritizes performance and does not provide any RAS features beyond standard ECC (Error-Correcting Code).

Memory mirroring has two adjacent memory channels configured to write the same data to each channel. If one memory channel fails or encounters an error, the other channel continues to transmit data. It's an excellent safeguard for systems requiring uninterrupted operation, though it cuts memory capacity in half, can double the cost per gigabyte, and can increase power consumption.

Fault resilient memory is a Dell patented technology that works with the VMWare ESXi Hypervisor to provide a fault resilient zone that protects virtual machines from the ramifications of memory faults.

Memory sparing can reduce downtime from correctable errors by allocating one rank (64-bit wide data area on a DIMM) per channel (Single Rank Spare Mode) or two ranks per channel (Multi Rank Spare Mode) as memory spares. If a correctable error occurs in a rank or channel, it's moved to the spare rank while the OS is running. This prevents the error from causing a failure. Memory sparing reduces memory capacity by one rank per channel or two ranks per channel (depending if Single Rank or Multi Rank is selected) and can increase the cost per gigabyte.

DIMM speed and frequency

The following table shows the PowerEdge memory speeds and CPU support:

Table 11. Memory speeds and CPU support

CPU family	DIMM type	DIMM ranking	Capacity	Speed (MT/s)
Intel® Xeon® Scalable	RDIMM	1R/2R	8GB, 16GB, and 32GB	2666
2nd Generation Intel® Xeon® Scalable	RDIMM	1R	8GB	2666
2nd Generation Intel® Xeon® Scalable	RDIMM	2R	16GB, 32GB, and 64Gb	2933
Intel® Xeon® Scalable	LRDIMM	4R/8R	64GB and 128GB	2666
2nd Generation Intel® Xeon® Scalable	LRDIMM	8R	128GB	2666
2nd Generation Intel® Xeon® Scalable	PMem	N/A	128GB, 256GB, and 512GB	2666
Intel® Xeon® Scalable or 2nd Generation Intel® Xeon® Scalable	NVDIMM	1R	16GB	2666

7

Storage

The PowerEdge R640 provides scalable storage that allows you to adapt to your workload and operational requirements. With comprehensive storage options, the PowerEdge R640 offers various internal and external storage controllers, drive types, and different chassis and backplanes for varied numbers of drives. Features such as Express Flash PCIe SSDs, PERC H740P, and H840 RAID controllers provide vastly accelerated performance compared to the previous technologies.

PERC series controller offerings

The following table describes the PERC series controller supported by the PowerEdge R640:

Table 12. Perc offering

Performance level	Controller and description
Entry	S140-SATA, NVMe
Value	HBA330-Internal, HBA350i (adapter only), HBA355e (adapter only, non-RAID), H330, 12 Gbps SAS HBA-External
Value Performance	H730P
Premium Performance	H740P, H840P, H750 (adapter only)

NOTE: The PERC H750 and HBA350i cards are not supported on 4x3.5 + 2x2.5 dual PERC, 10x2.5 + 2x2.5 dual PERC, or x10 NVMe configurations.

Supported drives - SAS and SATA:

The PowerEdge R640 system supports:

- Up to 4 x 3.5 inch hot-swappable HDDs or 2.5 inch hot-swappable SSDs or HDDs using hybrid carrier to fit in the 3.5 inch drive bay
- Up to 8 x 2.5 hot-swappable HDDs or SSDs
- Up to 10 x 2.5 hot-swappable HDDs or SSDs

Table 13. Supported drives - NVMe SSD

NVMe SSD drives description
375 GB 2.5-inch Device
1.6 TB 2.5-inch Device
3.2 TB 2.5-inch Device
3.84TB 2.5 -inch Device
6.4TB 2.5 -inch Device

Table 14. External storage

Device Type	Description
External Tape	Supports connection to external USB tape products
NAS/IDM appliance	Software Supports NAS software stack
JBOD	Supports connection to 12 Gb MD-series JBODs

Topics:

- Storage controllers
- Optical drives
- Tape drives
- IDSDM or vFlash card

Storage controllers

The new PERC Controller offerings is a heavy leverage of previous generation PERC family. The Value Performance level controllers, carried-over from previous generation to PowerEdge R640, are a high-end offering that drives Input/Output Operations Per Second (IOPs) performance and enhance the SSD performance.

NOTE: On-board SATA ports (S140) are not accessible if mini PERC is installed.

Table 15. Performance level and controllers

Performance Level	Controller and Description
Entry	S140-SATA, NVMe
Value	HBA330-Internal, HBA350i (adapter only), HBA355e (adapter only, non-RAID), H330, 12 Gbps SAS HBA-External
Value Performance	H730P
Premium Performance	H740P, H840, H750 (adapter only)

NOTE: The PERC H750 and HBA350i cards are not supported on 4x3.5 + 2x2.5 dual PERC, 10x2.5 + 2x2.5 dual PERC, or x10 NVMe configurations.

Optical drives

The PowerEdge R640 supports one of the following internal optical drive options:

- DVD-ROM
- DVD+ROM

Tape drives

The R640 does not support internal tape drives, however, external tape backup devices are supported.

Supported external tape drives:

- External RD1000 USB
- External LTO-5, LTO-6, LTO-7 and LTO-8 and 6 Gb SAS tape drives
- 114X rack mount chassis with LTO-6 and LTO-7 and LTO-8 6 Gb SAS tape drives
- TL1000 with LTO-5, LTO-6 and LTO-7 and LTO-8 6Gb SAS tape drives
- TL2000 with LTO-5, LTO-6 and LTO-7 and LTO-8 6Gb SAS tape drives
- TL4000 with LTO-5, LTO-6 and LTO-7 and LTO-8 6Gb SAS tape drives
- TL4000 with LTO-5, LTO-6 and LTO-7 and LTO-8 8Gb FC tape drives
- ML3/ML3e with LTO-6 and LTO-7 and LTO-8 6Gb SAS tape drives
- ML3/ML3e with LTO-6 and LTO-7 and LTO-8 8Gb FC tape drives

IDSDM or vFlash card

In the PowerEdge R640 system, the IDSDM module contains the Internal Dual SD Module (IDSDM) and vFlash card that are combined into a single card module. The following are options available for PowerEdge R640 system:

- vflash only

- IDSDM only
- vflash + IDSDM

NOTE: The IDSDM only option is available with vFlash hardware and requires an iDRAC Enterprise license to enable this feature.

The IDSDM with vFlash module has a dedicated slot at the back of the system chassis. This is a Dell EMC-proprietary PCIe x1 slot that uses a USB 3.0 interface to host. In the PowerEdge R640 systems, the IDSDM and vFlash card size changes from SD to microSD and the supported capacity for IDSDM microSD cards are 16 GB, 32 GB, or 64 GB, while for vFlash the capacity is 16 GB only. The write-protect switch is built onboard on the IDSDM module.

Boot Optimized Storage Subsystem (BOSS)

BOSS is offered as a means of booting 14G servers to a full OS when:

- A solution such as IDSDM may be desired, but the target OS is a full OS (not just a hypervisor)
- The user does not wish to trade off standard hot plug drive slots for OS install
- A separate hardware RAID is required for OS boot so that data drives can be in Passthrough mode with an HBA

The HW RAID BOSS card is a RAID controller with a limited feature set that presents M.2 SATA-only SSDs as either Non-RAID disks or a single RAID1 volume.

8

Networking and PCIe

The PowerEdge R640 offers balanced, scalable I/O capabilities, including integrated PCIe 3.0-capable expansion slots. Dell EMC Network Daughter Cards allow you to choose the right network fabric without using up a valuable PCI slot. You can pick the speed, technology, vendor, and other options, such as switch-independent partitioning, which allows you to share and manage bandwidth on 10 GbE connections.

For details on the various networking cards available, talk to Dell representative or visit https://www.dell.com/en-us/work/shop/povw/poweredge-r640 and choose the green view configurations button at the top for a full list of options.

Topics:

- PCIe riser and options

PCIe riser and options

The PowerEdge R640 system has one standard PCIe connector and four Speededge connectors. The PowerEdge R640 system has the following four riser cards:

- Right Riser 1A - One x16 PCIe Gen3 for low-profile cards on left side and one x16 PCIe Gen3 for low-profile card on right side – connected to processor 1—Top and bottom.
- Right Riser 1B - One x16 PCIe Gen3 for low-profile card on left side – connected to processor 1—Top and bottom.
- Left Riser 2A - One x16 PCIe Gen3 for low-profile cards - connected to processor 2.
- Left Riser 2B - One x16 PCIe Gen3 for full-height cards, may be used for full-height 3/4 length PCIe cards - connected to processor 2.

With all the risers, the PowerEdge R640 system board provides one x8 PCIe Gen3 slot for dedicated storage controller card connected to the processor 1 and one x8 PCIe Gen3 slot for dedicated NDC connected to the processor 1.

PCIe expansion card riser configurations

The following table shows the PCIe expansion card riser configurations for PowerEdge R640:

Table 16. PCIe expansion card riser configurations for PowerEdge R640

Expansion card riser	PCIe slots on the riser	Height	Length	Link
Riser 1A	Slot 2	Low Profile	Half Length	x16
	Slot 1	Low Profile	Half Length	x16
Riser 1B	Slot 1	Low Profile	Half Length	x16
Riser 2A	Slot 3	Low Profile	Half Length	x16
Riser 2B	Slot 2	Full Height	3/4 Length	x16

9

Power, thermal and acoustics

Topics:

- Power consumption and energy efficiency
- Thermal and Acoustics
- Power supply units
- Acoustical design

Power consumption and energy efficiency

With the rise in the cost of energy coupled with increasing data center density, Dell EMC provides tools and technologies to help you realize greater performance with lower energy cost and wastage. More efficient data center usage can reduce costs by slowing the need for additional data center space. The following table lists the tools and technologies that Dell EMC offers to help you achieve your data center goals by lowering power consumption and increasing energy efficiency.

Table 17. Power tools and technologies

Feature	Description
Power supply units (PSU) portfolio	PSU portfolio includes intelligent features such as dynamically optimizing efficiency while maintaining availability and redundancy.
Tools for right-sizing	Enterprise Infrastructure Planning Tool (EIPT) is a tool that helps you plan and tune your computer and infrastructure equipment for maximum efficiency by calculating hardware power consumption, power infrastructure and storage. Learn more at Dell.com/calc.
Industry compliance	Dell EMC's servers are compliant with all relevant industry certifications and guidelines, including 80 PLUS, Climate Savers, and ENERGY STAR.
Power monitoring accuracy	PSU power monitoring improvements include: ● Power monitoring accuracy of 1%, whereas the industry standard is 5% ● More accurate reporting of power ● Better performance under a power cap
Power capping	Use Dell EMC systems management tools such as OpenManage Power Center and iDRAC9 with an Enterprise license can be used to set a power limit for your server. This limits the output of a PSU and reduce system power consumption and help in constrained power situations.
Systems management	The integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller is embedded within every Dell EMC PowerEdge™ server and provides functionality that helps IT administrators deploy, update, monitor, and maintain servers with no need for any additional software to be installed. iDRAC functions regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state, iDRAC is ready to work because it is embedded within each server from the factory.
Active power management	Dell EMC offers a complete power management solution accessed through the iDRAC9 with Enterprise licensing and OpenManage Power Center to implement policy-based management of power and thermal levels at the individual system, rack, or data center level. Hot spares reduce power consumption of redundant power supplies. Thermal control of fan speed optimizes the thermal settings for your environment to reduce fan consumption and lower system power consumption.

Thermal and Acoustics

The system's thermal management delivers high performance through optimized cooling of components at the lowest fan speeds across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F) and to extended ambient temperature ranges. These optimizations result in lower fan power consumption which translate to lower system power and data center power consumption.

Power supply units

Energy Smart power supplies have intelligent features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. Also featured are enhanced power-consumption reduction technologies, such as high-efficiency power conversion and advanced thermal-management techniques, and embedded power-management features including high-accuracy power monitoring.

The system supports two hot-swappable AC power supplies with 1 + 1 redundancy, auto-sensing and auto-switching capability.

Acoustical design

Dell EMC focuses on sound quality in addition to sound power level and sound pressure level. Sound quality describes how disturbing or pleasing a sound is interpreted, and Dell EMC references a number of psychacoustical metrics and thresholds in delivering to it. Tone prominence is one such metric. Sound power and sound pressure levels increase with greater populations or higher utilization, while sound quality remains good even as the frequency content changes. A reference for comparison to sound pressure levels for familiar noise sources is given in the following table. An extensive description of Dell EMC Enterprise acoustical design and metrics is available in the Dell Enterprise Acoustics white paper.

Table 18. Acoustical performance

Value measured at your ears		Equivalent familiar noise experience
LpA, dBA, re 20 µPa	**Loudness, sones**	
90	80	Loud concert.
75	39	Data center, vacuum cleaner, voice must be elevated to be heard.
60	10	Conversation levels.
45	4	Whispering, open office layout, normal living room.
35	2	Quiet office
30	1	Quiet library
20	0	Recording studio

10

Rack rails

The rail offerings for the R640 system consist of two types of rails—sliding and static.

The sliding rails allow the system to be fully extended out of the rack for service. They are available with or without the optional cable management arm (CMA).

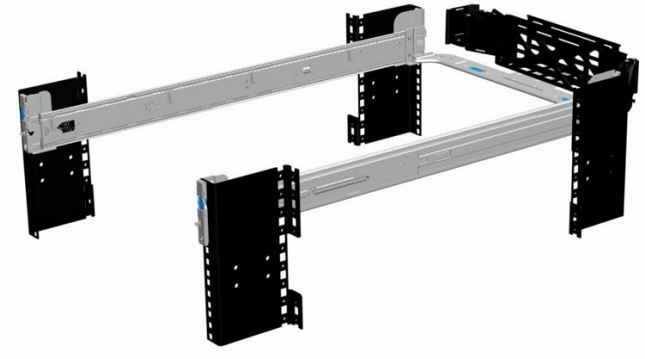

Figure 10. Sliding rails

The static rails support a wider variety of racks than the sliding rails. However, they do not support serviceability in the rack and are thus not compatible with the CMA.

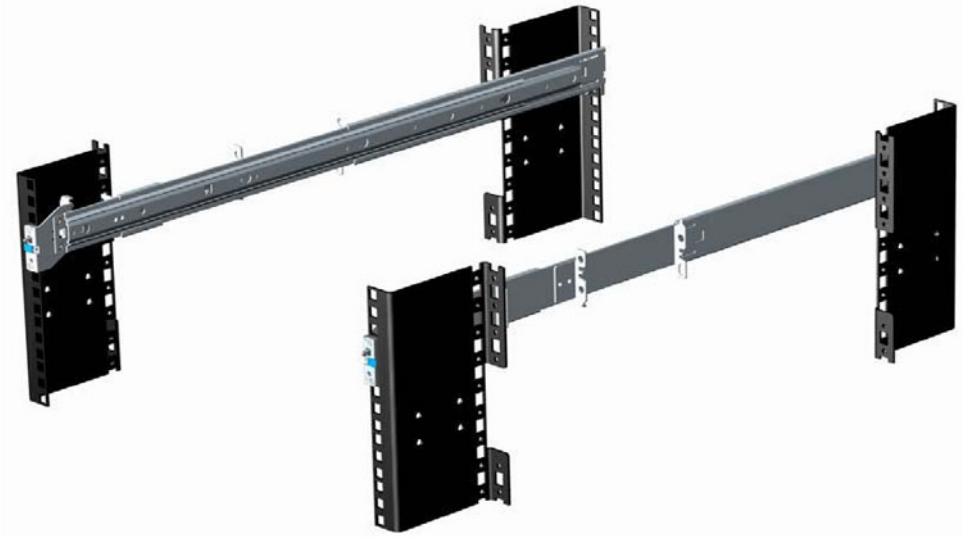

Figure 11. Static rails

One key factor in selecting the proper rails is identifying the type of rack in which they are installed. Both the sliding rails and the static rails support tool-less mounting in 19 inch-wide, EIA-310-E-compliant square hole and unthreaded round hole 4-post racks. Both also support tooled mounting in threaded hole 4-post racks, but only the static rails, as the more universal solution, support mounting in 2-post (Telco) racks.

Table 19. Static and sliding rails

Sliding and static rail								
Product	**Rail identifier**	**Mounting interface**	**Rail type**	**Rack types supported**				
				4-Post			**2-Post**	
				Square	**Round**	**Thread**	**Flush**	**Center**
R640	B6	ReadyRails II	Sliding	√	√	√	X	X
	B4	ReadyRails	Static	√	√	√	√	√

Screws are not included in either kit as threaded racks are offered with various thread designations. Users must therefore provide their own screws when mounting the rails in threaded racks.

NOTE: Screw head diameter for the sliding rails must be 10 mm or less.

Other key factors governing proper rail selection include the following:

- Spacing between the front and rear mounting flanges of the rack
- Type and location of any equipment mounted in the back of the rack such as power distribution units (PDUs)
- Overall depth of the rack

The static rails offer a greater adjustability range and a smaller overall mounting footprint than the sliding rails. This is because of their reduced complexity and lack of need for CMA support.

Table 20. Static rails adjustability

Product	**Rail identifier**	**Rail type**	**Rail adjustable range (mm) Rack types supported**						**Rail depth—mm**	
			Square		**Round**		**Threaded**		**Without CMA**	**With CMA**
			Min	**Max**	**Min**	**Max**	**Min**	**Max**		
R640	B6	Sliding	630	883	616	876	630	897	714	845
	B4	Static	608	879	594	872	604	890	622	N/A

The adjustment range of the rails is a function of the type of rack in which they are being mounted. The Min/Max values listed above represent the allowable distance between the front and rear mounting flanges in the rack. Rail depth without the CMA represents the minimum depth of the rail with the outer CMA brackets removed (if applicable) as measured from the front mounting flanges of the rack.

11

Supported operating system

The following lists the supported operating systems for the PowerEdge R740 and R740xd:

1. Canonical® Ubuntu® Server LTS
2. Citrix® Hypervisor
3. Microsoft® Windows Server® LTSC with Hyper-V
4. Oracle® Linux
5. Red Hat® Enterprise Linux
6. SUSE® Linux Enterprise Server
7. VMware® ESXi®

For specifications and interoperability details, see Dell.com/OSsupport.

12

Dell EMC OpenManage systems management

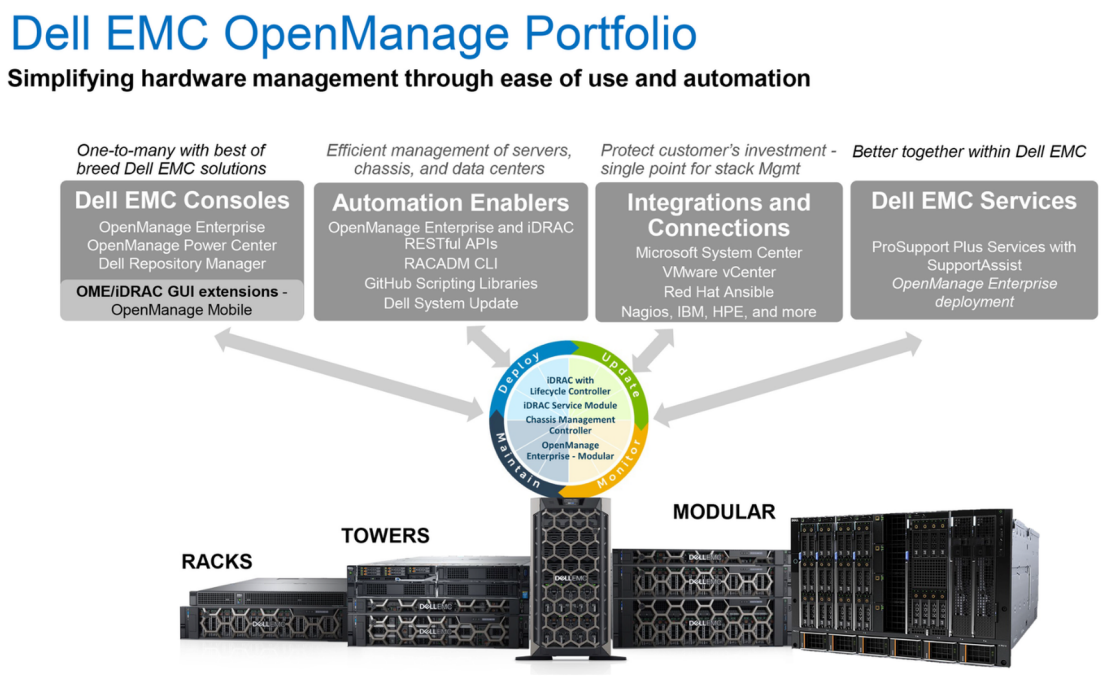

Figure 12. Dell EMC OpenManage Portfolio

Dell EMC delivers management solutions that help IT Administrators effectively deploy, update, monitor, and manage IT assets. OpenManage solutions and tools enable you to quickly respond to problems by helping them to manage Dell EMC servers effectively and efficiently; in physical, virtual, local, and remote environments, operating in-band, and out-of-band (agent-free). The OpenManage portfolio includes innovative embedded management tools such as the integrated Dell Remote Access Controller (iDRAC), Chassis Management Controller and Consoles like OpenManage Enterprise, OpenManage Power Manager plug in, and tools like Repository Manager.

Dell EMC has developed comprehensive systems management solutions based on open standards and has integrated with management consoles that can perform advanced management of Dell hardware. Dell EMC has connected or integrated the advanced management capabilities of Dell hardware into offerings from the industry's top systems management vendors and frameworks such as Ansible, thus making Dell EMC platforms easy to deploy, update, monitor, and manage.

The key tools for managing Dell EMC PowerEdge servers are iDRAC and the one-to-many OpenManage Enterprise console. OpenManage Enterprise helps the system administrators in complete lifecycle management of multiple generations of PowerEdge servers. Other tools such as Repository Manager, which enables simple yet comprehensive change management.

OpenManage tools integrate with systems management framework from other vendors such as VMware, Microsoft, Ansible, and ServiceNow. This enables you to use the skills of the IT staff to efficiently manage Dell EMC PowerEdge servers.

Topics:

- Server and Chassis Managers
- Dell EMC consoles
- Automation Enablers
- Integration with third-party consoles
- Connections for third-party consoles
- Dell EMC Update Utilities
- Dell resources

Server and Chassis Managers

- Integrated Dell Remote Access Controller (iDRAC)
- iDRAC Service Module (iSM)

Dell EMC consoles

- Dell EMC OpenManage Enterprise
- Dell EMC Repository Manager (DRM)
- Dell EMC OpenManage Enterprise Power Manager plugin to OpenManage Enterprise
- Dell EMC OpenManage Mobile (OMM)

Automation Enablers

- OpenManage Ansible Modules
- iDRAC RESTful APIs (Redfish)
- Standards-based APIs (Python, PowerShell)
- RACADM Command Line Interface (CLI)
- GitHub Scripting Libraries

Integration with third-party consoles

- Dell EMC OpenManage Integrations with Microsoft System Center
- Dell EMC OpenManage Integration for VMware vCenter (OMIVV)
- Dell EMC OpenManage Ansible Modules
- Dell EMC OpenManage Integration with ServiceNow

Connections for third-party consoles

- Micro Focus and other HPE tools
- OpenManage Connection for IBM Tivoli
- OpenManage Plug-in for Nagios Core and XI

Dell EMC Update Utilities

- Dell System Update (DSU)
- Dell EMC Repository Manager (DRM)
- Dell EMC Update Packages (DUP)
- Dell EMC Server Update Utility (SUU)
- Dell EMC Platform Specific Bootable ISO (PSBI)

Dell resources

For additional information about white papers, videos, blogs, forums, technical material, tools, usage examples, and other information, go to the OpenManage page at https://www.dell.com/openmanagemanuals or the following product pages:

Table 21. Dell resources

Resource	Location
Integrated Dell Remote Access Controller (iDRAC)	https://www.dell.com/idracmanuals
iDRAC Service Module (iSM)	https://www.dell.com/support/kbdoc/000178050/
OpenManage Ansible Modules	https://www.dell.com/support/kbdoc/000177308/
OpenManage Essentials (OME)	https://www.dell.com/support/kbdoc/000175879/
OpenManage Mobile (OMM)	https://www.dell.com/support/kbdoc/000176046
OpenManage Integration for VMware vCenter (OMIVV)	https://www.dell.com/support/kbdoc/000176981/
OpenManage Integration for Microsoft System Center (OMIMSSC)	https://www.dell.com/support/kbdoc/000147399
Dell EMC Repository Manager (DRM)	https://www.dell.com/support/kbdoc/000177083
Dell EMC System Update (DSU)	https://www.dell.com/support/kbdoc/000130590
Dell EMC Platform Specific Bootable ISO (PSBI)	Dell.com/support/article/sln296511
Dell EMC Chassis Management Controller (CMC)	www.dell.com/support/article/sln311283
OpenManage Connections for Partner Consoles	https://www.dell.com/support/kbdoc/000146912
OpenManage Enterprise Power Manager	https://www.dell.com/support/kbdoc/000176254
OpenManage Integration with ServiceNow (OMISNOW)	Dell.com/support/article/sln317784

NOTE: Features may vary by server. Please refer to the product page on https://www.dell.com/manuals for details.

13

Appendix A. Additional specifications

Topics:

- Chassis dimensions
- Video specifications
- USB
- Power supply specifications
- Environmental specifications

Chassis dimensions

Dimensions for the 4 HDD and 10 HDD chassis

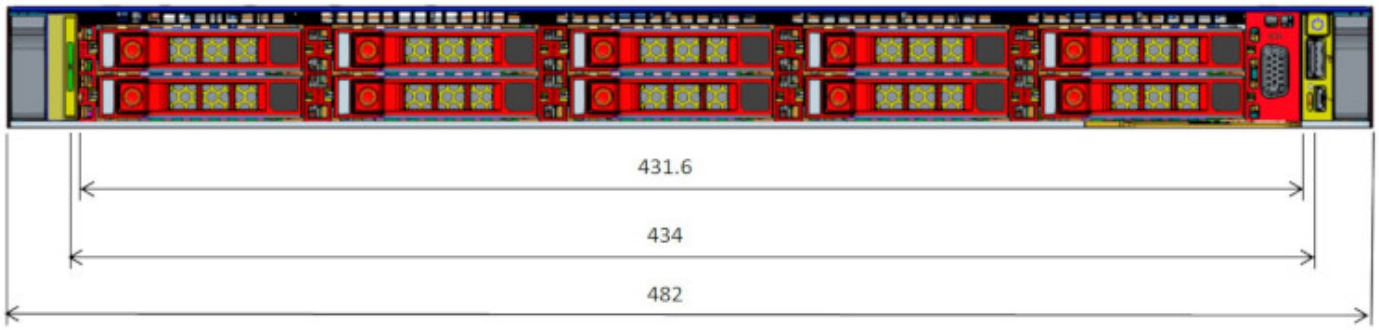

Figure 13. Front view measurements

- 482.0 mm = Left Slam latch handle outer surface to Right Slam latch handle outer surface.
- 434.0 mm = Chassis Base width.
- 431.6 mm = Left Slam latch handle inner surface to Right Slam latch handle inner surface.

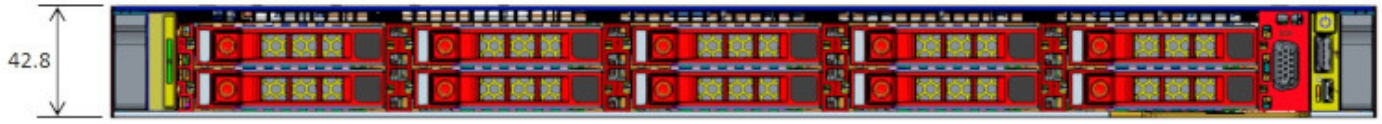

Figure 14. Front view height measurement

- 42.8 mm = Chassis bottom surface to upper surface of Top Cover and Slam latch handle

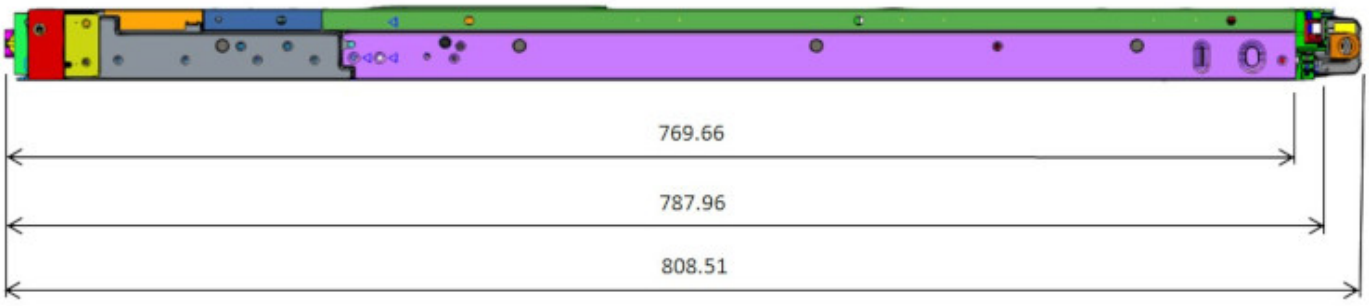

Figure 15. Depth measurements

- 769.66 mm = Bezel to Die Casting Rear Wall.
- 787.96 mm = Bezel to Die Casting Rear Wall PCIe area.
- 808.51 mm = Bezel to rear PSU handle.

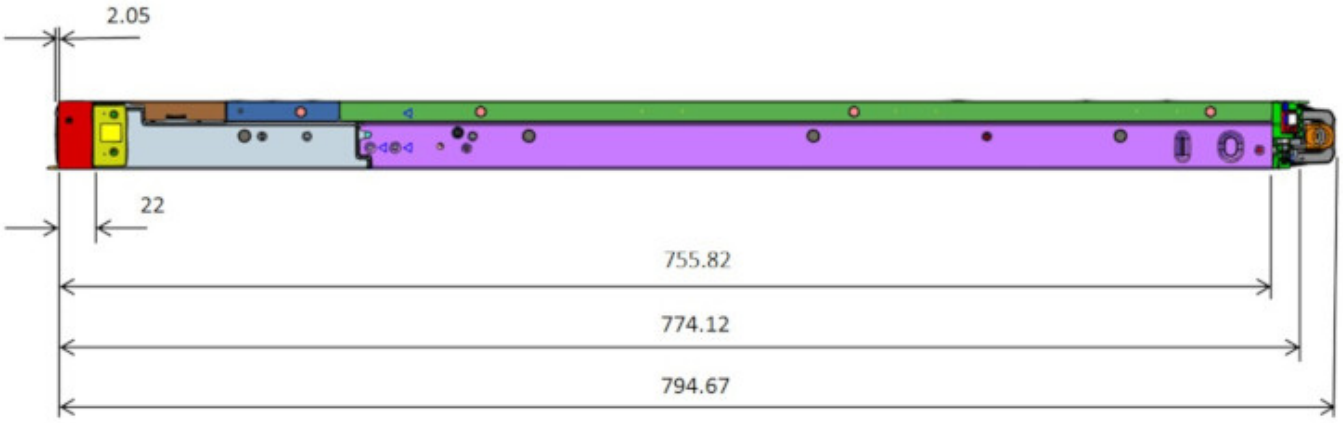

Figure 16. Depth measurements

- 755.82 mm = Front plate to Die Casting Rear Wall.
- 774.12 mm = Front plate to Die Casting Rear Wall PCIe area.
- 794.67 mm = Front plate to Rear PSU handle.
- 2.05 mm = Front plate to Slam latch front surface.
- 22.0 mm = Front plate to Slam latch rear surface (Rail mating surface.)

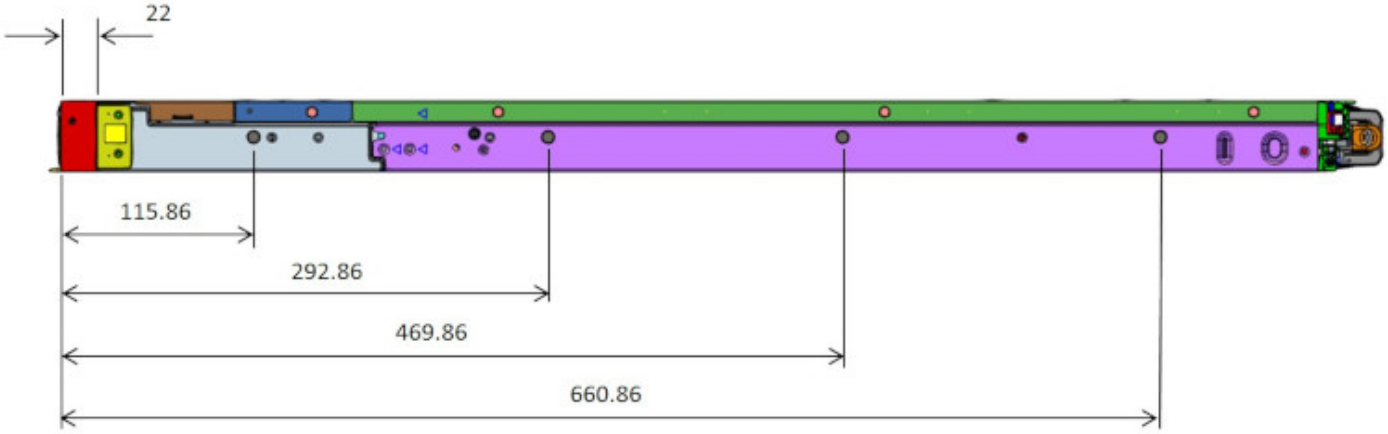

Figure 17. Depth measurements

- 660.86 mm = Front plate to 4th Rail Nut Center.
- 469.86 mm = Front plate to 3th Rail Nut Center.

- 292.86 mm = Front plate to 2nd Rail Nut Center.
- 115.86 mm = Front plate to 1st Rail Nut Center.
- 22.0 mm = Front plate to Slam latch rear surface (Rail mating surface.)

Dimensions for the 8 HDD chassis

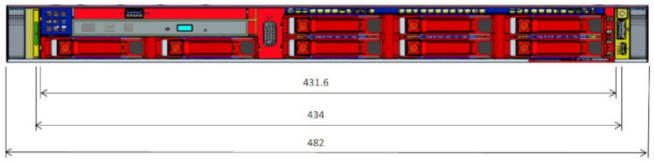

Figure 18. Front view measurements

- 482.0 = Left Slam latch handle outer surface to Right Slam latch handle outer surface.
- 434.0 = Chassis Base width.
- 431.6 = Left Slam latch handle inner surface to Right Slam latch handle inner surface.



Figure 19. Front view height measurement

- 42.8 = Chassis bottom surface to upper surface of Top Cover and Slam latch handle.

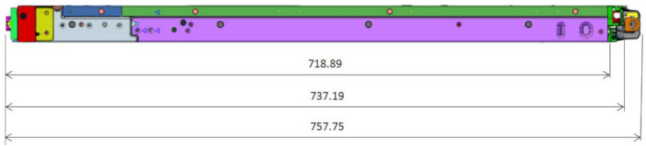

Figure 20. Depth measurements

- 718.89 = Bezel to Die Casting Rear Wall.
- 737.19 = Bezel to Die Casting Rear Wall PCIe area.
- 757.75 = Bezel to rear PSU handle.

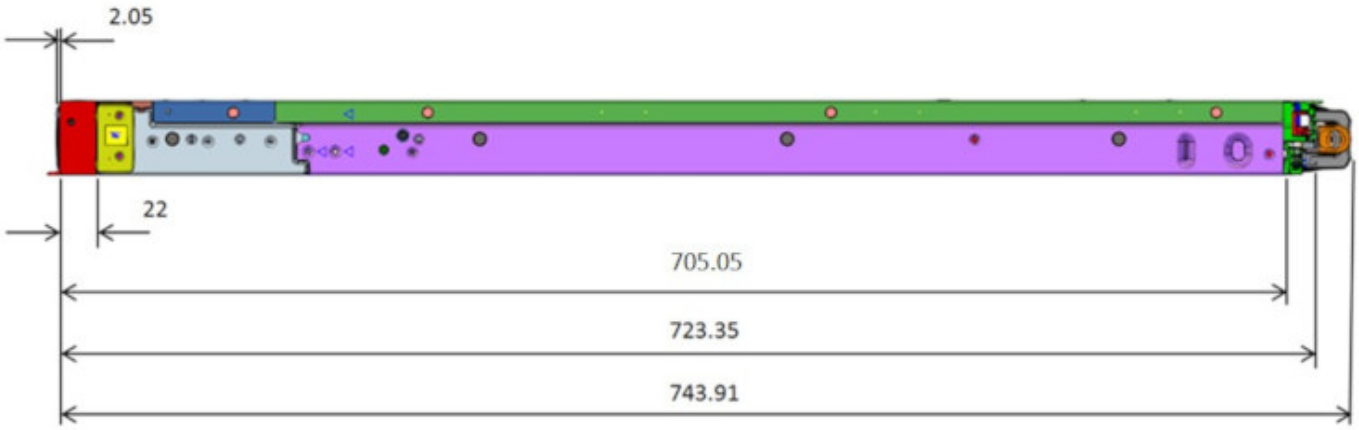

Figure 21. Depth measurement

- 705.05 = Front plate to Die Casting Rear Wall.
- 723.35 = Front plate to Die Casting Rear Wall PCIe area.
- 743.91 = Front plate to Rear PSU handle.
- 2.05 = Front plate to Slam latch front surface.
- 22.0 = Front plate to Slam latch rear surface (Rail mating surface)

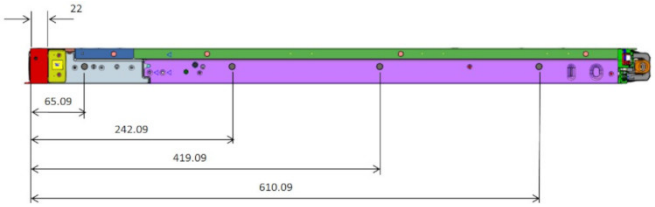

Figure 22. Depth measurement

- 610.09 = Front plate to 4th Rail Nut Center.
- 419.09 = Front plate to 3th Rail Nut Center.
- 242.09 = Front plate to 2nd Rail Nut Center.
- 65.09 = Front plate to 1st Rail Nut Center.
- 22.0 = Front plate to Slam latch rear surface (Rail mating surface.)

Video specifications

The PowerEdge T440 system supports the Integrate Matrox G200 graphics card with iDRAC9. The following table lists the video technical specifications:

Table 22. Video specifications

Resolution	Refresh rate	Horizontal frequency	Pixel clock	Rear panel	Front panel	DVO DisplayPort
1024 x 768	60 Hz	48.4 kHz	65.0 MHz	Yes	Yes	Yes
1280 x 800	60 Hz	49.7 kHz	83.5 MHz	Yes	Yes	Yes
1280 x 1024	60 Hz	64.0 kHz	108.0 MHz	Yes	Yes	Yes
1360 x 768	60 Hz	47.71 kHz	85.5 MHz	Yes	Yes	Yes
1440 x 900	60 Hz	55.9 kHz	106.5 MHz	Yes	Yes	Yes
1600 x 900	60 Hz	55.54 kHz	97.75 MHz	Yes	Yes	Yes
1600 x 1200	60 Hz	75.0 kHz	162.0 MHz	Yes	Yes	Yes
1680 x 1050	60 Hz	64.7 kHz	119.0 MHz	Yes	Yes	Yes
1920 x 1080	60 Hz	67.158 kHz	173.0 MHz	Yes	No	No
1920 x 1200	60 Hz	74.556 kHz	193.25 MHz	Yes	No	No

USB

Front, rear, and internal USB ports are included in the base system for R640. Rear and internal ports support up to USB 3.0, while front ports support USB 2.0. The R640 offers an option that adds an additional USB 3.0 port to the front of the chassis. The USB module cable connects to the internal USB port on the planar and the default internal moves closer to the front of the chassis

The front USB 3.0 port option is not available on the 4 x 3.5 -inch or 10 x 2.5 -inch storage configurations.

Power supply specifications

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

Table 23. 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		100–240 V AC, autoranging	10 A – 5 A
750 W AC	Titanium	2843 BTU/hr		200–240 V AC, autoranging	5 A
750 W Mixed Mode AC	Titanium	2902 BTU/hr		100–240 V AC, autoranging	10 A – 5 A
750 W Mixed Mode HVDC—for China only	Platinum	2891 BTU/hr		100–240 V AC, autoranging	10 A – 5 A
1100 W AC	Platinum	4100 BTU/hr		100–240 V AC, autoranging	12 A – 6.5 A
1100 W Mixed Mode HVDC—for China and Japan only	Platinum	4100 BTU/hr		100–240 V AC, autoranging	12 A – 6.5 A
1600 W AC	Platinum	6000 BTU/hr		100–240 V AC, autoranging	10 A

Table 24. PSU specifications

PSU	Class	Heat dissipation —maximum	Frequency	Voltage	Current
750 W Platinum Mixed Mode DC—for China only	Platinum	2902 BTU/hr		240 V DC, autoranging	5 A
750 W Mixed Mode HVDC—for China only	NA	2891 BTU/hr	50/60 Hz	240 V DC, autoranging	4.5 A
1100 W DC	NA	4416 BTU/hr		–(48–60) V DC, autoranging	32 A
1100 W Mixed Mode HVDC—for China and Japan only	NA	4100 BTU/hr		200–380 V DC, autoranging	6.4 A – 3.2 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 230 V.

Environmental specifications

The table below shows the environmental specifications for the PowerEdge R640. For additional information refer to dell.com/environmental_datasheets

Table 25. Temperature specifications

Temperature	Specifications
Storage	-40°C to 65°C (-40°F to 149°F)

Table 25. Temperature specifications (continued)

Temperature	Specifications
Continuous operation(for altitude less than 950m or 3117ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment NOTE: Certain system configurations may require reductions in the upper temperature limits, as listed in **Error! Reference source not found.** NOTE: The performance of the system may be impacted when operating above the upper temperature limit or with a faulty fan.
Fresh air	For information about Fresh Air see Expanded operating temperature refer to the Expanded operating temperature specifications below.
Maximum temperature gradient (operating and storage)	20°C/h (68°F/h)

Table 26. 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 27. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26Grms at 5Hz to 350Hz (x, y, and z axes)
Storage	1.88Grms at 10Hz to 500Hz for 15min (all six sides tested)

Table 28. Maximum shock specifications

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

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

Table 30. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 35°C (95°FJ)	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°FJ)	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°FJ	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

Table 31. Standard operating temperature specifications

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

Table 32. 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).

Table 33. 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 34. Gaseous contamination specifications

Gaseous contamination	Specification
Copper coupon corrosion rate	<300A/month per class G1 as defines by ANSI/ISA71.04-1985
Silver coupon corrosion rate	<200A/month as defined by ASHRAE TC9.9

14

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 35. Industry standard documents

Standard	URL for information and specifications
ACPIAdvance Configuration and Power Interface Specification, v2.0c	https://uefi.org/specsandtesttools
Ethernet IEEE 802.3-2005	https://standards.ieee.org/
HDGHardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR4 Memory DDR4 SDRAM Specification	jedec.org/standards-documents/docs/jesd79-4.pdf
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_I_Rev_1-1_20070205.pdf
SAS Serial Attached SCSI, v1.1	http://www.t10.org/
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	sata-io.org
SMBIOS System Management BIOS Reference Specification, v2.7	dmtf.org/standards/smbios
TPM Trusted Platform Module Specification, v1.2 and v2.0	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/specifications
USB Universal Serial Bus Specification, Rev. 2.0	usb.org/developers/docs

15

Appendix C Additional resources

Table 36. Additional resources

Resource	Description of contents	Location
Installation and Service Manual	This manual, available in PDF format, provides the following information: • Chassis features • System Setup program • System messages • System codes and indicators • System BIOS • Remove and replace procedures • Troubleshooting • Diagnostics • Jumpers and connectors	Dell.com/Support/Manuals
Getting Started Guide	This guide ships with the system, and is also available in PDF format. This guide provides the following information: • Initial setup steps • Key system features • Technical specifications	Dell.com/Support/Manuals
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	Dell.com/Support/Manuals
Information Update	This document ships with the system, is also available in PDF format online, and provides information on system updates.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Inside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information, and Dell EMC contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell EMC online ESSA enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use ESSA to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc

16

Appendix D. Support and deployment services

Topics:

- Dell EMC ProDeploy Enterprise Suite
- Deployment services
- Dell EMC Remote Consulting Services
- Dell EMC Data Migration Service
- ProSupport Enterprise Suite
- ProSupport Plus
- ProSupport
- ProSupport One for Data Center
- Support Technologies
- Additional professional services
- Dell Education Services
- Dell EMC Global Infrastructure Consulting Services
- Dell EMC Managed Services

Dell EMC ProDeploy Enterprise Suite

ProDeploy Enterprise Suite gets your server out of the box and into optimized production—fast. Our elite deployment engineers with broad and deep experience utilizing best-in-class processes along with our established global scale can help you around the clock and around the globe. From simple to the most complex server installations and software integration, we take the guess work and risk out of deploying your new server technology.

		Basic Deployment	ProDeploy	ProDeploy Plus
Pre-deployment	Single point of contact for project management	-	●	In-region
	Site readiness review	-	●	●
	Implementation planning	-	●	●
	SAM engagement for ProSupport Plus entitled devices	-	-	●
Deployment	Deployment service hours	Business hours	24x7	24x7
	Remote guidance for hardware installation or Onsite hardware installation and packaging material removal	Onsite	Remote or Onsite	Onsite
	Install and configure system software	-	Remote	Onsite
	Install support software and connect with Dell Technologies	-	●	●
	Project documentation with knowledge transfer	-	●	●
Post-deployment	Deployment verification	-	●	●
	Configuration data transfer to Dell EMC technical support	-	●	●
	30-days of post-deployment configuration assistance	-	-	●
	Training credits for Dell EMC Education Services	-	-	●

Figure 23. ProDeploy Enterprise Suite capabilities

NOTE: Hardware installation not applicable on selected software products.

Dell EMC ProDeploy Plus

From beginning to end, ProDeploy Plus provides the skill and scale needed to successfully execute demanding deployments in today's complex IT environments. Certified Dell EMC experts start with extensive environmental assessments and detailed migration planning and recommendations. Software installation includes set up of most versions of Dell EMC SupportAssist and OpenManage system management utilities. Post-deployment configuration assistance, testing, and product orientation services are also available.

Dell EMC ProDeploy

ProDeploy provides full service installation and configuration of both server hardware and system software by certified deployment engineers including set up of leading operating systems and hypervisors as well as most versions of Dell EMC SupportAssist and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning exercise. System testing, validation, and full project documentation with knowledge transfer complete the process.

Dell EMC Basic Deployment

Basic Deployment delivers worry-free professional installation by experienced technicians who know Dell EMC servers inside and out.

Dell EMC Residency Services

Residency Services helps customers transition to new capabilities quickly with the assistance of on-site or remote Dell EMC experts whose priorities and time you control. Residency experts can provide post implementation management and knowledge transfer related to a new technology acquisition or day-to-day operational management of the IT infrastructure.

Deployment services

Deployment services details and exceptions can be found in service description documents at the Enterprise Configuration and Deployment pageon Dell.com.

Dell EMC Remote Consulting Services

When you are in the final stages of your PowerEdge server implementation, you can rely on Dell EMC Remote Consulting Services and our certified technical experts to help you optimize your configuration with best practices for your software, virtualization, server, storage, networking, and systems management.

Dell EMC Data Migration Service

Protect your business and data with our single point of contact to manage your data migration project. Your project manager will work with our experienced team of experts to create a plan using industry-leading tools and proven processes based on global best practices to migrate your existing files and data so your business system get up and running quickly and smoothly.

ProSupport Enterprise Suite

With the ProSupport Enterprise Suite, we can help you keep your operation running smoothly, so you can focus on running your business. We will help you maintain peak performance and availability of your most essential workloads. ProSupport Enterprise Suite is a suite of support services that enable you to build the solution that is right for your organization. Choose support models based on how you use technology and where you want to allocate resources. From the desktop to the data center, address everyday IT challenges, such as unplanned downtime, mission-critical needs, data and asset protection, support

planning, resource allocation, software application management and more. Optimize your IT resources by choosing the right support model.

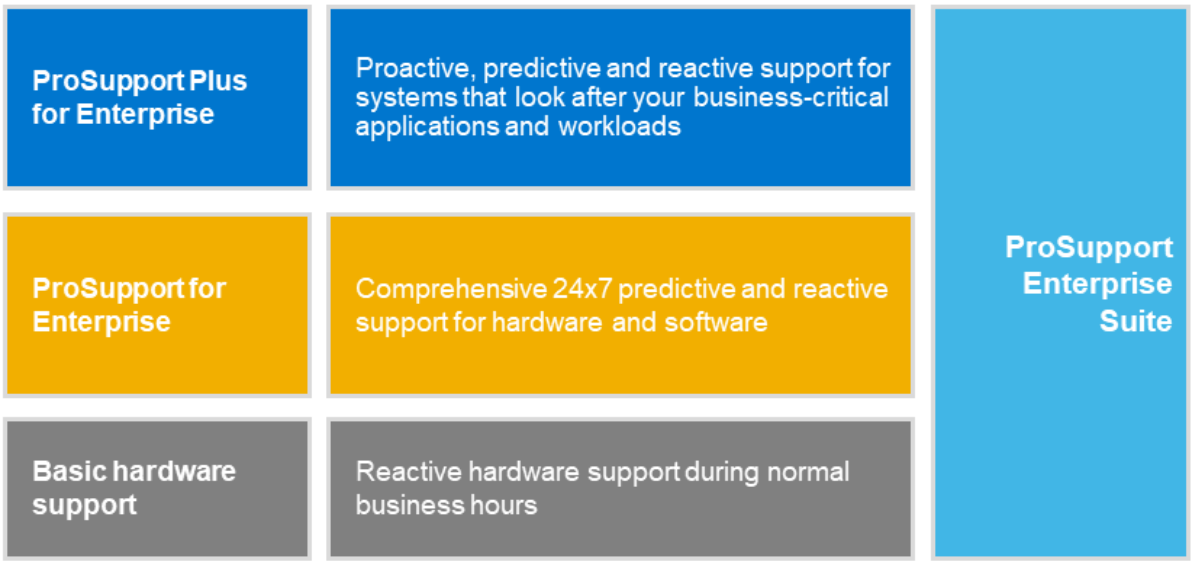

Figure 24. ProSupport Enterprise Suite

ProSupport Plus

When you purchase PowerEdge servers, we recommend ProSupport Plus, our proactive and preventative support, for business-critical systems. ProSupport Plus provides all the benefits of ProSupport, plus the following:

- An assigned Services Account Manager (SAM) who knows your business and your environment
- Access to senior ProSupport engineers for faster issue resolution
- Personalized, preventive recommendations based on analysis of support trends and best practices from across the Dell EMC customer base to reduce support issues and improve performance
- Predictive analysis for issue prevention and optimization enabled by SupportAssist
- Proactive monitoring, issue detection, notification and automated case creation for accelerated issue resolution enabled by SupportAssist
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect

ProSupport

Our ProSupport service offers highly trained experts around the clock and around the globe to address your IT needs. We will help you minimize disruptions and maximize availability of your PowerEdge server workloads with:

- 24x7x365 access to certified hardware and software experts
- Collaborative 3rd party support
- Hypervisor and OS support
- Consistent level of support available for Dell EMC hardware, software and solutions
- Onsite parts and labor response options including next business day or four-hour mission critical

ProSupport One for Data Center

ProSupport One for Data Center offers flexible site-wide support for large and distributed data centers with more than 1,000 assets. This offering is built on standard ProSupport components that leverage our global scale but are tailored to your company's needs. While not for everyone, it offers a truly unique solution for Dell EMC's largest customers with the most complex environments.

- Team of assigned Services Account Managers (SAM) with remote, on-site options
- Assigned ProSupport One technical and field engineers who are trained on your environment and configurations
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect
- Flexible on-site support and parts options that fit your operational model
- A tailored support plan and training for your operations staff

	ProSupport	ProSupport Plus	ProSupport One for Data Center
Remote technical support	24x7	24x7	24x7
Parts and labor response options	Next business day or Mission Critical	Next business day or Mission Critical	Flexible
Automated issue detection and case creation	●	●	●
Self-service case initiation and management	●	●	●
Hypervisor and OS support.	●	●	●
Priority access to specialized support experts		●	●
Designated Technology Service Manager		●	●
Personalized assessments and recommendations		●	●
On-demand support and utilization reports		●	●
Systems Maintenance guidance		Semiannual	Optional
Designated technical and field support teams			●

Figure 25. Enterprise Support feature comparison

Support Technologies

Powering your support experience with predictive, data-driven technologies.

SupportAssist

The best time to solve a problem is before it happens. The automated proactive and predictive technology SupportAssist* helps reduce steps and time to resolution, often detecting issues before they become a crisis. Benefits include:

- Value - SupportAssist is available to all customers at no additional charge.
- Improve productivity - replace manual, high-effort routines with automated support.
- Accelerate time to resolution - receive issue alerts, automatic case creation and proactive contact from Dell EMC experts.
- Gain insight and control - optimize enterprise devices with on-demand ProSupport Plus reporting in TechDirect and get predictive issue detection before the problem starts.

SupportAssist is included with all support plans but features vary based on service level agreement.

	Basic Hardware Warranty	ProSupport	ProSupport Plus
Automated issue detection and system state information collection	●	●	●
Proactive, automated case creation and notification		●	●
Predictive issue detection for failure prevention			●
Recommendation reporting available on-demand in TechDirect			●

Figure 26. SupportAssist model

Get started at Dell.com/SupportAssist

TechDirect

Boost your IT teams productivity when supporting Dell EMC systems. With over 1.4 million self-dispatches processed each year, TechDirect has proven its effectiveness as a support tool. You can:

- Self-dispatch replacement parts
- Request technical support
- Integrate APIs into your help desk

Or, access all your Dell EMC certification and authorization needs. Train your staff on Dell EMC products as TechDirect allows you to:

- Download study guides
- Schedule certification and authorization exams
- View transcripts of completed courses and exams

Register at techdirect.dell.com

Additional professional services

Dell Education Services

Dell Education Services offers the PowerEdge server training courses designed to help you achieve more with your hardware investment. The curriculum is designed in conjunction with the server development team, as well as Dell EMC's technical support team, to ensure that the training delivers the information and practical, hands-on skills you and your team need to confidently manage and maintain your Dell EMC server solution. To learn more or register for a class today, visit LearnDell.com/Server.

Dell EMC Global Infrastructure Consulting Services

Dell EMC Global Infrastructure Consulting Services use skilled solution architects, innovative tools, automated analysis and Dell EMC's intellectual property to give rapid insight into the root causes of unnecessary complexity. We seek better answers than traditional service models, and our strategy is to help quickly identify high-impact, short-duration projects that deliver return on investment (ROI) and free up resources. The results are practical, action-oriented plans with specific, predictable, measurable outcomes. From data center optimization to server virtualization to systems management, our consulting services can help build a more efficient enterprise.

Dell EMC Managed Services

Dell EMC Managed Services are a modular set of lifecycle services designed to help you automate and centrally configure, deploy, and manage your day-to-day data center operations. These services extend your existing on-premise IT infrastructure with off-premise cloud services designed to better address challenges with mobility, highly distributed organizations, security, compliance, business continuity, and disaster preparedness.