PowerEdge R640

Ideal balance of density and scalability

Get scalable computing and storage in a 1U, 2-socket platform with an ideal mix of performance, cost and density for most data centers.

The following documentation is designed as both an instructional aid and online reference material for the Dell EMC PowerEdge R640 rack server. The material introduces new technologies and features specific to the PowerEdge R640 in an effort to better prepare technicians to provide outstanding support to our customers.

Notes, cautions, and warnings

(i) | **NOTE: A NOTE indicates important information that helps you make better use of your product.**

△ | **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ | **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

System overview

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.

Introduction

The PowerEdge R640 is a general purpose platform expandable up to 1.5TB 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 R640 features:

- 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)
- 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

New technology	Detailed description
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.
2666 MT/s DDR4 memory	The Intel Xeon Scalable Processor product family that supports 2666 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.
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.

New technology	Detailed description
2.5-inch PCIe SSD	Supports up to eight CPU Direct Attach PCIe SSD
PERC S140	This new software RAID solution supports: • RAID 0, 1, 5, and Non-RAID • SATA HDD and SSD devices only • Up to eight 2.5-inch hot-plug SATA HDDs or SSDs • Software RAID is through the Intel Lewisburg chipset • Software RAID solution is supported on Linux and Windows For details, see the Storage section.
LCD bezel	The PowerEdge R640 LCD control panel is embedded in the front bezel for easy access and management.

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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, eight HDD back plane and 2 x rear back plane), expander—10 HDD system. 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

Table 2. Feature comparison

Feature	PowerEdge R640	PowerEdge R630
Processors	Intel Xeon Scalable Processor Family	Intel® Xeon processor E5-2600 v3 (Haswell) or E5- 2600 v4 (Broadwell)
Chipset	Intel C620	Intel C610
Memory	24x DDR4 RDIMM/LR-DIMM 12x NVDIMM + 12 x RDIMM	24x DDR4 RDIMM/LR-DIMM
Chassis	Storage design modularity • 4 Hard Drive Chassis • 8 Hard Drive Chassis • 10 Hard Drive Chassis	Three individual chassis for three SKU • 8 Hard Drive Chassis • 10 Hard Drive Chassis • 24 Hard Drive Chassis
Disk Drives	• Front drive bays: Up to 10 x 2.5 inch SAS/SATA (HDD/SSD) with up to 8 NVMe SSD 58TB (maximum) or up to 4 x 3.5 inch SAS/SATA HDD 40TB (maximum) • Rear drive bays: Up to 2 x 2.5 inch SAS/SATA (HDD/SSD), NVMe SSD 12TB (maximum)	• 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 8x CPU Direct Attach PCIe SSD	Up to 4x PCIe SSD from PCIe bridge card

Feature	PowerEdge R640	PowerEdge R630
RAID Controller	S140, HBA330, H330, H730, H730P, H740P, H840P, 12Gbps SAS HBA(External)	S130, H330, H730, H730P, H830 (External) Support for 2 internal RAID controllers for x24 SSD configuration only
LCD Module	LCD module option in bezel	LCD by default in base x8 chassis, not available on x10 and x24 chassis.
Backplane	• 8 x 2.5 inch SATA/SAS • 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/PCIe SSD • 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	• Broadcom 1G 4 x RJ45 • Broadcom 2 x 1G RJ45 + 2 x 10G SFP+ • Broadcom 2x 1G RJ45 + 2 x 10G RJ45 • Intel 1G 4 x RJ45 • Intel 2 x 1G RJ45 + 2 x 10G RJ45	• Broadcom 5730 Base-T • Intel 1350 Base-T • Broadcom 57800 SFP+ • Broadcom 57800 Base-T • Intel X540 Base-T
Power Supplies	• 495 W AC Platinum • 750 W AC Platinum • 750 W AC Titanium • 750 W Mixed Mode HVDC Gold (for China only) • 1100 W DC • 1100 W Mixed Mode HVDC Platinum (for China and Japan only) • 1100 W AC Platinum • 1600 W Platinum	• 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

Table 3. Technical specifications

Feature	PowerEdge R640 technical specification
Form factor	1U rack
Processor	Intel Xeon Processor Scalable Family
Processor sockets	2 sockets
Internal interconnect	Up to 3 Intel Ultra Path Interconnect (Intel® UPI); up to 11.2 GT/s
Chipset	Intel C620 series Chipset
Memory	Up to 1536 GB—24 DIMM slots: 8 GB, 16 GB, 32 GB, 64 GB DDR4 up to 2666 MT/s Supports DDR4 RDIMM/LRDIMM/NVDIMM-N
I/O slots	Up to 3 x PCIeGen slots plus a dedicated PERC and rNDC slot
RAID controller	Internal controllers: PERC S140 (SW RAID SATA), PERC H330, PERC H730, PERC H730P, PERC H740P Internal HBA (RAID): PERC HBA330 External HBA—non-RAID: 12 Gb/s SAS HBA
Hard drives	• 4 x 3.5 inch SAS/SATA • 8 x 2.5 inch SAS/SATA • 8 x 2.5 inch SATA only—PCH SATA • 10 x 2.5 inch SAS/SATA
Embedded NIC	Supports four Network Interface Controller (NIC) ports on the back panel, which are available in the following configurations: • Broadcom 1G 4 x RJ45 • Broadcom 2 x 1G RJ45 + 2 x 10G SFP+ • Broadcom 2 x 1G RJ45 + 2 x 10G RJ45 • Intel 1G 4 x RJ45 • Intel 2 x 1G RJ45 + 2 x 10G RJ45 ⓘ NOTE: You can install up to six PCIe add-on NIC cards.
Power supply	Dual, hot-plug, redundant, and high-efficiency power supply units: • 495 W, 750 W, 1100 W, and 1600 W Platinum • 750 W Titanium • 1100 W - (48 - 60) VDC • 750 W 240 HVDC
Availability	• Cluster support • ECC memory • Hot-plug hard drives • Hot-plug, redundant cooling

Feature	PowerEdge R640 technical specification
	• Hot-plug, redundant power • IDSDM Module • Single Device Data Correction (SDDC) • Spare Rank • Support for high availability, and virtualization • Proactive systems management alerts
Operating systems	• Microsoft Windows system 2012 R2 • Microsoft Windows system 2016 • Novell SUSE Linux Enterprise System 11 SP4 • Novell SUSE Linux Enterprise System 12 SP1 • Red Hat Enterprise Linux 6.8 • Red Hat Enterprise Linux 7.2 • VMware ESX **Virtualization options**: • Microsoft Windows system 2012 R2 with Hyper-V • Citrix XenServer 6.5 • VMware vSphere ESXi 2016 For more information on the specific versions and additions, visit Dell.com/OSsupport.
Systems management	**Systems management**: IPMI 2.0 compliant; Dell EMC OpenManage Essentials; Dell EMC OpenManage Mobile; Dell EMC OpenManage Power Center **Remote management**: iDRAC9 with Lifecycle Controller, iDRAC9 Express (default), iDRAC9 Enterprise (upgrade); 8 GB vFlash media (upgrade), 16 GB vFlash media (upgrade) iDRAC Quick Sync **Dell EMC OpenManage Integrations**: Dell EMC OpenManage Integration Suite for Microsoft® System Center, Dell EMC OpenManage Integration for VMware® vCenter™ **Dell EMC OpenManage Connections**: HP Operations Manager, IBM Tivoli® Netcool®, and CA Network and Systems Management, Dell EMC OpenManage Plug-in for Oracle® Database Manager
Dimensions and weight	• Height: 42.8 mm—1.68 inches • Width: 434.0 mm—17.08 inches • Depth: 70.47 mm, 27.74 inch, for x 8 • Depth: 75.55 mm, 29.74 inch, for x4/x10
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.

Chassis views and features

The PowerEdge R640 is a two socket, 1U rack system that is available in three different chassis configurations:

- Four hard drive chassis
- Eight hard drive chassis
- 10 hard drive chassis

Topics:

Front panel view and features

The PowerEdge R640 provides three chassis options: 4 x 3.5-inch, 8 x 2.5-inch, or 10 x 2.5-inch drives.

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 panel view and features

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.

The PowerEdge R640 system provides four backplane options:

- 4 x 3.5 inch SATA/SAS

- 8 x 2.5 inch SATA/SAS

The images below illustrate the types of backplanes supported on PowerEdge R640:
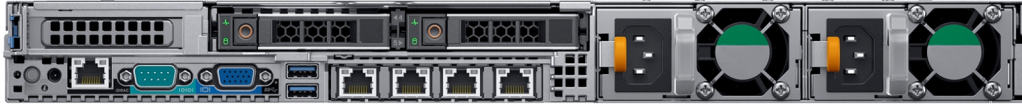
Figure 4. Back panel view of 2 x 2.5 inch hard drives with 1 PCIe expansion slot

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 chassis view

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.
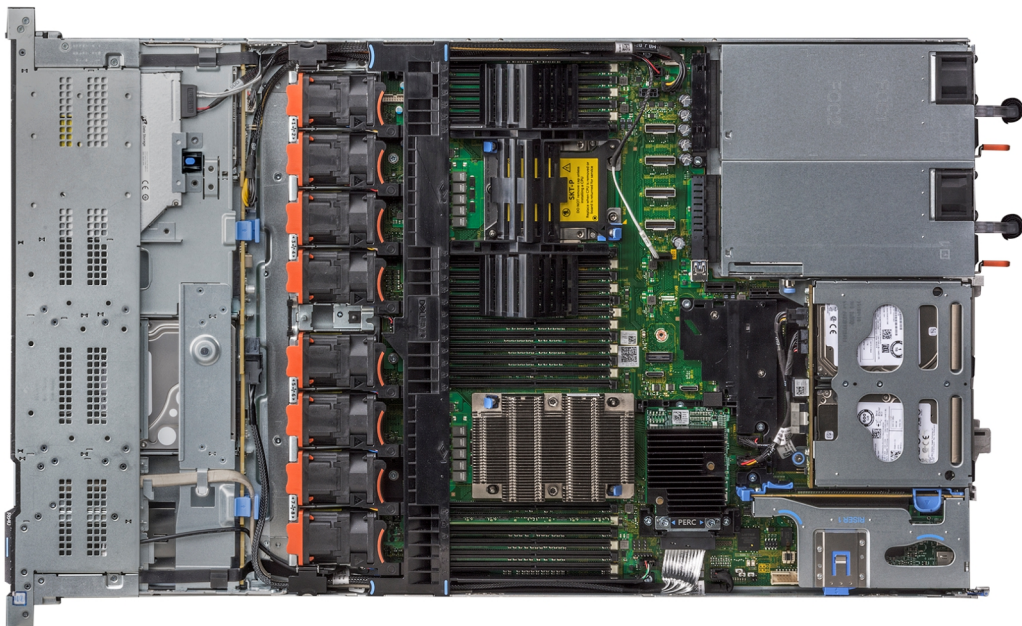
Figure 7. Internal chassis view - 1 PCIe expansion riser
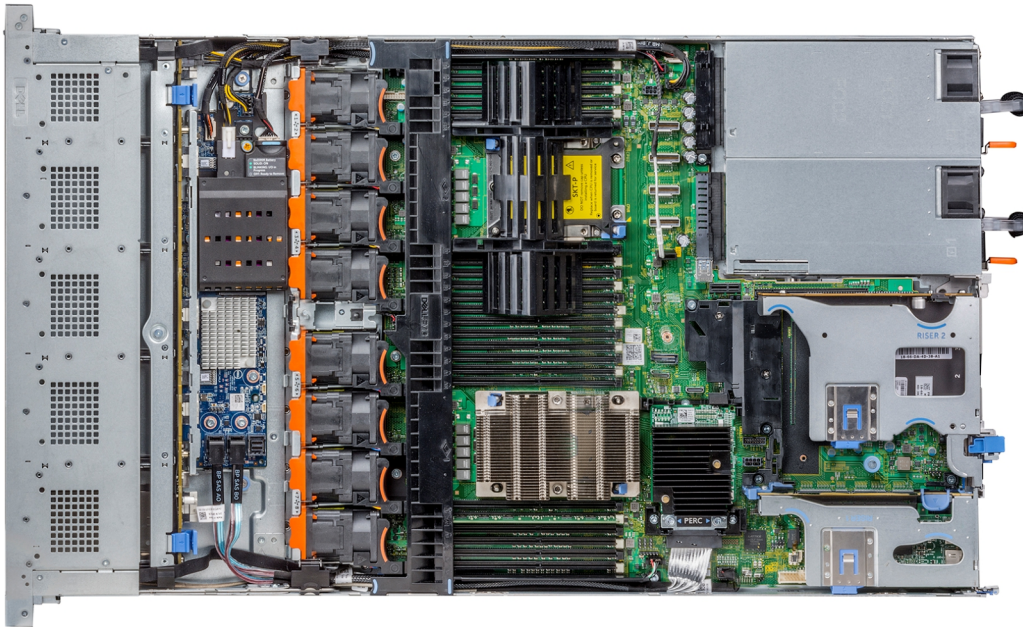
Figure 8. Internal chassis view - 2 PCIe expansion risers
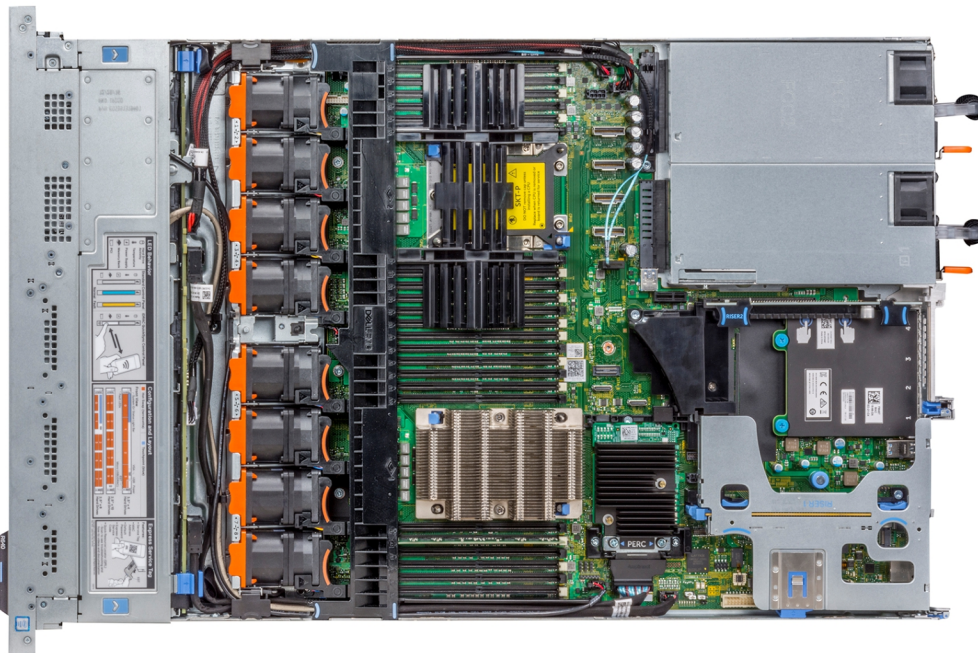
Figure 9. Internal chassis view - 3 PCIe expansion risers

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 side cover to secure it to the rack chassis.
Bezel	A standard bezel is an optional metal bezel mounted to the chassis front and shows the Dell EMC ID. A lock on the bezel protects unauthorized access to hard drives. NFC bezel enables the iDRAC QuickSync management function for managing the server from the front using an NFC-capable device and the free Dell EMC OpenManage Mobile App (currently Android only). Available only from the factory and not supported after purchase of sale.
TPM	The Trusted Platform Module (TPM) is used to generate/store keys, protect/authenticate passwords, and create/store digital certificates. TPM 1.2 is supported.
Power-off security	BIOS has the ability to disable the power button function.

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Processors

The PowerEdge R640 server features the exceptional performance, value, and power efficiency of the 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.

Topics:

Processor features

The new processor family is the next generation core architecture with improved Instructions per Cycle (IPC) and other architectural improvements.

The Intel Xeon Scalable Processor family not only adds new features, but also improves upon many features of the predecessor Intel Xeon processor E5-2600 v4 product family, including:

- Virtual address space of 48 bits and a physical address space of 46 bits
- Intel Hyper-Threading Technology (Intel® HT Technology) when enabled allow each core to support two threads
- First-Level Cache (FLC) 64 KB total. The FLC is composed of a 32 KB ICU (Instruction Cache) and 32 KB DCU—Data Cache
- MB MidLevel Cache (MLC) per core (noninclusive with the LLC)
- Intel® Advanced Vector Extensions 512 (Intel® AVX-512) with a single AVX512 fused multiply-add (FMA) execution units. Processors which support Advanced RAS enable a second FMA execution unit.

Supported processors

Table 5. Supported processors for PowerEdge R640

Model	Intel SKU	SKU type	Speed(GHz)	Cache(MB)	QPI—GT/s	Max Memory Speed—MT/s	Cores	Turbo	TDP
Intel Xeon Scalable Processor	3106	Bronze	1.7	24.75	9.6	2133	8	No Turbo	85 W
Intel Xeon Scalable Processor	3104	Bronze	1.7	19.25	9.6	2133	6	No Turbo	85 W
Intel Xeon Scalable Processor	6148	Gold	2.4	27.5	10.4	2400	20	Turbo	150 W
Intel Xeon Scalable Processor	6154	Gold	3	24.75	10.4	2400	18	Turbo	200 W

Model	Intel SKU	SKU type	Speed(GHz)	Cache(MB)	QPI— GT/s	Max Memory Speed— MT/s	Cores	Turbo	TDP
Intel Xeon Scalable Processor	6150	Gold	2.7	24.75	10.4	2400	18	Turbo	165 W
Intel Xeon Scalable Processor	6142	Gold	2.6	22	10.4	2400	16	Turbo	150 W
Intel Xeon Scalable Processor	6132	Gold	2.6	19.25	10.4	2400	14	Turbo	140 W
Intel Xeon Scalable Processor	6136	Gold	3	24.75	10.4	2400	12	Turbo	150 W
Intel Xeon Scalable Processor	6126	Gold	2.6	19.25	10.4	2400	12	Turbo	125 W
Intel Xeon Scalable Processor	6134	Gold	3.2	24.75	10.4	2400	8	Turbo	130 W
Intel Xeon Scalable Processor	6128	Gold	3.4	19.25	10.4	2400	6	Turbo	115 W
Intel Xeon Scalable Processor	5122	Gold	3.6	16.5	10.4	2400	4	Turbo	105 W
Intel Xeon Scalable Processor	6152	Gold	2.1	30.25	10.4	2400	22	Turbo	140 W
Intel Xeon Scalable Processor	6138	Gold	2	27.5	10.4	2400	20	Turbo	125 W
Intel Xeon Scalable Processor	6140	Gold	2.3	24.75	10.4	2400	18	Turbo	140 W
Intel Xeon Scalable Processor	6130	Gold	2.1	22	10.4	2400	16	Turbo	125 W
Intel Xeon Scalable Processor	5120	Gold	2.2	19.25	10.4	2400	14	Turbo	105 W
Intel Xeon Scalable Processor	5118	Gold	2.3	16.5	10.4	2400	12	Turbo	105 W
Intel Xeon Scalable Processor	5115	Gold	2.4	13.75	10.4	2400	10	Turbo	85 W
Intel Xeon Scalable Processor	8180	Platinum	2.5	38.5	10.4	2666	28	Turbo	205 W
Intel Xeon Scalable Processor	8168	Platinum	2.7	33	10.4	2666	24	Turbo	205 W
Intel Xeon Scalable Processor	8158	Platinum	3	24.75	10.4	2666	12	Turbo	150 W
Intel Xeon Scalable Processor	8156	Platinum	3.6	16.5	10.4	2666	4	Turbo	105 W
Intel Xeon Scalable Processor	8176	Platinum	2.1	22	10.4	2666	16	Turbo	120 W

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Model	Intel SKU	SKU type	Speed(GHz)	Cache(MB)	QPI— GT/s	Max Memory Speed— MT/s	Cores	Turbo	TDP
Intel Xeon Scalable Processor	8170	Platinum	2.1	35.75	10.4	2666	26	Turbo	165 W
Intel Xeon Scalable Processor	8164	Platinum	2	35.75	10.4	2666	26	Turbo	150 W
Intel Xeon Scalable Processor	8160	Platinum	2.1	33	10.4	2666	24	Turbo	150 W
Intel Xeon Scalable Processor	8153	Platinum	2	22	10.4	2666	16	Turbo	125 W
Intel Xeon Scalable Processor	4116	Silver	2.1	16.5	9.6	2400	12	Turbo	85 W
Intel Xeon Scalable Processor	4114	Silver	2.2	13.75	9.6	2400	10	Turbo	85 W
Intel Xeon Scalable Processor	4112	Silver	2.6	16.5	9.6	2400	4	Turbo	85 W
Intel Xeon Scalable Processor	4110	Silver	2.1	24.75	9.6	2400	8	Turbo	85 W
Intel Xeon Scalable Processor	4108	Silver	1.8	24.75	9.6	2400	8	Turbo	85 W

Processor configurations

The PowerEdge R640 supports up to two processors and up to 28 cores per processor.

Single CPU configuration

The PowerEdge R640 functions normally if there only a single processor placed in the CPU1 socket. However, CPU and memory blanks associated with CPU2 are required to be populated to maintain thermal efficiency. The system will not boot if only CPU2 socket is populated. With single CPU configuration, Riser 1 (1A/1B/1C/1D) card and Riser 2B is operational.

Processor installation

For processor installation instructions, see the Dell EMC PowerEdge R640 Installation and Service Manual at Dell.com/Support/Manuals.

Chipset

The PowerEdge R640 systems use the Intel C620 chipset, which provides extensive I/O support.

The functions and capabilities of the Intel C620 chipset include:

- 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
- 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
- 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® QuickAssist Technology
- Intel® Trace Hub for debug

For more information, visit Intel.com

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Memory

The PowerEdge R640 supports up to 1536 GB (RDIMM) or 768 GB (LRDIMMs) of memory (24 DIMMs), and at speeds up to 2666 MT/s, providing high performance in various applications. High memory density ensures that there is no compromise in virtualization.

The PowerEdge R640 supports both registered DIMMs (RDIMM) and load-reduced DIMMs (LRDIMMs), which use a buffer to reduce memory loading and provide greater density, allowing for the maximum platform memory capacity.

> (i) **NOTE: Mixing of DIMM types is not supported - either the platform is populated with all RDIMMs, or all LRDIMMs. Maximum two types of DIMMs allowed per system and only NVDIMM-Ns and RDIMMs are supported. NVDIMM-Ns are only supported on CPU 1 and CPU 2, that is, six per CPU with a total of 12. RDIMM with LRDIMM and LRDIMM with NVDIMM-N cannot be mixed.**

The system supports:

- Up to six channels with two DPC and total 24 DIMMs
- DDR4 RDIMM/LRDIMM/NVDIMM-N
- Only registered ECC DDR4 DIMMs
- DDR4 speeds up to 2666 MT/s

DIMMs supported

Table 6. Memory technologies

Feature	RDIMM	LRDIMM	NVDIMM-N
Register	Yes	Yes	Yes
Buffer	No	Yes	No
Frequencies	Up to 2666 MT/s	Up to 2666 MT/s	Up to 2666 MT/s
Ranks supported	Single or dual rank	Quad rank	Single rank
Capacity per DIMM	4 GB, 8 GB, 16 GB, 32 GB or 64 GB	32 GB	16 GB
Maximum DIMMs per channel	2	1, 2	1x NVDIMM-N for each channel Or Combined 2x (NVDIMM-N +RDIMM) for each channel
DRAM technology	x4 or x8	x4	x4
Temperature sensor	Yes	Yes	Yes
Error Correction Code (ECC)	Yes	Yes	Yes
Single Device Disable Code (SDDC)	Yes	Yes	Yes
Address parity	Yes	Yes	Yes

Table 7. Intel Xeon SP RDIMM/LRDIMM support

Type	Ranks per DIMM and data width	DIMM capacity (GB)			Speed (MT/s); Voltage (V) Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
					1 Slot Per Channel (SPC)	2 Slots Per Channel (SPC)	
					1DPC	1DPC	2DPC
		4 GB	8 GB	16 GB	1.2 V	1.2 V	1.2 V
RDIMM	SR x 4	8 GB	16 GB	32 GB	2666	2666	2440
RDIMM	SR x 8	4 GB	8 GB	16 GB			
RDIMM	DR x 8	8 GB	16 GB	32 GB			
RDIMM	DR x 4	16 GB	32 GB	64 GB			
LRDIMM	QR x 4	32 GB	64 GB	-			

Memory configurations

The PowerEdge R640 systems support flexible memory configurations ranging from capacities of 8 GB (minimum), to 1536 GB (maximum). The PowerEdge R640 supports up to 12 DIMMs per processor—up to 24 DIMMs in a dual-processor configuration. Each system has six memory channels per processor, with each channel supporting up to two DIMMs.

Memory population guidelines

Both systems support a flexible memory configuration, according to the following population guidelines:

- Speed: If DIMMs of different speeds are mixed, all channels across all processors operate at the common frequency of the slowest DIMM.
- DIMM type: Maximum two types of DIMMs allowed per system and only NVDIMM-Ns and RDIMMs are supported. RDIMM with LRDIMM and LRDIMM with NVDIMM-N cannot be mixed.
- DIMMs with different data widths can be mixed. For 14G, DIMMs with x4 and x8 data widths are supported and mixing is allowed.
- Can mix DIMMs with different capacities:
  - Population rules require the largest capacity DIMM be placed first (slot A1 populated first, then A2, and so on. The second CPU mirrors the first CPU population).
  - Maximum of two different capacity DIMMs allowed in a system
- Can mix DIMMs with different ranks:
  - Maximum of two different rank DIMMs allowed in a system

For more information on memory configuration and population, see the Dell EMC PowerEdge R640 Installation and Service Manual at Dell.com/Support/Manuals.

Memory RAS features

Reliability, Availability, and Serviceability (RAS) features help keep the system online and operational without significant impact to performance. RAS can decrease data loss and crashing due to errors. RAS helps in rapid, accurate diagnosis of faults that requires servicing.

Table 8. Supported RAS features

Feature	Description
Dense configuration optimized profile	Increased memory reliability can be a result from this selectable platform profile that adjusts parameters to reduce faults regarding refresh rates, speed, temperature, and voltage.
Memory demand and patrol scrubbing	Demand scrubbing is the ability to write corrected data back to the memory once a correctable error is detected on a read transaction. Patrol scrubbing proactively scans the system memory, detecting and repairing correctable errors.
Recovery from Single Device Data Correction (SDDC)	Single Device Data Correction provides error checking and correction that protects against any single memory chip failure and multi-bit errors from any portion of a single memory chip.
Failed DIMM isolation	This feature helps identify a specific failing DIMM channel pair, enabling the user to replace only the failed DIMM pair.
Memory mirroring	Memory mirroring is a method of keeping a duplicate (secondary or mirrored) copy of the contents of memory as a redundant backup for use if the primary intrasocket memory fails. The mirrored copy of the memory is stored in memory of the same processor socket.
Memory address parity protection	This feature helps detect transient errors on the address lines of the DDR channel.
Memory sparing—rank	Memory sparing allocates one rank per channel as a spare. If excessive correctable errors occur in a rank or channel, they are moved to the spare area while the operating system is running to prevent the errors from causing an uncorrectable failure.
Memory thermal throttling	This feature helps to optimize power/performance and can also be used to prevent DIMMs from overheating.

For information on memory mirroring and sparing configurations, see the Dell EMC PowerEdge R640 Installation and Service Manual at Dell.com/Support/Manuals.

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.

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 9. PERC series controller offerings

Performance Level	Controller and Description
Entry	S140—SATA, NVMe
	(SW RAID) SATA, NVMe
Value	HBA330—Internal, 12 Gbps SAS HBA—External
	H330, 12 Gbps SAS HBA—External
Value Performance	H730P
Premium Performance	H740P, H840

Supported drives

Table 10. Supported drives - SAS and SATA

Form Factor	Type	Speed	Rotational Speed	Capacities
2.5 inches	SATA, SSD	6 Gb	N/A	240 GB, 400 GB, 480 GB, 800 GB, 960 GB, 1.6 GB, 1.9 GB, 3.2 GB, 3.8 GB
	SATA	6 Gb	7.2 K	1 TB, 2 TB
	SAS	12 Gb	7.2 K	1 TB, 2 TB, 2 TB—SED FIPS
	SAS, SSD	12 Gb	N/A	400 GB, 480 GB, 800 GB, 960 GB, 1.6 GB, 1.9 GB, 3.8 GB, 800 GB(SED FIPS), 1.6 GB—SED FIPS
	SAS	12 Gb	10 K	300 GB, 600 GB, 1.2 TB, 1.8 TB, 2.4 TB, 1.2 TB(SED FIPS), 2.4 TB—SED FIPS

Form Factor	Type	Speed	Rotational Speed	Capacities
	SAS	12 Gb	15 K	300 GB, 600 GB, 900 GB, 900 GB—SED FIPS
3.5 inches	SATA	6 Gb	7.2 K	1 TB, 2 TB, 4 TB, 8 TB, 10 TB
	SAS	12 Gb	7.2 K	1 TB, 2 TB, 4 TB, 8 TB, 10 TB, 4 TB (SED FIPS), 8 TB—SED FIPS

Table 11. Supported drives - NVMe SSD

NVMe SSD drives description
800 GB 2.5-inch Device
1.6 TB 2.5-inch Device
3.2 TB 2.5-inch Device
KIT, CRD, NVM, 1.6, HHHL, PM1725
KIT, CRD, CTL, NVME, PM1725
KIT, CRD, NVM, 3.2, HHHL, PM1725

External storage

PowerEdge R640 supports the external storage device types listed in the table below.

Table 12. 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:

- IDSDM/vFlash card
- Optical drives
- Tape drives

IDSDM/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. There are two SKUs available for PowerEdge R640:

- vflash
- vflash + IDSDM

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.

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 6 Gb SAS tape drives
- 114X rack mount chassis with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL1000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL2000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL4000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL4000 with LTO-5, LTO-6, and LTO-7 8 Gb FC tape drives
- ML6000 with LTO-5, LTO-6, 6 Gb SAS tape drives
- ML6000 with LTO-5, LTO-6, LTO-7 8 Gb FC tape drives

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.

PCIe expansion cards

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 CPU1—Top and bottom
- Right Riser 1B - One x16 PCIe Gen3 for low-profile card on left side – connected to CPU1—Top and bottom
- Left Riser 2A - One x16 PCIe Gen3 for low-profile cards - connected to CPU2.
- Left Riser 2B - One x16 PCIe Gen3 for full-height cards, may be used for full-height 3/4 length PCIe cards - connected to CPU2.

With all the risers, the PowerEdge R640 system board provides one x8 PCIe Gen3 slot for dedicated storage controller card connected to the CPU1 and one x8 PCIe Gen3 slot for dedicated NDC connected to the CPU1.

PCIe expansion card riser configurations

Table 13. 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

PCIe expansion cards

Table 14. Optional add-in PCIe expansion cards for PowerEdge R640

Type	Adapter
NIC	• Intel PRO/1000 PT Dual Port Server Adapter, Gigabit, Copper, PCI-E x4

Type	Adapter
	• Intel PRO/1000 VT Quad Port Server Adapter, Gigabit, Copper, PCI-E x4
	• Intel 10GBase-T Copper Single Port NIC, PCI-E x8
	• Intel Single Port Server Adapter, 10 Gigabit, SR Optical, PCI-E x8
	• Broadcom® BMC57710 10Base-T Cooper Single Port NIC, PCI-E x8
	• Broadcom® BMC5709C IPV6 Gigabit Copper Dual Port NIC with TOE and iSCSI Offload, PCI-E x4
	• Broadcom® BMC5709C IPV6 Gigabit Copper Dual Port NIC with TOE, PCI-E x4
	• Broadcom® NetXtreme® II 57711 Dual Port Direct Attach 10 Gb Ethernet PCI-Express Network Interface Card with TOE and iSCSI Offload
	• Intel® Gigabit ET Dual Port Server Adapter
	• Intel® Gigabit ET Quad Port Server Adapter
	• Broadcom 10 GbE NIC, Broadcom Dual Port 10 GbE SFP+
HBA	• QLogic® QLE 2462 FC4 Dual Port 4 Gbps Fiber Channel HBA
	• QLogic® QLE 220 FC4 Single Port 4 Gbps Fiber Channel HBA
	• QLogic® QLE 2460 FC4 Single Port 4 Gbps Fiber Channel HBA
	• QLogic® QLE 2562 FC8 Dual-channel HBA, PCI-E Gen 2 x4
	• QLogic® QLE 2560 FC8 Single-channel HBA, PCI-E Gen 2 x4
	• Emulex® LPe-1150 FC4 Single Port 4 Gbps Fiber Channel HBA, PCI-E x4
	• Emulex® LPe-11002 FC4 Dual Port 4 Gbps Fiber Channel HBA, PCI-E x4
	• Emulex® LPe-12000, FC8 Single Port 4 Gbps Fiber Channel HBA, PCI-E Gen 2 x4
	• Emulex® LPe-12002, FC8 Dual Port 4 Gbps Fiber Channel HBA, PCI-E Gen 2 x4
CNA	• QLogic: QLE8152 HBA (10 GbE – 2 Port, PCIe Gen 2) – FCoE—Thunder Mountain Q
	• Emulex: OCE10102FM HBA (10 GbE – 2 Port, PCIe Gen 2) - FCoE—Thunder Mountain E
	• Emulex: OCE10102IM HBA (10 GbE – 2 Port, PCIe Gen 2 – iSCSI) - iSCSI—Thunder Mountain E
	• Broadcom 57711 NIC (10 GbE - 2 Port, PCIe Gen2) – iSOE—Punisher
	• Intel DT (10 GbE – 2 Port, PCIe Gen 2) – FCoE—Spring Fountain
	• Intel DT (10 GbE – 2 Port, PCIe Gen 2) – FCoE—Iron Pond

For the latest information on all supported add-in PCIe expansion cards for the PowerEdge R640, visit the PowerEdge R640 page at Dell.com.

For more information on server network adapters, visit www.dell.com/us/business/p/networking-cards.

Power, Thermal, and Acoustics

The lower overall system-level power draw is a result of the breakthrough system design developed by Dell EMC. The system aims to maximize performance-per-watt through a combination of energy efficient technologies, optimized thermal designs and intelligent fan control algorithms. System fan control algorithms use an extensive array of sensors that automatically monitor power and thermal activity to minimize fan speeds based on system cooling requirements, reducing the power required for cooling.

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 15. Power tools and technologies

Feature	Description
Power supply units (PSU) portfolio	Dell EMC PSU portfolio includes intelligent features such as dynamically optimizing efficiency while maintaining availability and redundancy. For more information, see, the *Power supply units* section.
Tools for right-sizing	The Dell 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.
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 to set the power cap limit for your systems to limit the output of a PSU and reduce system power consumption. Dell EMC is the first hardware vendor to leverage Intel Node Manager for circuit-breaker fast capping.

Systems management	iDRAC9 Enterprise provides system-level management that monitors, reports, and controls power consumption at the processor, memory and system level. OpenManage Power Center delivers group power management at the rack, row, and data center level for servers, power distribution units, and uninterruptible power supplies.
Active power management	Intel Node Manager is an embedded technology that provides individual system-level power reporting and power limiting functionality. Dell EMC offers a complete power management solution comprised of Intel Node Manager accessed through Dell EMC iDRAC9 Enterprise and OpenManage Power Center that allows policy-based management of power and thermals at the individual system, rack, and data center level. Hot spare reduces 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. Idle power enables Dell EMC servers to run as efficiently when idle as when at full workload.

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 for lower total 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 16. Acoustical reference points and output comparisons

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

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).
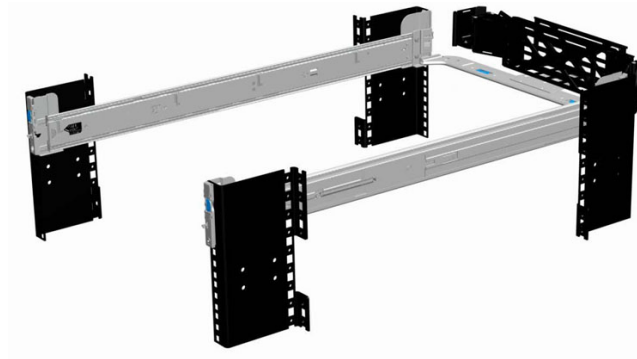
Figure 10. Sliding rails

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.
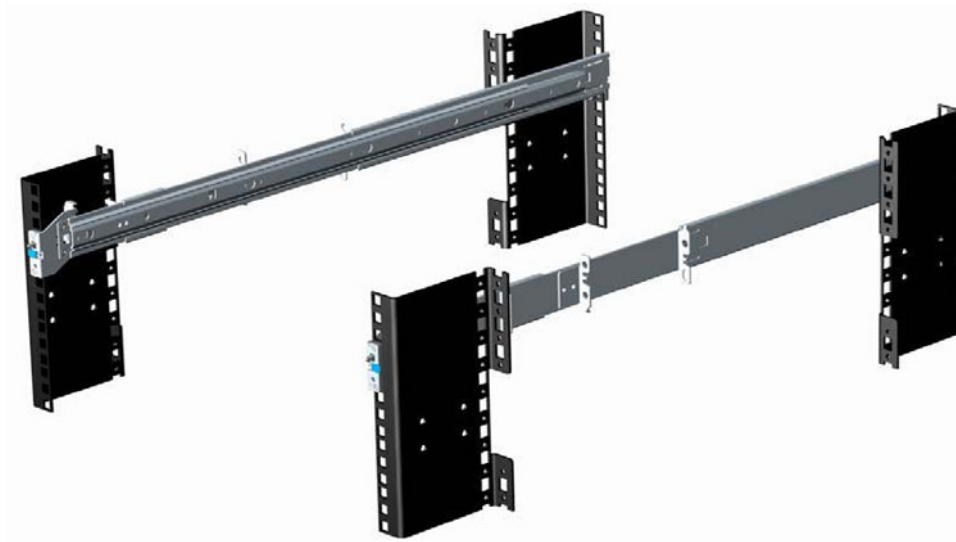
Figure 11. Static rails

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 17. 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 18. 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.

Dell EMC OpenManage systems management

Whether your IT environment consists of a few servers or a few thousand servers, Dell EMC OpenManage systems management solutions provide comprehensive management for evolving IT environments. OpenManage is based on open standards and provides agent-based and agent-free server lifecycle management functionality for Dell EMC PowerEdge servers. OpenManage solutions help you automate and streamline essential hardware management tasks.

Start with a firm foundation for efficient hardware management using OpenManage tools, utilities and management consoles. OpenManage systems management solutions consist of a combination of embedded management features and software products that help you automate and simplify the entire server lifecycle: deploy, update, monitor and maintain. OpenManage solutions are innovatively designed for simplicity and ease of use to help you reduce complexity, save time, achieve efficiency, control costs and empower productivity. OpenManage centers around efficient management of server lifecycle.
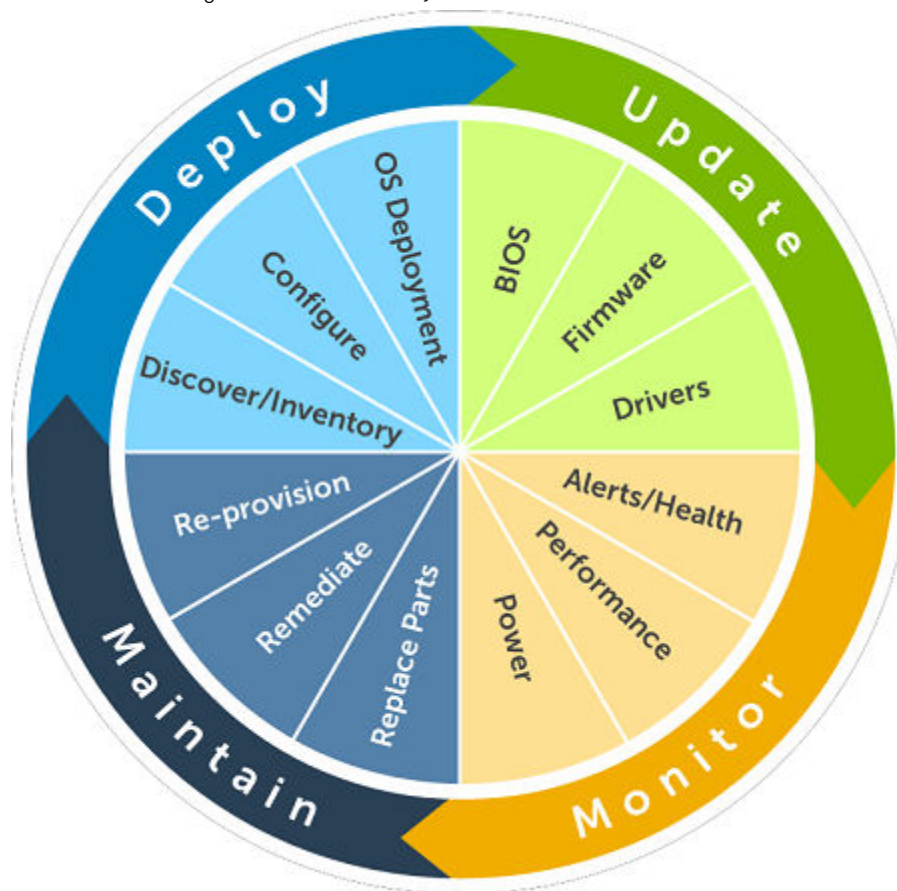

Figure 12. Server lifecycle management operations

Topics:

· OpenManage systems management
· iDRAC Lifecycle controller
· Agent-free management

DELLEMC

- Agent-based management
- Dell EMC consoles
- OpenManage systems management tools, utilities and protocols
- Integration with third-party consoles
- OpenManage connections with third-party consoles
- Dell EMC server management operations

OpenManage systems management

The Dell EMC OpenManage systems management portfolio includes powerful hardware and software management tools and consoles. OpenManage simplifies the lifecycle of deploying, updating, monitoring and maintaining your Dell EMC PowerEdge servers.

iDRAC Lifecycle controller

The PowerEdge server provides storage expandability that allows you to adapt to your workload and operational demands. With comprehensive storage options, the server offer various drive types, internal and external storage controllers, and different backplanes for varied number of drives. The microcontroller is responsible for acting as an interface or gateway between the host system (i.e., server management software) and the peripheral devices. These peripheral devices, which may or may not be Intelligent Platform Management Interface (IPMI) compliant, consist of the power supplies, the storage backplane, integrated storage controllers, control panel with semi-intelligent display, and Lifecycle Controller.

iDRAC features and comparison

iDRAC9 is available in basic, express, and enterprise options.

Table 19. iDRAC feature comparison

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Interface/Standards								
Redfish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPMI 2.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCMI 1.5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Web-based GUI—HTML5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Racadm command line—local/remote	Yesses	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SMASH-CLP—SSH-only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial redirection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WSMAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network Time Protocol		No	Yes	Yes	Yes	Yes	Yes	Yes
Connectivity								
Shared NIC	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Dedicated NIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VLAN tagging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP (new default; no static IP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP with Zero Touch	No	No	No	No	No	No	No	Yes
Dynamic DNS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS pass-through	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Direct-Front panel USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connection View	No	Yes	No	Yes	No	Yes	No	Yes
NFS v4	No	Yes	No	Yes	No	Yes	No	Yes
SMB3.0 with NTLM v1 and NTLM v2	No	Yes	No	Yes	No	Yes	No	Yes
Security								
Role-based authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local users	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSL encryption	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP blocking	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Directory services—AD, LDAP	No	No	No	No	No	No	Yes	Yes
2-factor authentication	No	No	No	No	No	No	Yes	Yes
Single sign-on	No	No	No	No	No	No	Yes	Yes
PK authentication	No	No	Yes	Yes	Yes	Yes	Yes	Yes
FIPS 140-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure UEFI boot-certificate management	No	Yes	No	Yes	No	Yes	No	Yes
Lock down mode	No		No		No		No	Yes
Unique iDRAC default password	No	Yes	No	Yes	No	Yes	No	Yes
Customizable Security Policy Banner-login page	No	Yes	No	Yes	No	Yes	No	Yes
Quick Sync 2.0-optional auth for read operations	No	Yes	No	Yes	No	Yes	No	Yes
Quick Sync 2.0-add mobile device number to LCL	No	Yes	No	Yes	No	Yes	No	Yes
Remote Presence								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Power control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boot control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial-over-LAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Media	No	No	No	No	Yes	Yes	Yes	Yes
Virtual Folders	No	No	No	No	No	No	Yes	Yes
Remote File Share	No	No	No	No	No	No	Yes	Yes
Virtual Console	No	No	No	No	Yes	Yes	Yes	Yes
HTML5 access to virtual console	No	No	No	No	Yes	Yes	Yes	Yes
VNC connection to OS	No	No	No	No	No	No	Yes	Yes
Quality/bandwidth control	No	No	No	No	No	No	Yes	Yes
Virtual Console collaboration—6 users	No	No	No	No	No	No	Yes	Yes
Virtual Console chat	No	No	No	No	No	No	Yes	Yes
Virtual Flash partitions	No	No	No	No	No	No	Yes	Yes
Group manager	No	No	No	No	No	No	No	Yes
HTTP/HTTPS support along with HFS/CIFS	No	Yes	No	Yes	No	Yes	No	Yes
Power and Thermal								
Real-time power meter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power thresholds & alerts	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Real-time power graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Historical power counters	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Power capping	No	No	No	No	No	No	Yes	Yes
Power Center integration	No	No	No	No	No	No	Yes	Yes
Temperature monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Temperature graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Health Monitoring								
Full agent-free monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Predictive failure monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv1, v2 and v3—traps and gets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Email alerting	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Configurable thresholds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fan monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Supply monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Memory monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CPU monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NIC monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HD monitoring—enclosure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Out of Band Performance Monitoring	No	No	No	No	No	No	Yes	Yes
Alerts for excessive SSD wear	No	Yes	No	Yes	No	Yes	No	Yes
Customizable settings for Exhaust Temperature	No	Yes	No	Yes	No	Yes	No	Yes
Update								
Remote agent-free update	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded update tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sync with repository—scheduled updates	No	No	No	No	No	No	Yes	Yes
Auto update	No	No	No	No	No	No	Yes	Yes
Improved PSU firmware updates	No	Yes	No	Yes	No	Yes	No	Yes
Deployment and Configuration								
Local configuration via F10	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded OS deployment tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded configuration tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AutoDiscovery	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Remote OS deployment	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Embedded driver pack	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Full configuration inventory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inventory export	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zerotouch configuration	No	No	No	No	No	No	Yes	Yes
System Retire/Repurpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Profile in GUI	No	Yes	No	Yes	No	Yes	No	
Diagnostics, Service and Logging								
Embedded diagnostic tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Part Replacement	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Backup	No	No	No	No	No	No	Yes	Yes
Server Configuration Restore	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore—system configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore Auto Timeout	No	Yes	No	Yes	No	Yes	No	Yes
LED health status indicator	No	No	No	No	No	No	No	No
LCD screen—iDRAC9 requires optional bezel	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Quick Sync—require NFC bezel	Yes	No	Yes	No	N/A	No	Yes	No
Quick Sync 2.0—requires BLE/WiFi hardware	No	Yes	No	Yes	No	N/A	No	Yes
iDRAC Direct—front USB mgmt port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Service Module (iSM) embedded	No	Yes	No	Yes	No	Yes	No	Yes
iSM to inband alert forwarding to consoles	No	Yes	No	Yes	No	Yes	No	Yes
Crash screen capture	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Crash video capture	No	No	No	No	No	No	Yes	Yes
Boot capture	No	No	No	No	No	No	Yes	Yes
Manual reset for iDRAC—LCD ID button	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote reset for iDRAC—requires iSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual NMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS watchdog	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SupportAssist Report—embedded	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
System Event Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lifecycle Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced logging in the Lifecycle controller log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Work notes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote Syslog	No	No	No	No	No	No	Yes	Yes
License management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Improved customer experience

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
iDRAC -Faster processor, more memory	No	Yes	No	Yes	No	Yes	No	Yes
GUI rendered in HTML5	No	Yes	No	Yes	No	Yes	No	Yes
Add BIOS configuration to iDRAC GUI	No	Yes	No	Yes	No	Yes	No	Yes
iDRAC support for SW RAID licensing	No	Yes	No	Yes	No	Yes	No	Yes

Agent-free management

As Dell EMC PowerEdge servers have embedded server lifecycle management, in many cases, there is no need to install an OpenManage systems management software agent into the operating system of a Dell EMC PowerEdge server. This greatly simplifies and streamlines the management footprint.

Agent-based management

Most systems management solutions require pieces of software, called agents, to be installed on each node in order to be managed within the IT environment. Additionally, the same agent is often used as a local interface into the hardware health and may be accessed remotely as a management interface, typically referred to as a one-to-one interface. For customers that continue to use agent-based solutions, Dell EMC provides OpenManage Server Administrator.

Dell EMC consoles

The central console in a systems management solution is often referred to as the one-to-many console. The central console provides a rapid view and insight into the overall health of all systems in the IT environment. The Dell EMC systems management portfolio includes several powerful consoles, depending upon your needs, including the following:

- **Dell EMC OpenManage Essentials**—OpenManage Essentials (OME) is a systems management console that provides a comprehensive view of Dell EMC systems, devices, and components in an enterprise network. It is used to monitor Dell EMC PowerEdge servers, EqualLogic and PowerVault storage, and PowerConnect™ switches; to update and configure Dell EMC servers; and to create asset reports. OpenManage Essentials also communicates health status alerts for Dell EMC servers, storage, and network devices to the Dell EMC KACE™ K1000 service desk. OpenManage Essentials is available as a no-charge software download from Dell.com/Support. When connected through OME, you can use Dell EMC OpenManage Mobile (OMM) to securely perform a subset of data center monitoring and remediation tasks from a mobile device.
- **OpenManage Power Center**—Dell EMC's power management solution, the Dell EMC OpenManage Power Center (OMPC) management console, provides increased visibility to power consumption, anomalies, and utilization through fine-grained instrumentation. This enables increased control, improved rack density, faster response times, greater accuracy, and broader decision-making intelligence than would otherwise be possible. When used with a suitably licensed PowerEdge server (with a iDRAC Enterprise license), OMPC leverages Intel Node Manager technology for platform-level power reporting and capping of Intel chipsets. Power Center then communicates with iDRAC to provide node, rack, row or data-center level aggregation of power-management data, as well as execution of control policy — making it easy for IT professionals to identify areas to gain efficiencies and cut wasteful costs.

OpenManage systems management tools, utilities and protocols

Dell EMC OpenManage systems management tools and utilities consist of the following:

- **Dell EMC Repository Manager:** The Dell EMC Repository Manager (RM) is a stand-alone GUI-based productivity tool that helps simplify the process of managing downloads and baseline BIOS, firmware and driver updates. Repository Manager can create deployment disks as well as create and manage customized repositories.

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- **Dell EMC Update Packages:** The Dell EMC Update Packages (DUP) is a self-contained executable in a standard package format that updates a software element on a Dell EMC server such as the BIOS, a driver, firmware and other software updates.
- **Dell EMC OpenManage Deployment Toolkit:** The Dell EMC OpenManage Deployment Toolkit (DTK) is a CLI-based tool that includes a set of utilities for configuring and deploying Dell EMC PowerEdge systems, and can be used to build scripted, unattended OS installations to deploy large numbers of servers in a reliable fashion.
- **RACADM:** The RACADM command-line utility provides a scriptable interface that allows you to locally or remotely configure iDRAC9.
- **IPMITool:** IPMITool includes scriptable console application programs used to control and manage remote systems using the IPMI version 1.5 and later protocol.
- **Web Services for Management (WSMAN):** WSMAN is a SOAP-XML–based protocol for exchanging system management information. Dell EMC's implementation provides remote management capabilities through a secure and standards-based Web Services–Management (WS-MAN) interface to PowerEdge servers and blade server node chassis.

Integration with third-party consoles

Dell EMC OpenManage provides integration with several leading third-party consoles, including:

- **OpenManage Integration Suite for Microsoft System Center**—This suite helps you further streamline, automate and simplify your most essential IT management tasks. For more information, visit http://www.dell.com/learn/us/en/04/solutions/dcsm-microsoft-system-center.
- **OpenManage Integration for VMware vCenter**—This plug-in allows IT administrators to monitor, provision, and manage the physical PowerEdge server hardware and firmware from a dedicated Dell EMC menu accessed through the VMware vCenter console using the same role-based access control model as vCenter, combining physical server management. For more information, visit http://www.dell.com/learn/us/en/04/virtualization/management-plug-in-for-vmware-vcenter.
- **BMC Software**—Dell EMC and BMC Software work together to simplify IT by ensuring tight integration between Dell EMC server, storage, and network management functionality and the BMC Software process and data center automation products.

OpenManage connections with third-party consoles

Dell EMC OpenManage Connections gives you an easy path to adding support for third-party devices, so you can continue to use your existing management tools while easily adding Dell EMC server systems to your existing IT environment. Integrate new systems at your own pace. Manage new Dell EMC servers and storage with your legacy management tools, while extending the useful life of your existing resources. With OpenManage Connections you can add monitoring and troubleshooting of Dell EMC assets to your IT infrastructure.

- OpenManage Connection for Nagios
- OpenManage Connection for Oracle
- OpenManage Connection for HP
- OpenManage Connection for IBM
- OpenManage Connection for CA

For more information on these OpenManage Connections, visit http://www.dell.com/learn/us/en/04/solutions/dcsm-partner-consoles.

Dell EMC server management operations

Dell EMC OpenManage systems management is centered on automating the server management lifecycle — deploy, update, monitor and maintain. To manage an infrastructure properly and efficiently, you must perform all of these functions easily and quickly. iDRAC9 with Lifecycle Controller technology provides you with these intelligent capabilities embedded within the server infrastructure. This allows you to invest more time and energy on business improvements and less on maintenance.
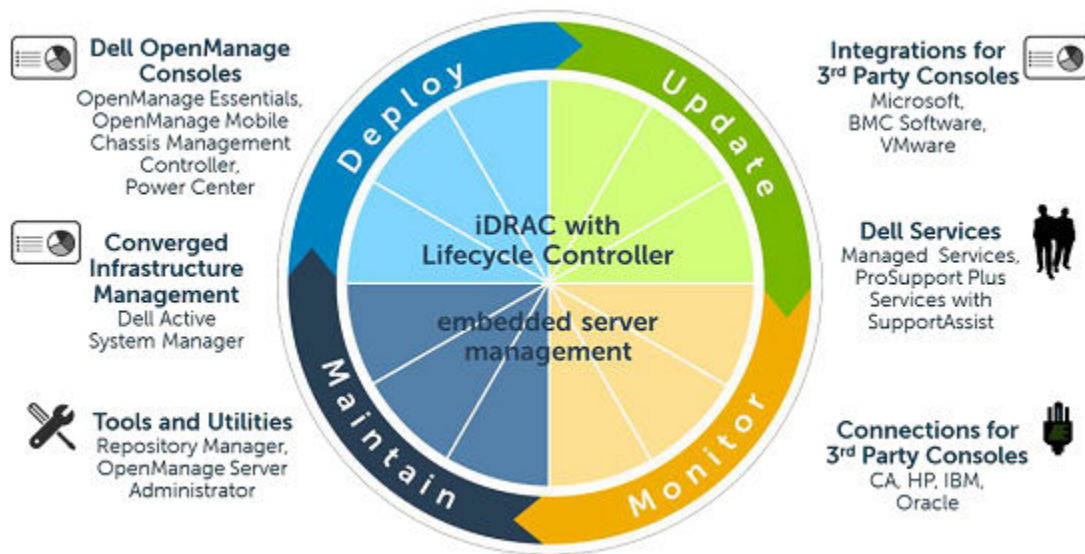
Figure 13. Systems management server lifecycle

Table 20. One-to-one and one-to-many operations

Operation	One-to-one	One-to-many
Deploy	• Lifecycle Controller GUI • DTK	• OpenManage Integration for VMware vCenter • OpenManage Integration for BMC BladeLogic • OpenManage Integration for Microsoft System Center Configuration Manager
Update	• iDRAC9 with Lifecycle Controller • Repository Manager • DUP • SUU • OpenManage Integration for VMware vCenter	• Dell EMC OpenManage Essentials • OpenManage Integration for Microsoft System Center Configuration Manager
Monitor	• iDRAC9 with Lifecycle Controller • OMSA	• Dell EMC OpenManage Essentials • Dell EMC OpenManage Power Center • OpenManage Integration for VMware vCenter • OpenManage Integration for Microsoft System Center Operations Manager
Maintain	• iDRAC9 with Lifecycle Controller • IPMI	• Lifecycle Controller Remote Services Remediate and replace parts: • OpenManage Integration for Microsoft System Center Virtual Machine Manager (SCVMM) • Server Pro Management Pack and Lifecycle Controller Integration (DLCI)

For additional detailed information on Dell EMC systems management portfolio, visit Dell.com/OpenManage.

Appendix A. Additional specifications

Topics:

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

Power supply specifications

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

Table 21. 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 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 22. PSU specifications

PSU	Class	Heat dissipation—maximum	Frequency	Voltage	Current
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

PSU	Class	Heat dissipation—maximum	Frequency	Voltage	Current
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.
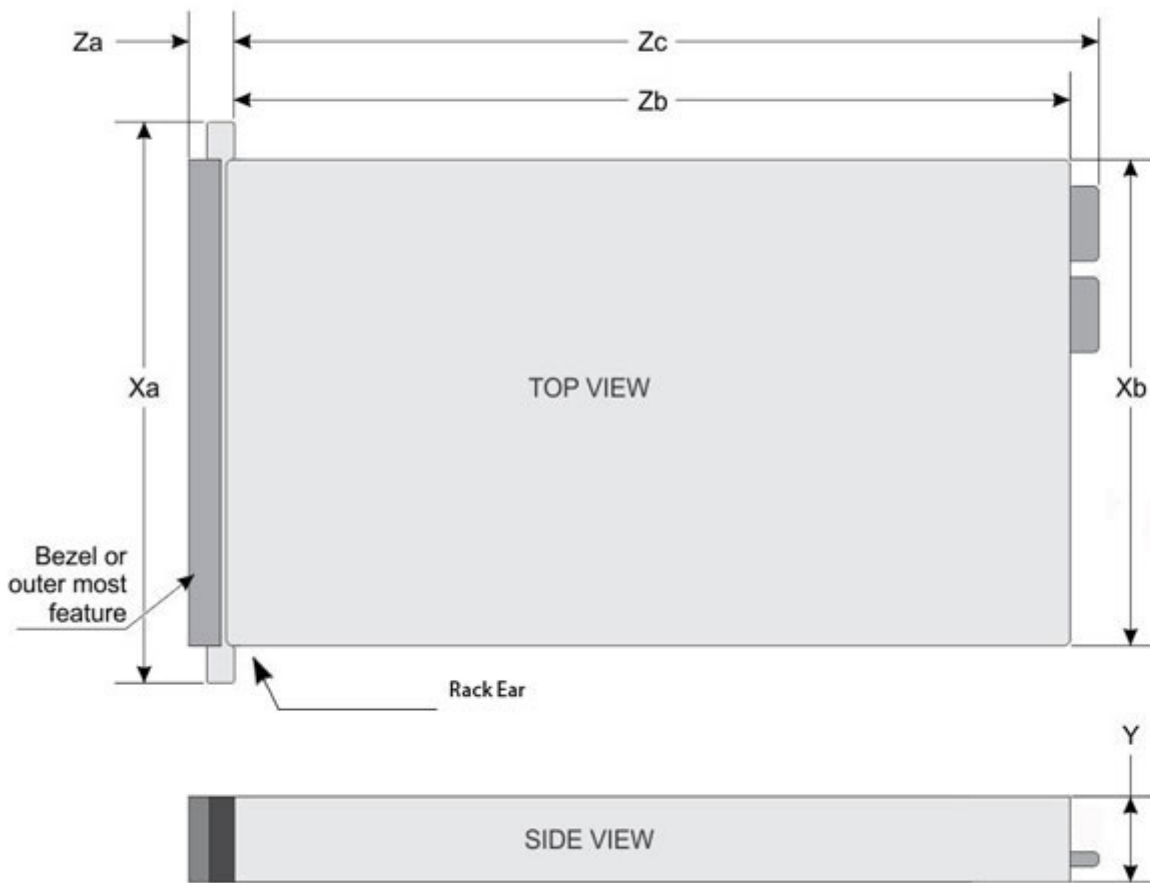
Chassis dimensions

Figure 14. Chassis dimensions for PowerEdge R640

Table 23. Dimensions

System	Xa	Xb	Y	Za—with bezel	Za—without bezel	Zb*	Zc
4 x 3.5 inches Or	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

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System	Xa	Xb	Y	Za—with bezel	Za—without bezel	Zb*	Zc
10 x 2.5 inches							(30.42 inches)
8 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)	683.05 mm (26.89 inches)	721.91 mm (28.42 inches)

Table 24. Chassis weight

Configuration	Maximum Weight
4 x 3.5 inch HDD	21.1 Kilograms
8 x 2.5 inch HDD	19.5 Kilograms
10 x 2.5 inch HDD	21.9 Kilograms

Environmental specifications

See Dell EMC PowerEdge R640 Installation and Service Manual on Dell.com/Support/Manuals for detailed environmental specifications.

Video specifications

The PowerEdge R640 systems support integrated Matrox G200eW3 graphics card with 4 MB SPI capacity.

Table 25. Supported video resolution options

Resolution	Refresh rate—Hz	Color depth—bits
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 26. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	acpi.info
Ethernet IEEE 802.3-2005	standards.ieee.org/getieee802/802.3.html
HDG Hardware 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	pmbus.info/specs.html
SAS Serial Attached SCSI, v1.1	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

Appendix C 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

Appendix D. Support and Deployment Services

Dell EMC Global Services include a wide, customizable range of service choices to simplify the assessment, design, implementation, management and maintenance of your IT environment and to help you transition from platform to platform. Depending on your current business requirements and the level of service you want, we can provide you with factory, on-site, remote, modular and specialized services that fit your needs and budget. We'll help you with a little or a lot - your choice - and provide you with access to our global resources.

Topics:

- Server Deployment Services
- Remote Consulting Services
- Data Migration Service
- ProSupport
- ProSupport Plus (for business-critical servers)
- ProSupport Flex for Data Center
- ProSupport Enterprise Suite
- Additional professional services
- Dell EMC Education Services
- Dell EMC Global Infrastructure Consulting Services
- Dell EMC managed services

Server Deployment Services

Our Server Deployment Services can maximize the value of your servers quickly using our expert server deployment engineers. With over 10,000 server deployment projects each year, we have experience, best practices, and comprehensive deployment tools to install, configure, and integrate your new solution optimally and correctly. Our deployment experts will assess your environment and understand your goals, then design and integrate your server solution for you.

Table 28. Server deployment capabilities

	Server Installation	Server Integration
Place single server in target workspace	Yes	
Rack, cable, and label servers	Yes	
Install image	Yes	
Connect to network	Yes	Yes
Test and validate connection	Yes	Yes
Install operating system		Yes
Install applications		Yes
Perform advanced configuration services		Yes
Remote configuration services		Yes

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	Server Installation	Server Integration
Virtualization		Yes
Converged infrastructure		Yes
Test and validate data center integration		Yes

Remote Consulting Services

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

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 gets up and running quickly and smoothly.

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 experts
- Collaborative support assistance with over 195 third-party vendors
- Hypervisor and operating system support
- Onsite parts and labor response options including next business day or four-hour mission critical

ProSupport Plus (for business-critical servers)

When you purchase your PowerEdge server, we recommend ProSupport Plus, our proactive and preventative support for your business-critical systems. Dell EMC ProSupport Plus provides you with all the benefits of ProSupport, plus access to a dedicated Technical Account Manager and our elite ProSupport Plus engineers. ProSupport Plus gives you quick and efficient resolutions, working along with our SupportAssist technology that enables us to get ahead of issues in your environment before they become problems.

ProSupport Flex for Data Center

Dell EMC ProSupport Flex for Data Center offers flexible site-wide support for hyperscale data centers with more than 1,000 assets. Built on standard Dell EMC ProSupport components, Flex for Data Center leverages our global scale while being tailored to suit your needs. While not for everyone, it offers a flexible solution for those with large and complex environments. When you choose Dell EMC ProSupport Flex for Data Center, you will get:

- Enterprise-wide support that covers your entire data center.
- A dedicated Technical Account Manager with remote, on-site, part-time and full-time options.
- Dedicated elite ProSupport Flex technical and field engineers who are trained on your environment and configurations.
- Flexible on-site support and parts options that fit your operational model
- A tailored support plan for your operations staff.

	ProSupport	ProSupport Plus	ProSupport Flex for Data Center
Technical support access	24x7	24x7	24x7
Parts and labor response	NBD or Mission Critical	NBD or Mission Critical	Flexible
TechDirect online cases and dispatch	✓	✓	✓
SupportAssist remote monitoring	✓	✓	✓
Dispatch monitoring and crisis management	✓	✓	✓
Escalation management	✓	✓	✓
Hypervisor and OS support	✓	✓	✓
Collaborative 3rd party software support	✓	✓	✓
SupportAssist proactive resolution	✓	✓	✓
Direct access to elite ProSupport Plus engineers		✓	✓
Dedicated Technical Account Manager		✓	✓
Monthly health check and performance recommendations		✓	✓
Monthly contract renewal and service history reporting		✓	✓
System maintenance (as needed)		✓	✓
Dedicated technical and field support teams			✓
Site-wide entitlement and contract			✓
Case management API			✓

Figure 15. ProSupport Enterprise Suite comparison

ProSupport Enterprise Suite

With Dell EMC ProSupport Services, 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. Dell EMC ProSupport 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.
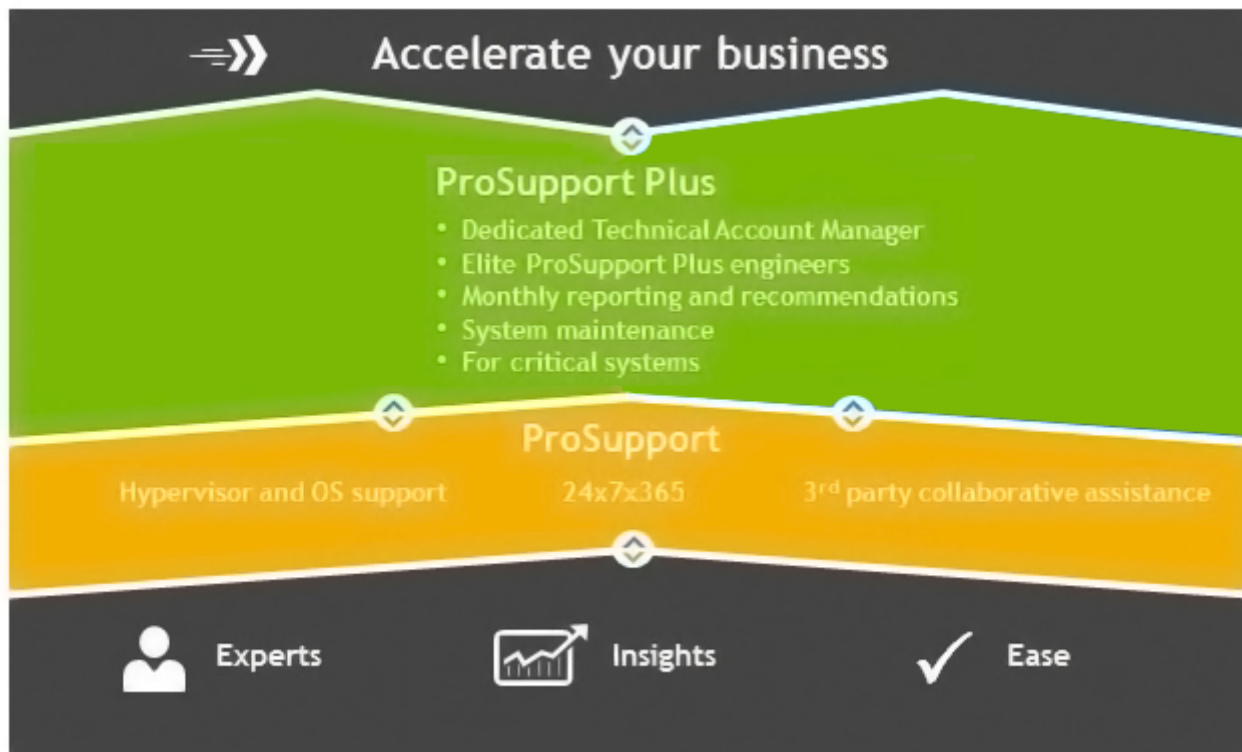
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Figure 16. ProSupport Enterprise Suite

Additional professional services

Dell EMC Education Services

Dell EMC 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.

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 you rapid insight into the root causes of unnecessary complexity. We seek better answers than traditional service models, and our strategy is to help you 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 you 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.