

Dell EMC PowerEdge R740 and R740xd

Technical Guide

Notes, cautions, and warnings

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

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

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

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Product overview

Introduction

The Dell EMC PowerEdge R740 and R740xd are two socket, 2U rack servers designed to run complex workloads using highly scalable memory, I/O capacity and network options. The R740 and R740xd features the 2nd Generation Intel® Xeon® Scalable processor family, up to 24 DIMMs, PCI Express® (PCIe) 3.0 enabled expansion slots, and a choice of network interface technologies to cover NIC and rNDC.

The PowerEdge R740 is a general-purpose platform capable of handling demanding workloads and applications, such as data warehouses, e-commerce, databases, and high-performance computing (HPC).

The PowerEdge R740xd adds extraordinary storage capacity options, making it well-suited for data-intensive applications that require greater storage, while not sacrificing I/O performance.

New technologies

Table 1. New technologies in R740 and R740xd

New technology	Detailed description
2nd Generation Intel® Xeon® Processor Scalable family	The 2nd Generation Intel® Xeon® Scalable processor family has advanced features that deliver exceptional performance and value. See the Processors section.
Intel C620 series chipset	Intel® Platform Controller Hub (PCH)
2933 MT/s DDR4 memory	The 2nd Generation Intel® Xeon® Scalable processor family supports up to 2933 MT/s memory. The R740 and R740xd supports two DIMMs per channel at 2933 MT/s with select processors. See the Memory section for details.
Intel® Optane™ DC persistent memory	Up to 6 per CPU socket. Max 12 for 2S configuration. <ul style="list-style-type: none"> • 256GB, 512GB per DIMM • 1866, 2133, 2400, 2666 MT/s • Up to 6.14TB max, (7.68TB max with DCPMM and LDRIMM)
iDRAC 9 with Lifecycle Controller	The new embedded system management solution features hardware and firmware inventory and alerting, in-depth memory alerting, faster performance, a dedicated gigabit port and many more features. See the iDRAC section.
Wireless management	The Quick Sync 2.0 will offer feature parity with the previous server generation NFC interface and improved user experience. To extend this Quick Sync feature to wide variety of Mobile OS's with higher data throughput, the Quick Sync 2.0 version replaces the previous server generation NFC technology with wireless at-the-box system management.

System features

Compared to the previous generation of Dell EMC PowerEdge servers, the R740 and R740xd have more drive bay options, more PCIe slots, next-generation RAID controllers and advanced system management.

Topics:

- [System features comparison](#)
- [Product specifications](#)

System features comparison

Table 2. Comparison of PowerEdge R740/R740xd and R730/R730xd


Feature	PowerEdge R740/R740xd	PowerEdge R730/R730xd
CPU	2 x 2nd Generation Intel® Xeon® Scalable processor family	Intel® Xeon® processor E5-2600 v3 product family
Intel Ultra Path Interconnect (UPI)	Intel® Ultra Path Interconnect (UPI)	Intel® QuickPath Interconnect (QPI)
Memory	<ul style="list-style-type: none"> • 24 x DDR4 RDIMM, LRDIMM • 12 x NVDIMM • 12 x DCPMM (Intel® Optane™ DC persistent memory) 	24 x DDR4 RDIMM, LRDIMM
Disk drives	<ul style="list-style-type: none"> • 3.5 -inch or 2.5 -inch 12Gb/s SAS, 6Gb/s SATA • Up to 24 x NVMe 	<ul style="list-style-type: none"> • 3.5 -inch, 2.5 -inch or 1.8 -inch 12Gb/s SAS, 6Gb/s SATA • 4 x PCIe SSD with common slot
Storage controllers	Adapters: HBA330, H330, H730P, H740P, H840, 12G SAS HBA Mini Mono: HBA330, H330, H730P, H740P SW RAID: S140	Adapters: HBA330, H330, H730, H730P, H830 (ext) Mini Mono: HBA330, H330, H730, H730P SW RAID: S130
PCIe slots	Max 8 x PCIe 3.0	Max 7 x PCIe 3.0 or 6 x PCIe 3.0
rNDC	4x 1GbE, 4x 10GbE, 2x 10GbE + 2x 1GbE, or 2x 25GbE	4x 1GbE, 4x 10GbE, or 2x 10GbE + 2x 1GbE
USB ports	Front: <ul style="list-style-type: none"> • 1 x Dedicated iDRAC direct USB • 2 x USB 2.0 • 1 x USB 3.0 (optional only for R740) • 1 x Video Rear: <ul style="list-style-type: none"> • 1 x Dedicated iDRAC network port • 1 x Serial • 2 x USB 3.0 • 1 x Video 	Front: two ports (USB 2.0), one managed port Rear: two ports (USB 3.0) Internal: one port (USB 3.0)
Rack height	2U	2U

Feature	PowerEdge R740/R740xd	PowerEdge R730/R730xd
Power supply	<ul style="list-style-type: none"> AC (Platinum): 495W, 750W, 1100W, 1600W, 2000W, 2400W AC (Titanium): 750W DC: 1100W DC: 750 W Mixed Mode Platinum (for China only) AC: 750 W Mixed Mode Platinum Mixed mode/HVDC: 750W, 1100W 	<ul style="list-style-type: none"> AC: 495W, 750W, 1100W DC: 750W, 1100W
System management	Lifecycle Controller 3.x, OpenManage, QuickSync2.0, OMPC3, Digital License Key, iDRAC Direct(dedicated micro-USB port), Easy Restore, vFlash	Lifecycle Controller 3.x, OpenManage, QuickSync1.0, PM3, Digital License Key, iDRAC8, iDRAC Direct(dedicated micro-USB port), Easy Restore, vFlash
Internal GPU	<ul style="list-style-type: none"> *3 x 300W (double-width) or 6 x 150W (single-width) <p>NOTE: *Only supports up to 2 x NVIDIA M10 GPUs.</p>	<ul style="list-style-type: none"> 2 x 300W (double-wide) or 4 x 150W (single-wide) Not supported on R730xd FPGAs not supported on the R730/xd.
Availability	<ul style="list-style-type: none"> Hot-plug drives Hot-plug redundant cooling Hot-plug redundant power supplies IDSDM support Boot Optimized Storage Subsystem (BOSS) 	<ul style="list-style-type: none"> Hot-plug drives Hot-plug redundant cooling Hot-plug redundant power supplies IDSDM support

Product specifications

Table 3. R740 product specifications

Features	Technical Specification
Processor	<ul style="list-style-type: none"> Up to two 2nd Generation Intel® Xeon® Scalable processors Up to 28 cores per processor
Memory	<ul style="list-style-type: none"> 24 DDR4 DIMM slots Supports RDIMM /LRDIMM, 3TB max Speeds up to 2933MT/s Up to 12 NVDIMM, 192 GB Max Up to 12 Intel® Optane™ DC persistent memory DCPMM, 6.14TB max, (7.68TB max with DPCMM + LRDIMM)
Storage controllers	<p>Internal controllers:</p> <ul style="list-style-type: none"> PERC H330 PERC H730P PERC H740P Software RAID (SWRAID) S140 <p>Boot Optimized Storage Subsystem:</p> <ul style="list-style-type: none"> HW RAID 2 x M.2 SSDs 240GB or 480GB <p>External PERC (RAID):</p> <ul style="list-style-type: none"> PERC H840 <p>12Gbps SAS HBAs (non-RAID):</p> <ul style="list-style-type: none"> External - 12Gbps SAS HBA (non-RAID) Internal- HBA330 (non-RAID)

Features	Technical Specification
Drive bays	Front drive bays: Up to 16 x 2.5" SAS/SATA (HDD/SSD) max 122.88TB or up to 8 x 3.5" SAS/SATA HDD max 128TB Optional DVD-ROM, DVD+RW
Power supplies	<ul style="list-style-type: none"> • Titanium 750W • Platinum 495W, 750W, 750W Mixed Mode HVDC (for China only), 750 W Mixed Mode 240 V DC (For china only),1100W, 1600W, 2000W, and 2400W • 1100W 380VDC (China and Japan only) • Gold 1100W -48VDC • Hot plug power supplies with full redundancy. Up to 6 hot plugs fans with full redundancy
Dimensions	<ul style="list-style-type: none"> • Form factor: Rack (2U) • Height: 86.8mm (3.4") • Width: 434.0mm (17.08") • Depth: 737.5mm (29.03") • Weight: 28.6kg (63lbs.)
<p> NOTE: Dimensions do not include bezel</p>	
Embedded management	iDRAC9, iDRAC RESTful with Redfish, iDRAC Direct, Quick Sync 2 wireless module optional
Bezel	Optional LCD Bezel or Security bezel
OpenManage™ Software	<ul style="list-style-type: none"> • OpenManage Enterprise • OpenManage Mobile • OpenManage Power Center
Integrations and connections	<p>Integrations:</p> <ul style="list-style-type: none"> • Microsoft® System Center • VMware® vCenter™ • BMC Truesight • Red Hat Ansible <p>Connections:</p> <ul style="list-style-type: none"> • Nagios Core & Nagios XI • Micro Focus Operations Manager i (OMi) • IBM Tivoli Netcool/OMNibus • IBM Tivoli® Network Manager IP Edition
Security	<ul style="list-style-type: none"> • TPM 1.2/2.0, optional TCM 2.0 • Cryptographically signed firmware • Secure Boot • System Lockdown (requires OpenManage Enterprise) • Secure erase
I/O & Ports	<p>Network daughter card options</p> <ul style="list-style-type: none"> • 4 x 1GbE • 2 x 10GbE + 2 x 1GbE • 4 x 10GbE • 2 x 25GbE <p>Front ports:</p> <ul style="list-style-type: none"> • Video • 2 x USB 2.0 • 1 x USB 3.0 (optional) • 1 x Dedicated iDRAC Direct Micro-USB <p>Rear ports:</p> <ul style="list-style-type: none"> • Video, serial


Features	Technical Specification
	<ul style="list-style-type: none"> 2 x USB 3.0 1 x Dedicated iDRAC network port Video card: VGA Riser options with up to 8 PCIe Gen 3 slots, maximum of 4 x 16 slots
Accelerator options	Up to three 300W or six 150W GPUs, or up to three double-width or four single-width FPGAs.
Supported operating systems	<ul style="list-style-type: none"> Canonical® Ubuntu® LTS Citrix® Hypervisor Oracle® Linux Microsoft Windows Server® LTSC with Hyper-V Red Hat® Enterprise Linux SUSE® Linux Enterprise Server VMware® ESXi For specifications and interoperability details, see dell.com/OSsupport
Recommended support	Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available.

R740xd product specifications

The following table shows the technical specifications for the PowerEdge R740xd:

Table 4. R740xd product specifications

Features	Technical Specifications
Processor	<ul style="list-style-type: none"> Up to two 2nd Generation Intel® Xeon® Scalable processors Up to 28 cores per processor
Memory	<ul style="list-style-type: none"> 24 DDR4 DIMM slots Supports RDIMM /LRDIMM, up to 3TB Speeds up to 2933 MT/s Up to 12 NVDIMM, 192 GB Max Up to 12 Intel® Optane™ DC persistent memory DCPMM, 6.14TB max, (7.68TB max with DPCMM + LRDIMM)
Storage controllers	Internal controllers: <ul style="list-style-type: none"> PERC H730P PERC H740P Software RAID (SWRAID) S140 Boot Optimized Boot Optimized Storage Subsystem: <ul style="list-style-type: none"> HW RAID 2 x M.2 SSDs 240 GB or 480 GB External PERC (RAID): <ul style="list-style-type: none"> PERC H840 12Gbps SAS HBAs (non-RAID): <ul style="list-style-type: none"> External - 12Gbps SAS HBA (non-RAID) Internal - HBA330 (non-RAID)
Drive bays	Front bays: <ul style="list-style-type: none"> Up to 24 x 2.5" SAS/SSD/NVMe, max 184TB Up to 12 x 3.5" SAS/SATA HDD max 192TB Mid bay:

Features	Technical Specifications
	<ul style="list-style-type: none"> • up to 4 x 2.5" SAS/SSD, max 30.72TB • Up to 4 x 3.5" max 64TB <p>Rear bays:</p> <ul style="list-style-type: none"> • Up to 4 x 2.5" SAS/SSD/NVMe, max 30.72TB • Up to 2 x 3.5" max 32TB SAS/SATA HDD
Power supplies	<ul style="list-style-type: none"> • Titanium 750W • Platinum 495W, 750W, 750W Mixed Mode HVDC (for China only), 750W Mixed Mode 240 V DC (For China only), 1100W, 1600W, 2000W, and 2400W • 1100W 380VDC (China and Japan only) • Gold 1100W -48VDC • Hot plug power supplies with full redundancy • Up to 6 hot plugs fans with full redundancy
Dimensions	<ul style="list-style-type: none"> • Form factor: Rack (2U) • Height: 86.8mm (3.4") • Width*: 434mm (17.1") • Depth*: 737.5mm (29.0") • Weight: 33.1kg (73.0lbs.) <p> NOTE: * Dimensions do not include bezel.</p>
Embedded management	<ul style="list-style-type: none"> • iDRAC9 • Quick Sync 2 wireless module optional • iDRAC RESTful with Redfish • iDRAC Direct
Bezel	Optional LCD Bezel or Security bezel
OpenManage™ Software	<ul style="list-style-type: none"> • OpenManage Enterprise • OpenManage Mobile • OpenManage Power Center
Integrations and connections	<p>Integrations:</p> <ul style="list-style-type: none"> • Microsoft® System Center • VMware® vCenter™ • BMC Truesight • Red Hat Ansible <p>Connections:</p> <ul style="list-style-type: none"> • Nagios Core & Nagios XI • Micro Focus Operations Manager i (OMi) • IBM Tivoli Netcool/OMNibus • IBM Tivoli® Network Manager IP Edition
Security	<ul style="list-style-type: none"> • TPM 1.2/2.0, TCM 2.0 optional • Cryptographically signed firmware • Secure Boot • System Lockdown (requires OpenManage Enterprise) • Secure erase
I/O & Ports	<p>Network daughter card options:</p> <ul style="list-style-type: none"> • 4 x 1GbE or • 2 x 10GbE + 2 x 1GbE or • 4 x 10GbE or • 2 x 25GbE

Features

Technical Specifications

Front ports:

- VGA
- 2 x USB 2.0
- 1 x USB 3.0 (optional)
- 1 x Dedicated iDRAC direct USB

Rear ports:

- VGA
- Serial
- 2 x USB 3.0
- 1 x Dedicated iDRAC network port

Video card:

- VGA

Riser options with p to 8 PCIe Gen 3 slots, maximum of 4 x 16 slots

Accelerator options

- Up to three 300W or six 150W GPUs or
- Up to three double-width or four single-width FPGAs.
- GPU and FPGA options are available only on 24 x 2.5 -inch drive chassis. Up to two GPUs are supported on NVMe configurations.

Supported operating systems

- Canonical® Ubuntu® LTS
- Citrix® Hypervisor
- Microsoft® Windows Server® LTSC with Hyper-V
- Oracle® Linux
- Red Hat® Enterprise Linux
- SUSE® Linux Enterprise Server
- VMware® ESXi®

Recommended support

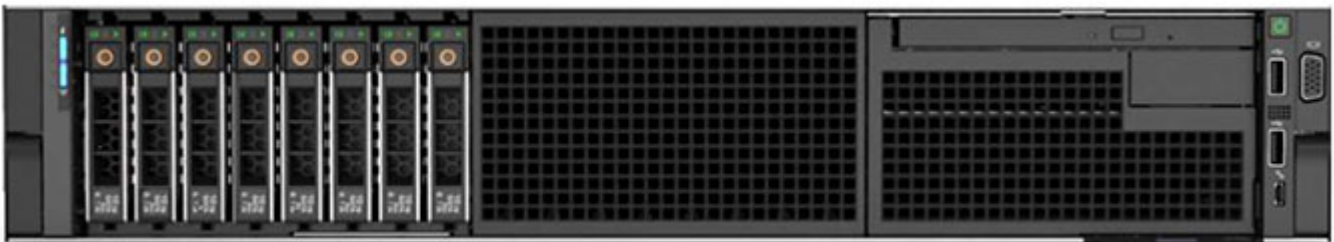
Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available.

Chassis views and features

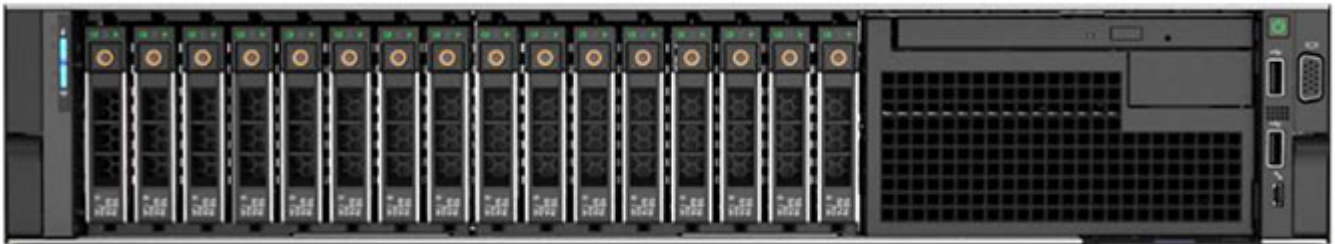
R740 and R740xd front views

The R740 supports up to 16 x 2.5 -inch or up to 8 x 3.5 -inch front-accessible, hot-plug hard drives that are secured by a removable front bezel.

R740 Front view - 8 x 2.5 -inch hard drive configuration



R740 Front view - 16 x 2.5 -inch hard drive configuration



R740 Front view - 8 x 3.5 -inch hard drive configuration



R740xd

The R740xd supports up to 12x 3.5 -inch or up to 24 x 2.5 -inch front-accessible, hot-plug hard drives that are secured by a removable front bezel.

R740xd Front view - 12 x 3.5 -inch hard drive configuration



R740xd Front view - 24 x 2.5 -inch hard drive configuration



R740 and R740xd Rear views

The R740 back panel includes PSUs, Ethernet connectors, PCIe slots and many other features described in this guide

R740 Rear view - with 8x PCIe slots available



R740 Rear view - with 4x PCIe slots available with riser 2 and riser 3 blanks

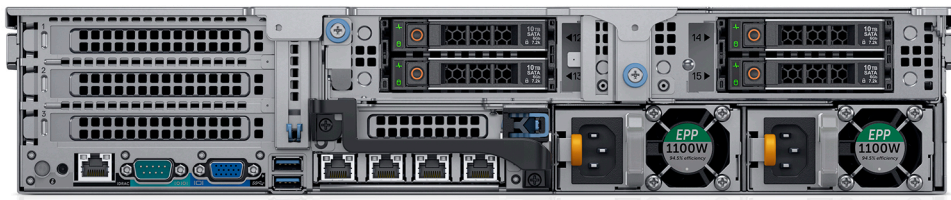


R740xd

R740xd Rear view - with 2 x 3.5-inch backplane installed



R740xd Rear view - with 4 x 2.5-inch backplane installed



Internal view of the system

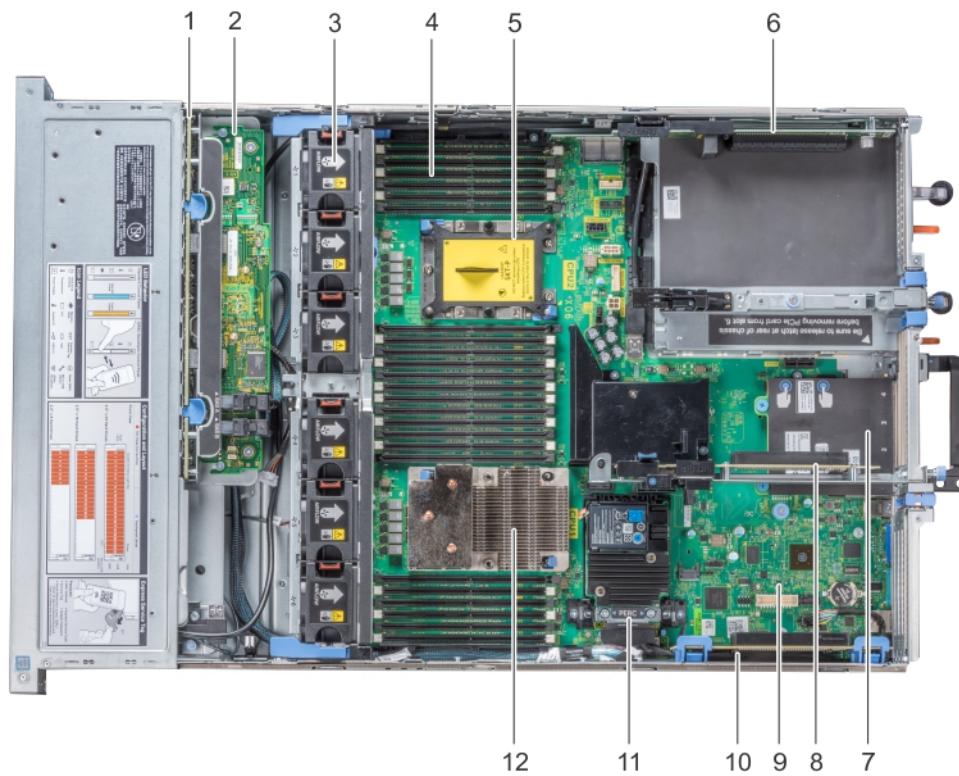


Figure 1. R740 internal chassis view

- | | |
|------------------------------------------------|-------------------------------------|
| 1. hard drive backplane | 2. SAS expander card |
| 3. cooling fan in the cooling fan assembly (6) | 4. memory module |
| 5. CPU2 processor heat sink module socket | 6. expansion card riser 3 |
| 7. network daughter card | 8. expansion card riser 2 |
| 9. system board | 10. expansion card riser 1 |
| 11. integrated storage controller card | 12. CPU1 processor heat sink module |

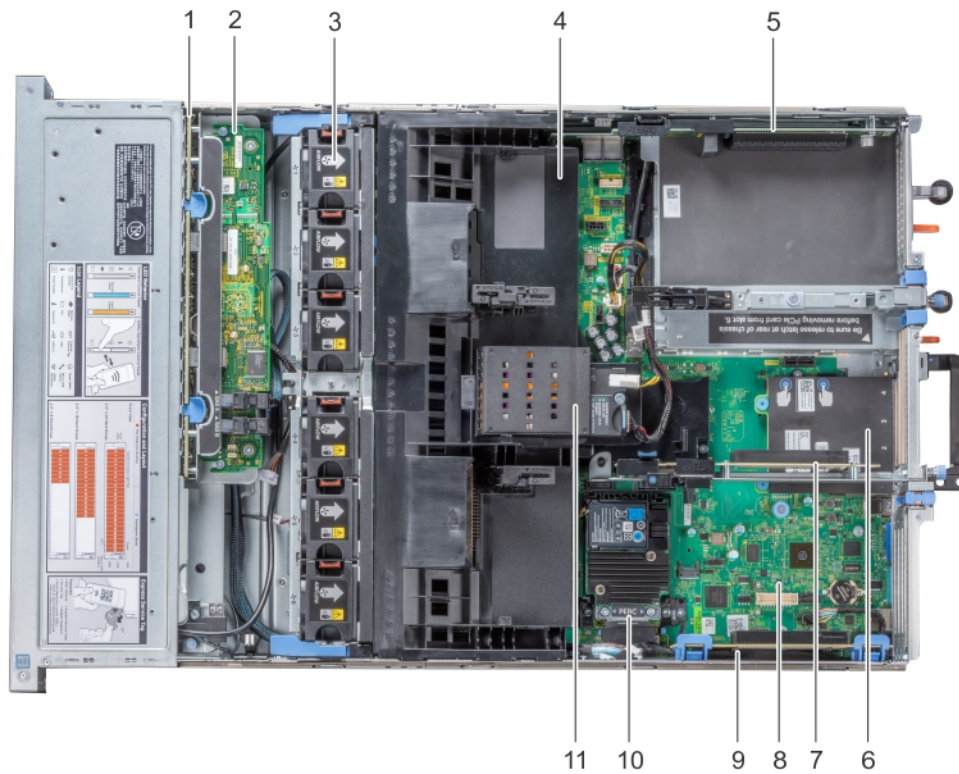


Figure 2. R740 internal chassis view – NVDIMM-N battery

- | | |
|------------------------------------------------|----------------------------------------|
| 1. hard drive backplane | 2. SAS expander card |
| 3. cooling fan (6) in the cooling fan assembly | 4. air shroud |
| 5. expansion card riser 3 | 6. network daughter card |
| 7. expansion card riser 2 | 8. system board |
| 9. expansion card riser 1 | 10. integrated storage controller card |
| 11. NVDIMM-N battery | |

R740xd

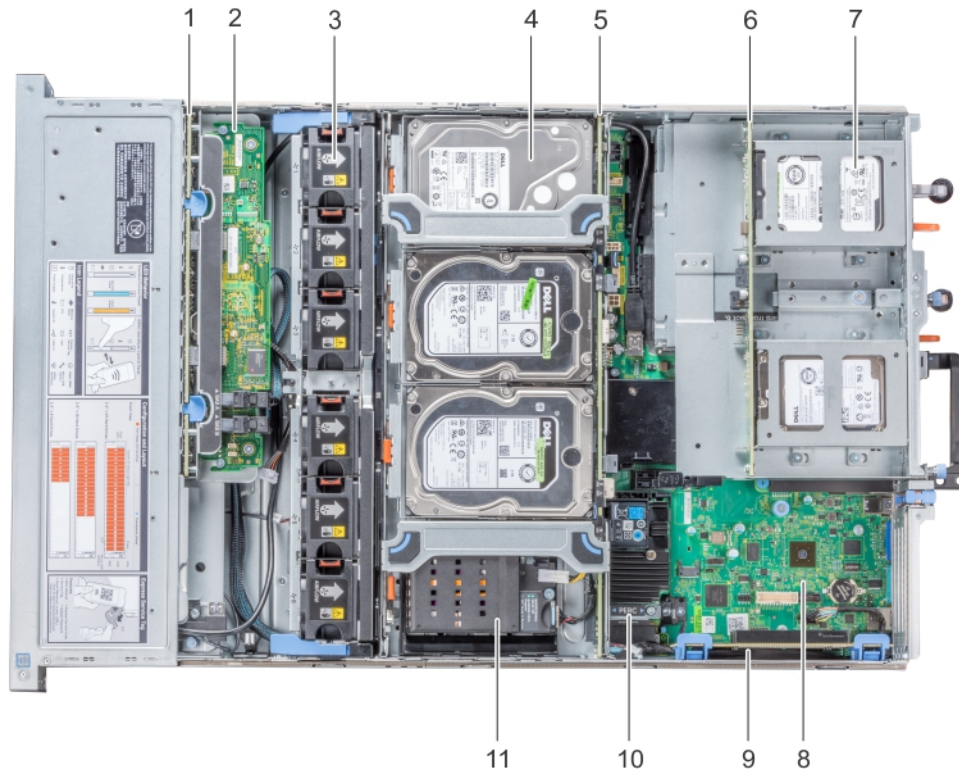


Figure 3. R740xd internal chassis view – hard drive tray and hard drive cage with NVDIMM-N battery

- | | |
|------------------------------------------------|------------------------------------------|
| 1. hard drive backplane | 2. SAS expander card |
| 3. cooling fan (6) in the cooling fan assembly | 4. hard drive (4) in the hard drive tray |
| 5. mid hard drive backplane | 6. rear hard drive backplane |
| 7. hard drive (2 or 4) in the hard drive cage | 8. system board |
| 9. expansion card riser 1 | 10. integrated storage controller card |
| 11. NVDIMM-N battery | |

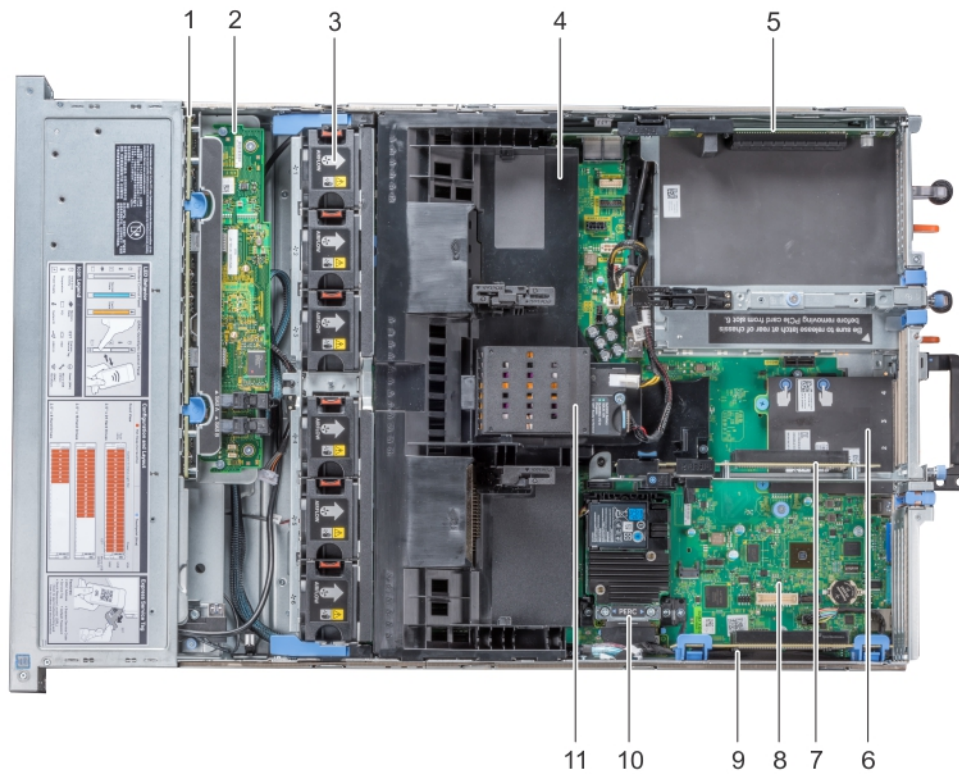


Figure 4. R740xd internal chassis view with NVDIMM-N battery on the air shroud

- | | |
|------------------------------------------------|----------------------------------------|
| 1. hard drive backplane | 2. SAS expander card |
| 3. cooling fan (6) in the cooling fan assembly | 4. air shroud |
| 5. expansion card riser 3 | 6. network daughter card |
| 7. expansion card riser 2 | 8. system board |
| 9. expansion card riser 1 | 10. integrated storage controller card |
| 11. NVDIMM-N battery | |

For additional system views, see the Dell EMC PowerEdge R740 and R740xd installation and service manual on [Dell.com/Support/Manuals](https://www.dell.com/support/manuals)

Processors

The 2nd Generation Intel® Xeon® Scalable processor family provides the foundation for a powerful datacenter platform. The key features are as follows:

- Higher Per-Core Performance: Up to 28 cores, delivery high performance and scalability for compute-intensive workloads across compute, storage & network usages. 2nd Generation Intel® Xeon® Processors can offer even greater core or frequencies, or both.
- Large Memory Bandwidth/Capacity: 6 memory channels and up to 6 DCPMMs per socket of Intel® Optane™ DC persistent memory for data-centric workloads on select processors
- AI capability: Intel® Deep Learning Boost drives inferencing for vector neural networks right in your CPU
- 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, as well as 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 2nd FMA execution unit.
- Security without Compromise: Near-zero encryption overhead enables higher performance on all secure data transactions with enhanced hardware mitigation.

Topics:

- [Supported processors](#)
- [Chipset](#)

Supported processors

The following table lists the supported 1st and 2nd Generation processors for the PowerEdge R740 and R740xd:

Table 5. 1st and 2nd Generation processors

Medal	Processor	Frequency (GHz)	Cores/ Threads
Platinum	8280	2.70	28/56
Platinum	8280M	2.70	28/56
Platinum	8280L	2.70	28/56
Platinum	8276	2.20	28/56
Platinum	8276M	2.20	28/56
Platinum	8276L	2.20	28/56
Platinum	8270	2.70	26/52
Platinum	8268	2.90	24/48
Platinum	8260	2.40	24/48
Platinum	8260M	2.40	24/48
Platinum	8260L	2.40	24/48
Platinum	8253	2.20	16/32
Platinum	8180M	2.5	28/56
Platinum	8180	2.5	28/56
Platinum	8176M	2.1	28/56
Platinum	8176	2.1	28/56
Platinum	8170M	2.1	26/52

Medal	Processor	Frequency (GHz)	Cores/ Threads
Platinum	8170	2.1	26/52
Platinum	8168	2.7	24/48
Platinum	8164	2.0	26/52
Platinum	8160M	2.1	24/48
Platinum	8160	2.1	24/48
Platinum	8153	2.0	16/32
Gold	6254	3.10	18/36
Gold	6252	2.10	24/48
Gold	6248	2.50	20/40
Gold	6246	3.30	12/24
Gold	6244	3.60	8/16
Gold	6242	2.80	16/32
Gold	6240	2.60	18/36
Gold	6240M	2.60	18/36
Gold	6240L	2.60	18/36
Gold	6238	2.10	22/44
Gold	6238M	2.10	22/44
Gold	6238L	2.10	22/44
Gold	6234	3.30	8/16
Gold	6230	2.10	20/40
Gold	6226	2.70	12/24
Gold	6152	2.1	22/44
Gold	6150	2.7	18/36
Gold	6148	2.4	20/40
Gold	6146	3.2	12/24
Gold	6144	3.5	8/16
Gold	6142M	2.6	16/32
Gold	6142	2.6	16/32
Gold	6140M	2.3	18/36
Gold	6140	2.3	18/36
Gold	6138	2.0	20/40
Gold	6136	3.0	12/24
Gold	6134M	3.2	8/16
Gold	6134	3.2	8/16
Gold	6132	2.6	14/28
Gold	6130	2.1	16/32
Gold	6128	3.4	6/12
Gold	6126	2.6	12/24
Gold	5222	3.80	4/8
Gold	5220S	2.70	18/36

Medal	Processor	Frequency (GHz)	Cores/ Threads
Gold	5220	2.20	18/36
Gold	5218	2.30	16/32
Gold	5217	3.00	8/16
Gold	5215	2.50	10/20
Gold	5215M	2.50	10/20
Gold	5215L	2.50	10/20
Gold	5122	3.6	4/8
Gold	5120	2.2	14/28
Gold	5118	2.3	12/24
Gold	5117	2.0	14/28
Gold	5115	2.4	10/20
Silver	4216	2.10	16/32
Silver	4215	2.50	8/16
Silver	4214	2.20	12/24
Silver	4210	2.20	10/20
Silver	4208	2.10	8/16
Silver	4116	2.1	12/24
Silver	4114	2.2	10/20
Silver	4112	2.6	4/24
Silver	4110	2.1	8/16
Silver	4108	1.8	8/16
Bronze	3106	1.7	8/8
Bronze	3104	1.7	6/6
Bronze	3204	1.90	6/6

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

Processor Model #	Frequency	Cores- Threads	R740	R740xd
8260Y	• 2.40 GHz	• 24 - 48	•	•
	• 2.50 GHz	• 20 - 40		
	• 2.70 GHz	• 16 - 32		
6240Y	• 2.60 GHz	• 18 - 36	•	•
	• 2.80 GHz	• 14 - 28		
	• 3.10 GHz	• 8 - 16		
4214Y	• 2.20 GHz	• 12 - 24	•	•
	• 2.30 GHz	• 10 - 20		
	• 2.40 GHz	• 8 - 16		

Table 7. Search Optimized (-S) offerings

Processor Model #	Frequency	Cores- Threads	R740	R740xd
5220S	2.70 GHz	18 - 32	•	•

Table 8. Single Socket (-U) offerings

Processor Model #	Frequency	Cores- Threads	R740	R740xd
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	R740	R740xd
6262V	1.90 GHz	24 - 48	•	•
6222V	1.80 GHz	20 - 40	•	•

i **NOTE:** For the most up-to-date processor list visit see <https://www.dell.com/en-us/work/shop/povw/poweredge-r740> or <https://www.dell.com/en-us/work/shop/povw/poweredge-r740xd> (configurations button) or by talking to your representative.

Chipset

The Dell EMC PowerEdge R740 and R740xd use the Intel C620 chipset (PCH) that provides extensive I/O support. Functions and capabilities 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
- Serial Peripheral Interface
- Enhanced Serial Peripheral Interface
- Flexible I/O - Allows some high speed I/O signals to be configured as PCIe root ports, PCIe uplink for use with certain PCH SKUs, 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

Memory

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.

Supported type DIMMs are:

- RDIMMs (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.
- LRDIMMs (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.
- 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.
- DCPMM (also known as Intel® Optane™ DC persistent memory) - Provides a large memory capacity at an affordable price. Any application can take advantage of DCPMM in Memory Mode with a compatible operating system. Unlock more performance as well as persistency when using an application that supports App Direct Mode. DCPMM is used in conjunction with RDIMMs or LRDIMMs and a maximum number of 6 DCPMMs can be used per CPU. This persistent memory technology does not require a battery.

Intel® Optane™ DC Persistent Memory (DCPMM)

Intel® Optane™ DC 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.

DCPMM comes in 3 different memory sizes, 128GB, 256GB, and 512GB.

RDIMMs and LRDIMMs are used in conjunction with Intel® Optane™ DC persistent memory. Each channel will be populated with up to one DIMM of DRAM and one DIMM of DCPMM. That means that each CPU will have up to 6 DIMMs of DRAM and 6 DIMMs of DCPMM. For best performance it is recommended to have all 12 DIMMs slots per CPU populated.

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

Table 10. Operating 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 DCPMM and DRAM are available as system memory
Persistence	No	Yes

Supported memory

The table below lists the supported DIMMs for the R740 and R740xd:

Table 11. Supported memory

DIMM Capacity	DIMM Type	DIMM Speed 1 DPC - 2 DPC	Ranks per DIMM	Data Width
8 GB	RDIMM	2666 MT/s - 2666 MT/s	1	x8
16 GB	RDIMM	2933 MT/s - 2666 MT/s	2	x8
32 GB	RDIMM	2933 MT/s - 2666 MT/s	2	x4
64 GB	RDIMM	2933 MT/s - 2666 MT/s	2	x4
128 GB	L RDIMM	2666 MT/s - 2666 MT/s	8	x4
16 GB	NVDIMM-N	2666 MT/s	1	x4

DIMM Capacity	DIMM Type	DIMM Speed 1 DPC - 2 DPC	Ranks per DIMM	Data Width
256GB	DCPMM	2666 MT/s	N/A	N/A
512GB	DCPMM	2666 MT/s	N/A	N/A

DIMM speed and frequency

The table below lists the memory speed and frequency for the R740 and R740xd:

Table 12. Memory speed and frequency

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	DCPMM	N/A	128GB, 256GB, and 512GB	2666
Intel® Xeon® Scalable or 2nd Generation Intel® Xeon® Scalable	NVDIMM	1R	16GB	2666

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 increases the cost per gigabyte.

Storage

The Dell EMC PowerEdge R740 and R740xd provide scalable storage that allows you to adapt to your workload and operational demands. With comprehensive storage options, the R740 and R740xd offer various internal and external storage controllers, drive types and different chassis and backplanes for varied numbers of drives. Features such as NVMe, H740P and H840 RAID controller provide vastly accelerated performance over previous technologies. Dell EMC Express Flash drives use PCIe lanes to connect directly to the processor and chipset and are easily accessible through a hot-plug drive bay.

The PowerEdge R740 offers the storage options below:

- 8 x 2.5 -inch drives in front backplane
- 8 x 3.5 -inch drives in front backplane
- 16 x 2.5 -inch drives in front backplane
- No rear or mid-bay storage options

The PowerEdge R740xd expands the available options with new rear and mid-bay storage capabilities. It offers 12 x 3.5 -inch and 24 x 2.5 -inch storage options in the front backplane with the following additional options:

- A new 4 x 2.5 -inch rear storage option.
- A new 2 x 3.5 -inch rear storage option.
- The 4 x 3.5 -inch mid-bay storage option, which also supports 2.5 -inch drives in the Hybrid carrier

Topics:

- [Supported drives](#)
- [Storage controllers](#)
- [Optical Drives](#)
- [Tape Drives](#)
- [IDSDM with vFlash card](#)

Supported drives

The following table shows the list of supported drives by the R740 and R740xd:

Table 13. Supported drives

Form Factor	Type	Speed	Rotational Speed	Capacities
2.5 -inch	SATA SSD	6Gb	N/A	120GB Boot, 240GB Boot, 240GB, 400GB, 480GB, 800GB, 960GB, 1600GB, 1920GB, 3200GB, 3840GB.
2.5 -inch	SATA	6Gb	7.2K	1TB, 2TB
2.5 -inch	SAS	12Gb	7.2K	1TB, 2TB, 2TB(SED FIPS)
2.5 -inch	SAS SSD	12Gb	N/A	400GB, 480GB, 800GB, 960GB, 1600GB, 1920GB, 3840GB, 7.68TB
2.5 -inch	SAS	12Gb	10K	300GB, 600GB, 768 GB, 1.2TB, 1.8TB, 2.4TB(P-RTS), 1.2TB(SED FIPS), 2.4TB (SED FIPS)(P-RTS)
2.5 -inch	SAS	12Gb	15K	300GB, 600GB, 900GB, 900GB (SED FIPS)
3.5 -inch	SATA	6Gb	7.2K	1TB, 2TB, 4TB, 8TB, 10TB, 12TB, 14TB, 16TB
3.5 -inch	SAS	12Gb	7.2K	1TB, 2TB, 4TB, 8TB, 10TB, 4TB (SED FIPS), 8TB (SED FIPS)

The following table list the supported NVMe SSD drives:

Table 14. NVMe SSD offerings

Description

- 375GB 2.5 -inch device
- 1.6TB 2.5 -inch device
- 3.2TB 2.5 -inch device
- 3.84TB 2.5 -inch device
- 6.4TB 2.5 -inch device

Storage controllers

The PowerEdge R740 and R740xd supports the following storage controllers:

- Internal storage controller cards: H330, H730P, H740P, HBA330 and S140, Boot Optimized Storage Subsystem (BOSS) module.
- External storage controller cards: H840 and 12Gbps SAS HBA

Optical Drives

The PowerEdge R740 supports one of the following internal optical drive options:

- DVD-ROM
- DVD+ROM

The R740xd does not support an internal optical drive.

Tape Drives

The R740 and R740xd do not support internal tape drives. However, external tape backup devices will be supported on both R740 and R740xd.

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 6Gb 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 8Gb FC tape drives
- ML6000 with LTO-5, LTO-6, 6 Gb SAS tape drives
- ML6000 with LTO-5, LTO-6, LTO-7 8Gb FC tape drives

IDSDM with vFlash card

The PowerEdge R540 system supports Internal Dual SD module (IDSDM) and vFlash card. In the current generation of PowerEdge servers, IDSDM and vFlash card are combined into a single card module, and are available in these configurations:

- vFlash or
- IDSDM or
- vFlash and IDSDM

The IDSDM/vFlash card sits in the back of the system, in a Dell-proprietary slot. IDSDM/vFlash card supports three micro SD cards (two cards for IDSDM and one card for vFlash). Micro SD cards capacity for IDSDM is 16/32/64 GB while for vFlash the microSD card capacity is 16 GB.

Boot Optimized Storage Subsystem (BOSS)

BOSS is a simple RAID solution card that is designed specifically for booting the system's operating system, which supports up to two 6 Gbps M.2 SATA drives. This card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.

Networking and PCIe

The PowerEdge R740/740xd 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-r740> or <https://www.dell.com/en-us/work/shop/povw/poweredge-r740xd> and choose the green view configurations button at the top for a full list of options.

PCIe subsystem

There are a number of riser combinations offered for the R740 and R740xd. Specific riser options are required for certain options like GPU enablement and NVMe PCIe SSD enablement.

The following list the PCIe risers offered for both R740 and R740xd:

NOTE: The R740 and R740xd also offer "no riser" options for customers that do not require any PCIe cards in their system

The below table shows the PCIe expansion card riser configuration for R740 and R740xd:

Table 15. PCIe expansion card riser configuration for R740 and R740xd

Expansion card riser	PCIe slots on the riser	Height	Length	Link
Riser 1A	Slot 1	Full Height	Full Length	x16
	Slot 3	Full Height	Half Length	x16
Riser 1B	Slot 1	Full Height	Full Length	x8
	Slot 2	Full Height	Full Length	x8
	Slot 3	Full Height	Half Length	x8
Riser 1D	Slot 1	Full Height	Full Length	x16
	Slot 2	Full Height	Full Length	x8
	Slot 3	Full Height	Half Length	x8
Riser 2A	Slot 4	Full Height	Full Length	x16
	Slot 5	Full Height	Full Length	x8
	Slot 6	Low Profile	Half Length	x8
Riser 2B	Slot 4	Low Profile	Half Length	x8
Riser 2C	Slot 4	Low Profile	Half Length	x16
Riser 3A	Slot 7	Full Height	Full Length	x8
	Slot 8	Full Height	Full Length	x16

The below table shows the PCIe riser configuration for R740 and R740xd:

Table 16. PCIe riser configuration

Riser configuration	Numbers of CPUs	Supported PERC type	Possible rear storage
No riser	1 or 2	Mini-Mono	Yes
1B+2B	1 or 2	Mini-Mono / Adapter	Yes
1B+2C	2	Mini-Mono / Adapter	Yes

Riser configuration	Numbers of CPUs	Supported PERC type	Possible rear storage
1A+2A	2	Adapter	No
1A+2A+3A	2	Adapter	No
1B+2A+3A	2	Mini-Mono / Adapter	No
1D+2A+3A	2	Adapter	No

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](https://www.dell.com/ossupport).

Power, thermal and acoustics

Power

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.

Table 17. PSU specification

Wattage	Frequency	Voltage	Class	Heat dissipation
495W	50/60Hz	100-240Vac/6.5-3A	Platinum	1908 BTU/hr
750W	50/60Hz	100-240Vac/10-5A	Platinum	2891 BTU/hr
750WT	50/60Hz	200-240Vac/5A	Titanium	2843 BTU/hr
750W Mix Mode/ HVDC(China Only)	50/60Hz	100-240Vac/10-5A	Platinum	2891 BTU/hr
	N/A	240Vdc/4.5A	N/A	
1100W DC	-	-48--60Vdc/32A	Gold	4416 BTU/hr
1100W	50/60Hz	100-240Vac/12-6.5A	Platinum	4100 BTU/hr
1100W Mix Mode/ HVDC(China and Japan Only)	50/60Hz	100-240Vac/12A-6.5A	Platinum	4100 BTU/hr
	N/A	200-380Vdc/6.4A-3.2A	N/A	4100 BTU/hr
1600W	50/60Hz	100-240Vac/10A	Platinum	6000 BTU/hr
2000W	50/60Hz	100-240Vac/11.5A	Platinum	7500 BTU/hr
2400W	50/60Hz	100-240Vac/16A	Platinum	9000 BTU/hr

Table 18. PSU efficiency

Form factor	Output	Class	10%	20%	50%	100%
Redundant 86mm	495W AC	Platinum	82.00%	90.00%	94.00%	91.00%
	750W AC	Titanium	90.00%	94.00%	96.00%	91.00%
	750W AC	Platinum	82.00%	90.00%	94.00%	91.00%
	750W HVDC	Platinum	82.00%	90.00%	94.00%	91.00%
	1100W AC	Platinum	89.00%	93.00%	94.50%	92.00%
	1100W DC	Gold	80.00%	88.00%	91.00%	88.00%
	1600W AC	Platinum	87.00%	90.00%	94.00%	91.00%
	2000W AC	Platinum	89.00%	93.0 0%	94.00%	91.00%
	2400W AC	Platinum	89.00%	93.00%	94.00%	91.50%

Thermal

Thermal management of the PowerEdge R740 and R740xd delivers high performance for the right amount of cooling to 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 (see [Environmental Specifications](#)). The benefits to you are lower fan power consumption (lower server system power and data center power consumption) and greater acoustical versatility.

NOTE: The recommended ambient temperature for R740 and R740xd is generally 30°C, there are some exceptions for R740xd GPU and NVMe configurations that can be found in the support documentation.

Thermal design

The PowerEdge R740 and R740xd server cooling builds on the features and capability of previous Dell EMC servers but expands support for higher power processors, PCIe cooling, and increased NVMe count. A new chassis mechanical architecture enables increased airflow capability for cooling of higher power and dense system configurations and results in fewer system restrictions and increased feature density. Dell Server Thermal, Mechanical, and Thermal Control designs are based on the following key tenets and order of priority.

The thermal design of the system reflects the following:

- **Optimized thermal design:** The system layout is architected for optimum thermal design. System component placement and layout are designed to provide maximum airflow coverage to critical components with minimal expense of fan power.
- **Comprehensive thermal management:** The thermal control system regulates the system fan speeds based on feedback from system component temperature sensors, as well as for system inventory and subsystem power draw. Temperature monitoring includes components such as processors, DIMMs, chipset, system inlet air temperature and hard disk drives.
- **Open and closed loop fan speed control:** Open loop fan control uses system configuration to determine fan speed based on system inlet air temperature. Closed loop thermal control uses temperature feedback to dynamically adjust fan speeds based on system activity and cooling requirements.
- **User-configurable settings:** With the understanding and realization that every customer has a unique set of circumstances or expectations from the system, in this generation of servers, we have introduced limited user-configurable settings in the iDRAC9 BIOS setup screen. For more information, see the Dell EMC PowerEdge system Installation and Service Manual on Dell.com/Support/Manuals and "Advanced Thermal Control: Optimizing across Environments and Power Goals" on Dell.com.
- **Cooling redundancy:** The system allows N+1 fan redundancy, allowing continuous operation with one fan failure in the system.

Acoustics

The PowerEdge R740 is quiet enough to be used in an office environment in typical and minimum configurations, and the R740Xd can also operate at a similar level in certain configurations.

Acoustical design

The acoustical design of the PowerEdge R740 and R740xd reflect the following:

- **Versatility:** The R740 and R740xd save you power draw in the data center but are also quiet enough for office environment in typical and minimum configurations. You may find that the system is sufficiently quiet where the sound it emits blends into the environment.
- **Adherence to Dell EMC's high sound quality standards:** Sound quality is different from sound power level and sound pressure level in that it describes how humans respond to annoyances in sound, like whistles and hums. One of the sound quality metrics in the Dell EMC specification is prominence ratio of a tone.
- **Noise ramp and descent at boot-up from power off:** Fan speeds and noise levels ramp during the boot process (from power-off to power-on) in order to add a layer of protection for component cooling in the event that the system were not to boot properly. In order to keep the boot-up process as quiet as possible, the fan speed reached during boot-up is limited to about half of full speed.
- **Noise level dependencies:** If acoustics is important to you, several configuration choices and settings are important to consider:
 - For lower acoustical output, use a small number of lower rotational-speed SATA hard drives, nearline SAS hard drives, or non-rotational devices like SSDs. 15k hard drives generate more acoustic noise than that of lower rotational-speed hard drives, and noise increases with number of hard drives.
 - Fan speeds and noise may increase from baseline factory configurations if certain profiles are changed by the user or the system configurations are updated.
 - iDRAC9 BIOS settings: Performance Per Watt (DAPC or OS) may be quieter than Performance or Dense Configuration (iDRAC Settings > Thermal > Max. Exhaust Temperature or Fan speed offset).
 - The quantity and type of PCIe cards installed: This affects overall system acoustics. Installation of more than two PCIe cards results in an increase in overall system acoustics.
 - Using a GPU card: This results in an increase in overall system acoustics.
 - PCIe controller-based SSD drives: Drives such as Express flash drives and Fusion-IO cards require greater airflow for cooling, and result in significantly higher noise levels.
 - Systems with an H330 PERC: This configuration may be quieter than those with an H730P PERC with battery backup. However, higher noise levels result when a system is configured as non-RAID.
 - Hot spare feature of power supply unit: In the system default setting, the Hot Spare Feature is disabled; acoustical output from the power supplies is lowest in this setting.

The following table shows the reference points and output comparisons:

Table 19. Reference points and output comparison

Value measured at your ears		Equivalent familiar noise experience
LpA, dBA, re 20 μ Pa	Loudness, sones	
90	80	Loud concert
75	39	Data center, vacuum cleaner, voice must be elevated to be heard
60	10	Conversation levels

Rack rails

The rail offerings for the PowerEdge R740 consist of two general types: sliding and static

Sliding rails features summary

The sliding rails (two varieties are offered) 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).

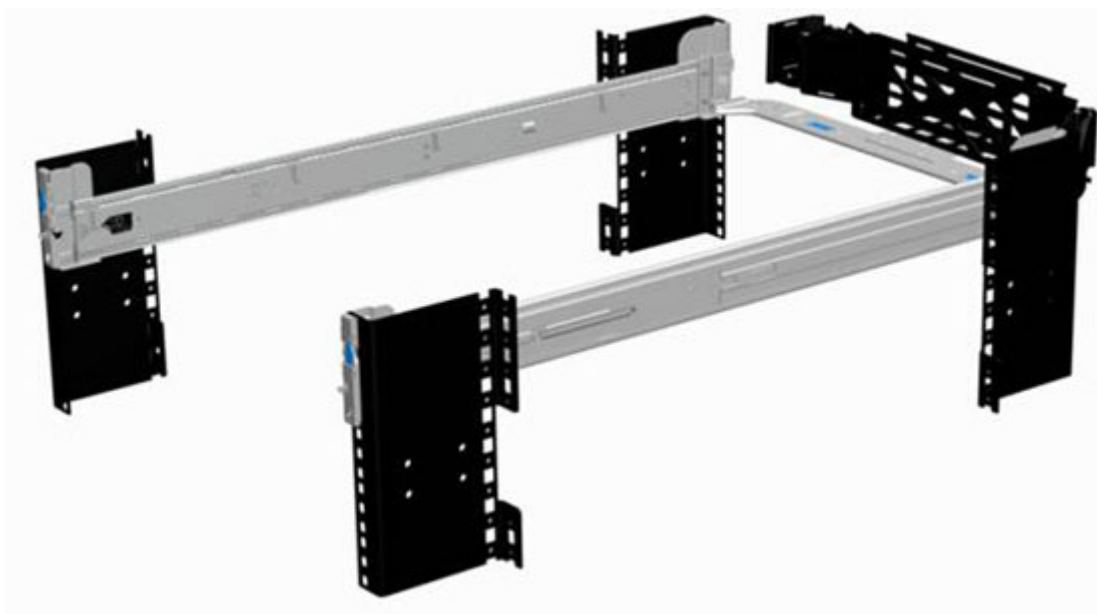


Figure 5. Sliding rails with optional CMA

ReadyRails-Sliding rails for 4-post racks

- Supports Drop-in Installation of the chassis to the rails.
- Support for tool-less installation in 19" EIA-310-E compliant square or unthreaded round hole 4-post racks including all generations of the Dell racks.
- Support for tooled installation in 19" EIA-310-E compliant threaded hole 4-post racks.
- Support full extension of the system out of the rack to allow serviceability of key internal components.
- Support for optional cable management arm (CMA).
- Minimum rail mounting depth without the CMA: 714 mm.
- Minimum rail mounting depth with the CMA: 845 mm.
- Square-hole rack adjustment range: 631-868 mm.
- Round-hole rack adjustment range: 617-861 mm.
- Threaded-hole rack adjustment range: 631-883 mm.

Stab-in/Drop-in sliding rails for 4-post racks (New for 14G systems)

- Supports drop-in or stab-in installation of the chassis to the rails.
- Support for tool-less installation in 19" EIA-310-E compliant square, unthreaded round hole racks including all generations of the Dell racks. Also supports tool-less installation in threaded round hole 4-post racks.
- Required for installing R740 in a Dell EMC Titan or Titan-D rack.
- Support full extension of the system out of the rack to allow serviceability of key internal components.
- Support for optional cable management arm (CMA).
- Minimum rail mounting depth without the CMA: 714 mm.
- Minimum rail mounting depth with the CMA: 845 mm.

- Square-hole rack adjustment range: 603-915 mm.
- Round-hole rack adjustment range: 603-915 mm.
- Threaded-hole rack adjustment range: 603-915 mm.

Static 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.

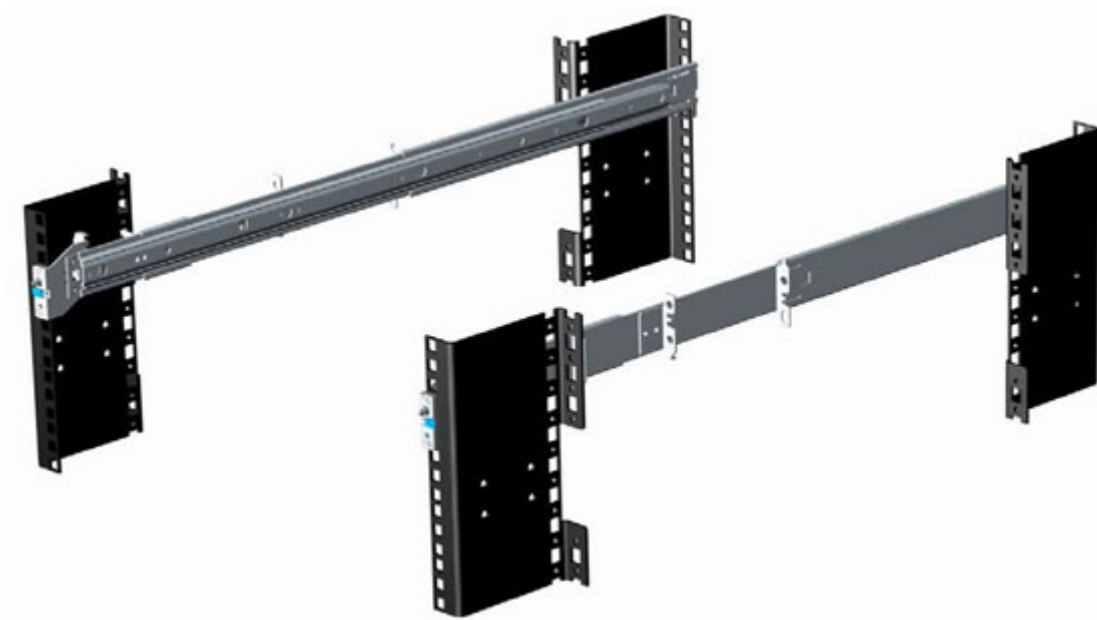


Figure 6. Static rails

Static rails features summary

Static Rails for 4-post & 2-post Racks:

- Supports Stab-in installation of the chassis to the rails.
- Support tool-less installation in 19" EIA-310-E compliant square or unthreaded round hole 4-post racks including all generations of Dell racks.
- Support tool installation in 19" EIA-310-E compliant threaded hole 4-post and 2-post racks.
- Minimum rail mounting depth: 622 mm.
- Square-hole rack adjustment range: 608-879 mm.
- Round-hole rack adjustment range: 594-872 mm.
- Threaded-hole rack adjustment range: 608-890 mm.

NOTE: One key factor in selecting the proper rails is identifying the type of rack in which they are installed.

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.

The Dell EMC OpenManage Portfolio

Simplifying hardware management through ease of use, intelligent automation and integrated security

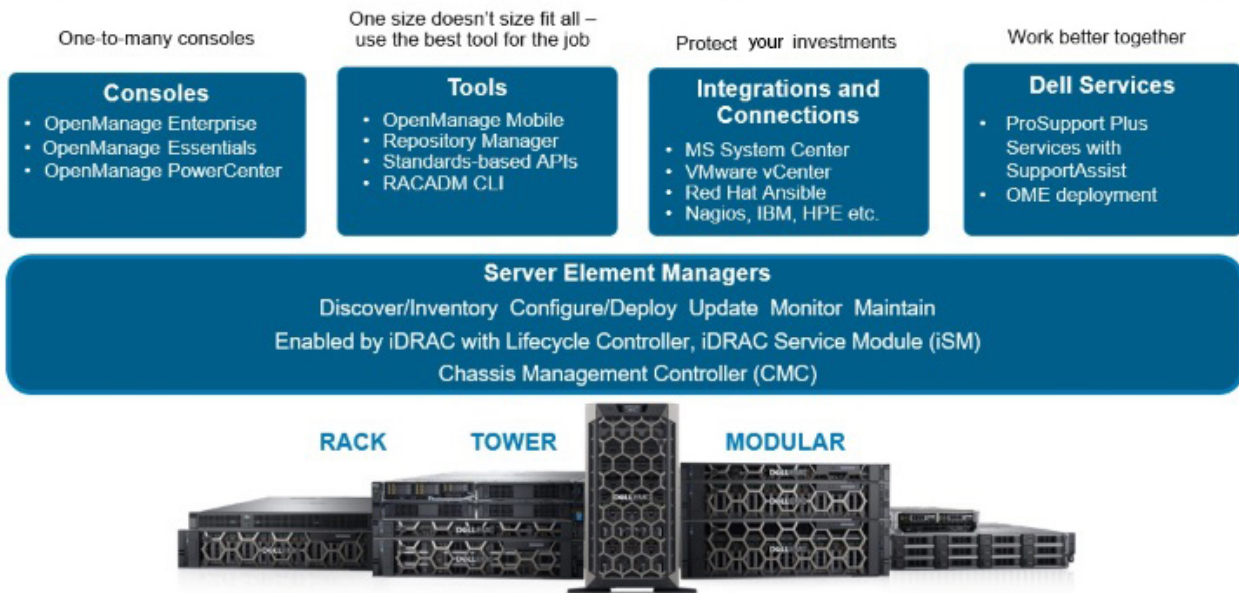


Figure 7. Server lifecycle management operations

Topics:

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

iDRAC with Lifecycle controller

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.

iDRAC features and comparison

The R740 supports the following iDRAC licenses – Basic (default), Express (upgrade) and Enterprise (upgrade).

i | **NOTE: The features listed in bold in the below table are new for iDRAC9.**

Table 20. 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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Racadm command line—local/remote	Yes	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	No	Yes	Yes	Yes	Yes	Yes	Yes
Connectivity								
Shared NIC	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
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
NTLM v1 and NTLM v2	No	Yes	No	Yes	No	Yes	No	Yes
Security								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
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
Two-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	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								
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 NFS/CIFS	No	Yes	No	Yes	No	Yes	No	Yes
Power and Thermal								
Real-time power meter	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
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								
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
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

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
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	Yes
Diagnostics, Service and Logging								
Embedded diagnostic tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LCD screen—iDRAC9 requires optional bezel	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Quick Sync—require NFC bezel (13 G only)	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

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
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								
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:

OpenManage Enterprise

OpenManage Enterprise is the next generation of OpenManage Essentials. It simplifies, centralizes, and automates the full span of server lifecycle management activities. It helps in discovery, configuration, deployment, updates, and remediation. These tasks are performed within a single console that unifies management of tower, rack, and modular platforms. OpenManage Enterprise helps in standardizing and supporting IT management policies and practices.

The OpenManage Enterprise console simplifies and strengthens the current capability of OpenManage Essentials in the following areas:

- Reduced time and effort that is required to manage small and large-scale IT environments using HTML5 GUI
- Simplified GUI workflow to provide a single management layer that unifies the management of PowerEdge tower, rack, and modular platforms
- Packaged and delivered as virtual appliance and supports ESXi, HyperV, and KVM
- Redesigned architecture on CentOS with the PostgreSQL database. Operating system and database license are no longer required
- Centralized user management with role-based access control
- Enabled with customer automation and solution integration using Northbound API
- Enhanced policy-driven management

For more information, see www.dell.com/support/article/sln310714

OpenManage Mobile

OpenManage Mobile(OMM) is a software application that enables easy, convenient, and secure monitoring and management of PowerEdge servers remotely, or at-the-server. With OpenManage Mobile, IT Administrators can securely perform several data center monitoring and remediation tasks using an Android or iOS mobile device. The OpenManage Mobile app is available as a free software download from the Apple Store and the Google Play Store.

OMM can also monitor and manage PowerEdge servers through a OpenManage Enterprise or Essentials console or by directly accessing the server's iDRAC.

The OpenManage Enterprise or Essentials console can be accessed through OpenManage Mobile over a secure IP network. This enables you to monitor all devices managed by OpenManage Enterprise or Essentials such as Dell EMC servers, storage, networking, firewall, and supported third party devices.

If you are remote, you can access iDRAC over a secure IP network.

Key Features of OpenManage Mobile (When connected through OpenManage Enterprise or Essentials console):

- Connect to multiple servers which have OpenManage Enterprise installed, from a single mobile device.
- Connect to multiple servers individually through the iDRAC interface.
- Receive critical alert notification on your mobile device as they arrive into your OpenManage Enterprise management console.
- Acknowledge, forward, and delete alerts from your mobile device.
- Browse through device details, firmware inventory, and event logs of individual systems.
- Perform several server management functions such as power-on, power cycle, reboot, and shutdown from the mobile application.

Key Features of OpenManage Mobile (When connected through iDRAC):

- Connect to legacy PowerEdge servers remotely. For more information, see OpenManage Mobile compatibility matrix at dell.com/support
- Access rack, tower and modular servers through Quick Sync 2 modules or Quick Sync bezels as applicable.
- Assign IP address, change credentials, and update common BIOS attributes for Bare Metal Configuration
- Configure one server manually, or multiple servers simultaneously through a template.
- Browse server details, health status, hardware & firmware inventory, networking details, and System Event or LC logs. Share this information easily with other IT Administrators.
- Access SupportAssist reports, Last Crash screen and video (For more information, see OpenManage Mobile compatibility matrix at dell.com/support)
- Access Virtual Console (and reduce the need for crash carts).
- Power On, Shut down, or Reboot your server from anywhere.
- Run any RACADM command

OpenManage Power Center

OpenManage Power Center is a one-to-many application that can read power usage and thermal readings information from Dell EMC servers, Power Distribution Units (PDU), and Uninterruptible Power Supplies (UPS). It can aggregate this information into rack, row, and room-level views. On servers with iDRAC Enterprise license, you can also cap or throttle the power consumption. You may need to set power caps to reduce the power consumption due to external events such as brownouts or failures of data-center cooling devices. You can also use power capping to safely increase the numbers of servers in a rack to match the power that is provisioned for that rack.

For more information, see OpenManage Power Center User's Guide available at Dell.com/openmanagemanuals.

Dell EMC OpenManage systems management tools, utilities and protocols

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

Dell EMC Repository Manager:

Dell EMC Repository Manager (DRM) is an application that helps you to:

- Identify the updates that are relevant to the systems in your data center.
- Identify and notify when updates are available.
- Package the updates into different deployment format.

To automate the creation of baseline repositories, DRM provides advanced integration capabilities with iDRAC/LC, OpenManage Essentials, Chassis Management Controller, OpenManage Integration for VMware vCenter and OpenManage Integration for Microsoft System Center (OMIMSSC). Also, DRM packages updates into custom catalogs that can be used for deployment.

Dell EMC Repository Manager can create the following deployment tools:

- Custom catalogs

- Lightweight deployment pack
- Bootable Linux ISO
- Custom Server Update Utility (SUU)

For more information, see Dell EMC Repository Manager User's Guide available at Dell.com/support/manuals.

Dell Update Packages

Dell Update Packages (DUP) is a self-contained executable supported by Microsoft Windows or Linux that updates a component on a server and applications like OMSA, iSM, and DSET.

DUPs can be executed in GUI or in CLI mode.

For more information, see Dell EMC Update Packages User's Guide available at www.delltechcenter.com/DSU.

Dell Remote Access Controller Administration (RACADM) CLI

The RACADM command-line utility provides a scriptable interface to perform inventory, configuration, update, and health status check of PowerEdge servers. RACADM operates in multiple modes:

- Local — supports running RACADM commands from the managed server's operating system.
- SSH or Telnet — known as Firmware RACADM; is accessible by logging in to iDRAC using SSH or Telnet
- Remote — supports running RACADM commands from a remote management station such as a laptop or desktop.

RACADM is supported by the iDRAC with Lifecycle Controller and by the Chassis Management Controller of the M1000e, VRTX and FX2 modular systems. Local and Remote RACADM is supported on Windows Server, Windows clients, and on Red Hat, SuSe and Ubuntu Linux.

For more information, see the RACADM Command Line Reference Guide for iDRAC and CMC available at Dell.com/support/manuals.

iDRAC with Lifecycle Controller Embedded Management APIs

iDRAC with Lifecycle Controller provides a range of standards-based applications programming interfaces (APIs) that enable scalable and automated management of PowerEdge servers. Standard systems management APIs have been developed by organizations such as the Institute of Electrical and Electronics Engineers (IEEE) and Distributed Management Task Force (DMTF). These APIs are widely used by commercial systems management products and by custom programs and scripts developed by IT staff to automate management functions such as discovery, inventory, health status checking, configuration, update, and power management. The APIs supported by iDRAC with Lifecycle Controller include:

- **Redfish** - In 2015, the DMTF Scalable Platforms Management Forum published Redfish, an open industry-standard specification and schema designed to meet the needs of IT administrators for simple, modern, and secure management of scalable platform hardware. Dell is a key contributor to the Redfish standard, acting as co-chair of the SPMF, promoting the benefits of Redfish, and working to deliver those benefits within industry-leading systems management solutions. Redfish is a next generation management standard using a data model representation inside a hypermedia RESTful interface. The data model is defined in terms of a standard, machine-readable schema, with the payload of the messages expressed in JSON and the OData v4 protocol.
- **WSMan** - The Web Services For Management (WSMan) API, first published by the DMTF in 2008, is the most mature and robust API provided by iDRAC with Lifecycle Controller. WSMan uses a Simple Object Access Protocol (SOAP) with data modeled using the Common Information Model. WSMan provides interoperability between management applications and managed resources, and identifies a core set of web service specifications and usage requirements that expose a common set of operations central to all systems management.
- **IPMI** - The Intelligent Platform Management Interface (IPMI) is a message-based, hardware-level interface specification that can operate over both LAN and serial interfaces. IPMI is supported broadly by server vendors, systems management solutions, and open source software.
- **SNMP** - The Simple Network Management Protocol (SNMP) helps in standardizing the management of network devices. SNMP allows commercial management consoles created for monitoring network switches and routers to also monitor X86 servers. SNMP is primarily used to deliver event messages to alert administrators of problems on their systems but can also be used to discover, inventory and configure servers.

To assist automating system management tasks and simplify API integration, Dell provides PowerShell and Python libraries and script examples utilizing the WSMan interface. The iDRAC with LC pages of Dell Techcenter offer a library of technical white papers detailing the use of the embedded management APIs. For more information, see delltechcenter.com/iDRAC and delltechcenter.com/LC.

Integration with third-party consoles

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

OpenManage Integration Suite for Microsoft System Center

The combination of Dell OpenManage Integration Suite and Microsoft System Center simplifies and enhances deployment, configuration, monitoring and updating of Dell servers and storage in physical and virtual environments. Our agent-free and agent-based plug-ins deliver a unique level of integration and efficiency when managing Dell hardware within a System Center environment.

The OpenManage Integration Suite for Microsoft System Center includes: Dell Server and Storage Management Packs for System Center Operations Manager (SCOM); Dell Server Deployment Packs and Update Catalogs for System Center Configuration Manager (SCCM); and tools for optimizing management of Dell PowerEdge servers in virtual environments using System Center Virtual Machine Manager (SCVMM).

OpenManage Integration for VMware vCenter

The OpenManage Integration for VMware vCenter allows you to monitor, provision, and manage PowerEdge server hardware and firmware. You can perform these tasks through a dedicated Dell menu that can be accessed directly through the VMware vCenter console. OMIVV also allows granular control and reporting for the hardware environment using the same role-based access control model as vCenter. The OpenManage Management Pack for vRealize Operations Manager is available with OMIVV v4.0 onwards. This helps in checking hardware health and alerting into vRealize operations, which also includes dashboard and reporting on the server environment.

You can manage and monitor Dell hardware within the virtualized environment

- Alerting and monitoring environment for servers and chassis
- Monitoring and reporting for servers and chassis
- Updating firmware on servers
- Deploying enhanced options

For more information, see delltechcenter.com/omivv

NOTE: The Dell EMC Repository Manager integrates with OpenManage Integration for VMware vCenter. The Dell EMC Repository Manager provides advanced functionality, simplifies the discovery, and deployment of new updates.

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 Core and Nagios XI
- OpenManage Connection for HPE Operations Manager i (OMi)

For more information on these OpenManage Connections, visit Dell.com/openmanage.

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.

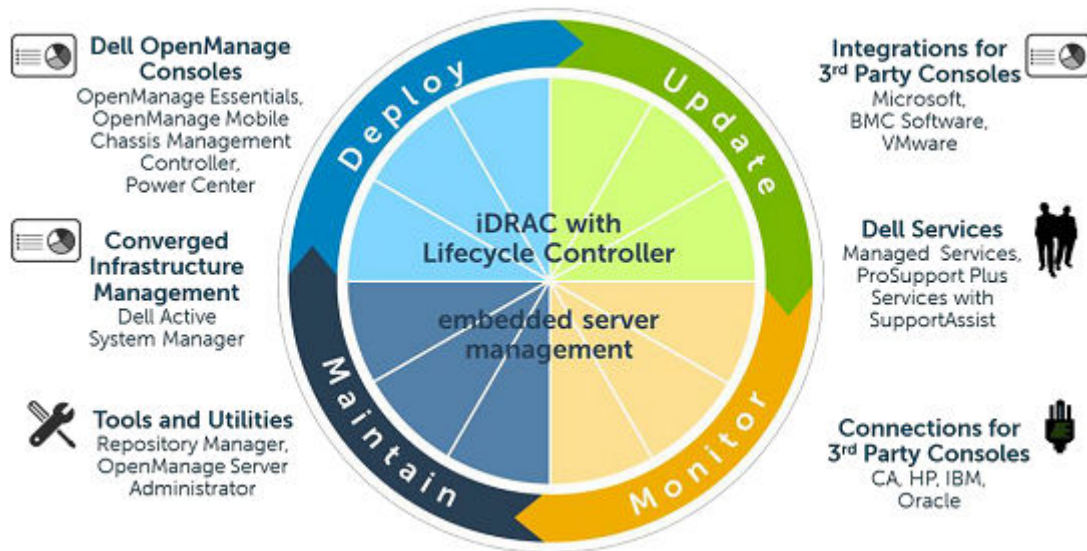


Figure 8. Systems management server lifecycle

The following table lists the products that are available for one-to-one and one-to-many operations, and when they are used in the server's lifecycle.

Table 21. One-to-one and one-to-many operations

Operation	One-to-one	One-to-many
Deploy	<ul style="list-style-type: none"> • Lifecycle Controller GUI • DTK 	<ul style="list-style-type: none"> • OpenManage Integration for VMware vCenter • OpenManage Integration for BMC BladeLogic • OpenManage Integration for Microsoft System Center Configuration Manager
Update	<ul style="list-style-type: none"> • iDRAC9 with Lifecycle Controller • Repository Manager • DUP • SUU • OpenManage Integration for VMware vCenter 	<ul style="list-style-type: none"> • Dell EMC OpenManage Essentials • OpenManage Integration for Microsoft System Center Configuration Manager
Monitor	<ul style="list-style-type: none"> • iDRAC9 with Lifecycle Controller • OMSA 	<ul style="list-style-type: none"> • Dell EMC OpenManage Essentials • Dell EMC OpenManage Power Center • OpenManage Integration for VMware vCenter • OpenManage Integration for Microsoft System Center Operations Manager
Maintain	<ul style="list-style-type: none"> • iDRAC9 with Lifecycle Controller • IPMI 	<ul style="list-style-type: none"> • 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

The following sections contain information about additional system specifications.

Topics:

- Chassis dimensions
- Chassis weight
- Video
- USB peripherals
- Environmental specifications

Chassis dimensions

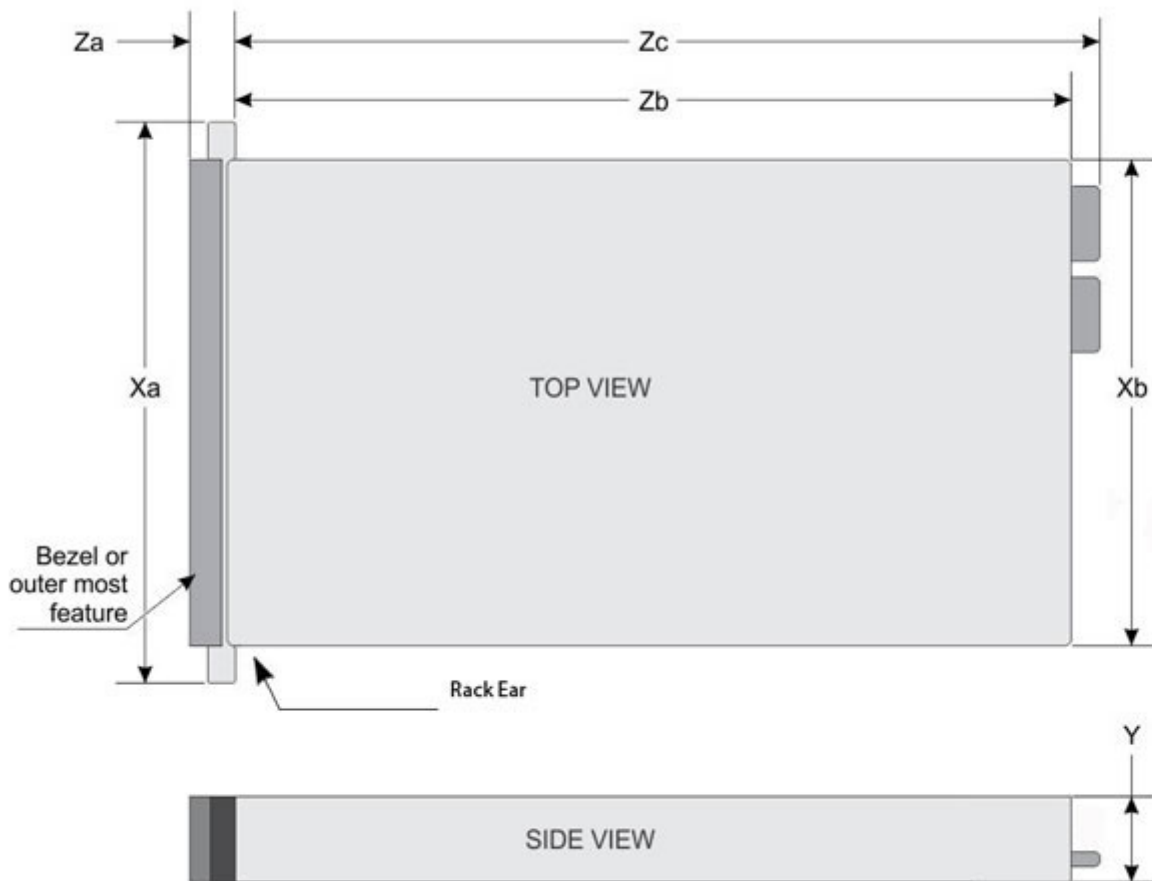


Figure 9. Chassis Dimensions for R740 and R740xd

The following table describes the chassis dimensions:

Table 22. Chassis dimensions

Chassis dimensions (cm)						
Xa	Xb	Y	Za bezel	Za without bezel	Zb	Zc
482.0 mm	434.0 mm	86.8 mm	35.84mm	22.0 mm	678.8 mm	715.5 mm

Chassis weight

This section describes the weight of the system.

Table 23. Chassis weight

Configuration	Maximum Weight
2.5-inch HDD for R740	26.3Kg (57.98 lb)
3.5-inch HDD for R740	28.6Kg (63.05 lb)
2.5-inch HDD for R740xd	28.1Kg (61.95 lb)
3.5-inch HDD for R740xd	33.1Kg (72.91 lb)

Video

The PowerEdge R740 system supports the Matrox G200eW3 graphics module. The following table shows the video specifications:

Table 24. Video specifications

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

USB peripherals

Front, rear, and internal USB ports are included in the base system for R740 and R740xd. Rear and internal ports support up to USB 3.0, while front ports support USB 2.0. The R740 offers an upsell option that adds an additional USB 3.0 port to the front of the chassis. The USB upsell module cable connects to the internal USB port on the planar and the default internal moves closer to the front of the chassis

Environmental specifications

See Dell EMC PowerEdge R740 and R740xd installation service manuals on Dell.com/Support/Manuals for detailed environmental specifications.

Appendix B. Standards compliance

Table 25. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	https://uefi.org/specsandtesttools
Ethernet IEEE 802.3-2005	https://standards.ieee.org/
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	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

Appendix C Additional resources

Table 26. Additional resources

Resource	Description of contents	Location
PowerEdge R740/R740xd Installation Service Manuals	<p>This manual, available in PDF format, provides the following information:</p> <ul style="list-style-type: none"> • 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
PowerEdge R740/R740xd Getting Started Guide	<p>This guide ships with the system, and is also available in PDF format. This guide provides the following information:</p> <ul style="list-style-type: none"> • 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 contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell 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

ProDeploy Enterprise Suite and Residency Services

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		•	•
	Technology Service Manager (TSM) engagement for ProSupport Plus entitled devices			•
Deployment	Deployment service hours	Business hours	24x7	24x7
	Onsite hardware installation*	•	•	•
	Packaging materials disposal	•	•	•
	Install and configure system software		•	Onsite
	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 10. ProDeploy Enterprise Suite capabilities

NOTE: Hardware installation not applicable on selected software products.

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.

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.

Basic Deployment

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

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 page on Dell.com.

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.

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 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.

The figure consists of three vertical rectangular boxes, each with a colored header and a white body. The first box has a blue header and contains text about ProSupport Plus. The second box has an orange header and contains text about ProSupport. The third box has a green header and contains text about ProSupport One for Data Center.

Service Name	Description
ProSupport Plus	Optimize your critical systems and free up staff to innovate the business. ProSupport Plus provides an assigned Technology Service Manager and access to senior technical engineers that quickly diagnose issues and provide personalized guidance to avoid problems before they ever impact your business.
ProSupport	Keep your hardware and software running smoothly with 24x7 access to technology engineers as well as proactive and preventive technologies to help you get ahead of issues.
ProSupport One for Data Center	Get a tailored, personalized support experience for your large IT environment, including an assigned service account management expert as well as flexible parts and labor options.

Figure 11. 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 Technology Service Manager 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 Technology Services Managers 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 12. 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 13. 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.