Dell PowerEdge R7615

Technical Guide

DELLTechnologies

Notes, cautions, and warnings

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

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

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

Contents

System overview

The PowerEdge R7615 system is a 2U server that supports:

● One AMD EPYC 4th Generation 9004 series processor with up to 96 cores
● 12 DDR5 DIMM slots
● Optional Direct Liquid Cooling (DLC) for required CPUs and/or configurations
● Two redundant AC or DC power supply units
● PCI Express® (PCIe) 5.0 enabled expansion slots
● Network interface technologies to cover Network Interface Card (NIC)
● Up to 12 x 3.5-inch, 8 x 3.5-inch, or 24 x 2.5-inch, 16 x 2.5-inch, 8 x 2.5-inch, or 2 x 2.5-inch(rear), 4 x 2.5-inch(rear) SAS, SATA, or NVMe (HDD/SSD) drives

ⓘ **NOTE:** For more information about how to hot swap NVMe PCIe SSD U.2 device, see the *Dell Express Flash NVMe PCIe SSD User's Guide* at https://www.dell.com/support **> Browse all Products** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents**.

ⓘ **NOTE:** All instances of SAS, SATA drives are referred to as drives in this document, unless specified otherwise.

⚠ **CAUTION: Do not install GPUs, network cards, or other PCIe devices on your system that are not validated and tested by Dell. Damage caused by unauthorized and invalidated hardware installation will null and void the system warranty.**

Topics:

• Key workloads
• New technologies

Key workloads

Customers looking for accelerated compute to maximize performance in a dense, scalable server architecture to address the following applications:

● High Performance Computing
● Virtual Desktop Infrastructure (VDI)
● Virtualization

New technologies

Table 1. New technologies

Technology	Detailed Description
AMD Genoa Processor (SP5)	Core count: Up to 96 core processor
	5nm process technology
	AMD Inter-chip global memory interconnect (xGMI) up to 64 lanes
	Speeds up to 4.1 GHz
	Maximum TDP: 300 W+
4800 MT/s DDR5 Memory	Up to 12 channels with 1 DPC per CPU and 12 DIMMs in total

Table 1. New technologies (continued)

Technology	Detailed Description
	Supports DDR5 ECC RDIMM
PCIe Gen	Gen5 @32 GT/s
PCIe Slot	Up to 8 x PCIe Slots with x8 or x16 lanes
Flex I/O	LOM board, 2 x1Gb with BCM5720 LAN controller
	Rear I/O with: ● 1 GB Dedicated Management Network Port ● USB 3.0 x1 ● USB 2.0 x1 ● VGA port
	Serial Port Option with STD RIO board
	OCP Mezz 3.0 (supported by x8 PCIe lanes)
	Front I/O with: ● USB 2.0 x1 ● 1 x iDRAC Direct (Micro-AB USB) port ● VGA x 1 port
CPLD 1-wire	Support payload data of Front PERC, Riser, BOSS N1, BP and Rear IO to BIOS and iDRAC
Dedicated PERC	PERC 11 ● HBA355i, H355, H755, H755N PERC 12 ● H965i
Software RAID	S160
Power Supplies	60 mm / 86 mm dimension is the same PSU form factor with 15G on 16G design
	Titanium 700 W AC/HVDC
	Platinum 800 W AC/HVDC
	Titanium 1100 W AC/HVDC
	Platinum 1400 W AC/HVDC
	Titanium 1800 W AC/HVDC
	Platinum 2400 W AC/HVDC

System features and generational comparison

The following table shows the comparison between the PowerEdge R7615 with the PowerEdge R7515.

Table 2. Features comparison

Features	PowerEdge R7615	PowerEdge R7515
Processors	One AMD® EPYC 4th Generation Genoa (SP5) processors	Two AMD® EPYC™ Generation 2 or Generation 3 processors.
CPU interconnect	Inter-chip global memory interconnect (xGMI) 32GT/sec	Inter-chip global memory interconnect (xGMI) 16GT/sec
Memory	12 x DDR5 RDIMM (3 TB), bandwidth up to 4800 MT/S	16 x DDR4 RDIMM (1TB), LRDIMM (2TB), bandwidth up to 3200 MT/S
Storage Controllers	- PERC 11: HBA355i, H355, H755, H755N - PERC 12: H965i - Software RAID: S160 - BOSS-N1	- Adapters: Mini PERC: HBA330 - PERC: H330, H730P - Software RAID: S150 - BOSS S1
Drive Bays	Front bays: - Up to 8 x 3.5-inch SAS4/SATA (HDD/SSD) max 160 TB - Up to 12 x 3.5-inch SAS/SATA (HDD/SSD) max 240 TB - Up to 8 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 122.88 TB - Up to 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 245.76 TB - Up to 24 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 368.64 TB Rear bays: - Up to 2 x 2.5-inch SAS4/SATA/NVMe (HDD/SSD) max 30.72 TB - Up to 4 x 2.5-inch SAS4/SATA/NVMe (HDD/SSD) max 61.44 TB	Front bays: 3.5 inches, 2.5 inches - 12 Gb SAS, 6 Gb SATA, NVMe HDD Rear bay: 2 x 3.5-inch SATA/SAS HDDs
Power Supplies	Hot swap PSUs with full redundancy. 700 W Titanium 200-240 VAC or 240 HVDC 800 W Platinum 100-240 VAC or 240 HVDC 1100 W LVDC -48 - -60 VDC 1100 W Titanium 100-240 VAC or 240 HVDC 1400 W Platinum 100-240 VAC or 240 HVDC 1800 W Titanium 200-240 VAC or 240 HVDC 2400 W Platinum 100-240 VAC or 240 HVDC	AC (Platinum) 495 W,1600 W AC (Titanium) 750 W, 1600 W Mix Mode (Platinum) 750 W, 1100 W
Cooling Options	Air Cooling	Air Cooling

Table 2. Features comparison (continued)

Features	PowerEdge R7615	PowerEdge R7515
Fans	Up to six high-performance silver grade (HPR SLVR) or high-performance gold (HPR Gold) hot plug fans	Up to six Standard (STD) / High performance (HPR) hot plug fans
Dimension	Height: 86.8 mm (3.41 inches)	Height: 86.8 mm (3.41 inches)
	Width: 482 mm (18.97 inches)	Width: 434 mm (17.09 inches)
	Depth: 772.13 mm (30.39 inches) with bezel	Depth: 647.1 mm (25.48 inches) with bezel
	Depth: 758.29 mm (29.85 inches) without bezel	Depth: 625 mm (24.6 inches) without bezel
Form Factor	2U rack server	2U rack server
Embedded Management	- iDRAC9 - iDRAC Direct - iDRAC RESTful API with Redfish - iDRAC Service Manual - Quick Sync 2 wireless module	- iDRAC9 - iDRAC Direct - iDRAC RESTful API with Redfish - iDRAC Service Manual - Quick Sync 2 wireless module
Bezel	Optional LCD bezel or security bezel	Optional LCD bezel or security bezel
OpenManage Software	- OpenManage Enterprise - OpenManage Power Manager plugin - OpenManage SupportAssist plugin - OpenManage Update Manager plugin - CloudIQ for PowerEdge plug in - OpenManage Enterprise Integration for VMware vCenter - OpenManage Integration for Microsoft System Center - OpenManage Integration with Windows Admin Center	- OpenManage Enterprise - OpenManage Power Manager plug-in - OpenManage Services plug-in - OpenManage Update Manager plug-in
Mobility	OpenManage Mobile	OpenManage Mobile
OpenManage Integrations	- BMC TrueSight - Microsoft System Center - OpenManage Integration with ServiceNow - Red Hat Ansible Modules - Terraform Providers - VMware vCenter and vRealize Operations Manager	- BMC TrueSight - Microsoft System Center - Red Hat Ansible Modules - VMware vCenter
Security	- Cryptographically signed firmware - Secure Boot - Secure Erase - Silicon Root of Trust - System Lockdown (requires iDRAC9 Enterprise or Datacenter) - TPM 2.0 (optional), TCM 2.0 optional - AMD Secure Memory Encryption (SME) - AMD Secure Encrypted Virtualization (SEV)	- Cryptographically signed firmware - Secure Boot - Secure Erase - Silicon Root of Trust - System Lockdown (requires iDRAC9 Enterprise or Datacenter) - TPM 1.2/2.0 (optional), TCM 2.0 optional - AMD Secure Memory Encryption (SME) - AMD Secure Encrypted Virtualization (SEV)
Embedded NIC	2 x 1GbE LOM (optional)	2 x 1GE LOM
Networking Options	1 x OCP card 3.0 (optional) ⓘ **NOTE:** The system allows either LOM card or an OCP card or both to be installed in the system.	OCP x16 Mezz 3.0

Table 2. Features comparison (continued)

Features	PowerEdge R7615		PowerEdge R7515	
GPU Options	3 x 300 W (DW) or 6 x 75 W (SW)		Up to 4 x 150 W	
Ports	Front Ports ● 1 x iDRAC Direct (Micro-AB USB) port ● 1 x USB 2.0 ● 1 x VGA	Rear Ports ● 1 x Dedicated iDRAC Ethernet port ● 1 x USB 2.0 ● 1 x USB 3.0 ● 1 x Serial (optional) ● 1 x VGA	Front Ports ● 1 x Dedicated iDRAC micro-USB ● 2 x USB 2.0 ● 1 x VGA	Rear Ports ● 2 x USB 2.0 ● 1 x iDRAC Direct/ ethernet port ● 2 x USB 3.0 ● 1 x Serial port (optioanl) ● 1 x VGA
	Internal Port: 1 x USB 3.0		Internal Port: 1 x USB 3.0	
PCIe	Up to eight PCIe slots ● 4 x PCIe Gen5 slots ● 4 x PCIe Gen4 slots		Up to four PCIe slots ● 2 x PCIe Gen 3 slots ● 2 x PCIe Gen 4 slots	
Operating System and Hypervisors	● Canonical Ubuntu Server LTS ● Microsoft Windows Server with Hyper-V ● Red Hat Enterprise Linux ● SUSE Linux Enterprise Server ● VMware ESXi For specifications and interoperability details, see Dell Enterprise Operating Systems on Servers, Storage, and Networking page at Dell.com/OSsupport.		● Canonical Ubuntu Server LTS ● Citrix Hypervisor ● Windows Server LTSC with Hyper-V ● Red Hat Enterprise Linux ● SUSE Linux Enterprise Server ● VMware ESXi For specifications and interoperability details, see Dell Enterprise Operating Systems on Servers, Storage, and Networking page at Dell.com/OSsupport.	

Chassis views and features

Topics:

Front view of the system

Figure 1. Front view of 24 x 2.5-inch drive system
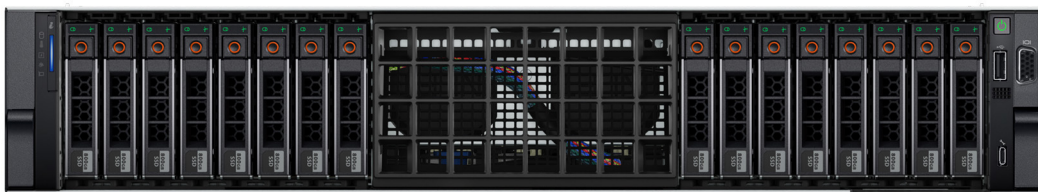
Figure 2. Front view of 16 x 2.5-inch drive system
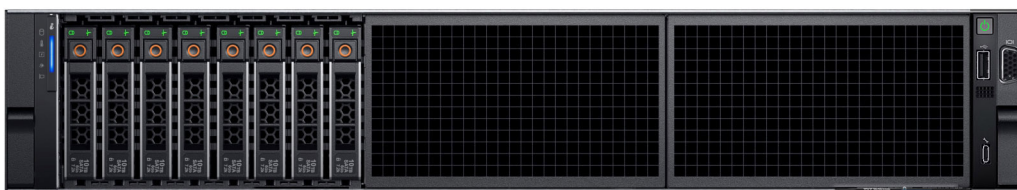
Figure 3. Front view of 8 x 2.5-inch drive system

Figure 4. Front view of 8 x 3.5-inch drive system

Figure 5. Front view of 12 x 3.5-inch drive system

(i) **NOTE:** For more information about ports, panels, and slots, see the Technical specifications section.

Rear view of the system

Figure 6. Rear view of the system

Figure 7. Rear view of the system with 2 x 2.5-inch rear drive module
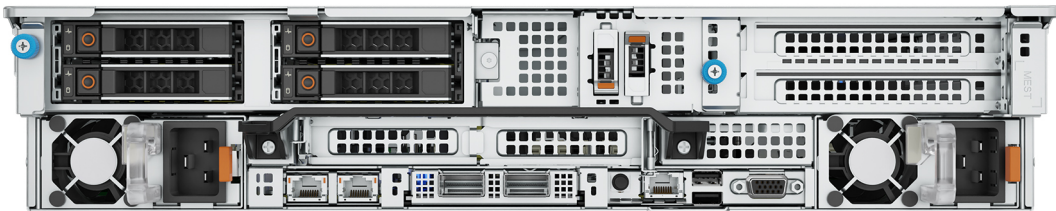
Figure 8. Rear view of the system with 4 x 2.5-inch rear drive module

(i) **NOTE:** For more information about ports, panels, and slots, see the Technical specifications section.

Inside the system
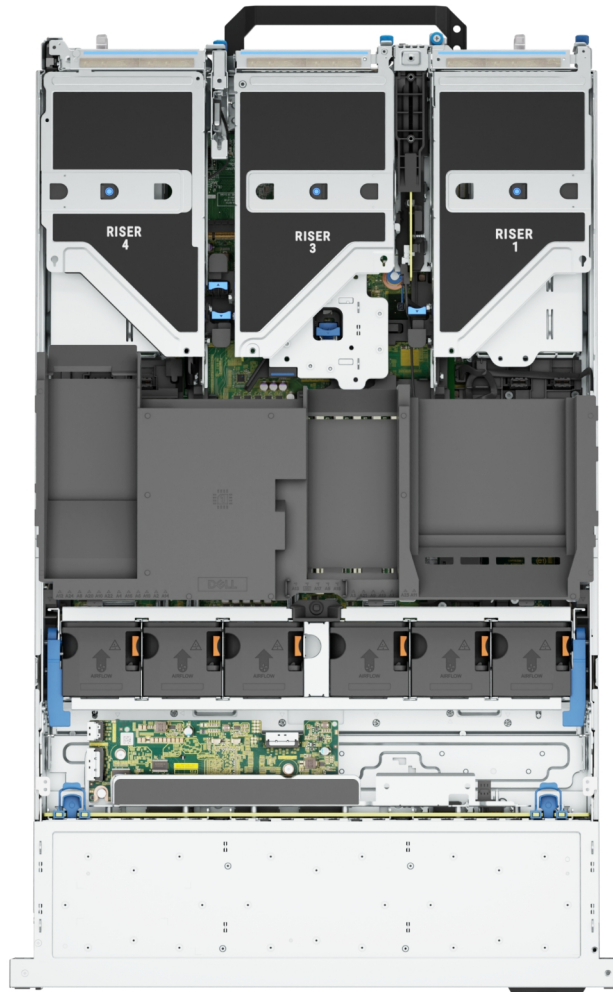
Figure 9. Inside the system
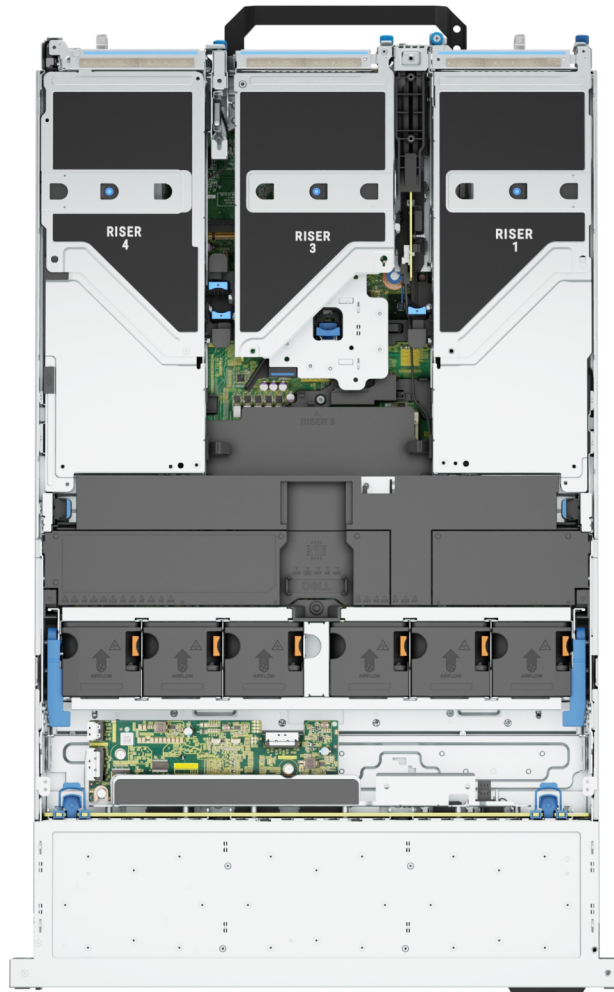
Figure 10. Inside the system with full length risers and GPU shroud

Quick Resource Locator for PowerEdge R7615 system

Quick Resource Locator
Dell.com/QRL/Server/PER7615

Figure 11. Quick Resource Locator for PowerEdge R7615 system

Processor

Topics:

* Processor features

Processor features

AMD

The AMD EPYC™9004 Series Processor ("Genoa") is the 4th Generation AMD EPYC™ System on a chip (SOC) supporting the modern data center. The AMD EPYC™ 9004 Series Processor is based on AMD's SP5 compatible socket infrastructure with a new BIOS. AMD EPYC™9004 Series Processor is not drop-in compatible to AMD's SP3 socket infrastructure for EPYC™ Series 7002 ("Rome") and 7003 ("Milan") Processors. Based on AMD's "Zen4" and "Zen4c" cores, integrated I/O controllers, up to 32 MB of L3 cache per core, advanced security, and synchronized fabric and memory clock speeds, "Genoa" is designed for improved performance, lower TCO, and faster time to results with next gen technologies.

The following lists the features and functions included in the AMD Genoa offering:

● Supports up to 128 AMD Zen4c cores, 96 AMD Zen4 x86 cores with enhance performance with 32 MB L3 cache/core. Integrated I/O support for up to 128 lanes with PCI Express 5 on Dell platforms (AMD support up to 160 I/O lanes with 2P).
● Enhanced Memory Performance with support up to 4800 MT/s DIMMs (1 DPC), 3DS RDIMM support. Enhanced Memory Performance with: Infinity Fabric™ and Memory Clock Synchronized. Largest Available x86 L3 Cache –Up to 32 MB / core.
● Memory Capacity up to 12 channels DDR5 and up to 256 GB/channel support with 2, 4, 6, 8, 10 and 12 channel performance optimization options.
● Enhanced physical and virtual security with AMD Infinity Guard that includes silicon embedded security and virtual features (Secure Memory Encryption and Secure Encrypted Virtualization-Secure Nested Paging (SEV-SNP) to further improve platform and data security capabilities.

Supported processors

Table 3. Supported processor list for the PowerEdge R7615

Processor model number	Base frequency (GHz)	Cores/Threads	Default TDP (W)	cTDP (W)	L3 Cache (MB)	Max DDR Freq (1 DPC)
9754	2.25	128/256	360	400	256	4800
9734	2.20	112/224	340	400	256	4800
9654	2.4	96/192	360	320-400	384	4800
9554	3.10	64/128	360	320-400	256	4800
9454	2.75	48/96	290	240-300	256	4800
9354	3.25	32/64	280	240-300	256	4800
9334	2.70	32/64	210	200-240	128	4800
9224	2.5	24/48	200	200-240	384	4800
9124	3.00	16/32	200	200-240	64	4800
9474F	3.6	48/96	360	320-400	256	4800

Table 3. Supported processor list for the PowerEdge R7615 (continued)

Processor model number	Base frequency (GHz)	Cores/Threads	Default TDP (W)	cTDP (W)	L3 Cache (MB)	Max DDR Freq (1 DPC)
9374F	3.85	32/64	320	320-400	256	4800
9174F	4.10	16/32	320	320-400	256	4800
9654P	2.4	96/192	360	320-400	384	4800
9554P	3.1	64/128	360	320-400	256	4800
9354P	3.25	32/64	280	240-300	256	4800

(i) **NOTE:** The processors are 12 channel and has a maximum frequency of 4800 MT/s (1DPC)

Memory subsystem

Topics:

• Supported memory

Supported memory

The R7615 support up to 12 DIMMs, with up to 3072 GB of memory and speeds of up to 4800MT/s.

The R7615 support registered (RDIMMs), allowing for the maximum platform memory capacity. Unbuffered DIMMs (UDIMMs) are not supported.

Table 4. Memory technology comparison

Feature	PowerEdge R7615 (DDR5)
DIMM type	RDIMM
Transfer speed	4800 MT/s
Voltage	1.1 V

The following table lists the supported DIMMs for the R7615. For the latest information about supported memory and memory configurations, reference the latest SDL.

Table 5. Supported DIMMs

DIMM Type	DIMM Capacity (GB)	Ranks per DIMM	Data Width	DIMM Volts (V)
DDR5 RDIMM	16	1	x8	1.1
DDR5 RDIMM	32	2	x8	1.1
DDR5 RDIMM	64	2	x4	1.1
DDR5 RDIMM	128	4	x4	1.1
DDR5 RDIMM	256	8	x4	1.1

Storage

Topics:

- Storage controller specifications
- Supported drives
- Internal storage configuration
- External Storage

Storage controller specifications

The PowerEdge R7615 system supports the following controller card:

Table 6. Storage controller cards

Supported storage controller card
Software RAID ● S160
Internal controllers ● PERC H965i ● PERC H755 ● PERC H755N ● PERC H355
Internal Boot ● Boot Optimized Storage Subsystem (BOSS-N1): HWRAID 2 x M.2 SSDs
External controllers ● HBA355e
SAS Host Bus Adapters ● HBA355i

Supported drives

The PowerEdge R7615 system supports:
- 8 x 3.5-inch hot-swappable SAS or SATA drives
- 12 x 3.5-inch hot-swappable SAS or SATA drives
- 8 x 2.5-inch hot-swappable NVMe drives
- 16 x 2.5-inch hot-swappable SAS, SATA, or NVMe drives
- 24 x 2.5-inch hot-swappable SAS or SATA drives
- 2 x 2.5-inch rear hot-swappable SAS, SATA, or NVMe drives
- 4 x 2.5-inch rear hot-swappable SAS, SATA, or NVMe drives
- Zero drive
- (i) **NOTE:** For more information about how to hot swap NVMe PCIe SSD U.2 device, see the *Dell Express Flash NVMe PCIe SSD User's Guide* at https://www.dell.com/support >**Browse all Products** > **Data Center Infrastructure** > **Storage Adapters & Controllers** > **Dell PowerEdge Express Flash NVMe PCIe SSD** > **Documentation** > **Manuals and Documents**.

Internal storage configuration

Table 7. R7615 Internal Storage Configuration Matrix

Total HDD/ SSD (not BOSS)	NVMe Enabled / Universal Slots	16G Storage Front	Rear Storage	PERC Qty (f+a)	Storage Controller(s)	Controller Form Factor
0*	0 / 0	N/A	N/A	0+0	N/A	N/A
8	0 / 0	2U 8x3.5" Passive	N/A	1+0	HBA355i / H355	N/A
12	0 / 0	2U 12x3.5" Passive v2	N/A	0+1	HBA355i / H355 / H755	PERC Adapter
14	0 / 0	2U 12x3.5" Passive v2	2U Rear 2x2.5" univ SAS4	0+1	HBA355i / H355 / H755	PERC Adapter
14	0 / 0	2U 12x3.5" Passive v2	2U Rear 2x2.5" univ SAS4	0+1	H965i	PERC Adapter
16	0 / 0	2U 12x3.5" Passive v2	2U Rear 4x2.5" univ SAS4	0+1	HBA355i / H355 / H755	PERC Adapter
16	0 / 0	2U 12x3.5" Passive v2	2U Rear 4x2.5" univ SAS4	0+1	H965i	PERC Adapter
8	8 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP	N/A	0+0	S160 _NVMe	N/A
8	8 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP	N/A	1+0	H755N	Front PERC
8	8 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP	N/A	1+0	H965i	Front PERC
16	0 / 0	2U 8x2.5" SAS4/ SATA v2 *2	N/A	1+0	HBA355i / H355 / H755	Front PERC
16	0 / 0	2U 8x2.5" SAS4/ SATA v2 *2	N/A	1+0	H965i	Front PERC
16	16 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP *2	N/A	0+0	S160_NVMe	N/A
16	16 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP *2	N/A	2+0	H755N	Front PERC
16	16 / 0	2U 8x2.5" Uni (as 8x2.5" NVMe or 16x2.5" NVME) Low-Loss PCB BP *2	N/A	2+0	H965i	Front PERC
24	8 / 0	2U 8x2.5" SAS4/ SATA v2 *3	N/A	1+0	HBA355i / H355 / H755 / S160_NVMe	Front PERC
24	8 / 0	2U 8x2.5" SAS4/ SATA v2 *3	N/A	1+0	H965i / S160_NVMe	Front PERC

Table 7. R7615 Internal Storage Configuration Matrix (continued)

Total HDD/ SSD (not BOSS)	NVMe Enabled / Universal Slots	16G Storage Front	Rear Storage	PERC Qty (f+a)	Storage Controller(s)	Controller Form Factor
24	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	N/A	1+0	HBA355i / H355 / H755	Front PERC
24	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	N/A	1+0	H965i	Front PERC
24	8 / 8	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	N/A	1+0	HBA355i / H355 / H755	Front PERC
24	8 / 8	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	N/A	1+0	H965i	Front PERC
26	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 2x2.5" univ SAS4	1+0	HBA355i / H355 / H755	Front PERC
26	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 2x2.5" univ SAS4	1+0	H965i	Front PERC
26	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 2x2.5" univ SAS4	1+0	HBA355i / H355 / H755	Front PERC
26	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 2x2.5" univ SAS4	1+0	H965i	Front PERC
28	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 4x2.5" univ SAS4	1+0	HBA355i / H355 / H755	Front PERC
28	0 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U Rear 4x2.5" univ SAS4	1+0	H965i	Front PERC
28	4 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U 4x E3 G5x2 Rear Ortho	1+0	HBA355i / H355 / H755 / S160_NVMe	Front PERC
28	4 / 0	2U 24x2.5" SAS4/ SATA expander (w/ 8x universal)	2U 4x E3 G5x2 Rear Ortho	1+0	H965i / S160_NVMe	Front PERC
24	24 / 0	2U 24x2.5" NVMe Switch BP - Atlas 2 Gen5	N/A	0+0	S160_NVMe	N/A
24	24 / 0	2U 24x2.5" NVMe Switch BP - Atlas 2 Gen5	N/A	2+0	H965i	Front PERC
16	16 / 0	2U 8x E3 G5x2 G5x4 Ortho *2	N/A	2+0	H755N	Front PERC
16	16 / 0	2U 8x E3 G5x2 G5x4 Ortho *2	N/A	2+0	H965i	Front PERC
32	32 / 0	2U 8x E3 G5x2 G5x4 Ortho *4	N/A	0+0	S160_NVMe	N/A

Table 7. R7615 Internal Storage Configuration Matrix (continued)

Total HDD/ SSD (not BOSS)	NVMe Enabled / Universal Slots	16G Storage Front	Rear Storage	PERC Qty (f+a)	Storage Controller(s)	Controller Form Factor
36	36 / 0	2U 8x E3 G5x2 G5x4 Ortho *4	2U 4x E3 G5x2 Rear Ortho	0+0	S160_NVMe	N/A
8	8 / 0	2U 8x E3 G5x2 G5x4 Ortho	N/A	0+0	S160_NVMe	N/A
16	16 / 0	2U 8x E3 G5x2 G5x4 Ortho *2	N/A	0+0	S160_NVMe	N/A
20	20 / 0	2U 8x E3 G5x2 G5x4 Ortho *3	N/A	0+0	S160_NVMe	N/A

(i) **NOTE:** *BOSS/IDSDM Mandatory: All other configurations support optional BOSS/IDSDM.

External Storage

The R7615 support the external storage device types listed in the table below.

Table 8. Support for External Storage Devices

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

Networking

Topics:

*   OCP 3.0 support

OCP 3.0 support

Table 9. OCP 3.0 feature list

Feature	OCP 3.0
Form factor	SFF
PCIe Gen	Gen4
Max PCIe width	x8
Max no.of ports	4
Port type	BT/SFP+/SFP28
Max port speed	25 GbE
NC-SI	Yes
SNAPI	Yes
WoL	Yes
Power consumption	35 W

Supported OCP cards

Table 10. R7615 OCP 3.0 support list

Form Factor	DPN	Vendor	# of ports	Max Port speed	Port type	SNAPI	WOL	Max PCIe width	PCIe Gen
OCP 3.0	50RV4	Intel	4	10GbE	BT	No	Yes	X8	Gen3
OCP 3.0	61X09	Intel	2	25GbE	SFP28	No	Yes	X8	Gen4
OCP 3.0	DN78C	Mellanox	2	25GbE	SFP28	No	Yes	X8	Gen4
OCP 3.0	G9XC9	Broadcom	4	1GbE	BT	No	Yes	X4	Gen2
OCP 3.0	VJWVJ	Broadcom	4	1GbE	BT	No	Yes	X4	Gen2
OCP 3.0	X1KR4	Broadcom	4	25GbE	SFP28	No	Yes	X16	Gen4
OCP 3.0	KHCTP	Broadcom	2	25GbE	SFP28	No	Yes	X8	Gen3
OCP 3.0	24FG6	Broadcom	2	25GbE	V3	No	Yes	X8	Gen3
OCP 3.0	T6HR8	Broadcom	2	10GbE	BT	No	Yes	X8	Gen3
OCP 3.0	RN1M5	Broadcom	2	10GbE	V2	No	Yes	X8	Gen3
OCP 3.0	VMFKR	Intel	2	10GbE	BT	No	Yes	X8	Gen3

Table 10. R7615 OCP 3.0 support list (continued)

Form Factor	DPN	Vendor	# of ports	Max Port speed	Port type	SNAPI	WOL	Max PCIe width	PCIe Gen
OCP 3.0	W5HC8	Broadcom	4	10GbE	BT	No	Yes	X16	Gen3
OCP 3.0	3Y64D	Broadcom	4	25GbE	V3	No	Yes	X16	Gen3
OCP 3.0	R1KTR	Intel	4	25GbE	SFP28	No	Yes	X16	Gen4
OCP 3.0	WW2NX	Intel	4	1GbE	BT	No	Yes	X4	Gen2

(i) **NOTE:** Supported OCP PCIe width is x8 on system board, OCP downgrades x16 to x8 when OCP R1KTR/3Y64D/W5HC8 is installed.

OCP NIC 3.0 vs. rack Network Daughter Card comparisons

Table 11. OCP 3.0, 2.0, and rNDC NIC comparison

Form Factor	Dell rNDC	OCP 2.0 (LOM Mezz)	OCP 3.0	Notes
PCIe Gen	Gen 3	Gen 3	Gen 4	Supported OCP3 are SFF (small form factor)
Max PCIe Lanes	x8	Up to x16	Up to x8	See server slot priority matrix
Shared LOM	Yes	Yes	Yes	This is iDRAC port redirect
Aux Power	Yes	Yes	Yes	Used for Shared LOM

PCIe subsystem

Topics:

*   PCIe risers

PCIe risers

Shown below are the riser offerings for R7615. For a full list of supported cards and slot priority, please see the PCIe Slot Priority Matrix found in Agile.
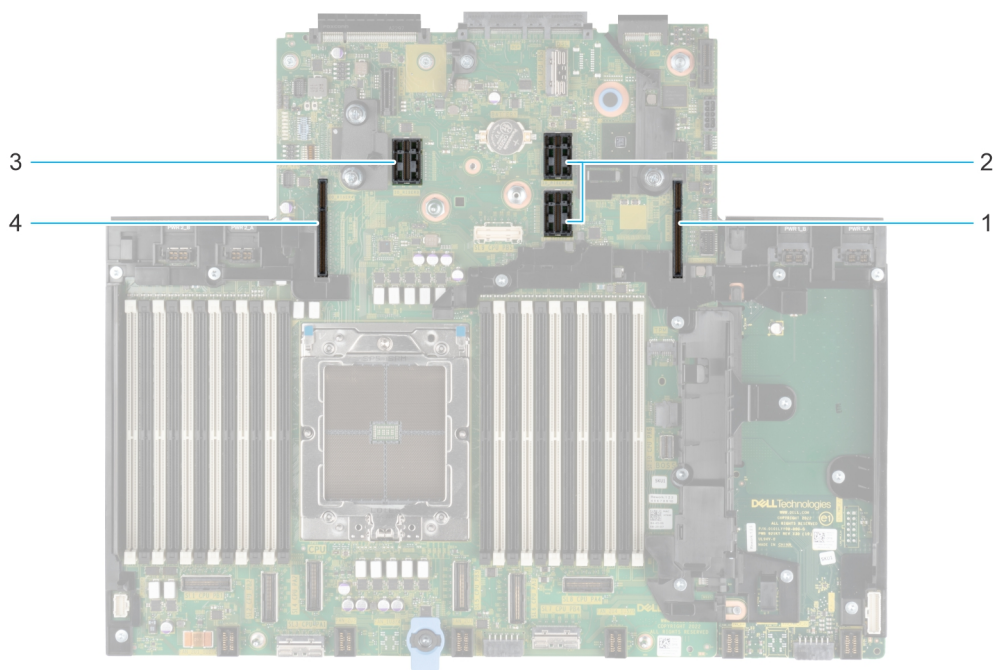
Figure 12. Expansion card riser slot connectors

1. Riser 1
2. Riser 2
3. Riser 3
4. Riser 4
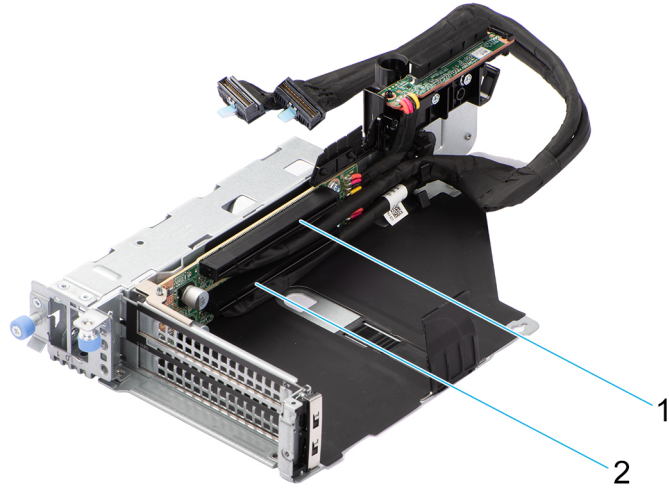
Figure 13. R1U

1. Slot 1
2. Slot 2
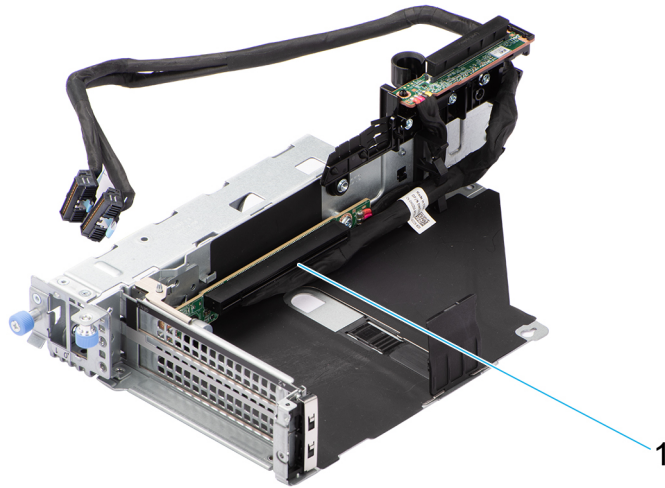
Figure 14. R1T

1. Slot 2
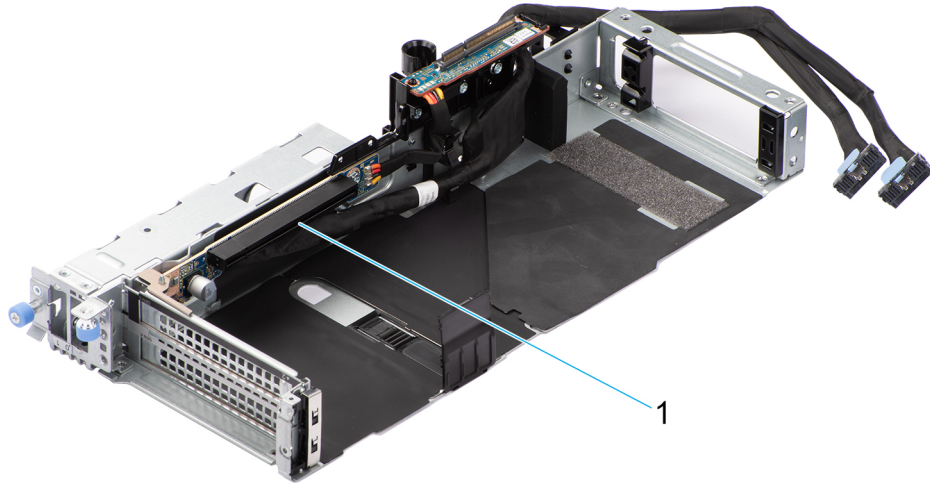
Figure 15. R1T

1. Slot 2
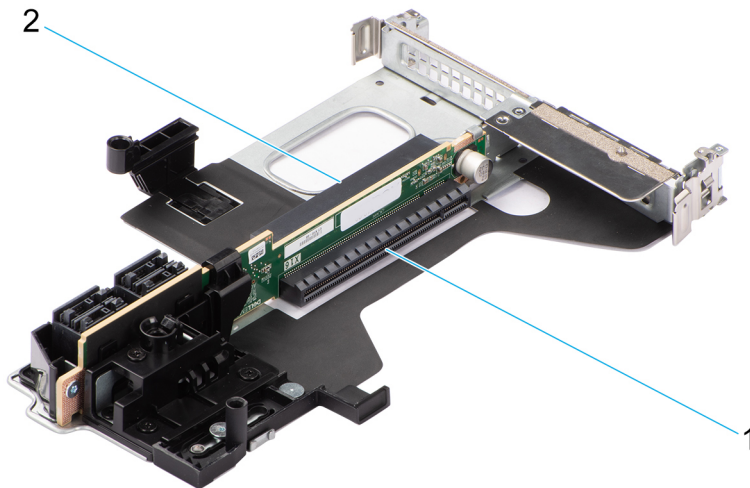
Figure 16. R2A

1. Slot 3
2. Slot 6
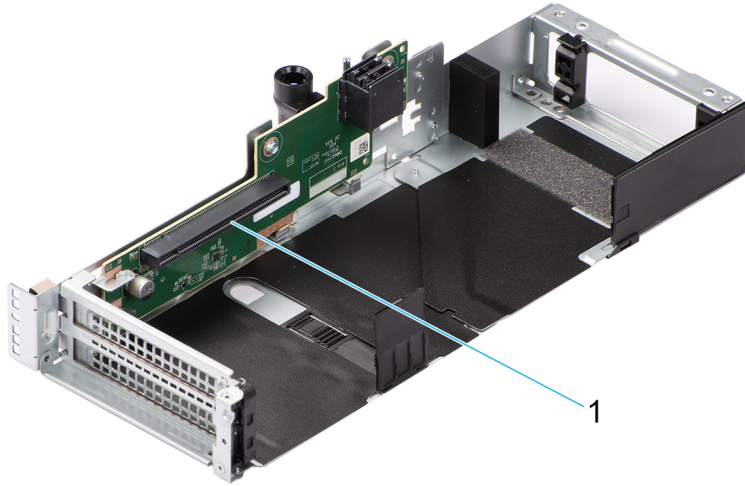
Figure 17. R3A

1. Slot 5
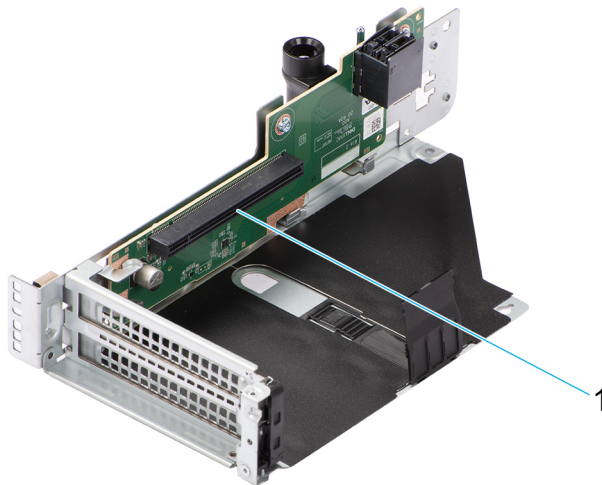
Figure 18. R3A

1. Slot 5
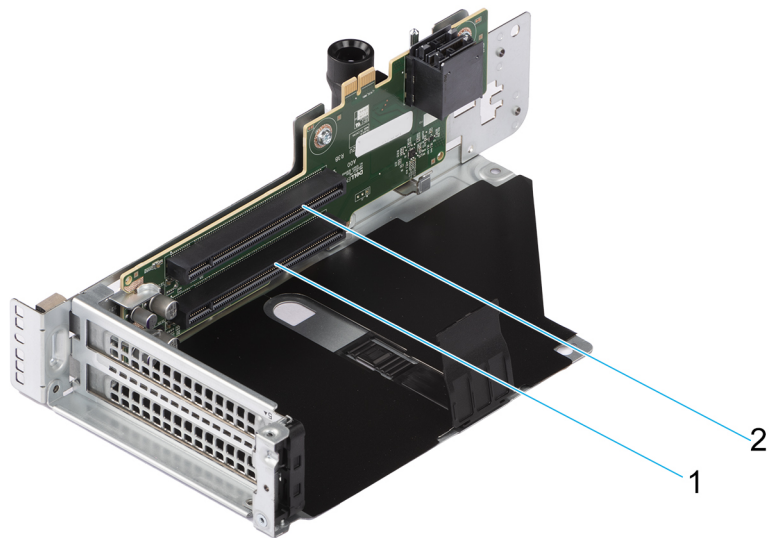
Figure 19. R3B

1. Slot 4
2. Slot 5
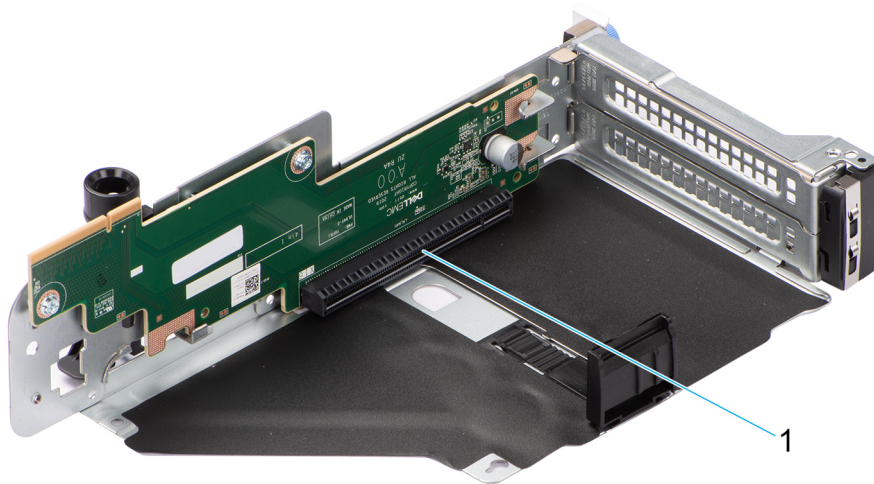
Figure 20. R4A

1. Slot 7
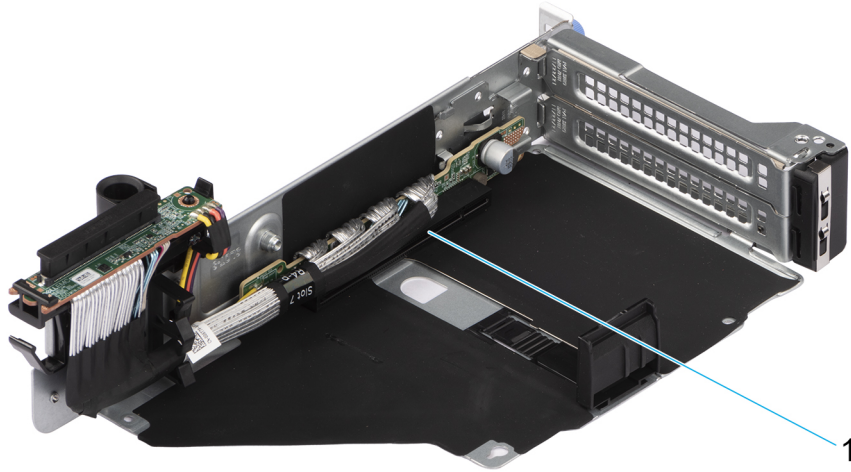
Figure 21. R4P

1. Slot 7
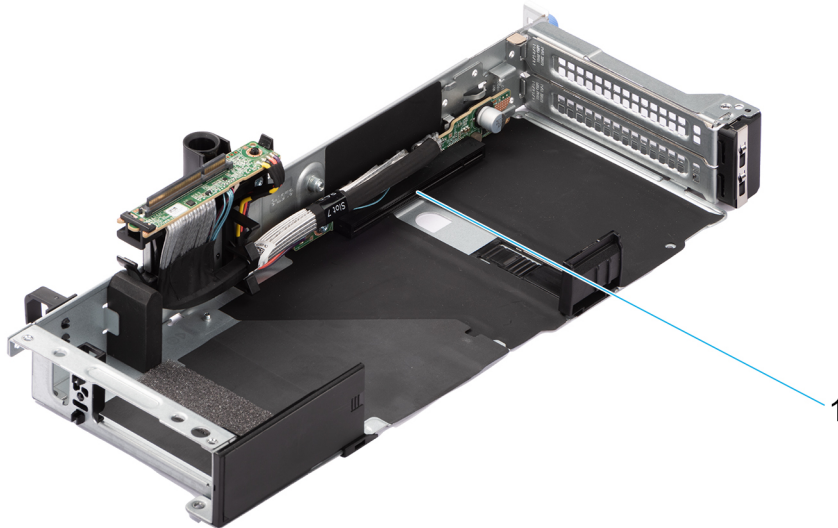
Figure 22. R4P

1. Slot 7
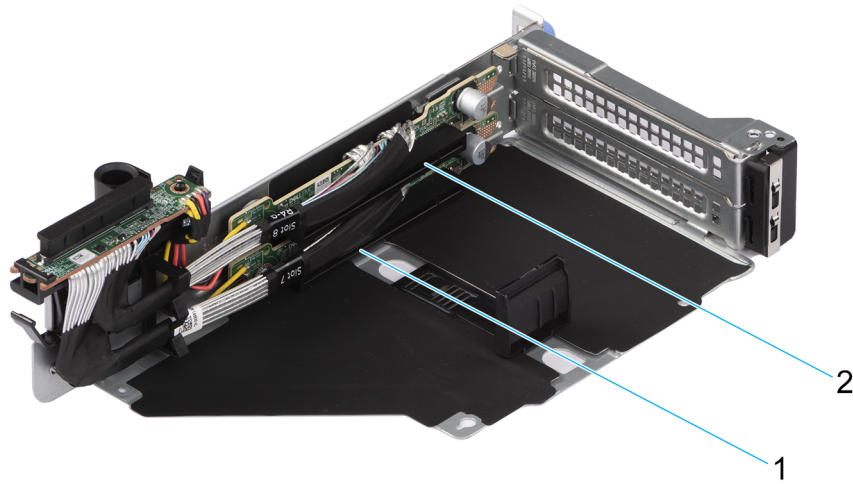
Figure 23. R4Q

1. Slot 7
2. Slot 8
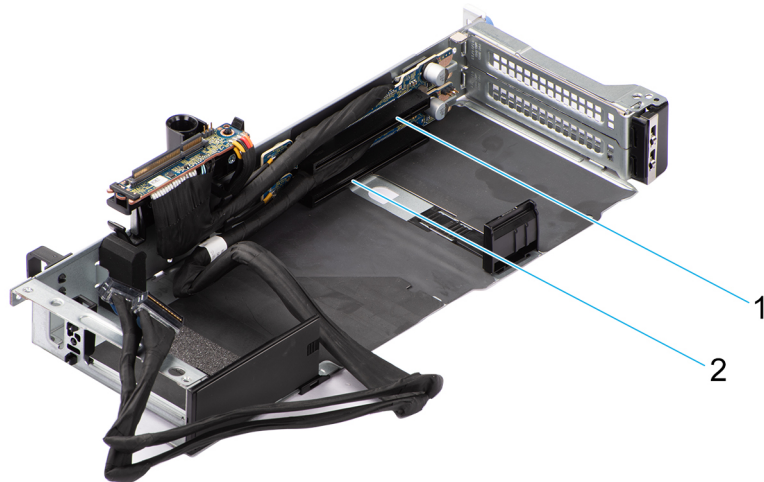
Figure 24. R4S

1. Slot 7
2. Slot 8

Table 12. PCIe Riser Configs

Config #	RSR Configuration	# of CPUs	PERC type supported	Rear Storage Possible
0	NO RSR	1	Front PERC	No
1	R2a + R3a + R4p (HL)	1	Front PERC	No
2	R1u + R2a + R3b + R4q	1	Front PERC/ PERC Adapter	No
3-1	R1t + R2t + R3b + R4p (HL)	1	Front PERC/ PERC Adapter	No

Table 12. PCIe Riser Configs (continued)

Config #	RSR Configuration	# of CPUs	PERC type supported	Rear Storage Possible
3-2	R1t + R2t + R3b + R4p (FL)	1	Front PERC/ PERC Adapter	No
4-1	R1t + R2t + R3a + R4p (HL)	1	Front PERC	No
4-2	R1t + R2t + R3a + R4p (FL)	1	Front PERC	No
5-1	R1t + R2t + R3a + R4s (HL)	1	Front PERC	No
5-2	R1t + R2t + R3a + R4s (FL)	1	Front PERC	No
6	R2t + R4q	1	Front PERC/ PERC Adapter	Yes
7	R1u + R2t + R4q	1	Front PERC/ PERC Adapter	Yes
8	R2a + R4a (HL)	1	Front PERC/ PERC Adapter	No
9	R2a + R3a + R4p (HL)	1	PERC Adapter	Yes
10	R1u+R3b+4q (HL)	1	Front PERC/ PERC Adapter	Yes

Table 13. R2a+R3a+R4p (HL)

Configuration	PCIe slot location	Width	Length	Height	R2a		R3a	R4q
			Assy DPN		3MPPM		C8KNG	535MN
1. R2a+R3a+R4p (HL)	PCIe Slot-3	SW	HL	LP	Gen4 x8	-	-	-
	PCIe Slot-6	SW	HL	LP	-	Gen4 x8		
	PCIe Slot-5	SW	HL/FL	FH		-	Gen4 x16	
	PCIe Slot-7	SW	HL/FL	FH			-	Gen5 x16

Table 14. R1u+R2a+R3b+R4q

Configuration	PCIe slot location	Width	Length	Height	R1u	R2a		R3b	R4q
			Assy DPN		92FFD	3MPPM		JGR1Y	26H63
2. R1u+R2a+R3b+R4q	PCIe Slot-1	SW	HL/FL	FH	Gen4 x8	-	-	-	-
	PCIe Slot-2	SW	HL/FL	FH	Gen4 x8				
	PCIe Slot-3	SW	HL	LP	-	Gen5 x8			
	PCIe Slot-6	SW	HL	LP		-	Gen5 x8		-
	PCIe Slot-4	SW	HL/FL	FH			-	Gen4 x8	
	PCIe Slot-5	SW	HL/FL	FH				Gen4 x8	

Table 14. R1u+R2a+R3b+R4q (continued)

Configuration	PCIe slot location	Width	Length	Height	R1u	R2a	R3b	R4q
	PCIe Slot-7	SW	HL/FL	FH			-	Gen5 x8
	PCIe Slot-8	SW	HL/FL	FH				Gen5 x8

Table 15. R1t+R2t+R3b+R4p

Configuration	PCIe slot location	Width	Length	Height	R1t	R2t		R3b	R4p
	Assy DPN				WJGW7	GCDC4		JGR1Y	5H2GJ
3. R1t+R2t+R3b+R4p	PCIe Slot-2	DW	HL/FL	FH	Gen5 x16	-	-	-	-
	PCIe Slot-3	SW	HL	LP	-	Gen4 x16	-	-	-
	PCIe Slot-6	SW	HL	LP	-	-	Gen4 x16	-	-
	PCIe Slot-4	SW	HL/FL	FH	-	-	-	Gen4 x8	-
	PCIe Slot-5	SW	HL/FL	FH	-	-	-	Gen4 x8	-
	PCIe Slot-7	DW	HL/FL	FH	-	-	-	-	Gen5 x16

Table 16. R1t+R2t+R3a+R4p

Configuration	PCIe slot location	Width	Length	Height	R1t	R2t		R3a	R4p
	Assy DPN				WJGW7	GCDC4		VTC3V	5H2GJ
4. R1t+R2t+R3a+R4p	PCIe Slot-2	DW	HL/FL	FH	Gen5 x16	-	-	-	-
	PCIe Slot-3	SW	HL	LP	-	Gen4 x16	-	-	-
	PCIe Slot-6	SW	HL	LP	-	-	Gen4 x16	-	-
	PCIe Slot-5	DW	HL/FL	FH	-	-	-	Gen4 x16	-
	PCIe Slot-7	DW	HL/FL	FH	-	-	-	-	Gen5 x16

Table 17. R1t+R2t+R3b+R4p

Configuration	PCIe slot location	Width	Length	Height	R1t	R2t		R3a	R4s
	Assy DPN				XWR65	GCDC4		3PPC3	83X3J
5. R1t+R2t+R3a+R4s	PCIe Slot-2	DW	HL/FL	FH	Gen5 x16	-	-	-	-
	PCIe Slot-3	SW	HL	LP	-	Gen4 x16	-	-	-

Table 17. R1t+R2t+R3b+R4p (continued)

Configuration	PCIe slot location	Width	Length	Height	R1t	R2t		R3a	R4s
	PCIe Slot-6	SW	HL	LP	-	-	Gen4 x16	-	-
	PCIe Slot-4	SW	HL/FL	FH	-	-	-	Gen4 x16	-
	PCIe Slot-5	SW	HL/FL	FH	-	-	-	-	Gen5 x16
	PCIe Slot-7	DW	HL/FL	FH	-	-	-	-	Gen5 x16

Table 18. R2t+R4q

Configuration	PCIe slot location	Width	Length	Height	R2t		R4q
	Assy DPN				GCDC4		26H63
6. R2t+R4q	PCIe Slot-3	SW	HL	LP	Gen5 x16	-	-
	PCIe Slot-6	SW	HL	LP	-	Gen4 x16	-
	PCIe Slot-7	SW	HL/FL	FH	-	-	Gen5 x8
	PCIe Slot-8	SW	HL/FL	FH	-	-	Gen5 x8

Table 19. R1u+R2t+R4q

Configuration	PCIe slot location	Width	Length	Height	R1tu	R2t	R3a	R4s
	Assy DPN				92FFD	GCDC4		26H63
7. R1u+R2t+R4q	PCIe Slot-1	SW	HL/FL	FH	Gen5 x8	-	-	-
	PCIe Slot-2	SW	HL/FL	FH	Gen5 x8	-	-	-
	PCIe Slot-3	SW	HL	LP	-	Gen4 x16	-	-
	PCIe Slot-6	SW	HL	LP	-	-	Gen4 x16	-
	PCIe Slot-7	SW	HL/FL	FH	-	-	-	Gen5 x8
	PCIe Slot-8	SW	HL/FL	FH	-	-	-	Gen5 x8

Table 20. R2a+R4a

Configuration	PCIe slot location	Width	Length	Height	R2a		R4a
	Assy DPN				3MPPM		NJPKX
8. R2a+R4a	PCIe Slot-3	SW	HL	LP	Gen4 x8	-	-
	PCIe Slot-6	SW	HL	LP	-	Gen4 x8	-
	PCIe Slot-7	SW	HL/FL	FH	-	-	Gen4 x16

Table 21. R2a+R3a+R4p

Configuration	PCIe slot location	Width	Length	Height	R2a		R3a	R4p
	Assy DPN				3MPPM		C8KNG	535MN
9. R2a+R3a+R4p	PCIe Slot-3	SW	HL	LP	Gen4 x8	-	-	-
	PCIe Slot-6	SW	HL	LP	-	Gen4 x8	-	-

Table 21. R2a+R3a+R4p (continued)

Configuration	PCIe slot location	Width	Length	Height	R2a		R3a	R4p
	PCIe Slot-5	SW	HL/FL	FH	-	-	Gen4 x16	-
	PCIe Slot-7	SW	HL/FL	FH	-	-	-	Gen5 x16

Table 22. R1U+R3B+R4Q

Configuration	PCIe slot location	Width	Length	Height	R1U	R3B	R4Q
	Assy DPN				92FFD	JGR1Y	26H63
10. R1U+R3B+R4Q	PCIe Slot-1	SW	HL/FL	FH	Gen5 x8	-	-
	PCIe Slot-2	SW	HL/FL	FH	Gen5 x8	-	-
	PCIe Slot-4	SW	HL/FL	FH	-	Gen4 x8	-
	PCIe Slot-5	SW	HL/FL	FH	-	Gen4 x8	-
	PCIe Slot-7	SW	HL/FL	FH	-	-	Gen5 x8
	PCIe Slot-8	SW	HL/FL	FH	-	-	Gen5 x8

Power, thermal, and acoustics

PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption. The table below lists the tools and technologies Dell offers to lower power consumption and increase energy efficiency.

Topics:

• Power

Power

Table 23. Power tools and technologies

Feature	Description
Power Supply Units(PSU) portfolio	Dell's PSU portfolio includes intelligent features such as dynamically optimizing efficiency while maintaining availability and redundancy. Find additional information in the Power supply units section.
Tools for right sizing	Enterprise Infrastructure Planning Tool (EIPT) is a tool that can help you determine the most efficient configuration possible. With Dell's EIPT, you can calculate the power consumption of your hardware, power infrastructure, and storage at a given workload. Learn more at www.dell.com/calc.
Industry Compliance	Dell's servers are compliant with all relevant industry certifications and guide lines, including 80 PLUS, Climate Savers and ENERGY STAR.
Power monitoring accuracy	PSU power monitoring improvements include: ● Dell's power monitoring accuracy is currently 1%, whereas the industry standard is 5% ● More accurate reporting of power ● Better performance under a power cap
Power capping	Use Dell's systems management to set the power cap limit for your systems to limit the output of a PSU and reduce system power consumption. Dell is the first hardware vendor to leverage Intel Node Manager for circuit-breaker fast capping.
Systems Management	iDRAC Enterprise and Datacenter provides server-level management that monitors, reports and controls power consumption at the processor, memory and system level. Dell OpenManage Power Center delivers group power management at the rack, row, and data center level for servers, power distribution units, and uninterruptible power supplies.
Active power management	Intel Node Manager is an embedded technology that provides individual server-level power reporting and power limiting functionality. Dell offers a complete power management solution comprised of Intel Node Manager accessed through Dell iDRAC9 Datacenter and OpenManage Power Center that allows policy-based management of power and thermal at the individual server, rack, and data center level. Hot spare reduces power consumption of redundant power supplies. Thermal control off a speed optimizes the thermal settings for your environment to reduce fan consumption and lower system power consumption. Idle power enables Dell servers to run as efficiently when idle as when at full workload.
Fresh Air cooling	Refer to ASHRAE A3/A4 Thermal Restriction.
Rack infrastructure	Dell offers some of the industry's highest-efficiency power infrastructure solutions, including:

Table 23. Power tools and technologies (continued)

Feature	Description
	• Power distribution units (PDUs) • Uninterruptible power supplies (UPSs) • Energy Smart containment rack enclosures Find additional information at: https://www.delltechnologies.com/en-us/servers/power-and-cooling.htm.

Power Supply Units

Energy Smart power supplies have intelligent features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. Also featured are enhanced power-consumption reduction technologies, such as high-efficiency power conversion and advanced thermal-management techniques, and embedded power-management features, including high-accuracy power monitoring. The table below shows the power supply unit options that are available for the R7615.

Table 24. Power Supply Unit Options

Wattage	Frequency	Voltage/Current	Class	Heat dissipation
700 W mixed mode	50/60Hz	200-240 V AC/4.1 A	Titanium	2625 BTU/hr
	N/A	240 V DC/3.4 A	N/A	2625 BTU/hr
800 W mixed mode	50/6 0Hz	100–240 Vac/ 9.2—4.7 A	Platinum	3000 BTU/hr
	N/A	240 Vdc/3.8 A	N/A	3000 BTU/hr
1100 W mixed mode	50/60 Hz	100–240 Vac/ 12—3.6 A	Titanium	4100 BTU/hr
	N/A	240 Vdc/5.2 A	N/A	4100 BTU/hr
1100 W -48 VDC	N/A	-48—-60 Vdc	N/A	4625 BTU/hr
1400 W mixed mode	50/60 Hz	100–240 Vac/ 12—8 A	Platinum	5250 BTU/hr
	N/A	240 Vdc/6.6 A	N/A	5250 BTU/hr
1800 W mixed mode	50/60 Hz	200-240 V AC/10 A	Titanium	6610 BTU/hr
	N/A	240 V DC/8.2 A	N/A	6610 BTU/hr
2400 W mixed mode	50/60 Hz	100–240 Vac/ 16—13.5 A	Platinum	9000 BTU/hr
	N/A	240 Vdc/11.2 A	N/A	9000 BTU/hr

ⓘ **NOTE:** If a system with AC 2400 W PSUs operates at low line 100-120 Vac, and then the power rating per PSU is degraded to 1400 W.

ⓘ **NOTE:** If a system with AC 1400 W or 1100 W PSUs operates at low line 100-120 Vac, and then the power rating per PSU is degraded to 1050 W.

Figure 25. PSU power cords

Table 25. PSU power cords

Form factor	Output	Power cord
Redundant 60 mm	700 W AC	C13
	800 W AC	C13
	1100 W AC	C13
	1100 W -48 VDC	C13
	1400 W AC	C13
	1800 W AC	C15
Redundant 86 mm	2400 W AC	C19

Thermal design

Thermal management of the platform helps deliver high performance with the right amount of cooling to components, while maintaining the lowest fan speeds possible. This is done across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F) and to extended ambient temperature ranges.
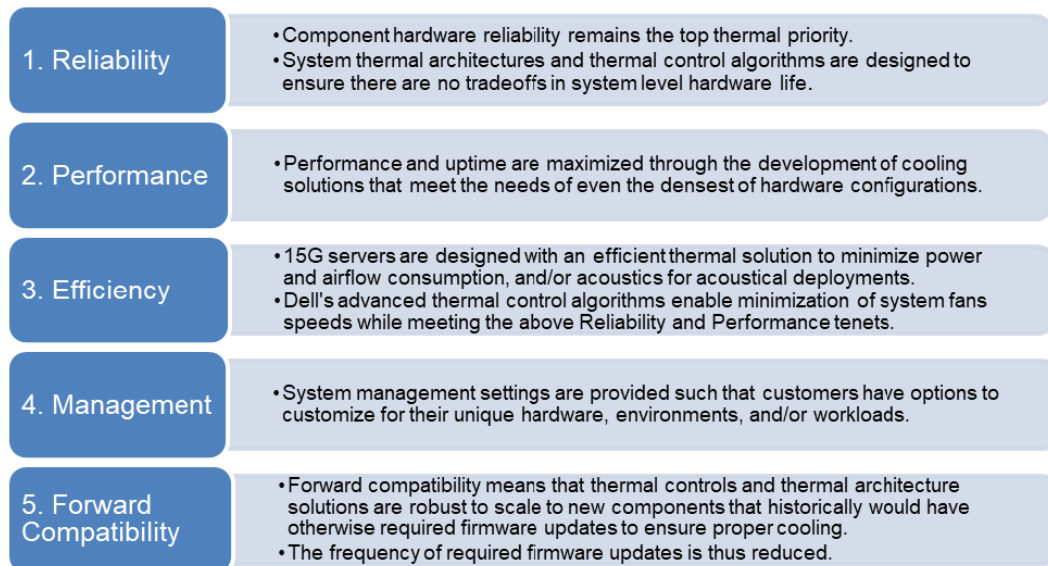

1. Reliability	• Component hardware reliability remains the top thermal priority. • System thermal architectures and thermal control algorithms are designed to ensure there are no tradeoffs in system level hardware life.
2. Performance	• Performance and uptime are maximized through the development of cooling solutions that meet the needs of even the densest of hardware configurations.
3. Efficiency	• 15G servers are designed with an efficient thermal solution to minimize power and airflow consumption, and/or acoustics for acoustical deployments. • Dell's advanced thermal control algorithms enable minimization of system fans speeds while meeting the above Reliability and Performance tenets.
4. Management	• System management settings are provided such that customers have options to customize for their unique hardware, environments, and/or workloads.
5. Forward Compatibility	• Forward compatibility means that thermal controls and thermal architecture solutions are robust to scale to new components that historically would have otherwise required firmware updates to ensure proper cooling. • The frequency of required firmware updates is thus reduced.

Figure 26. Thermal design characteristics

The thermal design of the PowerEdge R7615 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 minimum expense of fan power.
- Comprehensive thermal management: The thermal control system regulates the fan speed based on several different responses from all system-component temperature sensors, as well as inventory for system configurations. Temperature monitoring includes components such as processors, DIMMs, chipset, the inlet air ambient, hard disk drives, and OCP.
- Open and closed loop thermal fan speed control: Open loop thermal control uses system configuration to determine fan speed based on inlet air ambient temperature. Closed loop thermal control method uses feedback temperatures to dynamically determine proper fan speeds.
- User-configurable settings: With the understanding and realization that every customer has unique set of circumstances or expectations from the system, in this generation of servers, we have introduced limited user- configurable settings residing in the iDRAC "BIOS setup" screen. For more information, see the Dell PowerEdge R7615 Installation and Service Manual at www.dell.com/poweredgemanuals and "Advanced Thermal Control: Optimizing across Environments and Power Goals" on Dell.com.
- Cooling redundancy: The R7615 allows N+1 fan redundancy, allowing continuous operation with one fan failure in the system.
- Cooling redundancy: The R7615 with >4 fans allows N+1 fan redundancy, allowing continuous operation with one fan failure in the system.

- Environmental Specifications: The optimized thermal management makes the R7615 reliable under a wide range of operating environments.

Acoustics

Acoustical design

Dell PowerEdge delivers sound quality and smooth transient response in addition to sound power levels and sound pressure levels oriented to deployment environments.

Sound quality describes how disturbing or pleasing a person finds a sound, as a function of a variety of psycho-acoustical metrics and thresholds. Tone prominence is one such metric. Transient response refers to how sound changes with time. Sound power level, sound pressure level, and loudness refer to amplitude of sound. A reference for comparison to sound pressure levels and loudness for familiar noise sources is mentioned in the table below.

Table 26. Acoustical Reference Points and Output Comparisons

Value measured at your ears		Equivalent familiar noise experience
LpA, dBA, re 20μPa	Loudness, sones	
90	80	Loud concert
75	40	Data center, vacuum cleaner, voice must be elevated to be heard
60	10	Conversation levels
45	4	Whispering, open office layout, normal living room
35	2	Quiet office
30	1	Quiet library
20	0	Recording studio

For more information about PowerEdge acoustical design and metrics, see Understanding Acoustical Data and Causes of Sound in Dell Enterprise Products.

Standby Mode

In standby mode, one of the system air movers may continue to run at a low speed in order to provide cooling to components that are powered on when the system is plugged in and you may hear this sound.

Sound Cap

Sound cap is an iDRAC system profile which provides some system performance capping to achieve reduced acoustics without sacrificing reliability. When sound cap is enabled, acoustics are reduced at the expense of system performance. Designed for scenarios in which the server is redeployed from a data center into a noise-sensitive environment, Sound Cap results in limits to acoustical output by applying a power-capping percentage to the CPU(s). The power cap reduces heat generated by the CPUs during high utilization, which reduces fan speed needed for CPU cooling, which in turn reduces acoustical output.

Sound Cap may be useful in the following scenarios:

- Deployment of data center rack servers to quieter environments such as lab or office areas.
- Equipment setup when hardware or software is being loaded.
- Equipment demonstrations or tours in which presenters wish to minimize fan noise from the server.
- When limiting acoustics is consciously prioritized over CPU performance.

Sound Cap applies a percentage-based power cap to the CPU(s) in the server. Sound Cap can limit acoustical output, and it does not impact system cooling performance or any component thermal reliability. It also will not impact fan speeds in moderate CPU workloads or when the system is in idle state. Sound Cap should not be used or may be ineffective in the following scenarios:

- Benchmarking or performance-sensitive applications.
- Reducing idle fan speeds or make a quiet server even quieter.
- · Using PCIe-based or VDI workloads.

Sound Cap is enabled in System Settings of the iDRAC GUI or in iDRAC settings within the BIOS setup. Additional information about Sound Cap feature in iDRAC can be found in a white paper published online.

Tips for Acoustically Sensitive Environments

The main cause of computer noise is thermal management, which regulates air mover speeds (such as fans, blowers, etc.) to cool components within their designated limits. Since sound amplitude scales logarithmically with air movement speed, seemingly insignificant changes in speed can have surprisingly noticeable effects. For example, a 10% speed change results in an approximate 2 dB change in sound pressure level, while a 20% speed change results in an approximate 5 dB change in sound pressure level.

In light of this, Table 50 lists several typical thermal drivers and offers advice on how to deal with them in acoustically sensitive settings. It should be noted that additional components might start to make noise as the ambient temperature, component power, and/or loading drop to the point where air movers are operating at their lowest speed. Examples include the humming of hard drives and the ringing of capacitors.

Table 27. Thermal drivers and tips to address acoustically sensitive environments

Driver	Description	Tip
GPU / FPGA / Accelerator Cards	• GPU, FPGA, or other accelerator cards often push the limits of power and cooling requirements in the PCI form factor. • They may therefore require significantly higher air mover speeds and cause the host system to be much louder. • During system bootup, air mover speeds may ramp (sometimes to full speed) to ensure the cards comply with their thermal limits at assumed worst case thermal state before thermal telemetry feedback is established in bootup. After bootup and telemetry feedback ascertains actual thermal conditions, air mover speeds may reduce.	If deemed an acceptable compromise to accommodate the environment, uninstalling the GPU or running it at a lower loading may reduce air mover speed and acoustical amplitude.
PCI Cards	Dell works diligently with card vendors to validate and develop PCI cards to meet Dell's exacting standards for thermal performance. Although Dell's products can look up and cool appropriately for a variety of cards, some 3rd party cards may be unknown and thus air mover speed may be higher for thermal protection.	• Replace third party PCI cards with similar Dell supported temperature-controlled cards, if available. • Set target in Third party PCIe card options: Dell provides airflow customization for third-party PCIe adapters installed in PowerEdge platforms. If automatic cooling response is above desired levels (LFM) based on the card specifications, a different LFM target can be set using PCIe Airflow Settings options in iDRAC GUI.
Storage Type	NVME SSD consumes more power than SAS/SATA drive technologies and therefore demands more airflow to achieve system cooling targets thus higher air mover speeds.	If deemed an acceptable compromise to accommodate the environment, replacing NVME SSD devices with SAS/SATA drives may reduce acoustical amplitude.
Thermal Design Power (TDP)	Higher wattage components under load may require more airflow and thus higher air mover speeds and louder host system.	

Table 27. Thermal drivers and tips to address acoustically sensitive environments (continued)

Driver	Description	Tip
System thermal profile selection in BIOS or iDRAC GUI	*Default Thermal Profile*, generally provides a lower air mover speed thus lower acoustical output than those of other thermal profiles. *Maximum Performance (Performance Optimized)* prioritizes performance above other aspects thus will more quickly increase air mover speed and be louder. *Sound Cap*, for products that support the feature and when CPU cooling needs are dictating air mover speeds, can limit maximum acoustical output of the system by sacrificing some CPU performance.	
BOSS N1 module	If any BOSS N1 module is installed and "Maximum Performance (Performance Optimized)" is selected, air mover speed and acoustical noise may significantly increase at idle condition	
Ambient Temperature	ISO standards, ECMA standards, and Dell specs require acoustical tests in 23±2°C ambient temperature. When ambient temperature is higher, air movers must speed up to compensate and thus generate more sound.	

PowerEdge R7615 acoustics

Dell PowerEdge R7615 is a rack-mount server for which acoustical output ranges from that appropriate for an office to that of data centers. Acoustical performance is provided in terms of one configuration: Feature Rich.

Although the R7615 is intended for data centers, certain users might want a more peaceful environment. For such a circumstance, the section on "Tips for an Acoustically Sensitive Environment" may be useful. Please be aware, however, that in the majority of situations, the system's idle air mover speed cannot be reduced without modifying the system's configuration, and in some instances, even a configuration change may not be able to do so.

Configuration details are provided in the below table for Feature Rich configuration:

Table 28. Acoustical configurations of R7615

Configuration	Minimum	Typical-1, 2.5-inch	Typical-2, 3.5-inch	GPU	Feature Rich
CPU Type	AMD	AMD	AMD	AMD	AMD
CPU TDP / Cores	200 W / 24C	200 W / 24C	200 W / 24C	260 W / 32C	320 W / 32C
CPU Quantity	1	1	1	1	1
RDIMM Memory	16GB, RDIMM	16GB, RDIMM	32GB, RDIMM	32GB, RDIMM	32GB, RDIMM
Memory Quantity	6	12	12	24	24
Backplane Type	5" x 12	5" x 8	5" x 12 + 4 x E3 Rear	5" x 24 exp BP	5" x 24 exp BP
HDD Type	5" SATA	5" SSD	5" HDD+E3	5" SSD	5" SSD
HDD Quantity	1	8	3.5-inch x 12 + E3 x 4	16	24
PSU Type	800 W	800 W	1400 W	2400 W	2400 W
PSU Quantity	2	2	2	2	2
OCP	Dual Port 10 GbE	Dual Port 25 GbE	Dual Port 25 GbE	Dual Port 25 GbE	Dual Port 25 GbE
PCI 1	-	25 Gb PCI	10 Gb PCI	GPU: Double-Wide	100 Gb PCI
PCI 2	-	25 Gb PCI	10 Gb PCI	100 Gb PCI	100 Gb PCI
PCI 3	-	-	-	100 Gb PCI	-
PCI 4	-	-	-	GPU: Double-Wide	-

Acoustical experience data for the configuration: Feature Rich is provided in the below table.

Table 29. Acoustical performance of R7615

Configuration		Feature Rich
Acoustical Performance: Idle/ Operating @ 25 °C Ambient		
$L_{wA,m}(B)$	Idle	7.3
	Operating	7.3
$K_v(B)$	Idle	0.4
	Operating	0.4
$L_{pA,m}(dB)$	Idle	57
	Operating	57
Prominent tones		Prominence ratio < 15 dB
Acoustical Performance: Idle @ 28 °C Ambient		
$L_{wA,m}$ (B)		7.7
K_v (B)		0.4
$L_{pA,m}$ (dB)		61
Acoustical Performance: Max. Loading @ 35 °C Ambient		
$L_{wA,m}$ (B)		8.8
K_v (B)		0.4
$L_{pA,m}$ (dB)		73

- $L_{wA,m}$: The declared mean A-weighted sound power level (LwA) is calculated per section 5.2 of ISO 9296 with data collected using the methods described in ISO 7779 (2010). Engineering data presented here may not be fully compliant with ISO 7779 declaration requirements.
- $L_{pA,m}$: The declared mean A-weighted emission sound pressure level is at the bystander position per section 5.3 of ISO 9296 and measured using methods described in ISO 7779. The system is placed in a 24U rack enclosure, 25cm above a reflective floor. Engineering data presented here may not be fully compliant with ISO 7779 declaration requirements.
- **Prominent discrete tones:** Criteria of Annex D of ECMA-74 & Prominence Ratio method of ECMA-418 are followed to determine if discrete tones are prominent and to report them, if so.
- **Idle mode:** Idle mode is the steady-state condition in which the server is energized but not operating any intended function.
- **Operating mode:** Operating mode is represented by the maximum of the steady state acoustical output at 50% of CPU TDP or active storage drives for the respective sections of Annex C of ECMA-74.

The below Category tables show the R7615 configuration tested for acoustical experience of each configuration in a 23±2°C environment.

Category 1: Table-top in Office Environment

When Dell determines that a specific Enterprise product is to be used primarily on top of the table, then the acoustical specification in the table below applies. Noise from the product should not annoy or otherwise interfere with the user's thoughts or speech, for example, on the telephone.

Table 30. Dell Enterprise Category 1, "Table-top in Office Environment" acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			Simulate (that is, set fan speeds representative) for Idle at 28° C & 35° C Ambient, and for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required	
Sound Power	LWA,m, B	≤ 4.2	≤ 4.7	≤ 5.0	Report
Sound Quality (both positions must meet limits): Front Binaural HEAD and Rear Microphone	Tones, Hz, dB	No prominent tones per criteria D.10.6 and D.10.8 of ECMA-74			Report tones
	Tonality, tu	≤ 0.35	≤ 0.35	≤ 0.35	Report
	Dell Modulation, %	≤ 35	≤ 35	≤ 35	Report
	Loudness, sones	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report
Front Binaural HEAD	Transients	- Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria: - Max. {ΔLpA} < 3.0 dB - Event count < 3 for "1.5 dB < ΔLpA < 3.0 dB" - Acoustical Jump (see AC0159), during air mover speed transition from Idle to Operating Mode must be ≤ 15dB. - Startup behavior - Report Startup behavior re. AC0159 - Startup must proceed smoothly, i.e., no sudden or large jumps, and fan speed during startup must not exceed 50% of its maximum - Transient inputs: Report time-history sound pressure levels re AC0159 "Train of Step Functions on Processor"			N/A
Any	Other	- No rattles, squeaks, or unexpected noises. - Sound should be "even" around the EUT (one side should not be dramatically louder than another). - Unless otherwise specified, the "default" thermal-related settings shall be selected for BIOS and iDRAC. - Specific operating conditions are defined in "Configurations and Configuration Dependencies" for each platform.			
Sound Pressure	LpA-reported, dBA, re AC0158 and program configuration document	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Category 2: Floor-standing in Office Environment

When Dell determines that a specific Enterprise product is to be used primarily when it is sitting on the floor, that is, next to a user's feet, then the acoustical specification in the table below applies. Noise from the product should not annoy or otherwise interfere with the user's thoughts or speech, for example, on the telephone.

Table 31. Dell Enterprise Category 2, "Floor-standing in Office Environment" acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required	Simulate (that is, set fan speeds representative) for Idle at 28° C & 35° C Ambient, and for 100% loading and maximum configuration, at 35° C Ambient
Sound Power	LWA,m, B	≤ 4.9	≤ 5.1	≤ 5.4	Report
Sound Quality (both positions must meet limits): Front Binaural HEAD and Rear Microphone	Tones, Hz, dB	No prominent tones per criteria D.10.6 and D.10.8 of ECMA-74			Report tones
	Tonality, tu	≤ 0.35	≤ 0.35	≤ 0.35	Report
	Dell Modulation, %	≤ 35	≤ 35	≤ 35	Report
	Loudness, sones	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report
Front Binaural HEAD	Transients	- Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria: - Max. {ΔLpA} < 3.0 dB - Event count < 3 for "1.5 dB < ΔLpA < 3.0 dB" - Acoustical Jump (see AC0159), during air mover speed transition from Idle to Operating Mode must be ≤ 15 dB. - Startup behavior - Report Startup behavior re. AC0159 - Startup must proceed smoothly, that is, no sudden or large jumps, and fan speed during startup must not exceed 50% of its maximum - Transient inputs: Report time-history sound pressure levels re AC0159 "Train of Step Functions on Processor"			N/A
Any	Other	- No rattles, squeaks, or unexpected noises. - Sound should be "even" around the EUT (one side should not be dramatically louder than another). - Unless otherwise specified, the "default" thermal-related settings shall be selected for BIOS and iDRAC. - Specific operating conditions are defined in "Configurations and Configuration Dependencies" for each platform.			
Sound Pressure	LpA-reported, dBA, re AC0158 and program	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Table 31. Dell Enterprise Category 2, "Floor-standing in Office Environment" acoustical specification category (continued)

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			Simulate (that is, set fan speeds representative) for Idle at 28° C & 35° C Ambient, and for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	**Idle in 23±2° C Ambient**	**Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required**	
	configuration document				

Category 3: General Use Space

When Dell determines that a specific Enterprise product is to be predominantly used in a general use space, then the acoustical specification in the table below applies. These products could be found in laboratories, schools, restaurants, open office space layouts, small ventilated closets, etc., though not in close proximity to any particular person nor in quantities greater than a few in any location. People within proximity of a few of these products should not experience any impact to speech intelligibility or annoyance from the noise of the product. A rack product sitting on a table in a common area is an example.

Table 32. Dell Enterprise Category 3, "General Use Space" acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			Simulate (i.e., set fan speeds representative) for Idle at 28 & 35° C Ambient, and for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	**Idle in 23±2° C Ambient**	**Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required**	
Sound Power	LWA,m, B	≤ 5.2	≤ 5.5	≤ 5.8	Report
Sound Quality (both positions must meet limits): Front Binaural HEAD and Rear Microphone	Tones, Hz, dB	No prominent tones per criteria D.10.6 and D.10.8 of ECMA-74			Report tones
	Tonality, tu	≤ 0.35	≤ 0.35	≤ 0.35	Report
	Dell Modulation, %	≤ 35	≤ 35	≤ 35	Report
	Loudness, sones	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report

Front Binaural HEAD	Transients	● Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria:
		  ○ Max. {ΔLpA} < 3.0 dB
		  ○ Event count < 3 for "1.5 dB < ΔLpA < 3.0 dB"
					N/A

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			Simulate (i.e., set fan speeds representative) for Idle at 28 & 35° C Ambient, and for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	**Idle in 23±2° C Ambient**	**Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required**	
		○ Acoustical Jump (see AC0159), during air mover speed transition from Idle to Operating Mode must be ≤ 15dB. ● Startup behavior 　○ Report Startup behavior re. AC0159 　○ Startup must proceed smoothly, i.e., no sudden or large jumps, and fan speed during startup must not exceed 50% of its maximum ● ∞ Transient inputs: Report time-history sound pressure levels re AC0159 "Train of Step Functions on Processor"			
Any	Other	● No rattles, squeaks, or unexpected noises. ● Sound should be "even" around the EUT (one side should not be dramatically louder than another). ● Unless otherwise specified, the "default" thermal-related settings shall be selected for BIOS and iDRAC. ● Specific operating conditions are defined in "Configurations and Configuration Dependencies" for each platform.			
Sound Pressure	LpA-reported, dBA, re AC0158 and program configuration document	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Category 4: Attended Data Center

When Dell determines that a specific Enterprise product is to be predominantly used in an attended data center, then the acoustical specification of the table applies. The phrase "attended data center" is used to mean a space in which many (from tens to 1000s) of Enterprise products are deployed in proximity (that is, in the same room) to personnel whose speech (perhaps with raised voices) is expected to be intelligible over the data center noise. Hearing protection or hearing monitoring programs are not expected in these areas. Examples in this category include monolithic rack products. When Dell determines that a specific Enterprise product is to be predominantly used in a general use space, then the acoustical specification of the above table applies. These products could be found in laboratories, schools, restaurants, open office space layouts, small ventilated closets, etc., though not in close proximity to any particular person nor in quantities greater than a few in any location. People within proximity of a few of these products should not experience any impact to speech intelligibility or annoyance from the noise of the product. A rack product sitting on a table in a common area is an example.

Table 33. Dell Enterprise Category 4, "Attended Data Center" acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)				Simulate (that is, set fan speeds representative) for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required	Simulate (that is, set fan speeds representative) for Idle at 28° C & 35° C Ambient	
Sound Power	LWA,m, B	Report	≤ 6.9	≤ 7.1	Report	≤ 8.5
Front Binaural HEAD	Tones, Hz, dB	Report	< 15 dB	< 15 dB	Report	< 20 dB
	Tonality, tu	Report	Report	Report	Report	Report
	Dell Modulation, %	Report	Report	Report	Report	Report
	Loudness, sones	Report	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report	Report
	Transients	● Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria: ○ Max. {ΔLpA} < 3.0 dB ○ Event count < 3 for "1.5 dB < ΔLpA < 3.0 dB" ○ Acoustical Jump (see AC0159), during air mover speed transition from Idle to Operating Mode must be ≤ 15 dB. ○ Startup behavior ▪ Report Startup behavior re. AC0159 ▪ Startup must proceed smoothly, that is, no sudden or large jumps, and fan speed during startup must not exceed 50% of its maximum ● ∞ Transient inputs: Report time-history sound pressure levels re AC0159 "Train of Step Functions on Processor"	N/A		
Any	Other	● No rattles, squeaks, or unexpected noises. ● Sound should be "even" around the EUT (one side should not be dramatically louder than another). ● Unless otherwise specified, the "default" thermal-related settings shall be selected for BIOS and iDRAC. ● Specific operating conditions are defined in "Configurations and Configuration Dependencies" for each platform.				
Sound Pressure	LpA-reported, dBA	Report for all mics	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Category 5: Unattended Data Center

When Dell determines that a specific Enterprise product is to be predominantly used in an unattended data center (and not blades or blade enclosures; these have their own category), then the acoustical specification in the table below applies. The phrase "unattended data center" is used to mean a space in which many (from tens to 1000s) of Enterprise products are deployed together, its own heating and cooling systems condition the space, and operators or servicers of equipment enter

generally only to deploy, service, or decommission equipment. Hearing protection or hearing monitoring programs may be expected (per government or company guidelines) in these areas. Examples in this category include monolithic rack products.

Table 34. Dell Enterprise Category 5, "Unattended Data Center" acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)				Simulate (that is, set air mover speeds representative) for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	**Idle in 23±2° C Ambient**	**Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required**	**Simulate (that is, set air mover speeds representative) for Idle at 28° C & 35° C Ambient**	
Sound Power	LWA,m, B	Report	≤ 7.5	≤ 7.7	Report	≤ 8.7
Front Binaural HEAD	Tones, Hz, dB	Report	< 15 dB	< 15 dB	Report	< 20 dB
	Tonality, tu	Report	Report	Report	Report	Report
	Dell Modulation, %	Report	Report	Report	Report	Report
	Loudness, sones	Report	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report	Report
Front Binaural HEAD	Transients	● Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria: ○ Max. {ΔLpA} < 3.0 dB ○ Event count < 3 for "1.5 dB < ΔLpA < 3.0 dB" ● Report Acoustical Jump (see AC0159) during air mover speed transition from Idle to Operating Mode. ● Startup behavior ○ Report Startup behavior re. AC0159 ○ Startup must proceed smoothly, that is, no sudden or large jumps, and air mover speed during startup must not exceed 50% of its maximum ● Transient inputs: Report time-history sound pressure levels re AC0159 "Train of Step Functions on Processor"			N/A	
Any	Other	● No rattles, squeaks, or unexpected noises. ● Sound should be "even" around the EUT (one side should not be dramatically louder than another). ● Unless otherwise specified, the "default" thermal-related settings shall be selected for BIOS and iDRAC. ● Specific operating conditions are defined in "Configurations and Configuration Dependencies" for each platform.				

Table 34. Dell Enterprise Category 5, "Unattended Data Center" acoustical specification category (continued)

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)				Simulate (that is, set air mover speeds representative) for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	**Idle in 23±2° C Ambient**	**Operating in 23±2° C Ambient – if not otherwise specified in the program's configuration document, then processor and hard drive operating modes are required**	**Simulate (that is, set air mover speeds representative) for Idle at 28° C & 35° C Ambient**	
Sound Pressure	LpA-reported, dBA, re AC0158 and program configuration document	Report for all mics	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Rack, rails, and cable management

Topics:

*   Rails and cable management information

Rails and cable management information

The rail offerings for the PowerEdge R7615 consist of two general types: sliding and static. The cable management offerings consist of an optional cable management arm (CMA) and an optional strain relief bar (SRB).

See the *Dell Enterprise Systems Rail Sizing and Rack Compatibility Matrix* available at https://i.dell.com/sites/csdocuments/ Business_solutions_engineering-Docs_Documents/en/rail-rack-matrix.pdf for information regarding:

*   Specific details about rail types.
*   Rail adjustability ranges for various rack mounting flange types
*   Rail depth with and without cable management accessories
*   Rack types that are supported for various rack mounting flange types

Key factors governing proper rail selection include the following:

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

Sliding rails features summary

The sliding rails allow the system to be fully extended out of the rack for service. There are two types of sliding rails available, ReadyRails II sliding rails and Stab-in/Drop-in sliding rails. The sliding rails are available with or without the optional cable management arm (CMA) or strain relief bar (SRB).

B21 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 un-threaded 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 strain relief bar (SRB).
*   Support for optional cable management arm (CMA).
    *   (i) **NOTE:** For situations where CMA support is not required, the outer CMA mounting brackets can be uninstalled from the sliding rails. This reduces the overall length of the rails and eliminates the potential interferences with rear mounted PDUs or the rear rack door.
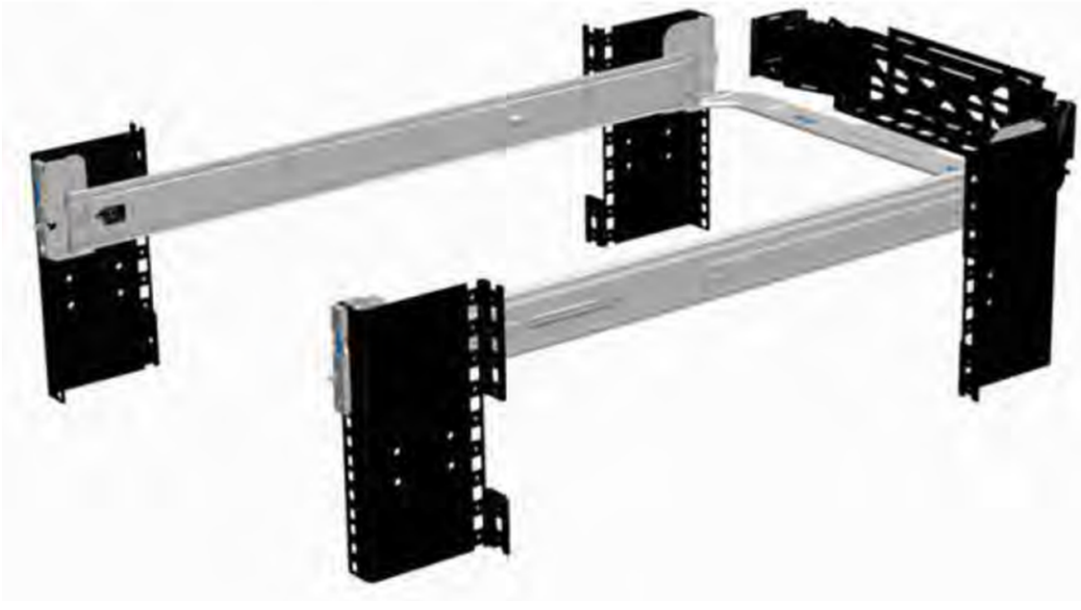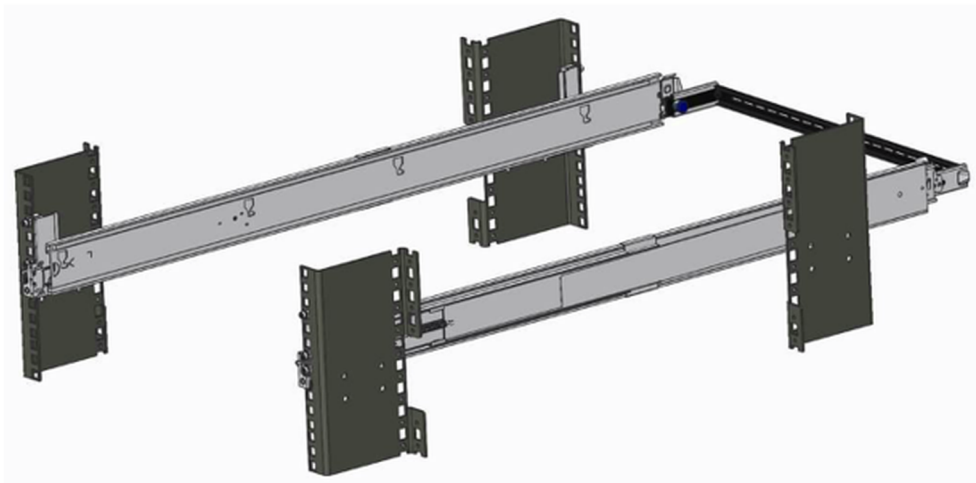
Figure 27. Sliding rails with optional CMA

Figure 28. Sliding rails with optional SRB

B22 Stab-in/Drop-in sliding rails for 4-post racks

- 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, un-threaded round hole racks including all generations of the Dell racks. Also supports tool-less installation in threaded round hole 4-post racks.
- Support for tool-less installation in Dell Titan or Titan-D 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).
- Support for optional strain relief bar (SRB).

  ⓘ **NOTE:** For situations where CMA support is not required, the outer CMA mounting brackets can be uninstalled from the sliding rails. This reduces the overall length of the rails and eliminates the potential interferences with rear mounted PDUs or the rear rack door.

Scan the QRL code for the documentation and trouble-shooting information regarding the installation procedures for Drop-in/ Stab-in rail types.

Figure 29. Quick resource locator for combo rails

B20 static rails summary

The static rails offer a greater adjustability range and a smaller overall mounting footprint than the sliding rails because of their reduced complexity and lack of need for CMA support. 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. The static rails are also not compatible with SRB.
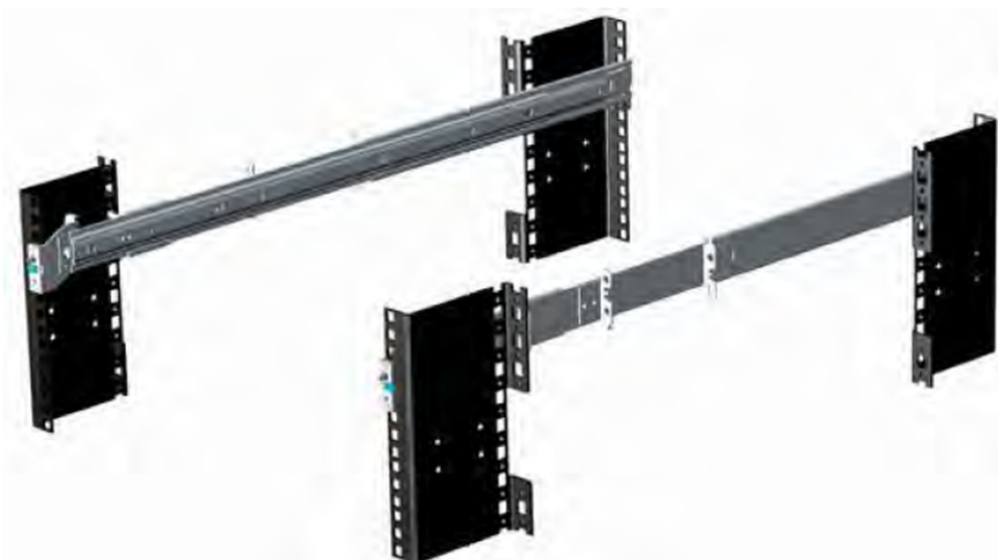
Figure 30. Static rails

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 un-threaded round hole 4-post racks including all generations of Dell racks.
● Support tooled installation in 19" EIA-310-E compliant threaded hole 4-post and 2-post racks.
● Support for tooled installation in Dell Titan or Titan-D rack.

ⓘ **NOTE:**
  ● Screws are not included with the static rail kit since racks are offered with various thread types. The screws are provided for mounting static rails in racks with threaded mounting flanges.
  ● Screw head diameter should be 10 mm or less.

2-Post racks installation

If installing to 2-Post (Telco) racks, the ReadyRails static rails (B20) must be used. Sliding rails support mounting in 4-post racks only.

Figure 31. Static rails in 2-post center mount configuration

Installation in the Dell Titan or Titan-D racks

For tool-less installation in Titan or Titan-D racks, the Stab-in/Drop-in Sliding rails (B22) must be used. This rail collapses down sufficiently to fit in the rack with mounting flanges that are spaced about 24 inches apart from front to back. The Stab-in/Drop-in Sliding rail allows bezels of the servers and storage systems to be aligned when installed in these racks. For tooled installation, Stab-in Static rails (B20) must be used for bezel alignment with Storage systems.

Cable management arm (CMA)

The optional cable management arm (CMA) organizes and secures the cords and cables exiting the back of the systems. It unfolds to allow the systems to extend out of the rack without having to detach the cables. Some key features of the CMA include:

- Large U-shaped baskets to support dense cable loads.
- Open vent pattern for optimal airflow.
- Ability to mount on either side by swinging the spring-loaded brackets from one side to the other.
- Utilizes hook-and-loop straps rather than plastic tie wraps to eliminate the risk of cable damage during cycling.
- Includes a low-profile fixed tray to both support and retain the CMA in its fully closed position.
- Both the CMA and the tray mount without the use of tools by simple and intuitive snap-in designs.

The CMA can be mounted to either side of the sliding rails without the use of tools or the need for conversion. For systems with one power supply unit (PSU), it is recommended to mount on the side opposite to that of the power supply to allow easier access to it and the rear drives (if applicable) for service or replacement.
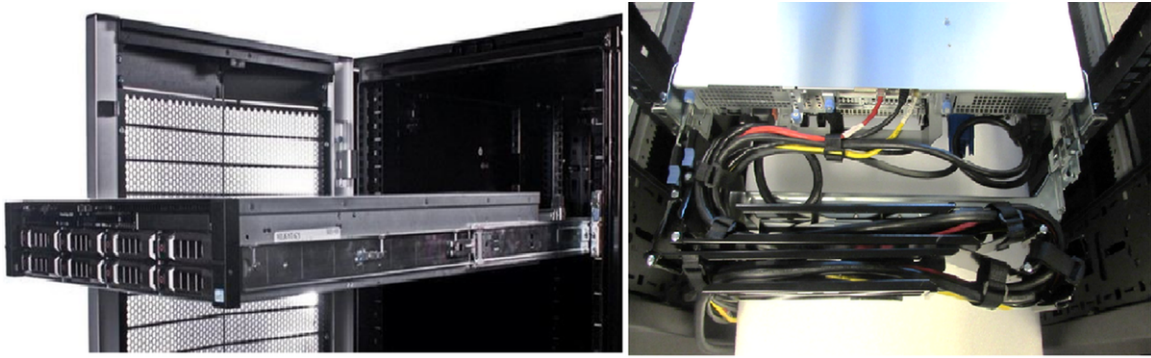
Figure 32. Sliding rails with CMA cabling

Strain Relief Bar (SRB)

The optional strain relief bar (SRB) for the PowerEdge R7615 organizes and supports cable connections at the rear end of the server to avoid damage from bending.
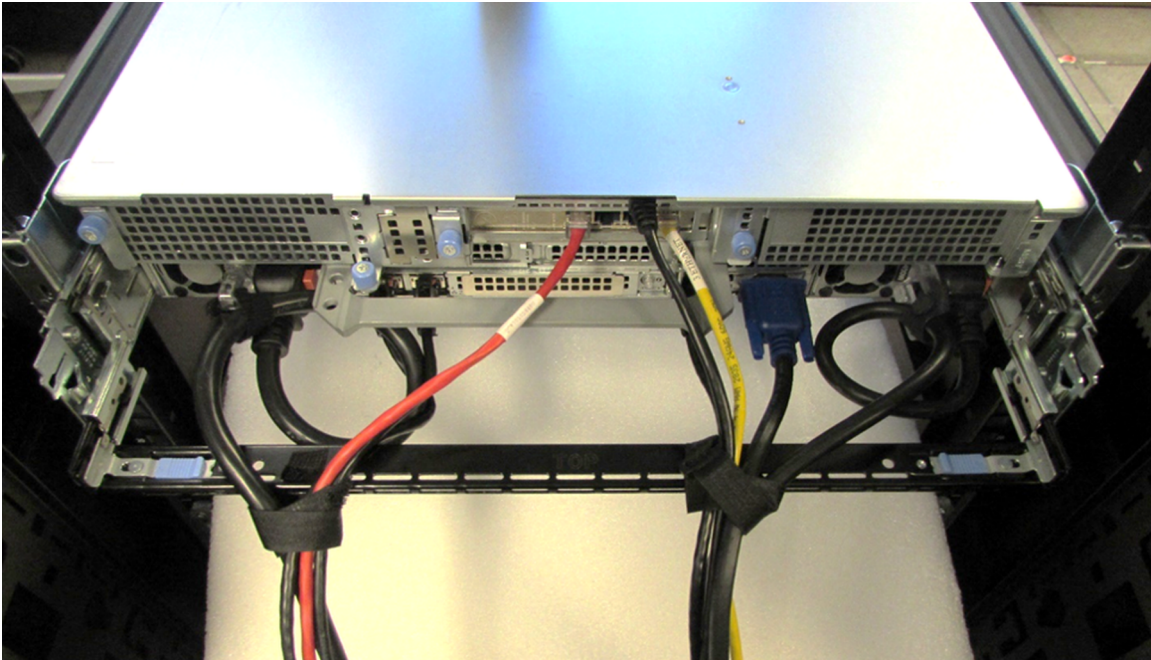
Figure 33. Cabled strain relief bar

- Tool-less attachment to the rails
- Two depth positions to accommodate various cable loads and rack depths
- Supports cable loads and controls stresses on server connectors
- Cables can be separated into discrete purpose-specific bundles

Rack Installation

Drop-in design means that the system is installed vertically into the rails by inserting the standoffs on the sides of the system into the J-slots in the inner rail members with the rails in the fully extended position. The recommended method of installation is to first insert the rear standoffs on the system into the rear J-slots on the rails to free up a hand and then rotate the system down into the remaining J-slots while using the free hand to hold the rail against the side of the system.
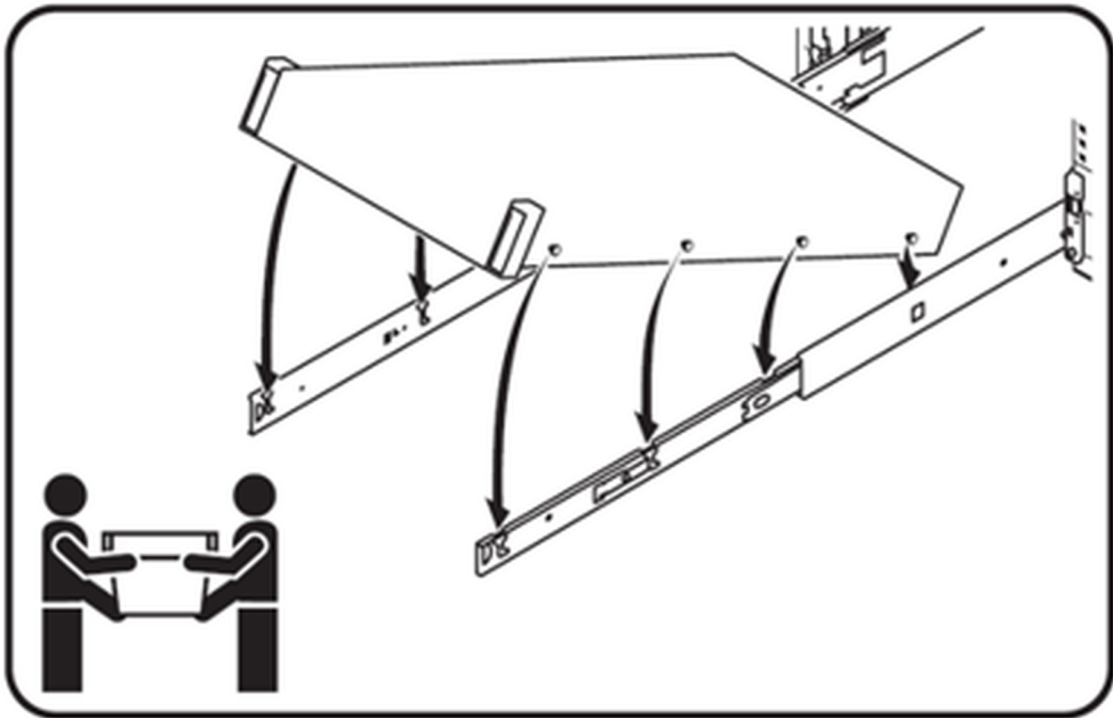
Figure 34. Installing the system in Drop-in sliding rails

Stab-in design means that the inner (chassis) rail members must first be attached to the sides of the system and then inserted into the outer (cabinet) members installed in the rack. For a 2U systems, this is a two person lift.

Installing system into the rack (option A: Drop-In)

1. Pull the inner rails out of the rack until they lock into place.
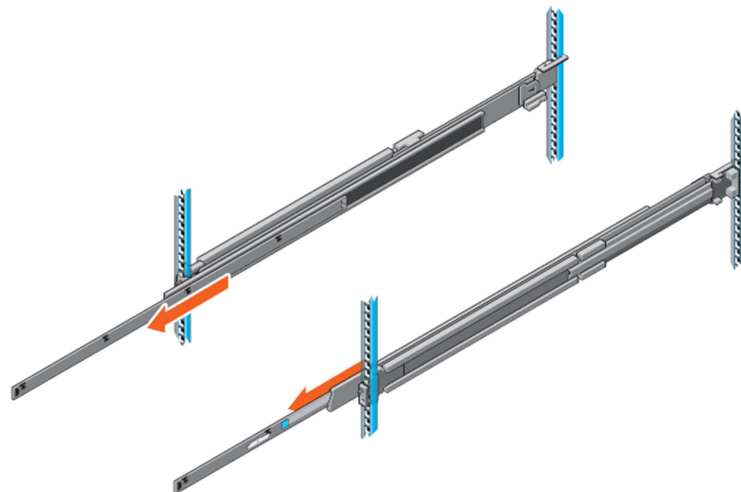
Figure 35. Pull out inner rail

2. Locate the rear rail standoff on each side of the system and lower them into the rear J-slots on the slide assemblies.
3. Rotate the system downward until all the rail standoffs are seated in the J-slots.
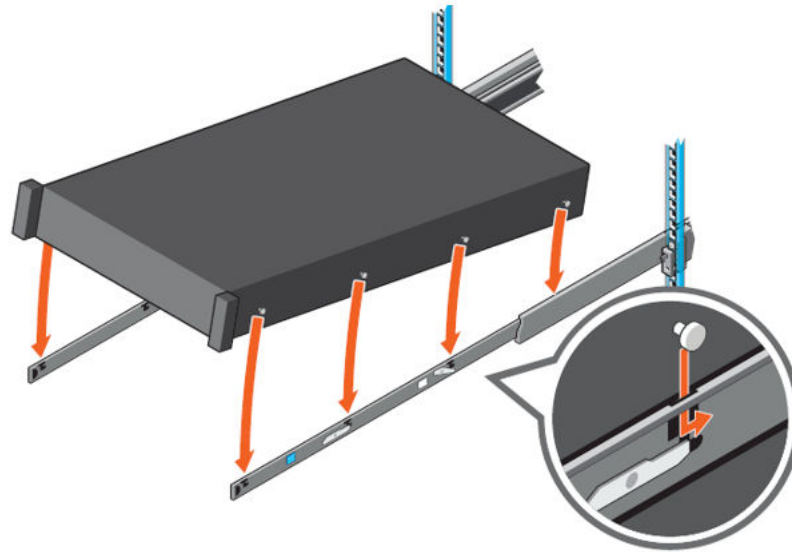
Figure 36. Rail standoffs seated in J-slots

4. Push the system inward until the lock levers click into place.
5. Pull the blue side release lock tabs forward or backward on both rails and slide the system into the rack until the system is in the rack.
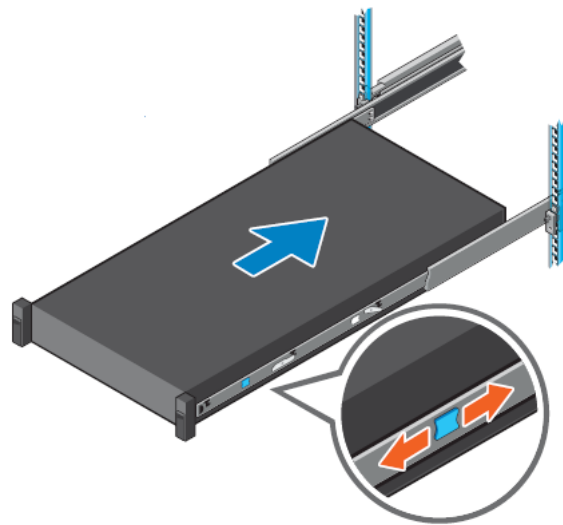
Figure 37. Slide system into the rack

Installing the system into the rack (option B: Stab-In)

1. Pull the intermediate rails out of the rack until they lock into place.
2. Release the inner rail lock by pulling forward on the white tabs and sliding the inner rail out of the intermediate rails.
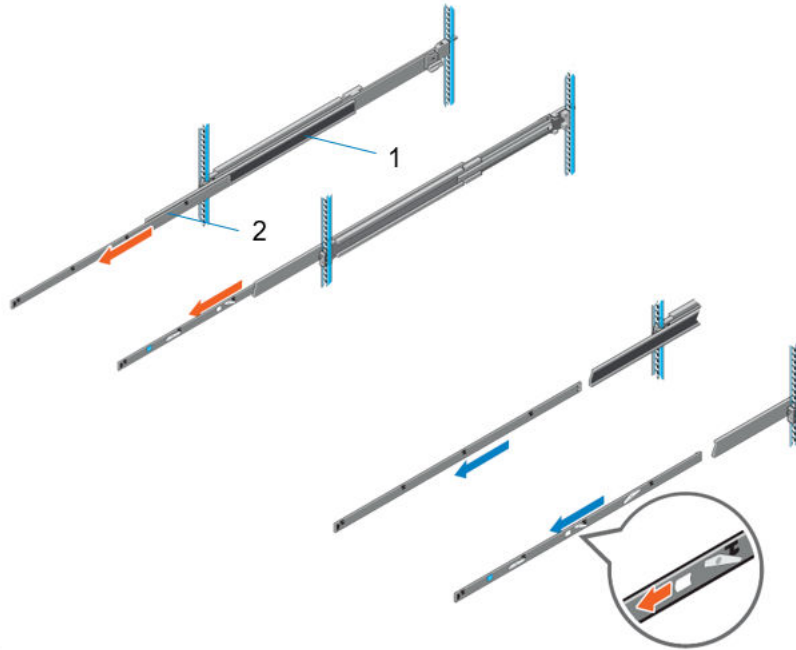
Figure 38. Pull out the intermediate rail

Table 35. Rail component label

Number	Component
1	Intermediate rail
2	Inner rail

3. Attach the inner rails to the sides of the system by aligning the J-slots on the rail with the standoffs on the system and sliding forward on the system until they lock into place.
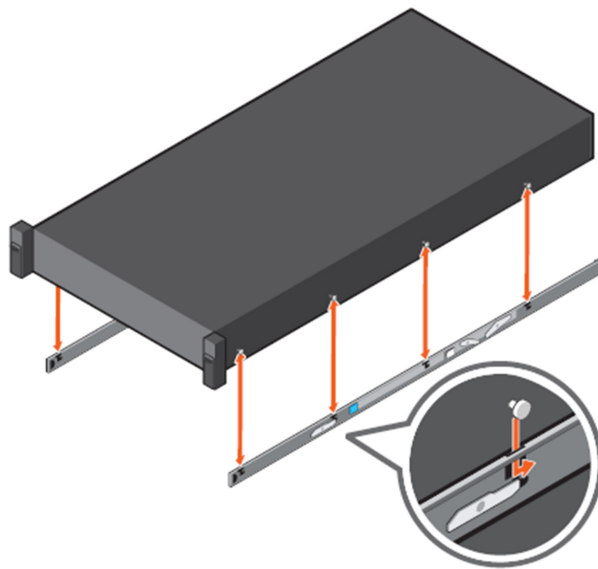
Figure 39. Attach the inner rails to the system

4. With the intermediate rails extended, install the system into the extended rails.
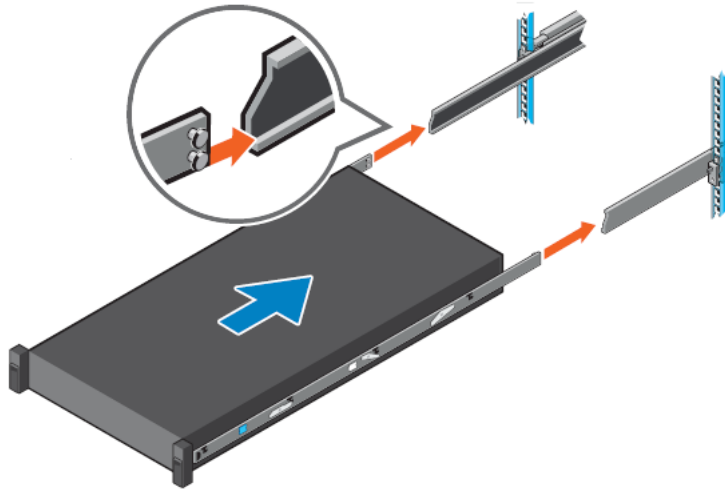
Figure 40. Install system into the extended rails

5. Pull blue slide release lock tabs forward or backward on both rails, and slide the system into the rack.
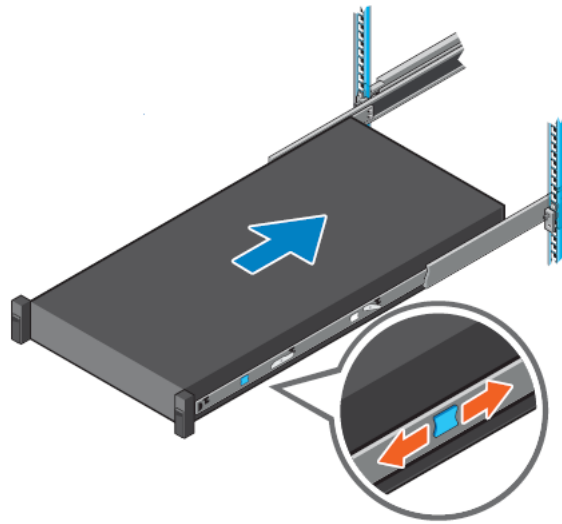
Figure 41. Slide system into the rack

Supported Operating Systems

The PowerEdge system supports the following operating system:

- Canonical Ubuntu Server LTS
- Microsoft Windows Server with Hyper-V
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware vSAN/ESXi

Links to specific OS versions and editions, certification matrices, Hardware Compatibility Lists (HCL) portal, and Hypervisor support are available at Dell Enterprise Operating Systems.

Dell OpenManage Systems Management

Dell delivers management solutions that help IT administrators effectively deploy, update, monitor, and manage IT assets. OpenManage solutions and tools enable you to quickly respond to problems by helping them to manage Dell servers efficiently; in physical, virtual, local, and remote environments; all without the need to install an agent in the operating system.

The OpenManage portfolio includes:

● Innovative embedded management tools - integrated Dell Remote Access Controller (iDRAC)
● Consoles - OpenManage Enterprise
● Extensible with plug-ins - OpenManage Power Manager
● Update tools - Repository Manager

Dell has developed comprehensive systems management solutions that are based on open standards and has integrated with management consoles from partners such as Microsoft and VMware, allowing advanced management of Dell servers. Dell management capabilities extend to offerings from the industry's top systems management vendors and frameworks such as Ansible, Splunk, and ServiceNow. OpenManage tools automate the full span of server life cycle management activities along with powerful RESTful APIs to script or integrate with your choice of frameworks.

For more information about the entire OpenManage portfolio, see:

● The latest Dell Systems Management Overview Guide.

Topics:

Integrated Dell Remote Access Controller (iDRAC)

iDRAC9 delivers advanced, agent-free, local and remote server administration. Embedded in every PowerEdge server, iDRAC9 provides a secure means to automate a multitude of common management tasks. Because iDRAC is embedded within every PowerEdge server, there is no additional software to install; just plug in power and network cables, and iDRAC is ready to go. Even before installing an operating system (operating system) or hypervisor, IT administrators have a complete set of server management features at their fingertips.

With iDRAC9 in-place across the Dell PowerEdge portfolio, the same IT administration techniques and tools can be applied throughout. This consistent management platform allows easy scaling of PowerEdge servers as an organization's infrastructure grows. Customers can use the iDRAC RESTful API for the latest in scalable administration methods of PowerEdge servers. With this API, iDRAC enables support for the Redfish standard and enhances it with Dell extensions to optimize at-scale management of PowerEdge servers. By having iDRAC at the core, the entire OpenManage portfolio of Systems Management tools allows every customer to tailor an effective, affordable solution for any size environment.

Zero Touch Provisioning (ZTP) is embedded in iDRAC. ZTP - Zero Touch Provisioning is Intelligent Automation Dell's agent-free management puts IT administrators in control. Once a PowerEdge server is connected to power and networking, that system can be monitored and fully managed, whether you're standing in front of the server or remotely over a network. In fact, with no need for software agents, an IT administrator can: · Monitor · Manage · Update · Troubleshoot and remediate Dell servers With features like zero-touch deployment and provisioning, iDRAC Group Manager, and System Lockdown, iDRAC9 is purpose-built to make server administration quick and easy. For those customers whose existing management platform utilizes in-band management, Dell does provide iDRAC Service Module, a lightweight service that can interact with both iDRAC9 and the host operating system to support legacy management platforms.

When ordered with DHCP enabled from the factory, PowerEdge servers can be automatically configured when they are initially powered up and connected to your network. This process uses profile-based configurations that ensure each server is configured per your specifications. This feature requires an iDRAC Enterprise license.

iDRAC9 offers following license tiers:

Table 36. iDRAC9 license tiers

License	Description
iDRAC9 Basic	- Available only on 100-500 series rack/tower - Basic instrumentation with iDRAC web UI - For cost conscious customers that see limited value in management
iDRAC9 Express	- Default on 600+ series rack/tower, modular, and XR series - Includes all features of Basic - Expanded remote management and server life-cycle features
iDRAC9 Enterprise	- Available as an upsell on all servers - Includes all features of Basic and Express. Includes key features such as virtual console, AD/LDAP support, and more - Remote presence features with advanced, Enterprise-class, management capabilities
iDRAC9 Datacenter	- Available as an upsell on all servers - Includes all features of Basic, Express, and Enterprise. Includes key features such as telemetry streaming, Thermal Manage, automated certificate management, and more - Extended remote insight into server details, focused on high end server options, granular power, and thermal management

For a full list of iDRAC features by license tier, see Integrated Dell Remote Access Controller 9 User's Guide at Dell.com.

For more details on iDRAC9 including white papers and videos, see:

- Support for Integrated Dell Remote Access Controller 9 (iDRAC9) on the Knowledge Base page at Dell.com

Systems Management software support matrix

Table 37. Systems Management software support matrix

Categories	Features	PE mainstream
Embedded Management and In-band Services	iDRAC9 (Express, Enterprise, and Datacenter licenses)	Supported
	OpenManage Mobile	Supported
	OM Server Administrator (OMSA)	Supported
	iDRAC Service Module (iSM)	Supported
	Driver Pack	Supported
Change Management	Update Tools (Repository Manager, DSU, Catalogs)	Supported
	Server Update Utility	Supported
	Lifecycle Controller Driver Pack	Supported
	Bootable ISO	Supported
Console and Plug-ins	OpenManage Enterprise	Supported
	Power Manager Plug-in	Supported
	Update Manager Plug-in	Supported
	SupportAssist Plug-in	Supported
	CloudIQ	Supported
Integrations and connections	OM Integration with VMware Vcenter/vROps	Supported
	OM Integration with Microsoft System Center (OMIMSC)	Supported
	Integrations with Microsoft System Center and Windows Admin Center (WAC)	Supported

Table 37. Systems Management software support matrix (continued)

Categories	Features	PE mainstream
	ServiceNow	Supported
	Ansible	Supported
	Third-party Connectors (Nagios, Tivoli, Microfocus)	Supported
Security	Secure Enterprise Key Management	Supported
	Secure Component Verification	Supported
Standard operating system	Red Hat Enterprise Linux, SUSE, Windows Server 2021 Ubuntu, CentOS	Supported (Tier-1)

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Appendix D: Service and support

Topics:

- Default support levels
- Other services and support information

Default support levels

This system offers 3 years Dell ProSupport Next Business Day (NBD), including 24x7 phone support and NBD parts and labor support.

Default deployment levels

This system offers **Dell Basic Deployment**, including onsite hardware installation during business hours with packaging materials disposal. Optionally, the customer may choose to any of the factory or field deployment offers listed below.

Other services and support information

Dell Technologies Services include a wide, customizable range of service options to simplify the assessment, design, implementation, management and maintenance of IT environments and to help transition from platform to platform.

Depending on the current business requirements and correct level of service for customers, we provide factory, onsite, remote, modular, and specialized services that fit the customer requirements and budget. We will help with a little or a lot, based on the customers choice, and provide access to our global resources.

Dell deployment services

Dell ProDeploy Infrastructure Suite

ProDeploy Infrastructure Suite provides a variety of deployment offerings that satisfy a customer's unique needs. It is made up of 5 offers: ProDeploy Configuration Services, ProDeploy Rack Integration Services, Basic Deployment, ProDeploy, and ProDeploy Plus.

Figure 42. ProDeploy Infrastructure Suite for servers

The new Factory Services consist of two tiers of deployment that happen prior to shipping to the customer's site.

Factory Based Services:

● ProDeploy Factory Configuration - Ideal for customers buying servers in volume and seeking pre-configuration prior to shipping such as: custom image, system settings, and asset tagging so it arrives ready to use out of the box. Furthermore, servers can be packaged and bundled to meet specific shipping and distribution requirements for each customer location to facilitate the rollout process. Upsell one of the field based services (below) if a customer needs assistance with the final server installation.

● ProDeploy Rack Integration - Ideal for customers seeking to build out fully integrated racks prior to shipping. These rack builds include hardware install, cabling, and full system configuration. You can also add-on a factory stress test and optional on-site final rack configuration to complete the rack installation.
  ○ STANDARD SKUs for Rack Integration is available in US only and requires:
    ▪ 20 or more devices (R and C series servers and all Dell or non-Dell switches). Use Informational SKUs for Dell switches or 3rd party products
    ▪ Shipping to contiguous US
  ○ USE CUSTOM QUOTE for Rack Integration for:
    ▪ All countries except USA
    ▪ Racks containing less than 20 servers
    ▪ Any rack that includes VxRail or Storage
    ▪ Shipping outside contiguous US
    ▪ Shipping to multiple locations

Field Based Services:

● Basic Deployment consists of the hardware installation, cabling and firmware update during normal standard business hours. Basic Deployment is traditionally sold to Competency Enabled Partners. Competency enabled partners often have Dell do the hardware installation while they complete the software configuration.

● ProDeploy consists of your hardware installation and configuration of the software using offshore resources. ProDeploy is great for customers who are price sensitive or who are remote from their data centers and don't require an onsite presence.

● ProDeploy Plus will give you in-region or onsite resources to complete the engagement for the customer. It also comes with additional features such as Post Deployment Configuration Assistance and Training Credits.

Figure 43. ProDeploy Infrastructure Suite - Factory services

Figure 44. ProDeploy Infrastructure Suite - Field services

Dell ProDeploy Plus for Infrastructure

From beginning to end, ProDeploy Plus provides the skill and scale that is must successfully perform demanding deployments in today's complex IT environments. Certified Dell experts start with extensive environmental assessments and detailed migration

planning and recommendations. Software installation includes set up of our enterprise connectivity solution (secure connect gateway) and OpenManage system management utilities.

Postdeployment configuration assistance, testing, and product orientation services are also available.

Dell ProDeploy for Infrastructure

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 our enterprise connectivity solution (secure connect gateway) and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning exercise. System testing, validation, and full project documentation with knowledge transfer complete the process.

Dell Basic Deployment

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

Additional Deployment Services

You can tailor the ProDeploy Infrastructure Suite offer to meet your customer's unique needs by leveraging "Additional Deployment Time." ADT will cover additional tasks above the normal scope of the standard offers. ADT can be sold for Project Management or Technical Resources and is sold as blocks of four hours remote or eight hours on-site.

Dell ProDeploy for HPC (available in US/Canada only. All other regions use custom)

HPC deployments require specialists that understand that cutting edge is yesterday's news. Dell deploys the world 's fastest systems and understands the nuances that make them perform. ProDeploy for HPC provides:

- Global team of dedicated HPC specialists
- Proven track record, thousands of successful HPC deployments
- Design validation, benchmarking, and product orientation

Learn more at Dell.com/HPC-Services.

ProDeploy Expansion for HPC
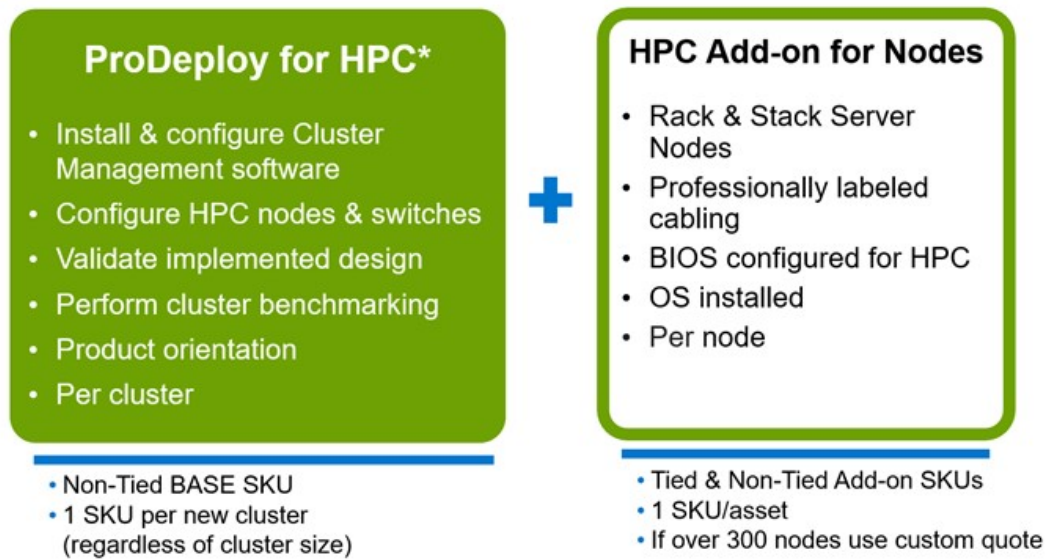### *Available as standard SKUs in US & Canada and as custom quote in APJC, EMEA, LATAM

ProDeploy for HPC*

- Install & configure Cluster Management software
- Configure HPC nodes & switches
- Validate implemented design
- Perform cluster benchmarking
- Product orientation
- Per cluster

• Non-Tied BASE SKU
• 1 SKU per new cluster
  (regardless of cluster size)

+

HPC Add-on for Nodes

- Rack & Stack Server Nodes
- Professionally labeled cabling
- BIOS configured for HPC
- OS installed
- Per node

• Tied & Non-Tied Add-on SKUs
• 1 SKU/asset
• If over 300 nodes use custom quote

Figure 45. ProDeploy Expansion for HPC

Dell custom deployment Services

Dell custom rack integration and other Dell configuration services help customers save time by providing systems that are racked, cabled, tested, and ready to be integrated into the data center. Dell support preconfigure RAID, BIOS and iDRAC settings, install system images, and even install third-party hardware and software.

For more information, see Server Configuration Services.

Dell Residency Services

Residency Services help customers transition to new capabilities quickly with the assistance of onsite or remote Dell experts whose priorities and time they control.

Residency experts can provide post implementation management and knowledge transfer that is related to a new technology acquisition or day-to-day operational management of the IT infrastructure.

Dell Data Migration Services

Protect business and data of the customer with our single point of contact to manage data migration projects.

A customer project manager works with our experienced team of experts to create a plan using industry-leading tools and proven processes that are based on global best practices to migrate existing files and data, so business systems are up and running quickly and smoothly.

Dell Enterprise Support Services

Dell ProSupport Enterprise Suite

With the ProSupport Enterprise Suite, we help keep IT systems running smoothly, so customers can focus on running their business. We help maintain peak performance and availability of the most essential workloads. ProSupport Enterprise Suite is a suite of support services that enable customers to build the solution that is right for their organization. They choose support models that are based on how they use technology and where they 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 customer IT resources by choosing the right support model.

Table 38. ProSupport Enterprise Suite

Service	Support model	Description
ProSupport Enterprise Suite	ProSupport Plus for Enterprise	Proactive, predictive, and reactive support for systems that look after your business-critical applications and workloads
	ProSupport for Enterprise	Comprehensive 24 x 7 predictive and reactive support for hardware and software
	Basic hardware support	Reactive hardware support during normal business hours

Dell ProSupport Plus for Enterprise

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

- An assigned Services Account Manager who knows their business and environment
- Immediate advanced troubleshooting from an engineer
- Personalized, preventive recommendations that are based on analysis of support trends and best practices from across the Dell Technologies infrastructure solutions customer base to reduce support issues and improve performance
- Predictive analysis for issue prevention and optimization that is enabled by secure connect gateway technology
- Proactive monitoring, issue detection, notification, and automated case creation for accelerated issue resolution enabled by secure connect gateway
- On-demand reporting and analytics-based recommendations that are enabled by secure connect gateway and TechDirect

Dell ProSupport for Enterprise

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

- 24x7 support through phone, chat and online
- Predictive, automated tools and innovative technology
- A central point of accountability for all hardware and software issues
- Collaborative third-party support
- Hypervisor, operating system and application support
- Consistent experience regardless of where customers are located or what language they speak

  (i) **NOTE:** Subject to service offer country or region availability.

- Optional onsite parts and labor response options including next business day or four-hour mission critical

Figure 46. ProSupport Enterprise Suite

Dell 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 a customer's needs. While not for everyone, this service option offers a truly unique solution for Dell Technologies largest customers with the most complex environments.

● Team of assigned Services Account Managers with remote, on-site options
● Assigned ProSupport One technical and field engineers who are trained on the customer's environment and configurations
● On-demand reporting and analytics-based recommendations that are enabled by secure connect gateway and TechDirect
● Flexible on-site support and parts options that fit their operational model
● A tailored support plan and training for their operations staff
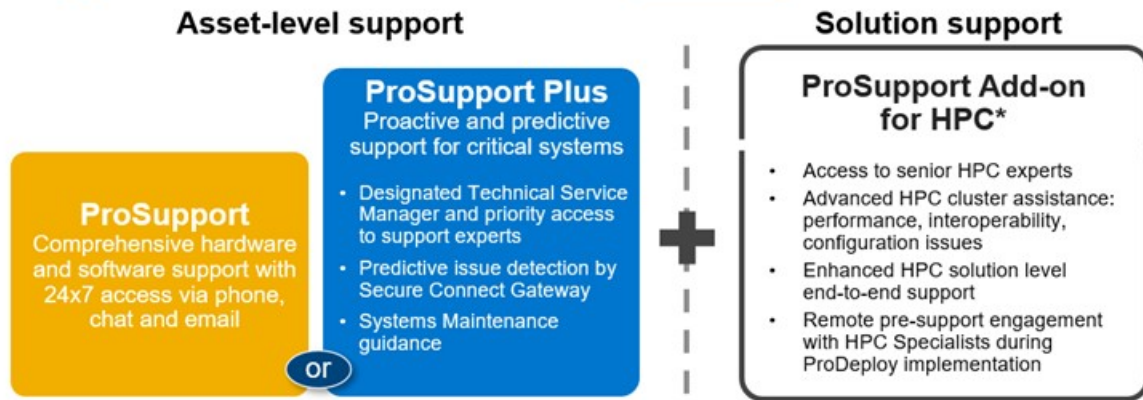
Dell ProSupport Add-on for HPC

The ProSupport Add-on for HPC provides solution-aware support including:

● Access to senior HPC experts
● Advanced HPC cluster assistance: performance, interoperability, and configuration
● Enhanced HPC solution level end-to-end support
● Remote presupport engagement with HPC Specialists during ProDeploy implementation

Learn more at Dell.com/HPC-Services.

Figure 47. ProSupport Add-on for HPC is an add-on to PS or PSP

Support Technologies

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

(i) **NOTE:** SupportAssist Enterprise capabilities are now part of the secure connect gateway technology.

Enterprise connectivity

The best time to solve a problem is before it happens. The automated proactive and predictive support features enabled by the secure connect gateway technology helps reduce steps and time to resolution, often detecting issues before they become a crisis. The gateway technology is available in virtual and application editions. It is also implemented as a direct connect version for select Dell hardware and a Services plugin within OpenManage Enterprise for PowerEdge servers. The legacy SupportAssist Enterprise solution has been retired and is now replaced by the secure connect gateway solutions.

Benefits include:

● Value: Our connectivity solutions are 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 experts
● Gain insight and control: Optimize enterprise devices with insights in portals reporting like TechDirect, and get predictive issue detection before the problem starts

(i) **NOTE:** Connect devices can access these features. Features vary depending on the service level agreement for the connected device. ProSupport Plus customers experience the full set of automated support capabilities.

Table 39. Features enabled by connectivity

—	Basic hardware warranty	ProSupport	ProSupport Plus
Automated issue detection and system state information collection	Supported	Supported	Supported
Proactive, automated case creation and notification	Not supported	Supported	Supported

Table 39. Features enabled by connectivity (continued)

—	Basic hardware warranty	ProSupport	ProSupport Plus
Predictive issue detection for failure prevention	Not supported	Not supported	Supported

Get started at DellTechnologies.com/secureconnectgateway.

Dell TechDirect

TechDirect helps boost IT team productivity when supporting Dell systems.

Boost your productivity with online servoce for Dell products from TechDirect. From deployment to technical support, TechDirect lets you do more with less effort and faster resolution. You can:

- OPen and manage support requests or in-warranty systems
- Execute online self-service for parts dispatch
- Collaborate on ProDeploy infrastructure deployment projects online
- Manage proactive and preditive alerts from secure connect gateway technology that help maximize uptime
- Integrate services functionality into your help desk with TechDirect APIs
- Join over 10,000 companies that choose TechDirect

Register at TechDirect.Dell.com.

Dell Technologies Consulting Services

Our expert consultants help customers transform faster, and quickly achieve business outcomes for the high value workloads Dell PowerEdge systems can handle. From strategy to full-scale implementation, Dell Technologies Consulting can help determine how to perform IT, workforce, or application transformation. We use prescriptive approaches and proven methodologies that are combined with portfolio and partner ecosystem of Dell Technologies to help achieve real business outcomes. From multi cloud, applications, DevOps, and infrastructure transformations, to business resiliency, data center modernization, analytics, workforce collaboration, and user experiences-we are here to help.

Dell Managed Services

Some customers prefer Dell to manage the complexity and risk of daily IT operations, Dell Managed Services utilizes proactive, AI enabled delivery operations and modern automation to help customers realize desired business outcomes from their infrastructure investments. With these technologies, our experts run, update and fine-tune customer environments aligned with service levels, while providing environment-wide and down-to-the-device visibility. There are two types of managed service offers. First the outsourcing model or CAPEX model where Dell manages the customer owned assets using our people and tools. The second is the as-a-Service model or OPEX model called APEX. In this service, Dell owns all technology and all the management of it. Many customers will have a blend of the two management types depending on the goals of the organization.

Figure 48. Dell Managed Services

Dell Technologies Education Services

Build the IT skills required to influence the transformational outcomes of the business. Enable talent and empower teams with the right skills to lead and perform transformational strategy that drives competitive advantage. Leverage the training and certification required for real transformation.

Dell Technologies Education Services offers PowerEdge server training and certifications that are designed to help customers achieve more from their hardware investment. The curriculum delivers the information and the practical, firsthand skills that their team must confidently install, configure, manage, and troubleshoot Dell servers.

To learn more or register for a class today, see Education.Dell.com.

Appendix A. Additional specifications

Topics:

Chassis dimensions

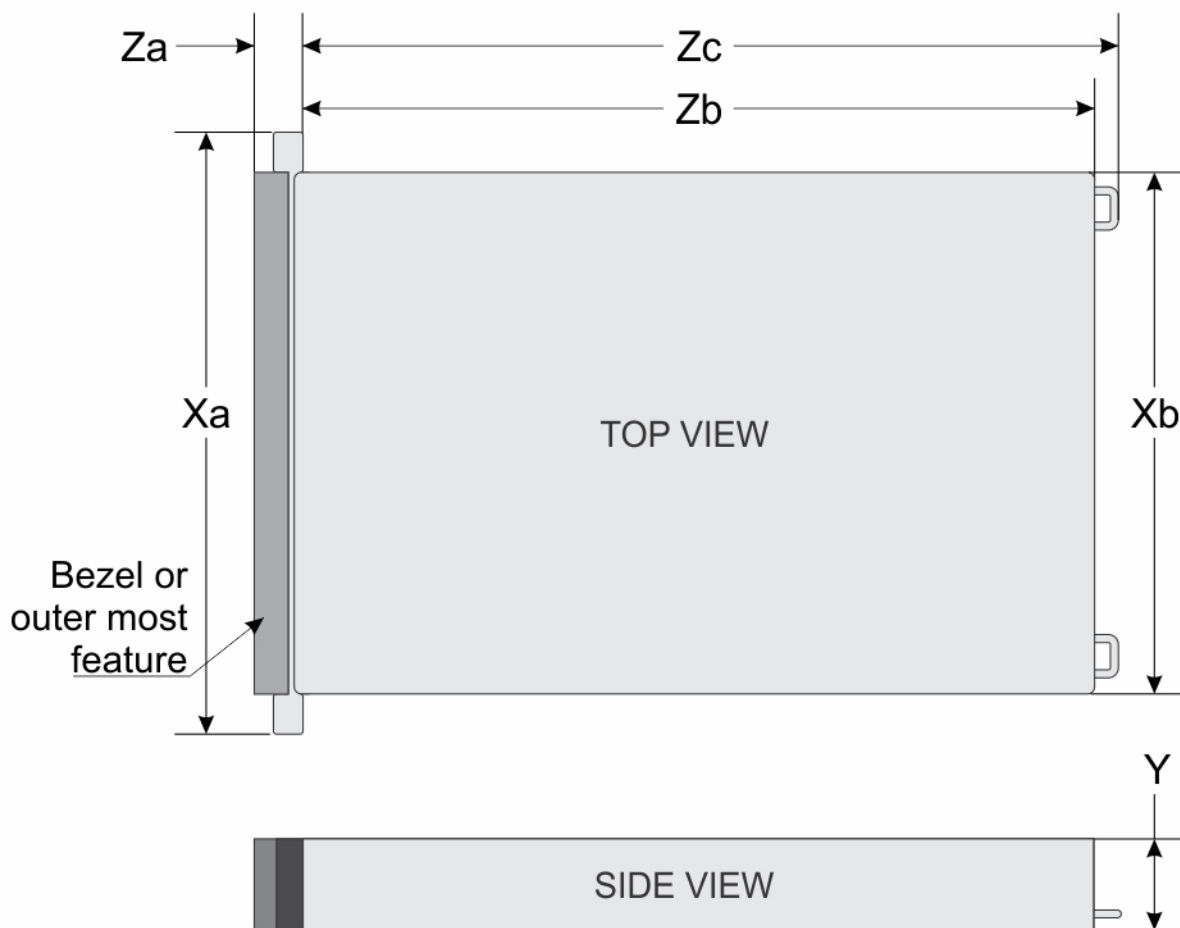**Figure 49. Chassis dimensions**

Table 40. PowerEdge R7615 chassis dimensions

Xa	Xb	Y	Za	Zb	Zc
482.0 mm (18.97 inches)	434.0 mm (17.08 inches)	86.8 mm (3.41 inches)	35.84 mm (1.96 inches) With bezel 22.0 mm (0.86 inches) Without bezel	700.7 mm (27.58 inches) Ear to rear wall	736.29 mm (28.98 inches) Ear to PSU handle

ⓘ **NOTE:** Zb is the nominal rear wall external surface where the system board I/O connectors reside.

System weight

Table 41. PowerEdge R7615 system weight

System configuration	Maximum weight (with all drives/SSDs)
A server with fully populated drives	34.5 kg (76.05 pound)
A server without drives and PSU installed	25.7 kg (56.65 pound)

NIC port specifications

The PowerEdge R7615 system supports up to two 10/100/1000 Mbps Network Interface Controller (NIC) ports embedded on the LAN on Motherboard (LOM) and integrated on the Open Compute Project (OCP) cards.

Table 42. NIC port specification for the system

Feature	Specifications
(Optional) LOM card	1 Gb x 2
(Optional) OCP card (OCP 3.0)	1GbE x 4, 10 GbE x 2, 10 GbE x 4, 25 GbE x 2, 25 GbE x 4

ⓘ **NOTE:** The system allows either LOM card or an OCP card or both to be installed in the system.

ⓘ **NOTE:** On the system board, the supported OCP PCIe width is x8; when x16 PCIe width is installed, it is downgraded to x8.

Video specifications

The PowerEdge R7615 system supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 43. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32

Resolution	Refresh rate (Hz)	Color depth (bits)
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

USB ports specifications

Table 44. PowerEdge R7615 USB specifications

Front		Rear		Internal (optional)	
USB port type	**No. of ports**	**USB port type**	**No. of ports**	**USB port type**	**No. of ports**
USB 2.0-compliant port	One	USB 2.0-compliant port	One	Internal USB 3.0-compliant port	One
iDRAC Direct port (Micro-AB USB 2.0-compliant port)	One	USB 3.0-compliant port	One		

(i) **NOTE:** The micro USB 2.0 compliant port can only be used as an iDRAC Direct or a management port.

PSU rating

Below table lists the power capacity the PSUs in high/low line operation mode.

Table 45. PSUs highline and lowline ratings

—	700 W Titanium	800 W Platinum	1100 W Titanium	1100 W -48 VDC	1400 W Platinum	1800 W Platinum	2400 W Platinum
Peak Power (Highline/-72 VDC)	1190 W	1360 W	1870 W	1870 W	2380 W	3060 W	4080 W
Highline/-72 VDC	700 W	800 W	1100 W	1100 W	1400 W	1800 W	2400 W
Peak Power (Lowline/-40 VDC)	N/A	1360 W	1785 W	N/A	1785 W	N/A	2380 W
Lowline/-40 VDC	N/A	800 W	1050 W	N/A	1050 W	N/A	1400 W
Highline 240 VDC	700 W	800 W	1100 W	N/A	1400 W	1800 W	2400 W
DC-48-60 V	N/A	N/A	N/A	1100 W	N/A	N/A	N/A

The PowerEdge R7615 supports up to two AC power supplies with 1+1 redundancy, autosensing, and auto switching capability.

If two PSUs are present during POST, a comparison is made between the wattage capacities of the PSUs. In case the PSU wattages do not match, the larger of the two PSUs is enabled. Also, there is a PSU mismatch warning that is displayed in BIOS, iDRAC, or on the system LCD.

If a second PSU is added at run-time, in order for that particular PSU to be enabled, the wattage capacity of the first PSU must equal the second PSU. Otherwise, the PSU is flagged as unmatched in iDRAC and the second PSU is not enabled.

Dell PSUs have achieved Platinum efficiency levels as shown in the table below.

Table 46. PSU efficiency level

Efficiency Targets by Load						
Form factor	Output	Class	10%	20%	50%	100%
Redundant 60 mm	700 W AC	Titanium	90.00%	94.00%	96.00%	91.50%
	800 W AC	Platinum	89.00%	93.00%	94.00%	91.50%
	1100 W AC	Titanium	90.00%	94.00%	96.00%	91.50%
	1100 W -48 VDC	N/A	85.00%	90.00%	92.00%	90.00%
	1400 W AC	Platinum	89.00%	93.00%	94.00%	91.50%
	1800 W AC	Titanium	90.00%	94.00%	96.00%	94.00%
Redundant 86 mm	2400 W AC	Platinum	89.00%	93.00%	94.00%	91.50%

Environmental specifications

Table 47. Continuous Operation Specifications for ASHRAE A2

Temperature	Specifications
Allowable continuous operations	
Temperature range for altitudes <= 900 m (<= 2953 ft)	10–35°C (50–95°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 80% RH with 21°C (69.8°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/300 m (1.8°F/984 Ft) above 900 m (2953 Ft)

Table 48. Continuous Operation Specifications for ASHRAE A3

Temperature	Specifications
Allowable continuous operations	
Temperature range for altitudes <= 900 m (<= 2953 ft)	5–40°C (41–104°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 85% RH with 24°C (75.2°F) maximum dew point
Operational altitude de-rating	Maximum temperature is reduced by 1°C/175 m (1.8°F/574 Ft) above 900 m (2953 Ft)

Table 49. Continuous Operation Specifications for ASHRAE A4

Temperature	Specifications
Allowable continuous operations	
Temperature range for altitudes <= 900 m (<= 2953 ft)	5–45°C (41–113°F) with no direct sunlight on the equipment
Humidity percent range (non-condensing at all times)	8% RH with -12°C minimum dew point to 90% RH with 24°C (75.2°F) maximum dew point

Table 49. Continuous Operation Specifications for ASHRAE A4 (continued)

Temperature	Specifications
Operational altitude de-rating	Maximum temperature is reduced by 1°C/125 m (1.8°F/410 Ft) above 900 m (2953 Ft)

Table 50. Common Environmental Specifications for ASHRAE A2, A3 and A4

Temperature	Specifications
Allowable continuous operations	
Maximum temperature gradient (applies to both operation and non-operation)	20°C in an hour* (36°F in an hour) and 5°C in 15 minutes (9°F in 15 minutes), 5°C in an hour* (9°F in an hour) for tape hardware ⓘ **NOTE:** * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change.
Non-operational temperature limits	-40 to 65°C (-40 to 149°F)
Non-operational humidity limits	5% to 95% RH with 27°C (80.6°F) maximum dew point
Maximum non-operational altitude	12,000 meters (39,370 feet)
Maximum operational altitude	3,050 meters (10,000 feet)

Table 51. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.21 G_{rms} at 5 Hz to 500 Hz for 10 minutes (all operation orientations)
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 52. Maximum shock pulse specifications

Maximum shock pulse	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axis of 6 G for up to 11 ms
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axis (one pulse on each side of the system) of 71 G for up to 2 ms

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any equipment damage or failure from particulates and gaseous contamination. If the levels of particulates or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 53. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit ⓘ **NOTE:** This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. ⓘ **NOTE:** Air entering the data center must have MERV11 or MERV13 filtration.
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles

Table 53. Particulate contamination specifications (continued)

Particulate contamination	Specifications
	(i) **NOTE:** This condition applies to data center and non-data center environments.
Corrosive dust	● Air must be free of corrosive dust ● Residual dust present in the air must have a deliquescent point less than 60% relative humidity (i) **NOTE:** This condition applies to data center and non-data center environments.
Walk-Up Edge Data Center or Cabinet (sealed, closed loop environment)	Filtration is not required for cabinets that are anticipated to be opened 6 times or less per year. Class 8 per ISO 1466-1 filtration as defined above is required otherwise (i) **NOTE:** In environments commonly above ISA-71 Class G1 or that may have known challenges, special filters may be required.

Table 54. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-2013
Silver coupon corrosion rate	<200 Å/month as defined by ANSI/ISA71.04-2013

Thermal restriction matrix

Table 55. Air cooling: Thermal restriction matrix(non-GPU)

Configuration			No BP	8 x 2.5"	16 x 2.5" SAS	24 x 2.5" SAS			16x2.5" SAS + 8x2.5" U.2	24 x 2.5" NVMe	8x3.5"	12x3.5"		
Rear storage														
CPU cTDP Max		CPU TDP	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan
CPU TDP / cTDP	240 W	210W	HPR Sliver Fan + 2U STD HSK		HPR Sliver Fan + 2U STD HSK	HPR Sliver Fan + 2U EXT HSK	HPR Sliver Fan + 2U STD HSK	HPR Sliver Fan + 2U STD HSK	HPR Gold Fan + 2U STD HSK	HPR Sliver Fan [75%] + 2U STD HSK	HPR Sliver Fan [70%] + 2U EXT HSK	HPR Gold Fan [70%] + 2U EXT HSK	
		200W												
	300 W	260 W	HPR Sliver Fan + 2U EXT HSK				HPR Gold Fan + 2U EXT HSK	HPR Sliver Fan + 2U EXT HSK	HPR Gold Fan + 2U EXT HSK	HPR Sliver Fan [75%] + 2U EXT HSK	HPR Gold Fan [70%] + 2U EXT HSK *	
		290 W												
		280 W												

Table 55. Air cooling: Thermal restriction matrix(non-GPU) (continued)

Configuration		No BP	8 x 2.5"	16 x 2.5" SAS	24 x 2.5" SAS			16x2.5" SAS + 8x2.5" U.2	24 x 2.5" NVMe	8x3.5"	12x3.5"		
Rear storage		No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan
CPU cTDP Max	CPU TDP												
400 W	360 W / 320 W				HPR Gold Fan + 2U EXT HSK			HPR Gold Fan + 2U EXT HSK	HPR Gold Fan + 2U STD HSK	HPR Gold Fan [75%] + 2U EXT HSK	Not supported		
Memory	16GB RDIMM	HPR Sliver Fan								HPR Sliver Fan [75%]	HPR GOLD Fan [70%]		
	32GB RDIMM	HPR Sliver Fan											
	64GB RDIMM	HPR Sliver Fan											
	128GB RDIMM	HPR GOLD Fan								HPR GOLD Fan [75%]	HPR GOLD Fan [70%]		
	256GB RDIMM	HPR GOLD Fan								Supports 30°C ambient temperature	Supports 30°C ambient temperature		

ⓘ **NOTE:** Standard supported operating temperature is 35°C.

***Note:** Supported ambient temperature is 30°C.

ⓘ **NOTE:** Three fan modules are required for single processor, and six fan modules are required for dual processor system.

Table 56. Air cooling: Thermal restriction matrix(GPU Configuration)

Configuration			No BP	8 x 2.5-inch U.2	16 x 2.5-inch SAS	16 x 2.5-inch U.2	24 x 2.5-inch SAS			16 x 2.5-inch SAS + 8 x 2.5-inch U.2	8 x 3.5-inch
Rear storage			No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan	No Rear Drives	No Rear Drives
CPU cTDP Max	CPU TDP	Model									
CPU TDP/ cTDP	240W	210W / 9334	HPR Gold Fan + 1U EXT HSK					Not Supported		HPR Gold Fan + 1U EXT HSK	HPR Gold Fan [75%] + 1U EXT HSK
		200W / 9254									
	300 W	290 W / 9224									
		280 W / 9124									
		9634									
		9534									
		9454									
		9354									
	400 W	360 W / 9654	HPR Gold Fan + 1U EXT HSK	Not Supported						Not Supported	
		9554	HPR Gold Fan + 1U EXT HSK*								
		9474F	HPR Gold Fan + 1U EXT HSK								
		9374F									
	320 W	9274F	HPR Gold Fan + 1U EXT HSK								
		9174F	HPR Gold Fan + 1U EXT HSK								
Memory	16GB RDIMM		HPR Gold Fan							HPR Gold Fan	HPR Gold Fan
	32GB RDIMM										
	64GB RDIMM										
	128GB RDIMM										
	256GB RDIMM										
GPU	A2		HPR Gold Fan								HPR Gold Fan **
	A16 64GB										
	A30 24GB										
	A40 48GB										HPR Gold Fan
	A100 80GB										

Table 56. Air cooling: Thermal restriction matrix(GPU Configuration) (continued)

Configuration			No BP	8 x 2.5-inch U.2	16 x 2.5-inch SAS	16 x 2.5-inch U.2	24 x 2.5-inch SAS			16 x 2.5-inch SAS + 8 x 2.5-inch U.2	8 x 3.5-inch
Rear storage			No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2x Rear 2.5" w/ 2x Rear-Fan	4x Rear 2.5 w/ 3x Rear-Fan	No Rear Drives	No Rear Drives
CPU cTDP Max	CPU TDP	Model									
		MI210 64GB									

*Note: Supported ambient temperature is 30ºC.

**Note: Supported ambient temperature is 35ºC.

(i) NOTE: "High-Performance Gold Fan" to be supported on all GPU configs.

(i) NOTE: GPU is not supported on 12 x 3.5-inch configs and system configs with rear module installed.

Table 57. Air cooling: Thermal Guidance (non-GPU)

Configuration			No BP	8 x 2.5" U.2	16 x 2.5" SAS	16 x 2.5" U.2	24 x 2.5" SAS			16 x 2.5" SAS + 8 x 2.5" U.2	8 x 3.5-inch	12 x 3.5-inch		
Rear storage			No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2 x Rear 2.5 "w / 2 x Rear fan	4 x Rear 2.5" w/ 3 x Rear fan	No Rear Drives	No Rear Drives	No Rear Drives	2 x Rear 2.5 " w/ 2 x Rear fan	4 x Rear 2.5 " w/ 3 x Rear fan
cTDP	Model	Core Count												
Shroud Type			Regular				Regular				Regular			
CPU TDP / cTDP	240 W	9334	32										35ºC	
	240 W	9224	24											
	240 W	9254	24											
	240 W	9124	16	35ºC	35ºC			35ºC			35ºC				
	300 W	9634	84										30ºC	
	300 W	9534	48											
	300 W	9454	64											
	300 W	9354	32											

Table 57. Air cooling: Thermal Guidance (non-GPU) (continued)

Configuration			No BP	8 x 2.5" U.2	16 x 2.5" SAS	16 x 2.5" U.2	24 x 2.5" SAS		16 x 2.5" SAS + 8 x 2.5" U.2	8 x 3.5-inch	12 x 3.5-inch		
Rear storage													
cTDP	Model	Core Count	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	No Rear Drives	2 x Rear 2.5" w/ 2 x Rear fan	4 x Rear 2.5" w/ 3 x Rear fan	No Rear Drives	No Rear Drives	No Rear Drives	2 x Rear 2.5" w/ 2 x Rear fan	4 x Rear 2.5" w/ 3 x Rear fan
Shroud Type			Regular				Regular					Regular		
400 W	9654	96										No Support		
400 W	9554	64												
400 W	9474F	48												
400 W	9354F	32												
400 W	9274F	21												
400 W	9174F	16												
Memory	16GB RDIMM		35°C		35°C		35°C			35°C		35°C		
	32GB RDIMM													
	64GB RDIMM													
	128GB RDIMM													
	256GB RDIMM													

Table 58. Air cooling: Thermal Guidance (GPU configuration)

Configuration				8 x 2.5" U.2		16 x 2.5" U.2		16 x 2.5" SAS		24x 2.5-inch SAS		8 x 3.5-inch	
GPU				DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2
Max Qty				x3	x6	x3	x6	x3	x6	x3	x6	x2	x6
Shroud Type				GPU		GPU		GPU		GPU		GPU	
CPU TDP / cTDP	cTDP	Model	Core Count	-									
	240 W	9334	32	35°C		35°C		35°C		35°C		35°C	

Table 58. Air cooling: Thermal Guidance (GPU configuration) (continued)

Configuration				8 x 2.5" U.2		16 x 2.5" U.2		16 x 2.5" SAS		24x 2.5-inch SAS		8 x 3.5-inch	
GPU				DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2	DW (A100/ A40/ A30/ A16/ MI210)	SW A2
Max Qty				x3	x6	x3	x6	x3	x6	x3	x6	x2	x6
Shroud Type				GPU		GPU		GPU		GPU		GPU	
	240 W	9224	24										
	240 W	9254	24										
	240 W	9124	16										
	300 W	9634	84										
	300 W	9534	48										
	300 W	9454/9454P	64										
	300 W	9354/9354P	32										
	400 W	9654/9654P	96			Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	
	400 W	9554/9554P	64										
	400 W	9474F	48	30°C									
	400 W	9354F	32										
	400 W	9274F	21	35°C									
	400 W	9174F	16										

(i) **NOTE:** GPU is not supported on 12 x 3.5-inch configs and system configs with rear module installed.

(i) **NOTE:** Standard supported operating temperature is 35°C.

(i) **NOTE:** "High-Performance GOLD Fan" to be supported on all GPU configs.

(i) **NOTE:** GPU is not supported on 12 x 3.5-inch configs and system configs with rear module installed.

Table 59. Label reference

Label	Description
HPR (Silver)	High performance (silver grade)
HPR (Gold)	High performance (gold grade)
HSK	Heat sink
LP	Low profile
FH	Full height

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 60. Industry standard documents

Standard	URL for information and specifications
ACPIAdvance Configuration and Power Interface Specification, v2.0c	https://uefi.org/specsandtesttools
Ethernet IEEE 802.3-2005	https://standards.ieee.org/
HDGHardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR5 Memory DDR5 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. 2.7	usb.org/developers/docs

Appendix C Additional resources

Table 61. Additional resources

Resource	Description of contents	Location
Installation and Service Manual	This manual, available in PDF format, provides the following information: ● Chassis features ● System Setup program ● System indicator codes ● System BIOS ● Remove and replace procedures ● Diagnostics ● Jumpers and connectors	Dell.com/Support/Manuals
Getting Started Guide	This guide ships with the system, and is also available in PDF format. This guide provides the following information: ● Initial setup steps	Dell.com/Support/Manuals
Rack Installation Guide	This document ships with the rack kits, and provides instructions for installing a server in a rack.	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
Enterprise Infrastructure Planning Tool (EIPT)	The Dell online EIPT enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use EIPT to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc