Dell PowerEdge XR5610

Technical Guide

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DELL Technologies

Notes, cautions, and warnings

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

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

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

Contents

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System overview

The Dell PowerEdge XR5610 is Dell's latest one-socket, rack server that is designed to run complex workloads using highly scalable memory, I/O, and network options.

The system features:

- Rear Accessed and Front Accessed configuration
- One 4th Generation and 5th Generation Intel Xeon Scalable and Edge-Enhanced processor with up to 32 cores
- 8 DDR5 DIMM slots
- Two redundant AC or DC power supply units
- Up to 4 x 2.5-inch SAS, SATA, or NVMe SSD drives
- Up to 2 PCI Express® (PCIe) 5.0 enabled expansion slots. PCIe 4.0 with Edge-Enhanced CPU.
- One OCP 3.0 slot
- Network interface technologies to cover Network Interface Card (NIC)

NOTE: Front-accessed configurations cannot be converted to Rear-accessed configurations, and vice versa.

Topics:

Key workloads

The key workloads for PowerEdge XR5610 are 5G vRAN, O-RAN, D-RAN, C-RAN, remote private network AI/ML/DL, video analytics, point of sale analytics, AI inferencing, IoT device aggregation

New technologies

Table 1. New technologies

Technology	Detailed Description
Intel Xeon Scalable processor (SPR-SP)	Core count: Up to 32 core processor
	Maximum number of PCIe lanes per CPU: Integrated 80 PCIe 5.0 lanes @ 32 GT/s PCIe Gen5
	Maximum TDP: 205W
Intel Xeon Edge-Enhanced processor (SPR-EE)	Core count: Up to 32 core processor
	Maximum number of PCIe lanes per CPU: Integrated 80 PCIe 4.0 lanes @ 32 GT/s PCIe Gen4 80 lanes reduced to 64 lanes with EE MCC CPU and 48 lanes with EE LCC CPU.
	Maximum TDP: 205W
Intel Xeon Edge-Enhanced processor (SPR-EE LCC mainline)	Core count: Up to 12 core processor (64 threads)
	Maximum number of PCIe lanes per CPU: Integrated 48 PCIe 5.0 lanes @ 32 GT/s PCIe Gen5
	Maximum TDP: 205W

Table 1. New technologies (continued)

Technology	Detailed Description
Intel Xeon Scalable processor "Emerald-Rapids" (EMR-SP)	Core count: Up to 16 core processor (32 threads)
	Maximum number of PCIe lanes per CPU: Integrated 80 PCIe 5.0 lanes @ 32 GT/s PCIe Gen5
	Maximum TDP: 150W
5600 MT/s DDR5 Memory	Max 8 DIMMs per system
	Supports DDR5 ECC RDIMM **NOTE:** The processor may reduce the performance of the rated DIMM speed.
Chassis orientation	The XR5610 has two chassis options: ● Rear Accessed configuration chassis that is standard with power supplies and network cards in the rear. ● Front Accessed configuration chassis that is with power supplies and network cards in the front. The control panels location also change with the chassis orientation.
iDRAC9 with Lifecycle Controller	The embedded systems management solution for Dell servers features hardware and firmware inventory and alerting, in-depth memory alerting, faster performance, a dedicated gigabit port and many more features.
Power Supplies	60 mm dimension is the new PSU form factor for the new generation of servers.
	Platinum 800 W AC/HDVC
	Titanium 1100 W AC/HVDC
	1100 W -48-(-60) LVDC
	Platinum 1400 W AC/HVDC
	Platinum 1800 W AC/HVDC

NOTE: 1100W -48VDC and 1400W AC are offered in the Front Accessed configuration.

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System features and generational comparison

The following table shows the comparison between the PowerEdge XR5610 with the PowerEdge XR11.

Table 2. Features comparison

Features	PowerEdge XR5610	PowerEdge XR11
Processors	1x 4th Gen and 5th Intel® Xeon® Scalable Processors including Edge Enhanced CPUs with Intel vRAN Boost	1 x 3rd Generation Intel® Xeon® Processor Scalable Family
CPU interconnect	Intel Ultra Path Interconnect (UPI)	Intel Ultra Path Interconnect (UPI)
Memory	• 8 x DDR5 RDIMM • Up to 4800 MT/s **NOTE:** The speed of the 4800 MT/s DIMM will be clocked down to match the CPU speed.	• 8 x DDR4 RDIMM, LRDIMM • Two Intel Optane Persistent Memory 200 series configuration: ○ 4+4 ○ 6+1
Storage Controllers	• PERC 11G: H755, H355 • PERC 12G: H965i, H965e • HBA 11: HBA355i, HBA355e • BOSS-N1 • Software RAID: S160 **NOTE:** PERC H965e is not compatible with Intel Ethernet 100G 2P E810--2C Adapter.	• PERC 10G: H345 • PERC 11G: H755, H355 • HBA 11: HBA355i, HBA355e • BOSS-S1 adapter • BOSS-S1 • Software RAID: S150
Drive Bays	4 x 2.5 inches 12 Gb SAS, 6 Gb SATA, NVMe	4 x 2.5 inches 12 Gb SAS, 6 Gb SATA, NVMe
Power Supplies	• AC (Platinum): 800 W, 1400 W, 1800 W • AC (Titanium): 1100 W • LVDC -48 VDC input: 1100 W	• AC (Platinum): 800 W, 1400 W, • AC (Titanium): 700 W, 1100 W • LVDC @-48 VDC Input: 800 W, 1100 W
Chassis Orientation	The XR5610 has two chassis options: 1. Rear Accessed Configuration, where power supplies and network cards are in the rear. **NOTE:** Network, serial, power supplies, USB, Mini DisplayPort, and PCIe slots are accessible in the rear of the platform and the hard drives, power button, Status LED, USB, and Management port are in the front of the system. 2. Front Accessed Configuration, where power supplies and network cards are in the front. **NOTE:** Power button, network ports, serial, USB, Mini DisplayPort, and PCIe Slots are accessible in the front of	The XR11 has two chassis options: 1. Rear Accessed Configuration, where power supplies and network cards are in the rear. **NOTE:** Network, serial, VGA, power supplies and PCIe slots are accessible in the rear of the platform and the hard drives, power button, Status LED, USB, and Management port are in the front of the system. 2. Front Accessed Configuration, where power supplies and network cards are in the front. **NOTE:** Power button, network ports, serial, VGA, and PCIe Slots are accessible in the front of the platform and the hard drives and Status LED are in the rear of the system.

Table 2. Features comparison (continued)

Features	PowerEdge XR5610		PowerEdge XR11	
	the platform and the hard drives and Status LED are in the rear of the system. The location of the control panel changes with the chassis orientation.		The location of the control panel changes with the chassis orientation.	
Fans	Standard fans		Very High Performance fans	
	Up to six cold swap fans		Up to six hot swap fans	
Dimension Form Factor	**Rear Accessed configuration**	**Front Accessed configuration**	**Rear Accessed configuration**	**Front Accessed configuration**
	Height: 42.8 mm (1.68 inches)	Height: 42.8 mm (1.68 inches)	Height: 42.8 mm (1.68 inches)	Height: 42.8 mm (1.68 inches)
	Width: 482.6 mm (19 inches)	Width: 482.6 mm (19 inches)	Width: 482.6 mm (19 inches)	Width: 482.6 mm (19 inches)
	Depth: 487.7 mm (19.2 inches) with bezel	Depth: 566.05 mm (22.28 inches) with bezel	Depth: 477 mm (18.77 inches) with bezel	Depth: 400 mm (15.74 inches) ear to rear wall
	463 mm (18.22 inches) without bezel	472.7 mm (18.61 inches) without bezel	463 mm (18.22 inches) without bezel	463 mm (18.22 inches) without bezel
	1U rack server		1U rack server	
Embedded Management	• iDRAC9 • iDRAC Direct • iDRAC RESTful API with Redfish • iDRAC Service Module • NativeEdge Endpoint Orchestrator		• iDRAC9 • iDRAC Direct • iDRAC RESTful API with Redfish • iDRAC Service Module	
Bezel	Optional LCD bezel or security bezel		Optional LCD bezel or security bezel	
OpenManage Software	• CloudIQ for PowerEdge plug-in • OpenManage Enterprise • OpenManage Enterprise Integration for VMware vCenter • OpenManage Integration for Microsoft System Center • OpenManage Integration with Windows Admin Center • OpenManage Power Manager plug-in • OpenManage Service plug-in • OpenManage Update Manager plug-in		• CloudIQ for PowerEdge plug-in • OpenManage Enterprise • OpenManage Enterprise Integration for VMware vCenter • OpenManage Integration for Microsoft System Center • OpenManage Integration with Windows Admin Center • OpenManage Power Manager plug-in • OpenManage Service plug-in • OpenManage Update Manager plug-in • OpenManage SupportAssist plug-in	
Mobility	OpenManage Mobile		OpenManage Mobile	
Integrations and Connections	OpenManage Integrations • BMC TrueSight • Microsoft System Center • OpenManage Integration with ServiceNow • Red Hat Ansible Modules • Terraform Providers • VMware vCenter and vRealize Operations Manager		OpenManage Integrations • Microsoft System Center • OpenManage Integration with ServiceNow • Red Hat Ansible Modules • VMware vCenter • Third-party Connectors (Naglos, Tivoli, Microfocus)	
Security	• Cryptographically signed firmware		• Cryptographically signed firmware	

Table 2. Features comparison (continued)

Features	PowerEdge XR5610	PowerEdge XR11
	• Data at Rest Encryption (SEDs with local or external key management) • Secure Boot • Secured Component Verification (Hardware integrity check) • Secure Erase • Silicon Root of Trust • System Lockdown (requires iDRAC9 Enterprise or Datacenter) • TPM 2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ	• Secure Boot • Secured Component Verification (Hardware integrity check) • Secure Enterprise Key Management • Silicon Root of Trust • System Lockdown (requires iDRAC9 Enterprise or Datacenter) • TPM 1.2/2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ
Embedded NIC	4 x 25 GbE LOM	4 x 25 GbE LOM
Networking Options	OCP 3.0 Mezz 3.0 (optional)	Not supported
GPU Options	Up to 2 x 75 W/150 W (SW/FH/HL)	Up to 2 x 70 W (SW/FH/HL)

Ports	Rear Accessed Configuration
	• Front:
	  ○ 1 x iDRAC Direct (Micro-AB USB 2.0) port
	  ○ 1 x USB 2.0
	• Rear:
	  ○ 1 x USB 3.0
	  ○ 1 x iDRAC dedicated port
	  ○ 1 x Serial port (Micro-AB USB 2.0-compliant)
	  ○ 1 x Mini-DisplayPort
	  ○ 1 x RJ45 for dry contact
	  ○ 4 x 25 GbE SFP+ LOM
		Rear Accessed Configuration
		• Front:
		  ○ one standard USB 2.0 port
		  ○ one micro USB 2.0 port dedicated to iDRAC management
		• Rear:
		  ○ one standard USB 3.0 port
		  ○ one standard USB 2.0 port
		  ○ one Dedicated 1 GbE
		  ○ one Serial port
		  ○ one VGA port
		• Internal: one standard USB 3.0 port on Riser 1 B

	Front Accessed Configuration
	• Front:
	  ○ 1 x iDRAC Direct (Micro-AB USB 2.0) port
	  ○ 1 x iDRAC dedicated port
	  ○ 1 x USB 3.0
	  ○ 1 x Serial (Micro-AB USB 2.0-compliant)
	  ○ 1 x Mini-DisplayPort
	  ○ 4 x 25 GbE SFP+ LOM
	  ○ 1 x RJ45 for dry contact
	• Rear: N/A
		Front Accessed Configuration
		• Front:
		  ○ one standard USB 3.0 port, one standard USB 2.0 port, one micro USB 2.0 port that is dedicated to iDRAC management, one Dedicated 1 GbE, one Serial port, one VGA port.
		• Rear: N/A
		• Internal: one standard USB 3.0 port on Riser 1 B

PCIe	One riser configuration: • Up to 2 x PCIe Gen5 (two x16 PCIe Gen5)	Two riser configuration options: • 3 x PCIe Gen4 (one x8 PCIe Gen4 + two x16 PCIe Gen4) • 3 x PCIe Gen4 (one x16 PCIe Gen4 + two x16 PCIe Gen4) (Only supported for Front Accessed Chassis)
Operating System and Hypervisors	• Canonical Ubuntu Server LTS • 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	• Canonical Ubuntu Server LTS • Citrix Hypervisor • Windows Server LTSC with Hyper-V • Red Hat Enterprise Linux • SUSE Linux Enterprise Server • VMware ESXi

Table 2. Features comparison (continued)

Features	PowerEdge XR5610	PowerEdge XR11
	Servers, Storage, and Networking page at Dell.com/OSsupport.	• RHEL Real time For specifications and interoperability details, see Dell Enterprise Operating Systems on Servers, Storage, and Networking page at Dell.com/OSsupport.

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Chassis views and features

Topics:

Front view of the system

Figure 1. Front view of the Rear Accessed configuration with front bezel

Figure 2. Front view of the Rear Accessed configuration without front bezel

Figure 3. Front view of the Front Accessed configuration with front bezel

Figure 4. Front view of the Front Accessed configuration without front bezel

Rear view of the system

Figure 5. Rear view of the Rear Accessed configuration

Figure 6. Rear view of the Front Accessed configuration with no bezel

Bezel view

Figure 7. Bezel for the Rear Accessed configuration

Table 3. Bezel for the Rear Accessed configuration

Item	Indicator, button, or connector	Description
1	Bezel filter	Provides protection from sand and dust. **NOTE:** To maintain optimal system health, Dell recommends checking and changing the filter every three months. Filters can be ordered from Dell.
2	Bezel key lock	Locking mechanism for the bezel. The bezel comes with a key.
3	Bezel LED indicator	System health indicator.
4	Bezel release button	When pressed, the bezel will unlock from the system.
5	Bezel filter release button	Bezel filter button is pressed to release the bezel filter.

Figure 8. Bezel for the Front Accessed configuration

NOTE: Without the front bezel, Front Accessed configuration support racks with 80 mm spacing from rack ear of chassis to inside surface of rack door. With the front bezel installed, the Front Accessed configuration system support racks with 100 mm spacing from rack ear of chassis to inside surface of the rack door

Table 4. Bezel for the Front Accessed configuration

Item	Indicator, button, or connector	Description
1	Bezel filter	Provides protection from sand and dust. **NOTE:** To maintain optimal system health, Dell recommends checking and changing the filter every three months. Filters can be ordered from Dell.
2	Bezel key lock	Locking mechanism for the bezel. The bezel comes with a key.
3	Bezel LED indicator	System health indicator.
4	Pressure sensor	Indicates when to replace the filter. **NOTE:** The pressure sensor device is located behind the bezel.
5	Bezel release button	When pressed, the bezel will unlock from the system.
6	Bezel filter release button	Bezel filter button is pressed to release the bezel filter.

Status LED control panel

Figure 9. Status LED control panel

Power button control panel

Figure 10. Power button control panel for Rear Accessed configuration

NOTE: For more information see the Dell PowerEdge XR5610 Technical Specifications on the product documentation page.

Power button control panel for Front Accessed configuration

NOTE: For more information see the Dell PowerEdge XR5610 Technical Specifications on the product documentation page.

Inside view of the system

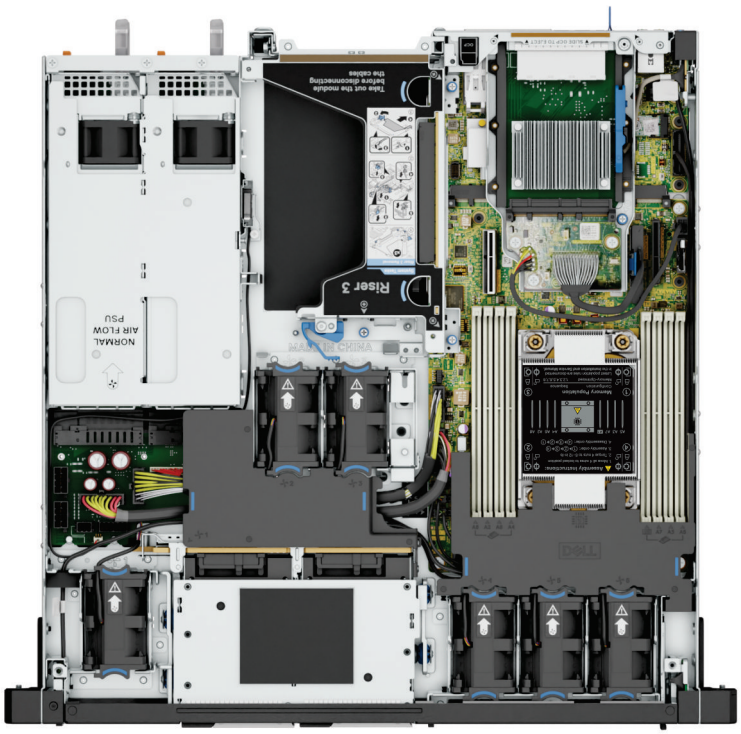

Figure 11. Inside the system - Rear Accessed configuration

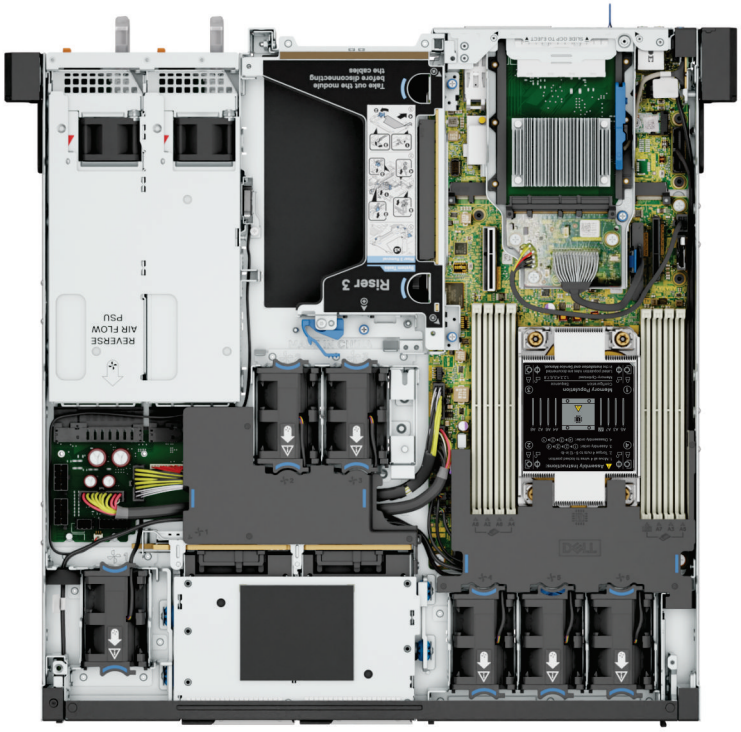

Figure 12. Inside the system - Front Accessed configuration

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Processor

Topics:

- Processor features

Processor features

The Intel 4th and 5th Generation Xeon® Scalable Processors and Edge-Enhanced CPUs is the next generation data center processor offering with significant performance increases, integrated acceleration, and next generation memory and I/O. Sapphire Rapids accelerate customer usage with unique workload optimizations.

The following lists the features and functions that are in the upcoming 4th and 5th Generation Intel® Xeon Scalable Processor and Edge-Enhanced CPUs offering:

- More, faster I/O with PCI Express 5 (Intel Xeon Scalable processor)/PCI Express 4 (Edge-Enhanced processor) and up to 80 lanes (per socket)
- Enhanced Memory Performance with DDR5 support and memory speed up to 5600 MT/s in one DIMM per channel (1DPC)

NOTE: It is recommended to use a maximum of two add-in cards with SPR EE-LCC CPU. Three add-in cards are supported, but this may result in an overall system performance degradation.

Supported processors

The following table shows the Intel Sapphire Rapids SKUs that are supported on the XR5610.

Table 5. Supported Processors for XR5610

Processor	Processor type	Clock Speed (GHz)	Cache (M)	Cores	Threads	Turbo	Memory Speed (MT/s)	Memory Capacity	TDP
3408U	SPR-SP	1.8	22.5	8	8	Turbo	4000	4 TB	125 W
5412U	SPR-SP	2.1	45	24	48	Turbo	4400	4 TB	185 W
5416S	SPR-SP	2.0	30	16	32	Turbo	4400	4 TB	150 W
6421N	SPR-SP	1.8	60	32	64	Turbo	4400	4 TB	185 W
5423N	SPR-EE-LCC	2.1	37.5	20	40	Turbo	4000	4 TB	145 W
6403N	SPR-EE-MCC	1.9	45	24	48	Turbo	4000	4 TB	185 W
6423N	SPR-EE-MCC	2.0	52.5	28	56	Turbo	4400	4 TB	195 W
6433N	SPR-EE-MCC	2.0	60	32	64	Turbo	4400	4 TB	205 W
5411N	SPR-SP MCC (QAT)	1.9	45	24	48	Turbo	4400	4 TB	165 W
6438N	SPR-SP MCC (QAT)	2.0	60	32	64	Turbo	4800	4 TB	205 W
XN8K0	EMR-SP MCC	2.0	30	16	32	Turbo	4400	4 TB	150 W
R6FN6	SPR-EE LCC mainline	2.4	30	12	24	Turbo	4400	4 TB	150 W
WYY2W	SPR-EE LCC mainline	2.6	22.5	8	16	Turbo	4400	4 TB	125 W

NOTE: It is recommended to use a maximum of two add-in cards with SPR EE-LCC CPU. Three add-in cards are supported, but this may result in an overall system performance degradation.

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Memory subsystem

Topics:

- Supported memory

Supported memory

Table 6. Memory technology comparison

Feature	PowerEdge XR5610 (DDR5)
DIMM type	RDIMM
Transfer speed	Processors in the XR5610 support up to 4800 MT/s transfer speed. DIMM transfer speed with 5600 MT/s may reduce according to the type of processor.
Voltage	1.1 V (DDR5)

Table 7. Supported memory matrix

DIMM type	Rank	Capacity	DIMM rated voltage and speed	Operating Speed
				One DIMM per channel (DPC)
RDIMM	1 R	16 GB	DDR5 (1.1 V), 5600 MT/s	4000 MT/s, 4400 MT/s, 4800 MT/s
	2 R	32 GB, 64 GB, 96 GB	DDR5 (1.1 V), 5600 MT/s	4000 MT/s, 4400 MT/s, 4800 MT/s
	4 R	128 GB	DDR5 (1.1 V), 5600 MT/s	4000 MT/s, 4400 MT/s, 4800 MT/s

NOTE: The processor may reduce the performance of the rated DIMM speed.

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Storage

Topics:

Storage controllers

The PowerEdge XR5610 supports many of Dell's RAID controller options that offer performance improvements from previous generations. Dell RAID controller options offer performance improvements, including the fPERC solution. fPERC provides a base RAID HW controller without consuming a PCIe slot by using a small form factor and high-density connector to the base planar. 16G PERC Controller offerings are a heavy leverage of 15G PERC family. The Value and Value Performance levels carry over to 16G from 15G. New to 16G is the Avenger-based Premium Performance tier offering. This high-end offering drives IOPs performance and enhanced SSD performance.

NOTE: The size of the RAID 1 drives must be less than that of the second RAID container.

Table 8. PERC Series controller offerings

Performance Level	Controller and Description
Entry	S160
Value	H355, HBA355 (internal/external)
Value Performance	H755
Premium Performance	H965i, H965e **NOTE:** PERC H965e is not compatible with Intel Ethernet 100G 2P E810--2C Adapter.

NOTE: For more information on the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card, and on deploying the cards, see the storage controller documentation at Storage Controller Manuals.

Supported Drives

The table shown below lists the internal drives supported by the XR5610 system. Refer to Agile for the latest SDL.

Table 9. Supported drive specifications

Form factor	Type	Speed	Rotational speed	Cpacities
2.5 inches	SATA SSD	6 Gb	N/A	480 GB, 960 GB, 1.92 TB, 3.84 TB
2.5 inches	SAS SSD	24 Gb	N/A	800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB, 15.36 TB
2.5 inches	NVMe	Gen4	N/A	960 GB, 1 TB, 2 TB, 4 TB, 8 TB, 1.6 TB, 3.2 TB, 6.4 TB, 1.92 TB, 3.84 TB, 7.68 TB, 12.8 TB, 15.36 TB, 30.72 TB

Internal storage configuration matrix for XR5610

Table 10. Internal storage configuration matrix

Configuration number	Chassis Orientation	Base Configuration Description	Backplane Description	Storage Controller(s)	Controller Form Factor	BOSS Enabled	NVME Enabled	Riser Configuration
1	Rear Accessed configuration	ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SATA (only)	Onboard SATA	Onboard SATA	N	N	N/A
2		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	HBA355i	Adapter	Y	N	C1: R3
3		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	H755	Adapter	Y	N	C1: R3
4		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	H355	Adapter	Y	N	C1: R3
5		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	S160	Direct Attach (SL)	Y	Y	N/A
6		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	H755	Adapter	Y	Y	C1: R3
7		ASSY, CHAS, NAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	H965i	Adapter	Y	Y	C1: R3
8	Front Accessed configuration	ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SATA (only)	Onboard SATA	Onboard SATA	N	N	N/A
9		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	HBA355i	Adapter	Y	N	C1: R3
10		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	H755	Adapter	Y	N	C1: R3
11		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 SAS/ SATA	H355	Adapter	Y	N	C1: R3
12		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	S160	Direct Attach (SL)	Y	Y	N/A
13		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	H755	Adapter	Y	Y	C1: R3
14		ASSY, CHAS, RAF, 4HD, 3PCI, 1U, XR5610	x4 2.5 NVME (only)	H965i	Adapter	Y	Y	C1: R3

External Storage

The XR5610 supports the external storage device types listed in the table below.

Table 11. Supported External Storage Devices

Device Type	Description
External Tape	Supports connection to external USB tape products
NAS/IDM appliance software	Supports NAS software stack

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Networking

Topics:

Overview

PowerEdge offers a wide variety of options to get information moving to and from our servers. Industry best technologies are chosen, and systems management features are added by our partners to firmware to tie in with iDRAC. These adapters are rigorously validated for worry-free, fully supported use in Dell servers.

OCP 3.0 support

Table 12. OCP 3.0 feature list

Feature	OCP 3.0
Form factor	SFF
PCIe Gen	Gen4
Max PCIe width	x4, x8 or x16
Max no. of ports	4
Port type	SFP/SFP+/SFP28
Max port speed	25 GbE
NC-SI	Yes
Power consumption	35 W(Front Accessed configuration 35°C critical)

Supported OCP cards

Table 13. Supported OCP cards

Form factor	Vendor	Port type	Port speed	Port count
OCP 3.0	Intel	S28	25 GbE	4
	Broadcom	BT	10 GbE	4
	Broadcom	S28	25 GbE	4
	Broadcom	V2	25 GbE	4
	Intel	BT	10 GbE	4
	Intel	BT	10 GbE	4
	Intel	BT	1 GbE	4
	Broadcom	BT	10 GbE	2

Table 13. Supported OCP cards (continued)

Form factor	Vendor	Port type	Port speed	Port count
	Broadcom	V2	25 GbE	2
	Broadcom	BT	1 GbE	4
	Intel	S28	10 GbE	2

OCP NIC 3.0 vs. rack Network Daughter Card comparisons

Table 14. 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 x16	See server slot priority matrix
Aux Power	Yes	Yes	Yes	Used for Shared LOM

OCP form factors

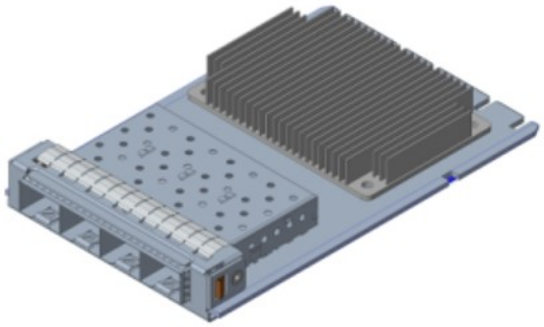

Figure 13. Floating OCP 3.0 (FLOP)

The process of installing the OCP card in XR5610 system:

1. Open the blue latch on the system board.
2. Slide the OCP card into the slot in the system.
3. Push until the OCP card is connected to the connector on the system board.
4. Close the latch to lock the OCP card to the system.

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PCIe subsystem

Topics:

- PCIe risers

PCIe risers

Shown below are the riser offerings for the platform.

Figure 14. Riser connector location on system board

1. Riser IO1A
2. Riser Riser 3A

Figure 15. IO1A

1. IO bay 1

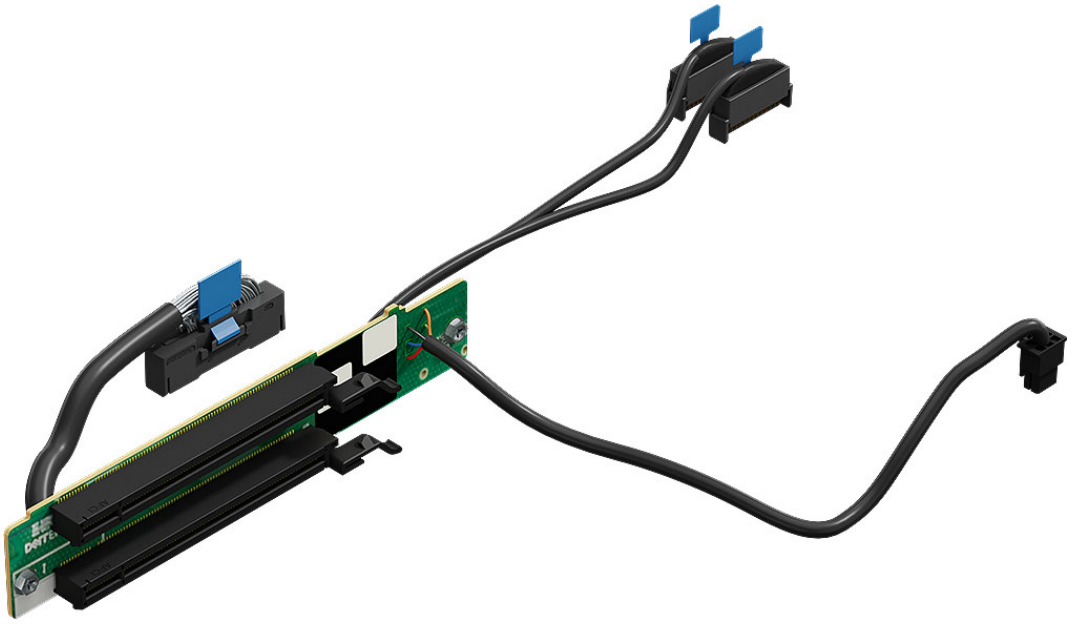

Figure 16. Riser 3A

1. Slot 1
2. Slot 2

Table 15. PCIe Riser Configurations

Config No.	Riser configuration	No. of Processors	PERC type supported	Rear storage possible
0	NO RSR	1	N/A	No
1	IO1A+R3A	1	PERC adapter	No
2	IO1A	1	N/A	No
3	R3A	1	PERC adapter	No

NOTE: PERC H965i adapter can only be installed in slot 1 of the riser 3A. Slot 2 must be empty.

9

Power, thermal, and acoustics

PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps to regulate temperature by 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

Table 16. 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 Enterprise Infrastructure Planning Tool.
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 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 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.
Rack infrastructure	Dell offers some of the industry's highest-efficiency power infrastructure solutions, including:

Table 16. Power tools and technologies (continued)

Feature	Description
	• Power distribution units (PDUs) • Uninterruptible power supplies (UPSs) • Energy Smart containment rack enclosures Find additional information at: Power and Cooling Solutions.

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 XR5610.

Table 17. Power Supply Unit Options

Wattage	Frequency	Voltage/Current	Class	Heat dissipation
800 W mixed mode	50/60 Hz	100—240 Vac/9.2 A—4.7 A	Platinum	3000 BTU/hr
	N/A	240 Vdc/3.8 A	Platinum	3000 BTU/hr
1100 W DC	N/A	-48—(-60) Vdc/27 A	N/A	4265 BTU/hr
1100 W mixed mode	50/60 Hz	100—240 Vac/12 A—6.3 A	Titanium	4299 BTU/hr
	N/A	240 Vdc/5.2 A	Titanium	4299 BTU/hr
1400 W DC	N/A	240 Vdc/6.6 A	Platinum	5406 BTU/hr
1400 W mixed mode	50/60 Hz	100—240 Vac/12 A—8 A	Platinum	5406 BTU/hr
	N/A	240 Vdc/6.6 A	Platinum	5406 BTU/hr
1800 W mixed mode	50/60 Hz	200—240 Vac/10 A	Titanium	5406 BTU/hr
	N/A	240 Vdc/8.2 A	Titanium	5406 BTU/hr

NOTE: 1100 W -48 VDC and 1400 W AC come in Front Accessed configuration offerings (Front Accessed configuration PSUs).

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.

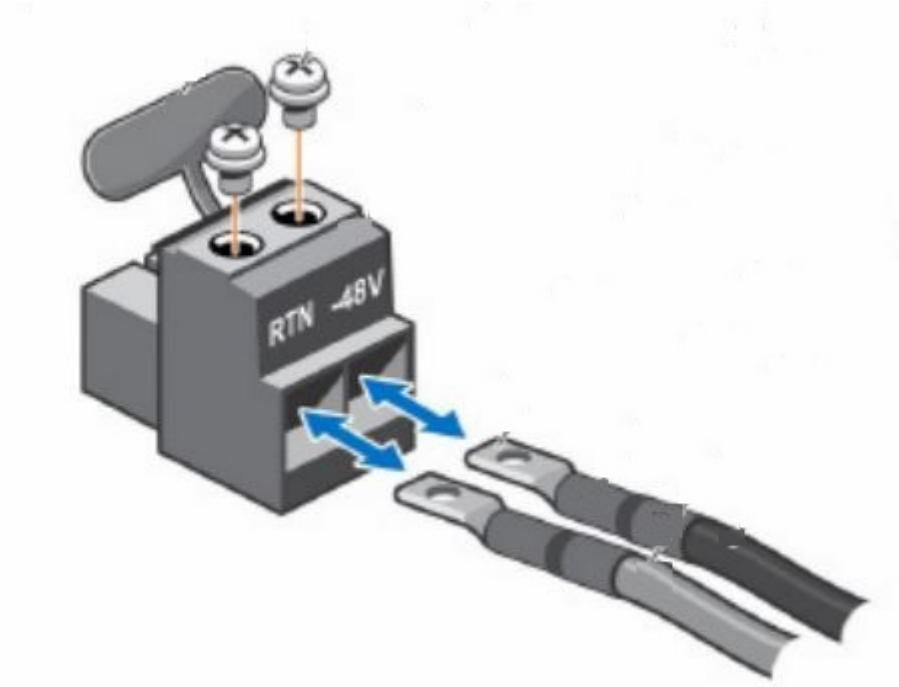

Figure 17. DC PSU power cords

Figure 18. AC PSU power cords

Table 18. PSU power cables

Form factor	Output	Power cord
Redundant 60 mm	800 W mixed mode	C13
	1100 W mixed mode	C13
	1100 W -48 VDC	DC power cable
	1400 W mixed mode	C15
	1800 W mixed mode	DC power cable

PSU rating

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

Table 19. PSUs highline and lowline ratings

—	800 W Platinum	1100 W Titanium	1100 W -48 VDC	1400 W Platinum	1800 W Titanium
Peak Power (Highline)	1360 W	N/A	N/A	2380 W	2074 W
Highline	800 W	N/A	N/A	1400 W	1800 W

Table 19. PSUs highline and lowline ratings (continued)

—	800 W Platinum	1100 W Titanium	1100 W -48 VDC	1400 W Platinum	1800 W Titanium
Peak Power (Lowline)	1360 W	N/A	N/A	1785 W	N/A
Lowline	800 W	N/A	N/A	1050 W	N/A
Highline 240 VDC	800 W	N/A	N/A	1400 W	1800 W
Highline 200—380 VDC	N/A	N/A	N/A	N/A	N/A
DC -48—(-60) V	N/A	800 W	1100 W	N/A	N/A

The PowerEdge XR5610 supports up to two AC or DC 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. If the PSU wattages do not match, the larger of the two PSUs is enabled and there is also a PSU mismatch warning that is displayed in BIOS and iDRAC.

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 will not be enabled.

The PowerEdge XR5610 Rear Accessed configuration chassis will only support Rear Accessed configuration PSUs. Front Accessed configuration PSUs cannot be installed in a Rear Accessed configuration chassis due to a specific keying mechanism on the chassis and PSU. Similarly, Front Accessed configuration PSUs are only allowed in Front Accessed configuration chassis. A Rear Accessed configuration PSU cannot be installed in a Front Accessed configuration chassis due to the same mechanical restrictions (keying mechanism) outlined above.

Table 20. PSU efficiency level

Efficiency Targets by Load						
Form factor	**Output**	**Class**	**10%**	**20%**	**50%**	**100%**
Redundant 60 mm	800 W AC	Platinum	89.00%	93.00%	94.00%	91.50%
	1100 W AC	Platinum	89.00%	93.00%	94.00%	91.50%
	1400 W AC	Platinum	89.00%	93.00%	94.00%	91.50%
	1800 W AC	Titanium	90.00%	94.00%	96.00%	94.00%

Thermal

PowerEdge servers have an extensive collection of sensors that automatically track thermal activity, which helps regulate temperature thereby reducing server noise and power consumption.

Multi Vector cooling 3.0

Multi Vector Cooling (MVC) was introduced in 14G and has been improved upon here to increase cooling capability, customization and automation.

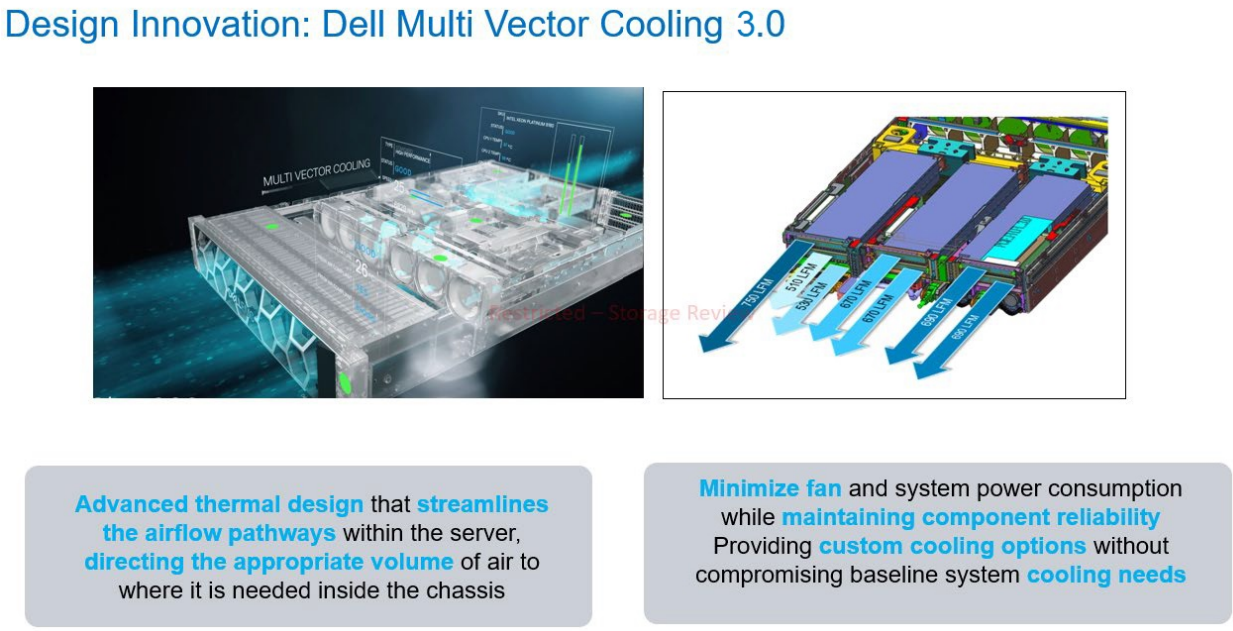

Figure 19. Multi Vector Cooling Overview

Features included in this new iteration of MVC include:

- Patented Adaptive closed loop power capping
- Patented baseline fan speed algorithm
- Custom delta-t; allowing customers to specify outlet temperature (Requires iDRAC Datacenter)
- Custom PCIe inlet temp and airflow control among other custom cooling capabilities for PCIe devices (Requires iDRAC Datacenter)

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 given in the table below.

Table 21. 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

Table 21. Acoustical Reference Points and Output Comparisons (continued)

Value measured at your ears		Equivalent familiar noise experience
LpA, dBA, re 20µPa	**Loudness, sones**	
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.

Acoustical configurations of XR5610

Dell PowerEdge XR5610 is a rack-mount server appropriate for general use space (Category 3) and unattended data center environment (Category 5).

The table below shows the acoustical performance of the XR5610 for various configurations and acoustical categories.

Table 22. XR5610 acoustical configurations

Configuration		Rear Accessed configuration			Front Accessed configuration		
		Minimum	**Typical**	**Maximum**	**Minimum**	**Typical**	**Maximum**
CPU TDP		125W	150W	185W	125W	150W	185W
CPU Quantity		1	1	1	1	1	1
RDIMM Memory		16G DDR5 RDIMM	16G DDR5 RDIMM	64G DDR5 RDIMM	16G DDR5 RDIMM	16G DDR5 RDIMM	64G DDR5 RDIMM
Memory Quantity		1	2	8	1	2	8
Backplane Type		2.5 inch x4 BP	2.5 inch x4 BP	2.5 inch x4 BP	2.5 inch x4 BP	2.5 inch x4 BP	2.5 inch x4 BP
Storage Type		2.5 inch SATA SSD 480GB	2.5 inch SATA SSD 480GB	2.5 inch NVMe 7.68TB	2.5 inch SATA SSD 480GB	2.5 inch SATA SSD 480GB	2.5 inch NVMe 7.68TB
Storage Quantity		1	4	4	1	4	4
BOSS/M.2		X	X	BOSS N1 2x 480GB	X	X	BOSS N1 2x 480GB
PSU Type		800W	800W	1400W	1400W	1400W	1400W
PSU Quantity		1	2	2	1	2	2
OCP		X	X	25GbE Dual Port	X	X	25GbE Dual Port
PCI 1		X	25GbE Dual Port	PERC H755	X	25GbE Dual Port	PERC H755
PCI 2		X	X	GPU A2	X	X	GPU A2
Acoustical Performance: Idle/ Operating @ 25 °C Ambient							
$L_{wA,m}$ (B)	Idle (4)	5.2	5.3	6.5	5.5	5.5	6.6
	Operating (5)	5.2	5.3	6.5	5.5	5.5	6.6
K_v (B)	Idle (4)	0.4	0.4	0.4	0.4	0.4	0.4
	Operating (5)	0.4	0.4	0.4	0.4	0.4	0.4
$L_{pA,m}$ (dB)	Idle (4)	37	37	48	38	3 9	48

Table 22. XR5610 acoustical configurations (continued)

Configuration		Rear Accessed configuration			Front Accessed configuration		
		Minimum	Typical	Maximum	Minimum	Typical	Maximum
	Operating [5]	37	3 8	4 8	38	3 9	48
Prominent discrete tones [3]			No prominent tones in Idle and Operating Modes				
Acoustical Performance: Idle @ 28 °C Ambient							
$L_{wA,m}$ [1] (B)		6.0	6.0	6.9	6.1	6.1	7.1
K_v (B)		0.4	0.4	0.4	0.4	0.4	0.4
$L_{pA,m}$ [2] (dB)		45	45	53	48	48	54
Acoustical Performance: Max. Loading @ 35 °C Ambient							
$L_{wA,m}$ [1] (B)		7.0	7.0	9.2	7.1	7.1	9.3
K_v (B)		0.4	0.4	0.4	0.4	0.4	0.4
$L_{pA,m}$ [2] (dB)		54	54	76	55	55	78

NOTE:

1. **LwA,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.
2. **LpA,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.
3. **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.
4. **Idle mode**: Idle mode is the steady-state condition in which the server is energized but not operating any intended function.
5. **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.

PowerEdge XR5610 acoustical dependencies

Some product features impact acoustical server output more than others. The following features are considered strong drivers of acoustical response, thus configurations, or operating conditions that include these features may increase air mover speed and acoustical output of the server:

- Ambient temperature: Dell evaluates the acoustical performance of servers in a 23±2°C environment. Ambient temperatures more than 25°C has higher acoustical output and may experience larger fluctuations between state changes.
- Processor thermal design power (TDP): Higher wattage processors may require more airflow to cool under load and thus increase the potential acoustical output of the system.
- Storage type: NVMe SSD consumes more power than SAS/SATA drives, and will pre-heat down-stream components (for example, Processor, DIMM), and hence requires higher fan speeds and hence higher acoustical outputs.
- **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) will result in higher acoustical output.
- PCIe cards: When 25 Gb NIC card or GPU card ≥ 60 W A2 GPU is installed, the acoustical outputs are higher in both idle and operating conditions.

10

Rack, rails, and cable management

Topics:

Rails and cable management information

The PowerEdge XR5610 only supports sliding rails. These rails have a slim rail design that is adequate for the wide system chassis.

See the *Enterprise Systems Rail Sizing and Rack Compatibility Matrix* available at Rail and Rack Matrix 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:

- Identifying the type of rack in which they will be installed.
- The spacing between the front and rear mounting flanges of the rack
- The type and location of any equipment that is mounted in the back of the rack such as power distribution units (PDUs), and the 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 and are available with the optional CMA. There are two types of sliding rails available, for XR5610 depending on the rack style or transit case for rugged mounting. These rails can be mounted in 2-post or 4-post racks and in a specific Pelican transit case customized for the XR5610 (Pelican DE2412-05/24/05) to meet 901E requirements.

The XR5610 sliding rails are stab-in style. A 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. 1U systems require a two-person lift.

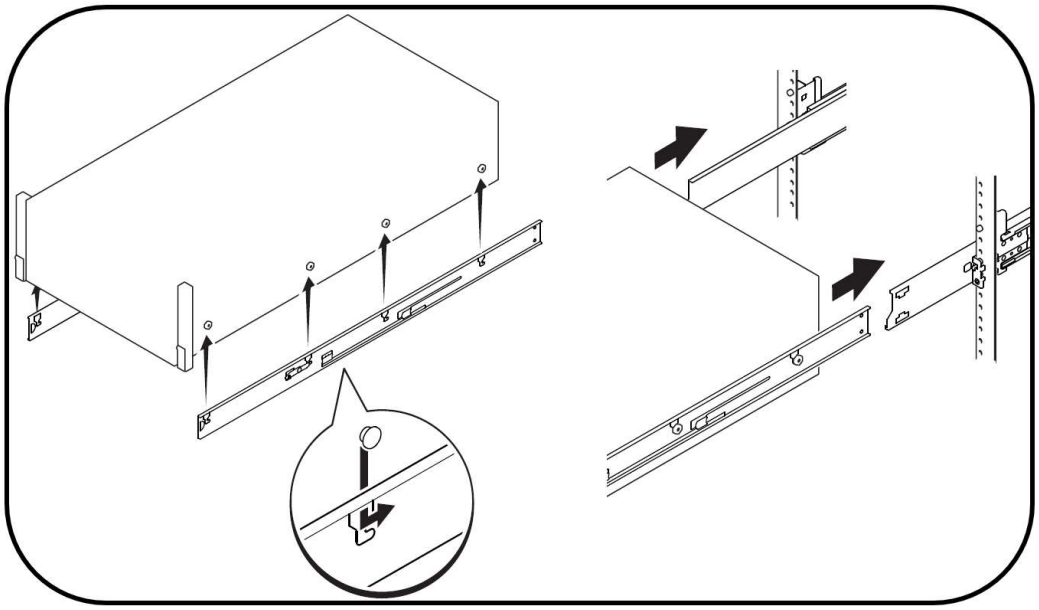

Figure 20. Installing the system in the stab-in sliding rails

XR5610 sliding rails overview:

- Support for tool-less installation in 19” EIA-310-E compliant square, unthreaded round hole racks including all generations of Dell racks. Also supports tool-less installation in threaded round hole 4-post racks.
- Support for 4-post rack depths between 470 - 750 mm (18.5 - 29.5") post-to-post depth range
- Supports Stab-in installation of the chassis to the rails.
- Support full extension of the system out of the rack to allow serviceability of key internal components.
- Support for optional cable management arm (CMA) and strain relief bar (SRB)

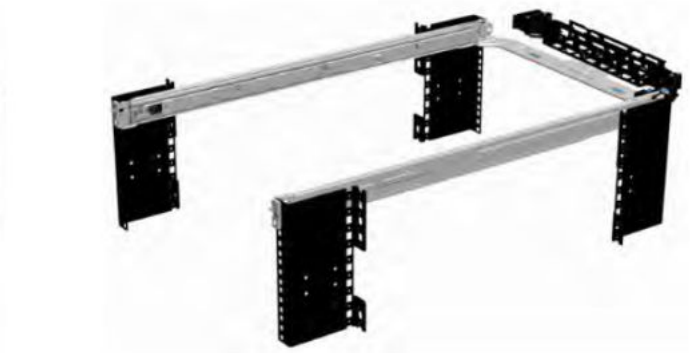

Figure 21. Sliding rails with optional CMA

Figure 22. Sliding rails with optional SRB

Sliding rails in 4-post rack

The sliding rails for XR5610 provide tool-less support for 4-post racks with 19” EIA-310-E compliant square or unthreaded round mounting holes including all generations of Dell racks when the post-to-post rack depth is between 470-750 mm (18.5 - 29.5"). There are additional screws that are included in the rail kit to tightly secure the rails to the 4-post rack if desired.

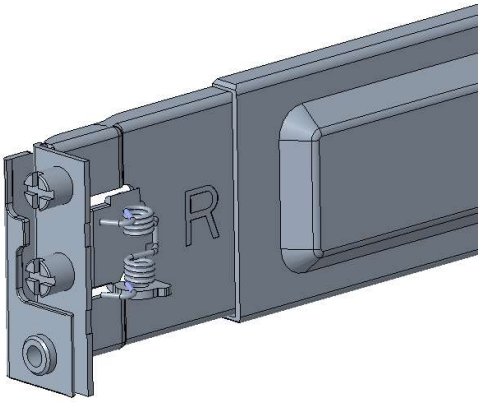

Figure 23. Stab-in sliding rail mounting interface for 4-post round or square hole racks

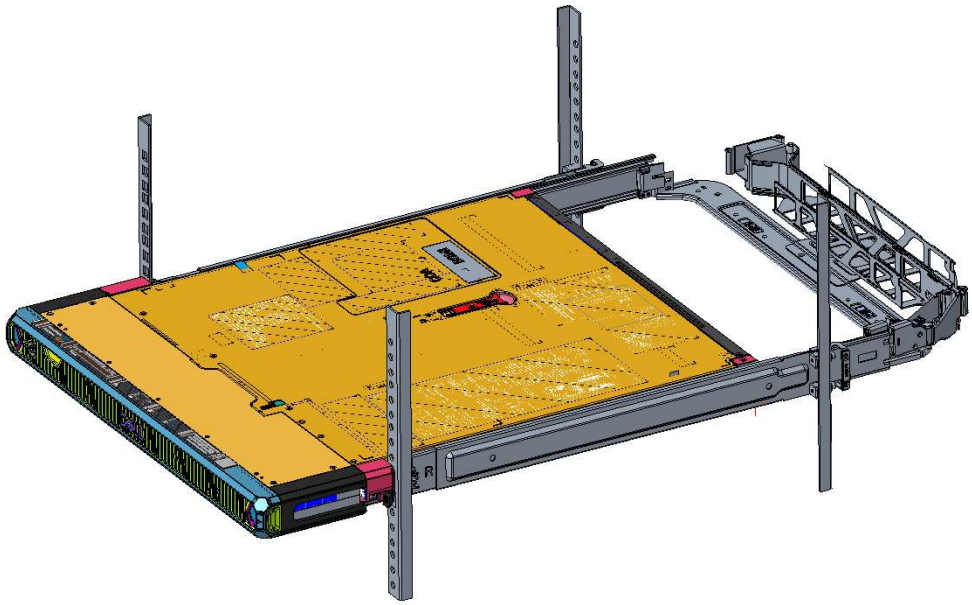

Figure 24. XR5610 system mounted in the sliding rail with the CMA in 4-post rack

Sliding rails in 2-post rack

The sliding rails for XR5610 provide support for 2-post racks with 19" EIA-310-E compliant square, round, or threaded round mounting holes. Adapter brackets and screws (included in the rail kit) are necessary to mount XR5610 into 2-post racks either in flush-mount or center-mount positions.

NOTE: Two-post racks are not supported in the rugged environment.

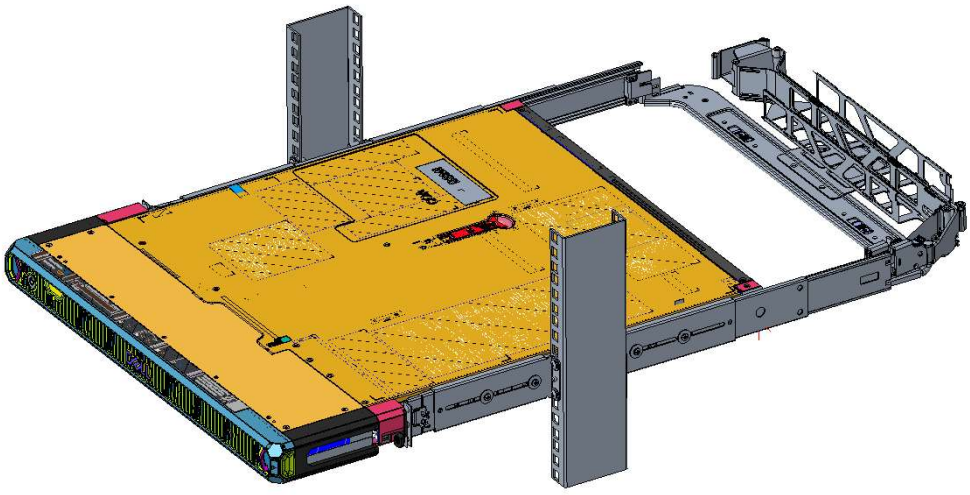

Figure 25. XR5610 mounted in sliding rails in 2-post center mount configuration

Sliding rails in Pelican transit case

For transit cases, a specific other type of rail has been designed and can be ordered from Dell that is compatible with the Pelican DE2412-05/24/05 transit case. Dell only certifies XR5610 compliance in this Pelican case.

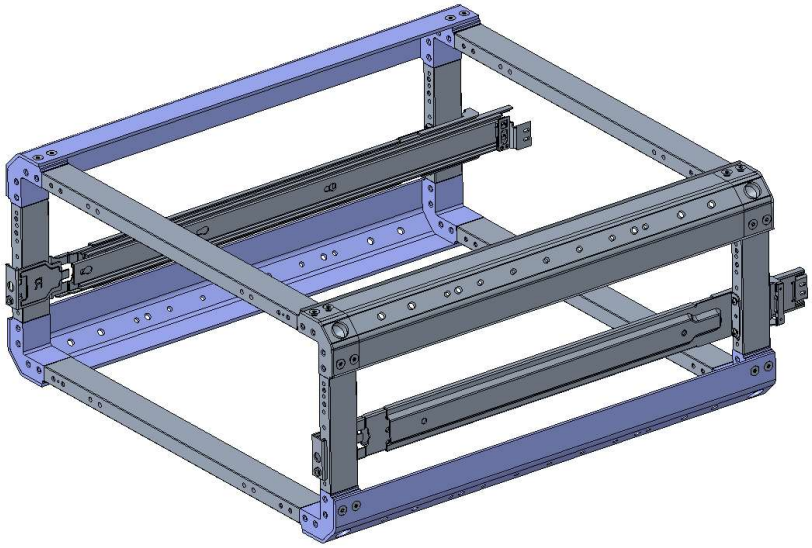

Figure 26. Pelican transit case for XR5610

Cable management arm (CMA)

The optional cable management arm (CMA) for the XR5610 organizes and secures the cords and cables exiting the back of the server and unfolds to allow the server 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.
- Can be mounted on either side by simply swinging the spring-loaded brackets from one side to the other.
- 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.

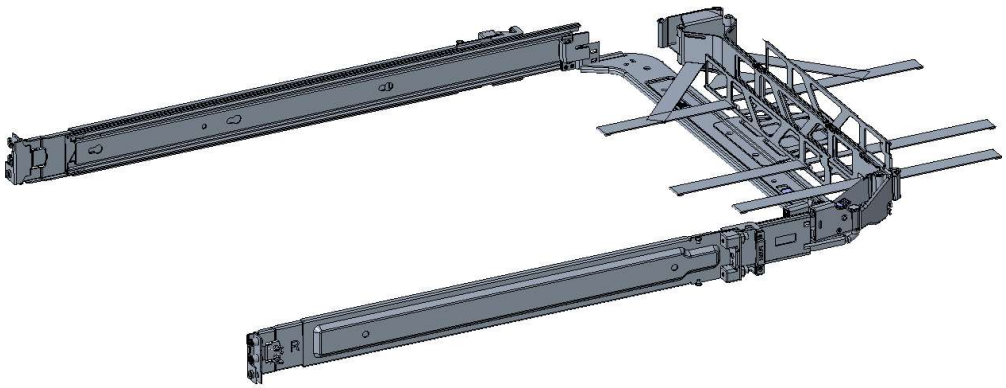

Figure 27. Sliding rails with optional CMA

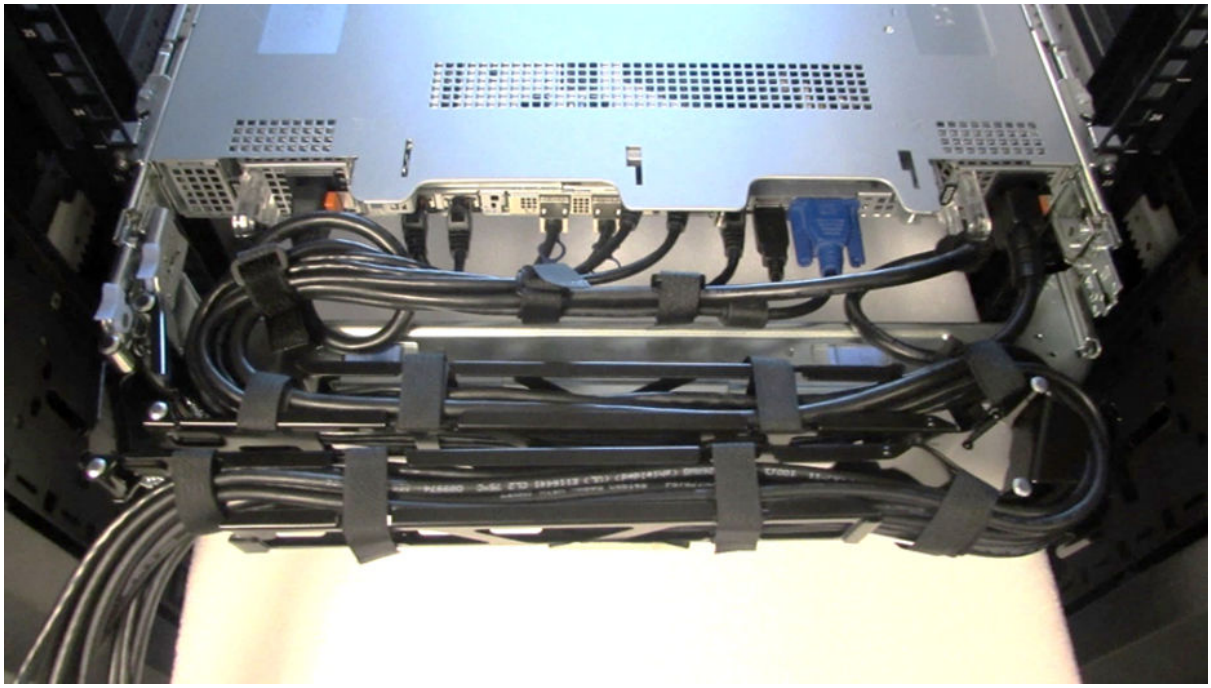

Figure 28. CMA Cabling

Strain Relief Bar (SRB)

The optional strain relief bar (SRB) for the XR5610 organizes and secures cables exiting the back of the server.

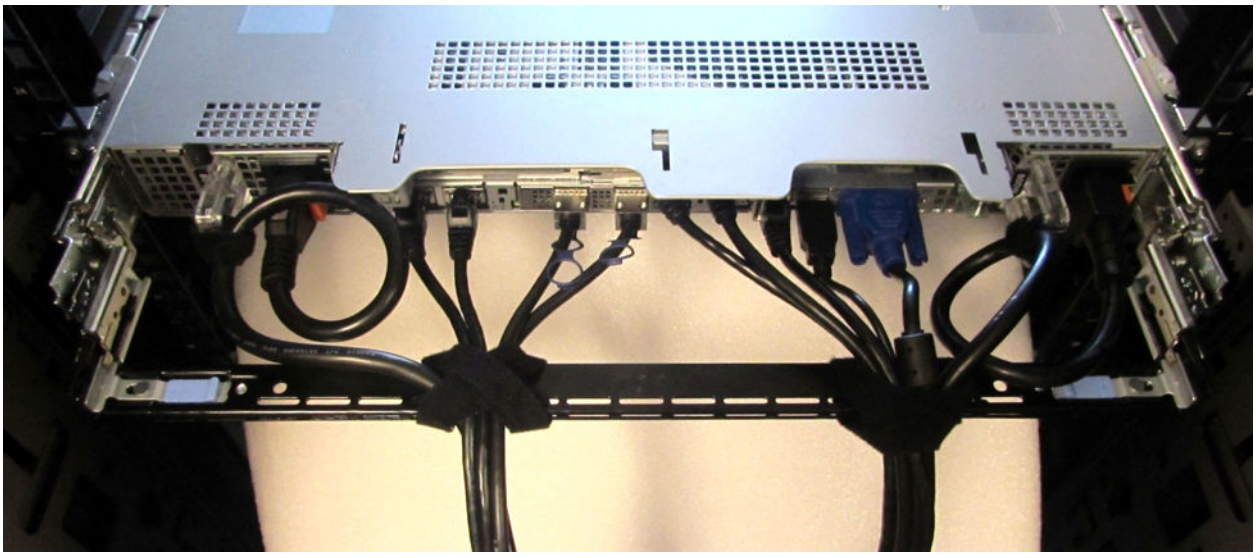

Figure 29. Cabled strain relief bar

- 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 segregated into discrete purpose-specific bundles.

Rack Installation

Installing the system into the rail (Stab-in)

1. Pull the intermediate rails out of the rack until they lock into place.

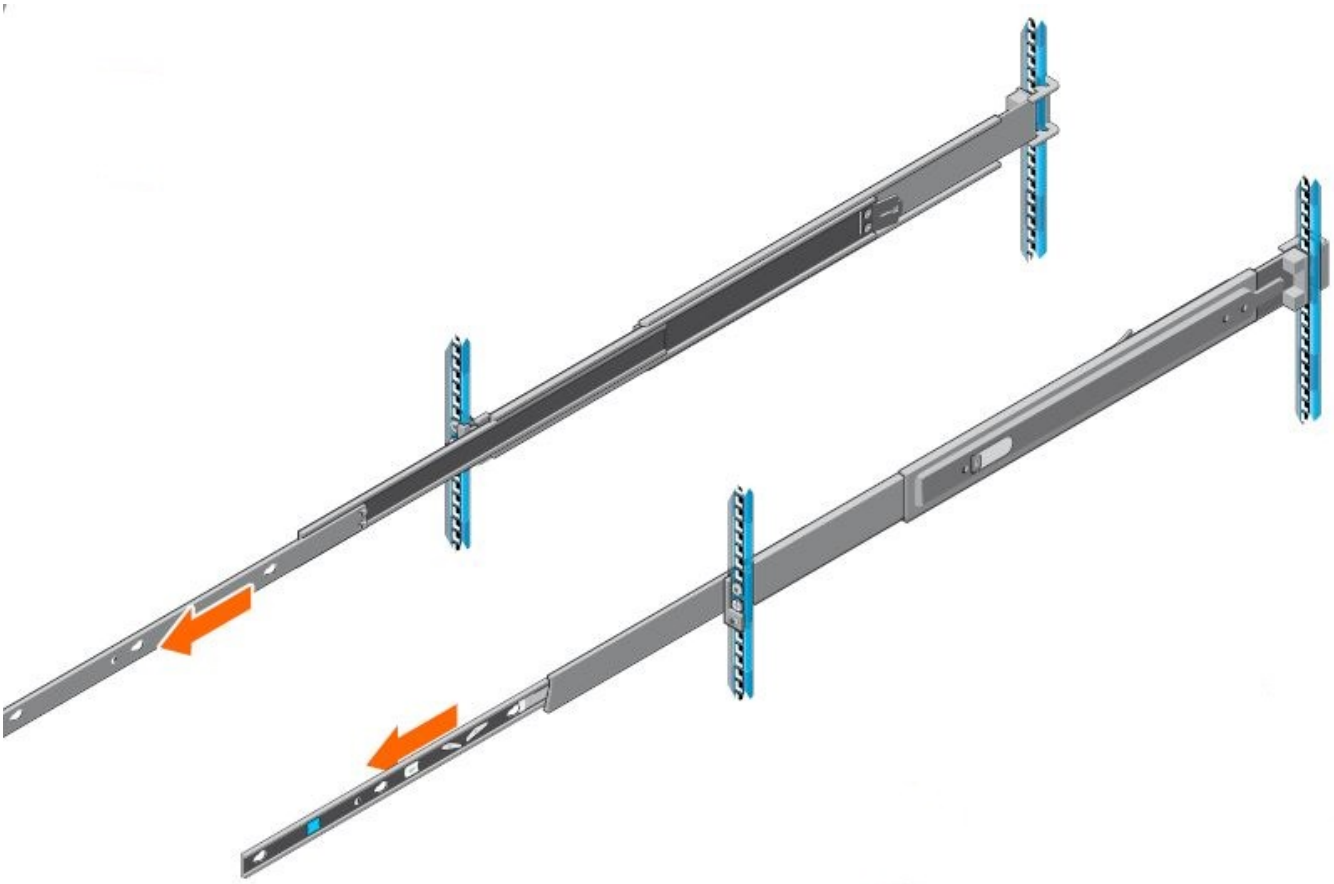

Figure 30. Pull out the intermediate rail

2. Release the inner rail lock by pulling forward on the white tabs and sliding the inner rail out of the intermediate rails.

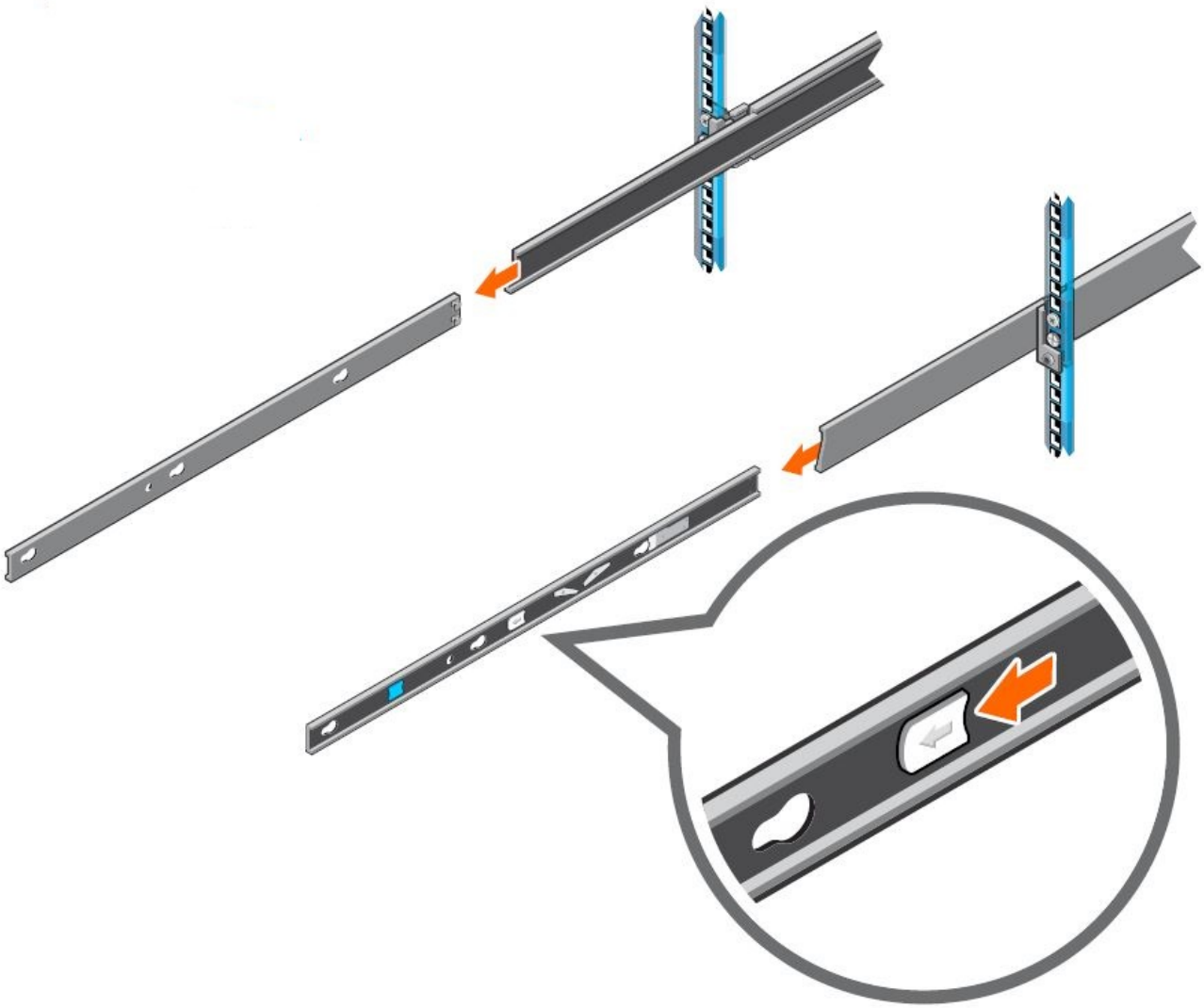

Figure 31. Releasing the inner rail

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

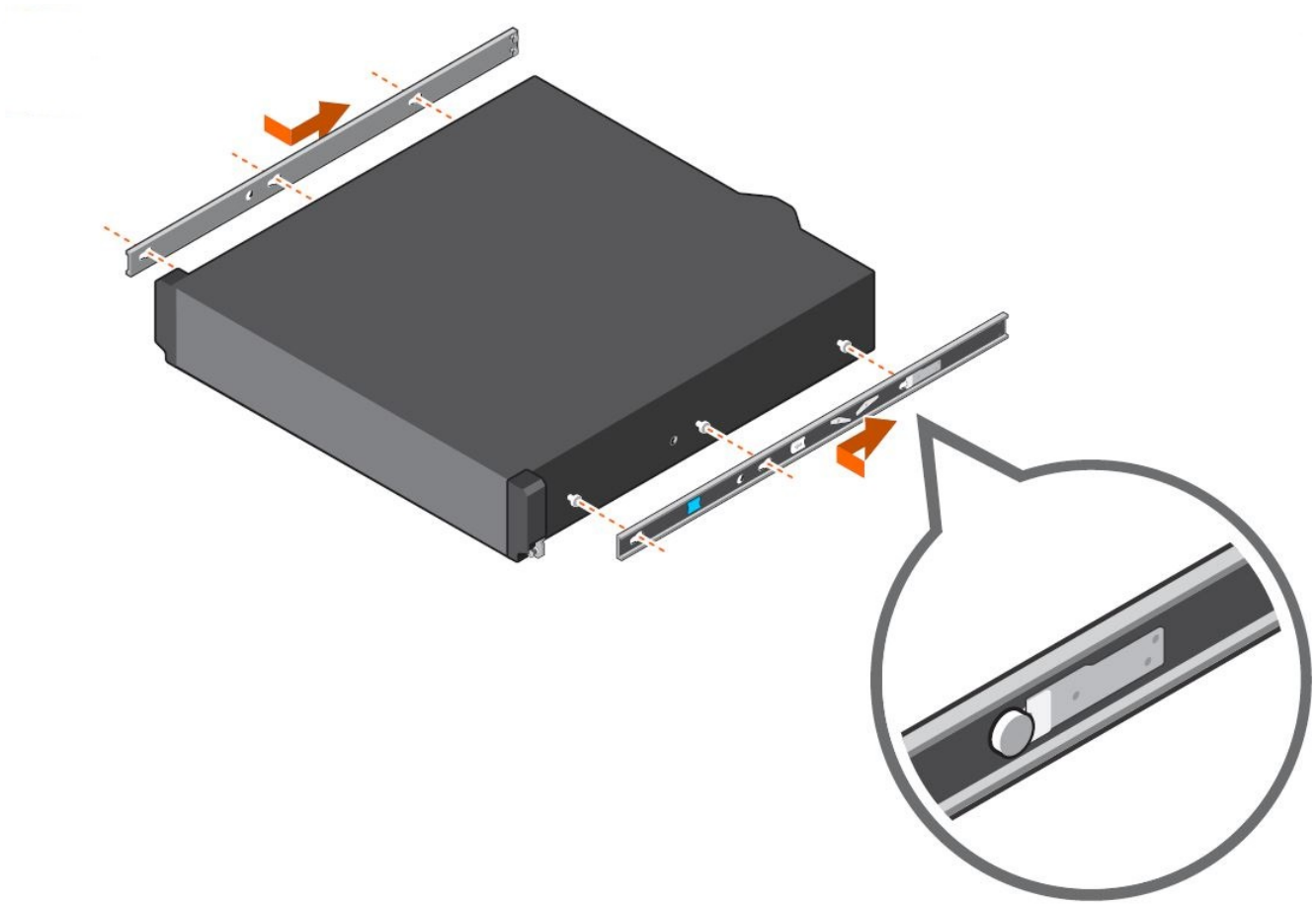

Figure 32. Attaching the rails to the sides of the system

4. With the intermediate rails extended, install the system into the extended rails.

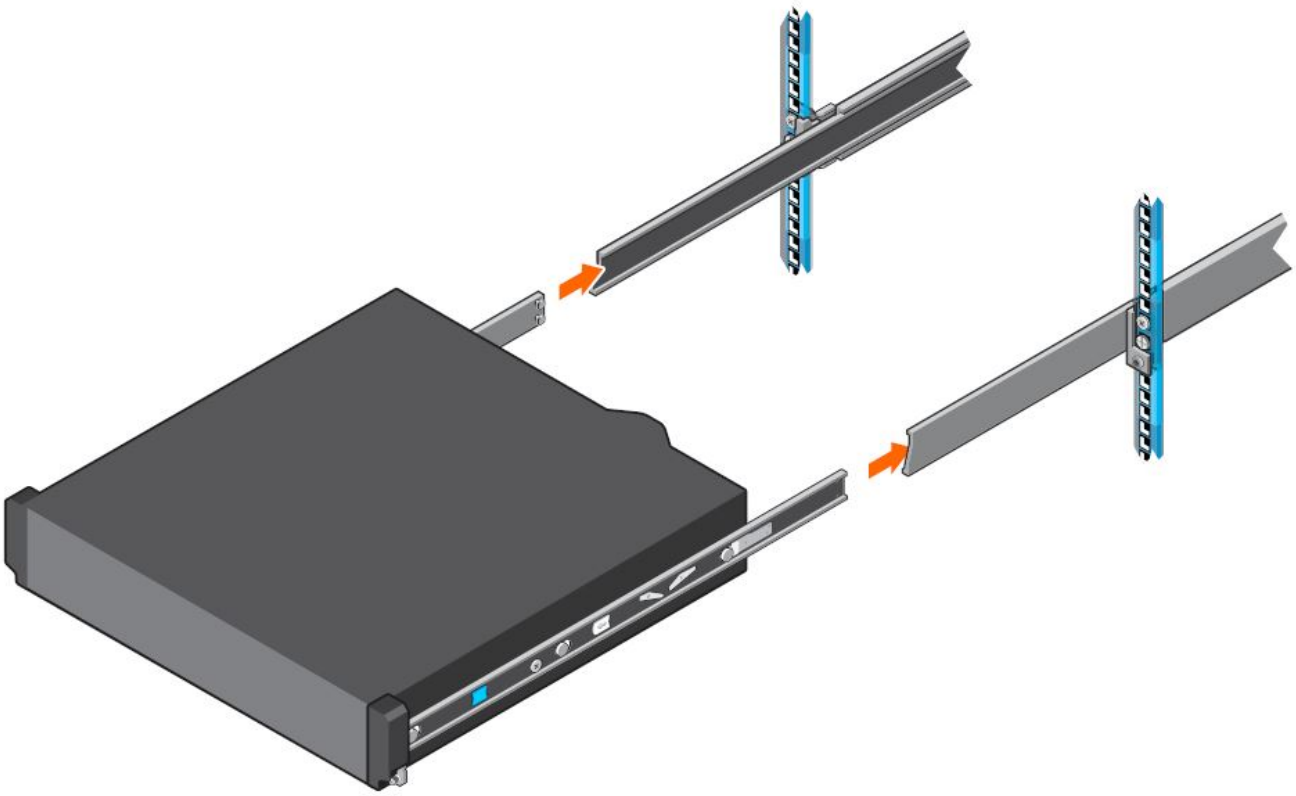

Figure 33. Installing the system into the extended rails

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

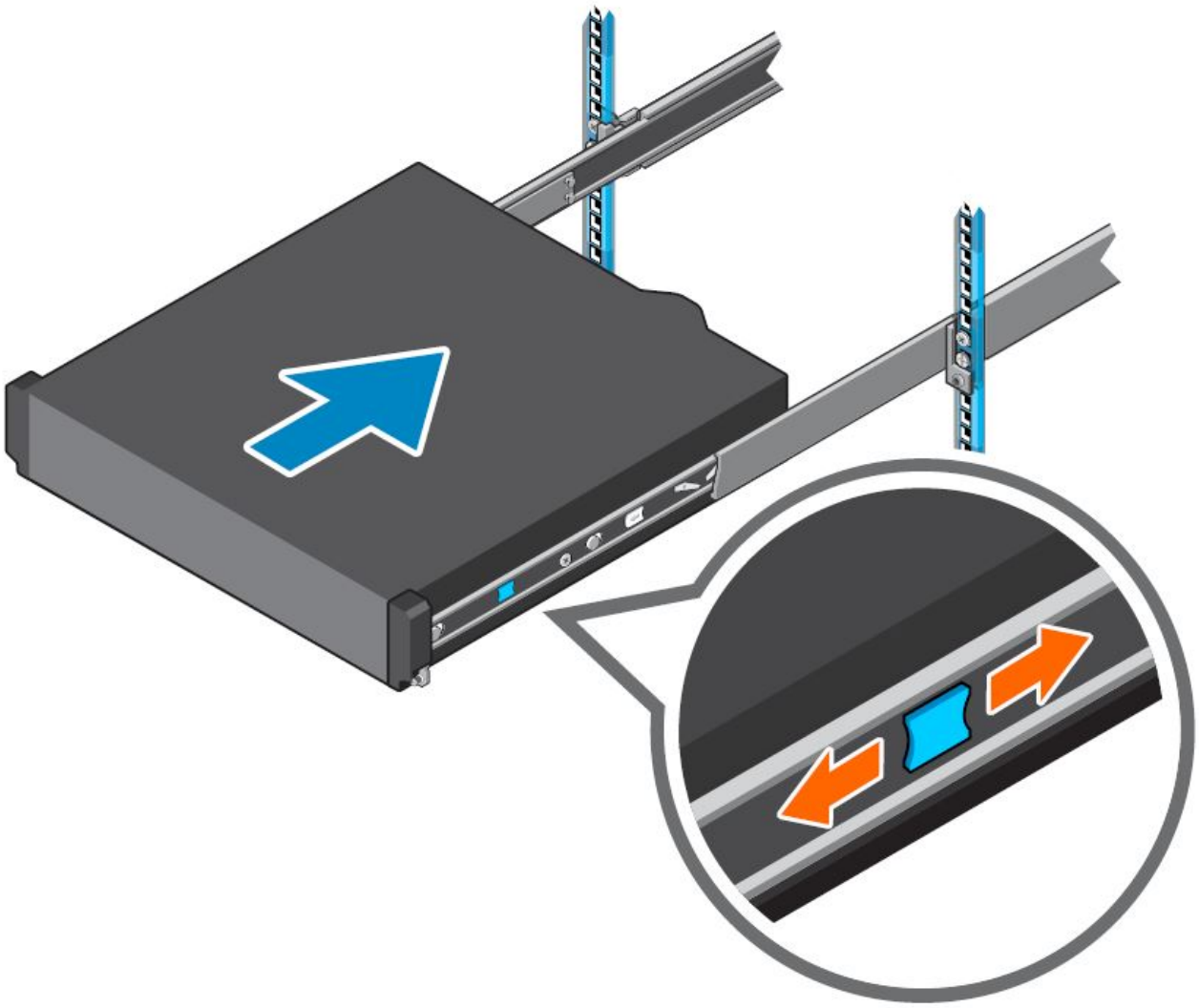

Figure 34. Sliding the system into the rack

11

Operating Systems and Virtualization

Topics:

Supported Operating Systems

The PowerEdge system supports the following operating systems:

- Canonical® Ubuntu® Server LTS
- Microsoft® Windows Server® with Hyper-V
- Red Hat® Enterprise Linux
- SUSE® Linux Enterprise server
- VMware® ESXi®
- Dell NativeEdge OS

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

Supported Virtualization

VMware vSphere (aka ESXi) is the virtualization software for workload consolidation from physical to virtualized environments.

One of the key features for virtualization on the platform is the support for a failsafe hypervisor. By running the hypervisor on an optional medium to high endurance storage card (i.e. BOSS) and installing a backup copy on another card, you can protect against hardware failure and avoid virtualization downtime. The table below highlights the virtualization support.

Table 23. Supported Virtualization

Operating Systems	Release
Microsoft	Windows Server 2019 Data C enter w/Hyper-V.
Microsoft	Windows Server 2019 Standard w/Hyper-V
VMware	VMware ESXi 8.0
VMware	VMware ESXi 7.0 U3

The current version of ESXi is 8.0 (November CY22 GA), and the previous major release 7.0 U3 (January CY22 GA) with patch. Both versions support 16G, 15G, and 14G volume servers. With 8.x we do not support 13G Servers, however with 7.x we support a few of the 13G servers see the 7.x Server compatibility guide to get the exact list. The certification requires that once a platform is added to VMware Compatibility Guide (VCG), there is continual sustaining certification when new VMware patches, updates, Dell driver, and firmware are updated.

The listing for the certification can be found at here.

12

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.

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 24. 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

Table 24. iDRAC9 license tiers (continued)

License	Description
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 25. 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
	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 2019 or 2022, Ubuntu, CentOS	Supported (Tier-1)

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Appendix D: Service and support

Topics:

Why attach service contracts

Dell PowerEdge servers include a standard hardware warranty that highlights our commitment to product quality by guaranteeing repair or replacement of defective components. While industry-leading, our warranties are limited to 1 or 3 years, depending on model, and do not cover software assistance. Call records show that failure rates for servers are roughly 1% and more commonly, customers seek Dell technical support for software-related issues like configuration guidance, troubleshooting, upgrade assistance, or performance tuning. Encourage customers to purchase ProSupport service contracts to supplement warranty coverage and ensure optimal support for both hardware and software. ProSupport provides a complete hardware guarantee beyond the original warranty period (up to 12 years: including seven years standard support and an additional five years of Post-Standard Support). Details of the ProSupport Suite and benefits are listed below.

ProSupport Infrastructure Suite

ProSupport Infrastructure Suite is a set of support services that enable customers to build the solution that is right for their organization. It is an industry-leading, enterprise-class support that aligns with the criticality of your systems, the complexity of your environment, and the allocation of your IT resources.

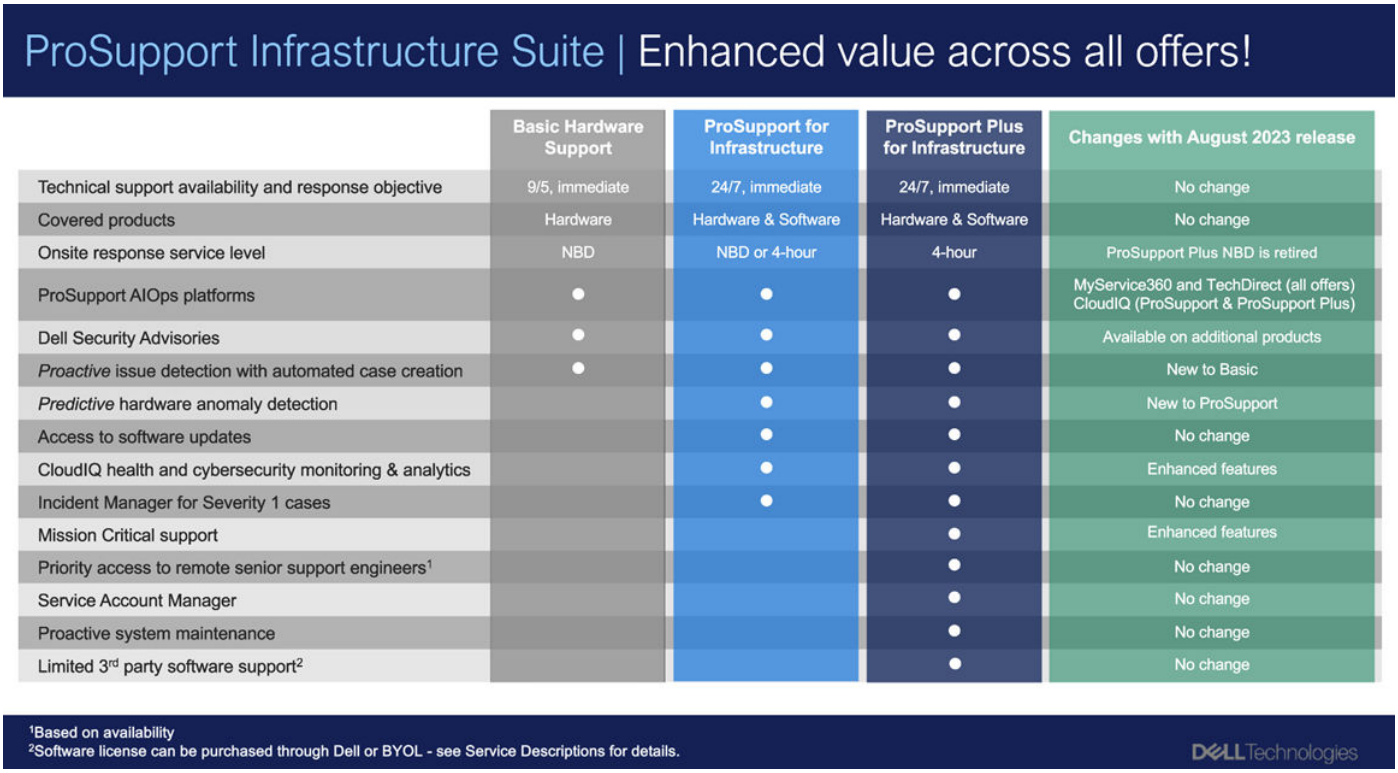

Figure 35. ProSupport Enterprise Suite

ProSupport Plus for Infrastructure

ProSupport Plus for Infrastructure is the ultimate solution for customers seeking preventative maintenance and optimal performance on their business-critical assets. The service caters to customers who require proactive, predictive, and personalized support for systems that manage critical business applications and workloads. 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, including the following "Top five reasons to buy ProSupport Plus (PSP)"

1. **Priority access to specialized support experts:** Immediate, advanced troubleshooting from an engineer that understands Dell infrastructure solutions.
2. **Mission Critical Support:** When critical (Severity 1) support issues happen, the customer is assured that we do all that we can to get them back up and running as quickly as possible.
3. **Service Account Manager:** A customer's #1 support advocate, ensuring they get the best possible proactive and predictive support experience.
4. **Systems maintenance:** On a semiannual basis, we will keep a customer's ProSupport Plus system(s) up to date by installing the latest firmware, BIOS, and driver updates to improve performance and availability.
5. **Third-party software support:** Dell is a customer's single point of accountability for any eligible third-partysoftware that is installed on their ProSupport Plus system, whether they purchased the software from us or not.

ProSupport for Infrastructure

Comprehensive 24x7 support for hardware and software – best for production, but not critical, workloads and applications. The 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
- A central point of accountability for all hardware and software issues
- Hypervisor, operating system and application support
- Dell security advisories
- Onsite response service levels 4 hour or Next Business Day options
- Proactive issue detection with automated case creation

- Predictive hardware anomaly detection
- Incident Manager assigned for Severity 1 cases
- Collaborative third-party support
- Access to AIOps Platforms - (MyService360, TechDirect, and CloudIQ)
- Consistent experience regardless of where customers are located or what language that they speak.

Basic Hardware Support

Provides reactive hardware support during normal business hours, excluding local national holidays. No software support orsoftware-related guidance. For improved levels of support, choose ProSupport or ProSupport Plus.

Specialty Support Services

Optional specialty support services complement the ProSupport Infrastructure Suite to provide additional proficiencies that are critical for modern data center operations.

Hardware coverage add-ons to ProSupport

- **Keep Your Hard Drive (KYHD), Keep Your Component (KYC), or Keep Your GPU:**

  Normally if a device fails under warranty, Dell replaces it using a one-for-one exchange process.KYHD/KYCC/KYGPU gives you the option to retain your device. It provides full control of sensitive data and minimizes security risk by letting you retain possession of failed drives, components, or GPU when receiving replacement parts without incurring additional cost.
- **Onsite Diagnosis Service:**

  Ideal for sites with non-technical staff. Dell field technician performs initial troubleshooting diagnosis onsite and transfers to Dell remote engineers to resolve the issue.
- **ProSupport Add-on for HPC:**

  Sold as an add-on to a ProSupport service contract, the ProSupport Add-on for HPC provides solution-aware support to cover the additional requirements that are required to maintain an HPC environment such as:

  - Access to senior HPC experts
  - Advanced HPC cluster assistance: performance, interoperability, and configuration
  - Enhanced HPC solution level end-to-end support
  - Remote pre-support engagement with HPC Specialists during ProDeploy implementation
- **ProSupport Add-on for Telco (Respond & Restore):**

  An add-on service designed for the top 31 TELCO customers globally, Respond & Restore provides direct access to Dell solution experts who specialize in TELCO carrier-grade support. This add-on also provides a hardware uptime guarantee, meaning if a system fails, Dell has it installed and operational within 4 hours for Severity 1 issues. Dell incurs penalties and fees if SLAs are not met.

Personalized Support and Supplemental Site-wide Expertise

- **Technical Account Manager:**

  Designated technology lead who monitors and manages the performance and configuration of specific technology sets.
- **Designated Remote Support:**

  Personalized support expert who manages all troubleshooting and resolution of IT assets.
- **Multivendor Support Service:**

  Support your third-party devices as one service plan for servers, storage, and networking (includes coverage for: Broadcom, Cisco, Fujitsu, HPE, Hitachi, Huawei, IBM, Lenovo, NetApp, Oracle, Quanta, SuperMicro and others).

Services for large enterprises

- **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 (combined total of server, storage, networking, so forth). This offering is built on standard ProSupport features that leverage our global scale and are tailored to specific customer needs. While not for everyone, this service option offers a truly unique solution for our largest customers with the most complex environments.

  - Team of assigned Services Account Managers with remote or onsite options
  - Assigned technical and field engineers who are trained on the customer's environment and configurations.
  - On-demand reporting and recommendations that are enabled by ProSupport AIOps tools (MyService360, TechDirect, and CloudIQ)
  - Flexible onsite support and parts options that fit their operational model
  - A tailored support plan and training for their operations staff
- **ProSupport One for CSPs (Cloud Serviced Providers)**

  ProSupport One for CSPs is a unique offer that is designed for a limited set of Dell accounts purchasing Gen AI computing solutions greater than 1,000 servers and $250M in sales. PS1 for CSPs improves the entire services experience combining support, deployment (rack integration), residency services, a designated support engineer and the LOIS parts locker as one holistic bundle. Special pricing has been determined to compete effectively against competitors and provide the best customer experience. PS1 for CSPs can only be sold with XE Servers and all networking platforms (Dell and NVIDIA). All other products would be eligible for the standard PS1DC not this special bundle offer. More details on PS1 for CSPs here.
- **Logistics Online Inventory Solution (LOIS)**

  Ideal for large organizations that have their own staff to support their data center. Dell offers a service that is called Logistics Online Inventory Solution which is an onsite parts locker that provides self-maintainers with a local inventory of common replacement components. Having access to these parts lockers allows the self-maintainer to replace a failed component immediately without delay. Each replacement part would automatically initiate a replenishment of the parts inventory that is shipped the next day or delivered onsite by Dell during a regular scheduled visit (called Scheduled Onsite Service). As part of the LOIS system, customers can integrate their systems directly to Dell TechDirect using APIs to help streamline the support management process.

End-of-Life Services

- **Post Standard Support (PSS)**

  Extend service life beyond the initial seven years of ProSupport, adding up to five more additional years of hardware coverage.
- **Data Sanitization & Data Destruction**

  Renders data unrecoverable on repurposed or retired products, ensuring security of sensitive data and enabling compliance and provides NIST-compliant certification.
- **Asset Recovery Services**

  Recycle, resale, and disposal of hardware. Helps you securely and responsibly retire IT assets that are no longer needed while protecting both your business and the planet.

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.

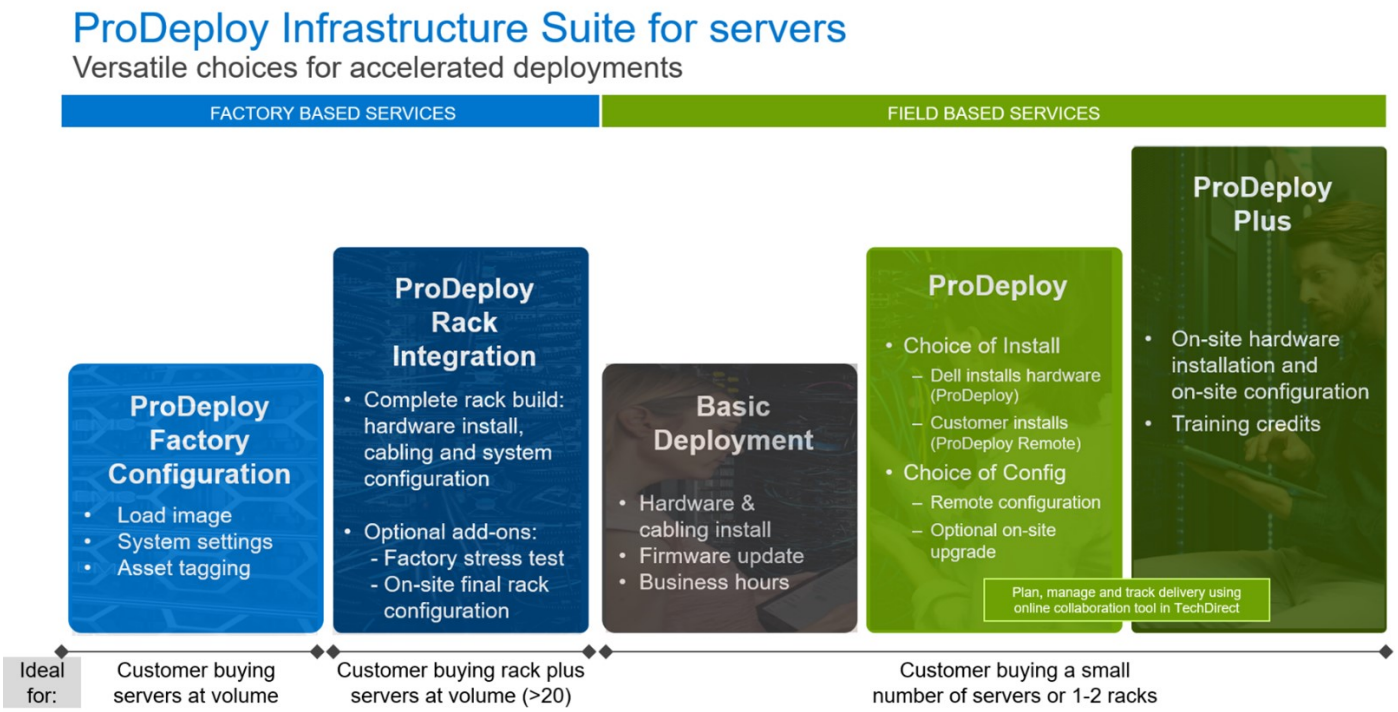

Figure 36. ProDeploy Infrastructure Suite for servers

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.

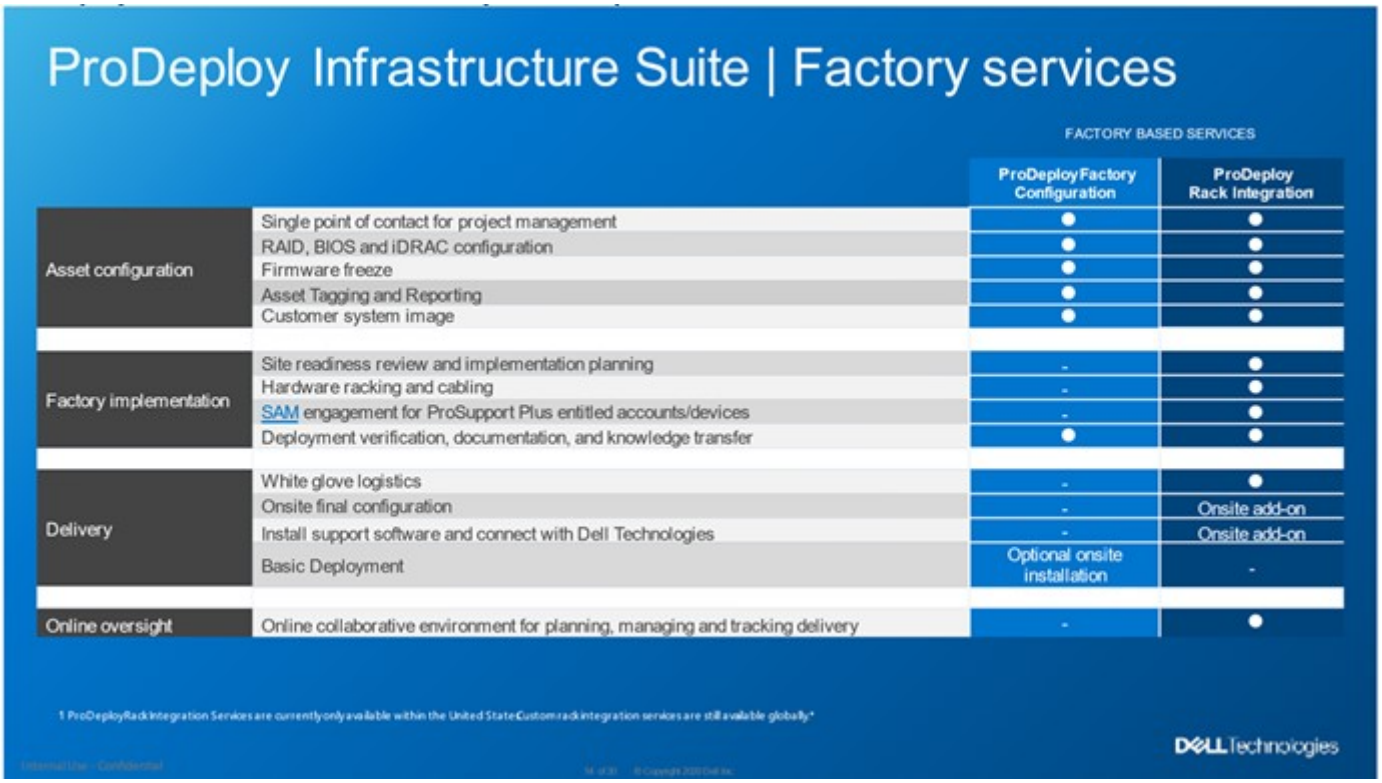

Figure 37. ProDeploy Infrastructure Suite - Factory services

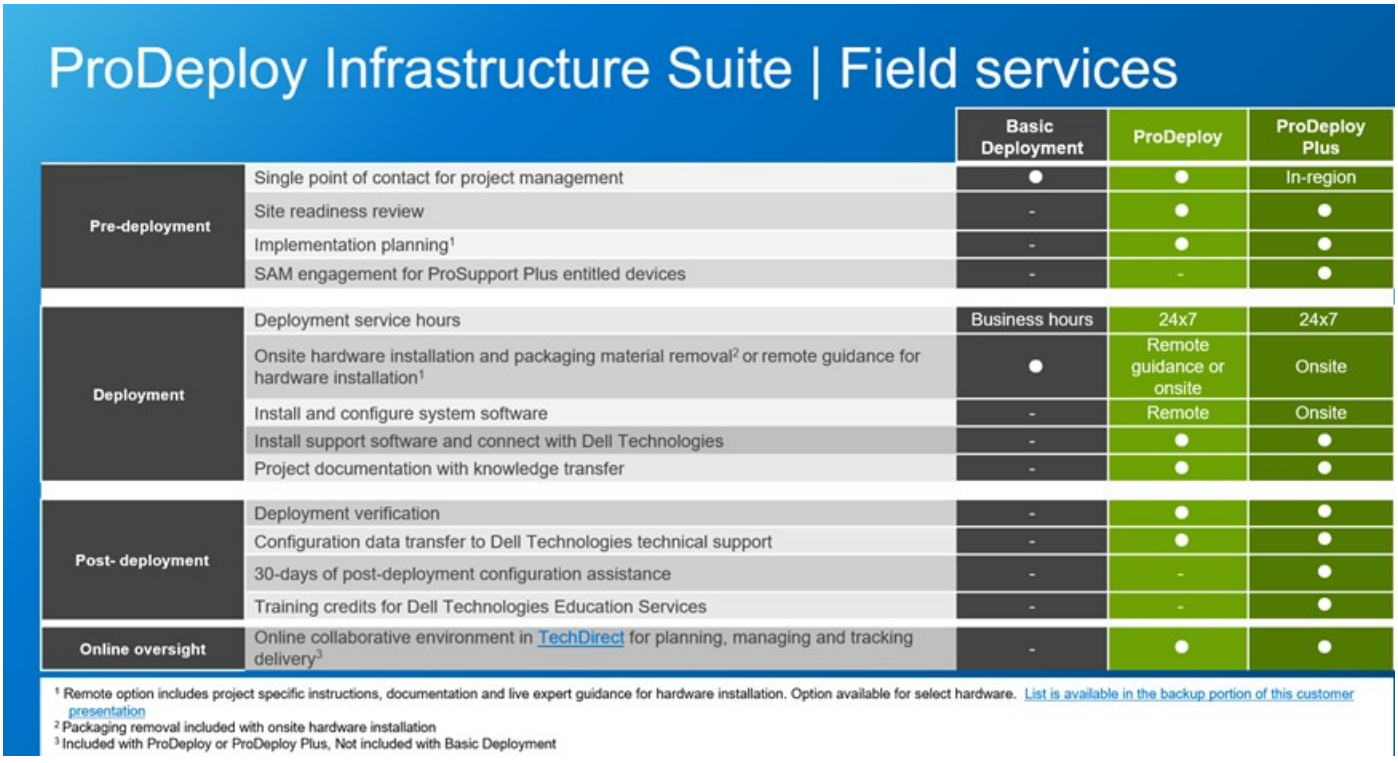

Figure 38. ProDeploy Infrastructure Suite - Field services

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.

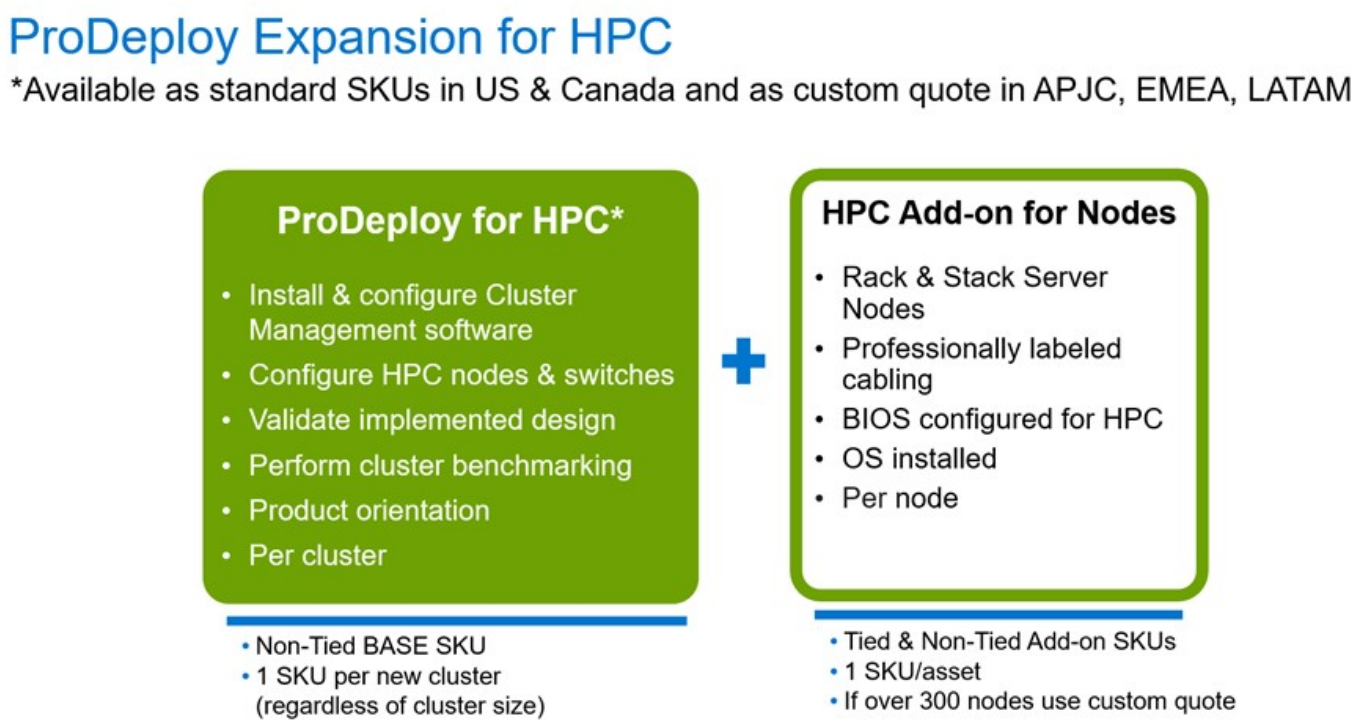

Figure 39. ProDeploy Expansion for HPC

Supplemental Deployment Services

Additional ways to expand scope or deploy for unique scenarios.

Two Host Adder (requires PD/PDP)

Deploying new storage, compute, or networking devices may require interconnection to other servers (also called hosts). The Dell delivery team will set up four hosts per device as part of every ProDeploy service. For example, if the customer is buying two storage arrays the ProDeploy service will automatically include connectivity of four hosts each (4x2=8 total hosts per project since there are two devices). This supplemental "Two Host Adder" service provides for the configuration of additional hosts above what is already provided as part of the ProDeploy service. In many cases, customers can work with us while we set up the included hosts, so they may understand how to do the rest themselves. Always ask the customer how many hosts are being connected and sell the host adder depending on the customer's technology skillset. Note that this service applies to the connectivity of Dell devices not 3rd party devices.

Additional Deployment Services (ADT) – sold with or without PD/PDP

You can expand the scope of a ProDeploy engagement leveraging Additional Deployment Time (ADT). ADT covers additional tasks above the normal deliverables of the ProDeploy offers. ADT can also be used as a standalone service without ProDeploy. SKUs are available for both Project Management and Technical Resource Expertise. SKUs are sold as blocks of four hours remote or eight hours onsite. The delivery team can help in scoping the number of hours required for additional tasks.

Data Migration Services

Migrating data sets is no easy task. Our experts use proven tools and process to streamline data migrations and avoid compromising data. A customer project manager works with our experienced team of experts to create a migration plan. Data migration is part of every technology upgrade, platform change, and shift to the cloud. You can rely on Dell data migration services to perform a seamless transition.

Residency Services

Certified technical professionals act like an extension of your IT staff to enhance internal capabilities and resources and help you realize faster adoption and maximized ROI of new technology. Residency Services help customers transition to new capabilities quickly by leveraging specific technology skill sets. 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.

- Global experts available to serve in-person (onsite) or virtual (remote)
- Engagements starting at 2 weeks with flexibility to adjust
- Residency is available for project management needs, and many different technology skills sets such as: Server, storage, Gen AI, networking, security, multi-cloud, data mgmt., and modern workforce application residents

Unique Deployment Scenarios

Custom Deployment Services

When a deployment is beyond the scope of the ProDeploy Infrastructure Suite, you can turn to the custom deployment services team to address complex implementation scenarios and customer unique requirements. The Dell custom deployment team is staffed with solution architects who will assist with customer scoping calls to define the project and develop the statement of work. Custom services can handle a wide range of deployments that can be performed in the factory or onsite. All custom engagement services are requested through SFDC.

ProDeploy FLEX

ProDeploy Flex is a modular service and a powerful tool for you to attach more services and improve revenue and margins. The ProDeploy Flex modular offer allows sales teams to build and better tailor services by mixing factory and field delivery options. You can also select special deployment scenarios without going to the custom order desk. FLEX is ideal for unique deployments where ProDeploy or ProDeploy Plus are not an adequate answer to the customer needs. Key features of ProDeploy FLEX :

- Build deployment quotes using modular, selectable features for both hardware and software.
- The system automatically scales pricing based on volume.
- Ideal for customers who require NativeEdge Orchestrator or edge deployments.
- Ability to add deployment services to third-party networking devices.

Deployment of HPC

High-Performance Computing (HPC) implementations require specialists that understand advanced feature sets. Dell deploys the world 's fastest systems and understands the nuances that make them perform. HPC deployments are most often scoped as custom service engagements, however we can do smaller HPC clusters under 300 nodes using a standard ProDeploy SKU. Any standard SKU for HPC deployment will be sold as one base SKU per cluster (ProDeploy for HPC Base) along with one ProDeploy for HPC Add-on for each device in the cluster (server nodes and switches).

Scope of ProDeploy for HPC:

NOTE: Available as standard SKUs in US and Canada. Custom Service would be required for all other regions.

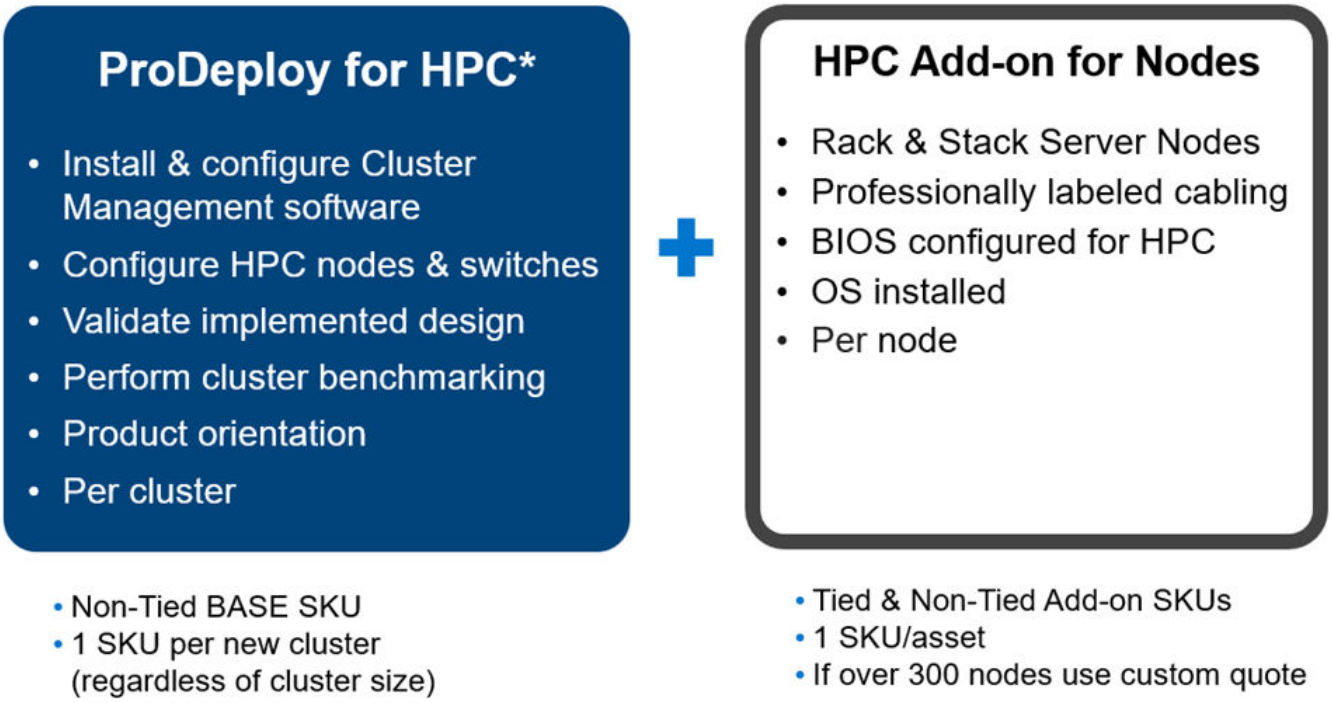

Figure 40. Standard deliverables of ProDeploy for HPC

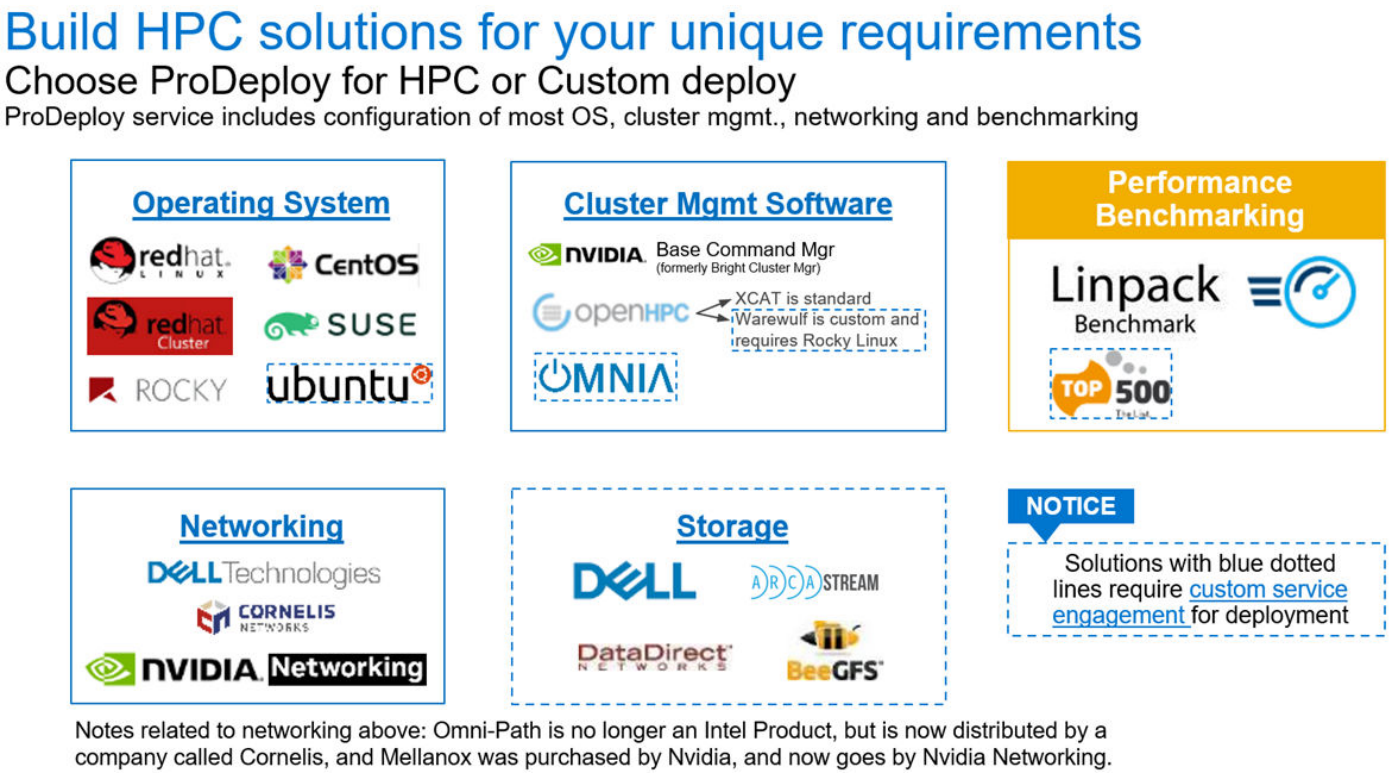

Figure 41. Visual view of HPC deployment options to include hardware and software

DAY 2 – Automation Services with Ansible

Dell solutions are built as "automation ready" with integrated APIs (Application Programming Interfaces) to allow customers to programmatically call actions on the product through code. Although Dell has published Anisble automation use cases, some customers need additional assistance with GitOps. By the end of the service, the customer will have the foundational

components required to accelerate automation and understand how the programming works together: Day 1 and Day 2 use case automation scripts (ansible modules), CI/CD tool (Jenkins), and Version control (Git).

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 42. 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.

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Appendix A: Additional specifications

Topics:

- Chassis dimensions
- Chassis weight
- NIC port specifications
- RJ45 dry contact
- Serial connector specifications
- iDRAC9 port specifications
- Display port specifications
- Environmental specifications
- USB Ports

Chassis dimensions

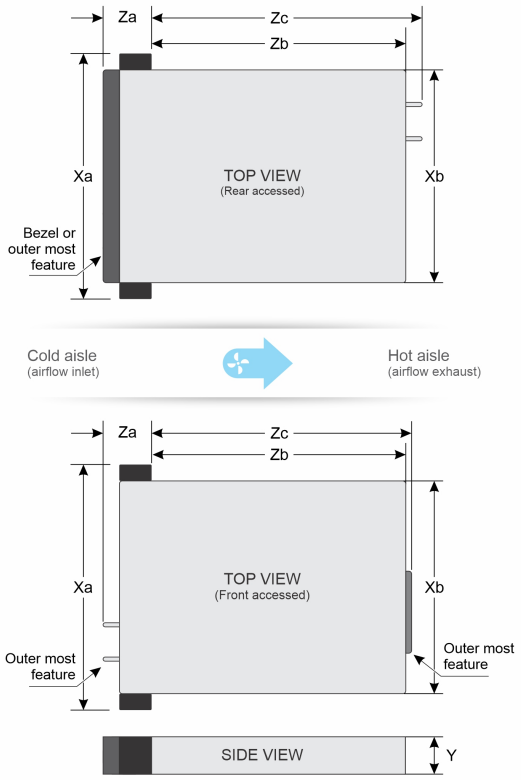

Figure 43. XR5610 Chassis dimensions for rear accessed (top) and front accessed (bottom)

Table 26. XR5610 chassis dimensions

Dimensions	Rear Accessed configuration	Front Accessed configuration
	XR5610	XR5610
Xa	482.6 mm (19 inches)	482.6 mm (19 inches)

Table 26. XR5610 chassis dimensions (continued)

Dimensions	Rear Accessed configuration	Front Accessed configuration
	XR5610	XR5610
Xb	434 mm (17.08 inches)	434 mm (17.08 inches)
Y	42.8 mm (1.68 inches)	42.8 mm (1.68 inches)
Za	22 mm (0.86 inches)	47.7 mm (1.88 inches) (left) 31.4 mm (1.23 inches) (right)
Za (with bezel)	46.5 mm (1.83 inches)	147.7 mm (5.82 inches)
Zb	439.2 mm (17.29 inches)	408.8 mm (16.09 inches)
Zc	441.2 mm (17.37 inches)	418.3 mm (16.47 inches)

NOTE: The XR5610 can support racks/cabinets with a minimum space of 30.4mm between the front post of the rack and the inside surface of the rack door, without the included cable management kit. The minimum front space that is required might be limited by front cable bending. When using the included cable management kit, the XR5610 can support racks/cabinets with a minimum distance of 89mm between the front post of the rack and the inside surface of the rack door. Other important parameters in the image are:

1. Minimum exhaust gap (between chassis rear and cabinet's rear door) required for thermal performance is, 50 mm minimum for ambient temperatures up to 55°C.
2. Four post rack.
3. 19-inch or 23-inch width cabinet boundary and 600 mm (23.62 inches) minimum cabinet depth.

Chassis weight

Table 27. Chassis weight

System Configuration	Maximum Weight
Rear Accessed configuration	11.27 kg (24.84 lbs)
Front Accessed configuration	11.37 kg (25.06 lbs)

NIC port specifications

The PowerEdge XR5610 system supports four embedded LOM ports that provide 4 x 25 GbE SFP28.

There is also a dedicated iDRAC management port that supports 1GbE.

Table 28. Network port specifications

Feature	Specifications
LOM	10 GbE, 25 GbE **NOTE:** The lowest connection speed for LOM is 10 GbE.
RJ45 for iDRAC	1 GbE
OCP card (3.0)	1 GbE, 10 GbE, 25 GbE

NOTE: The system allows either NIC card or OCP card or both to be installed in the system.

NOTE: Shared management of iDRAC is capable through the embedded LOM, OCP ports, and PCIe slots 1 from riser 3.

RJ45 dry contact

The PowerEdge XR5610 system supports 1 x RJ45 for dry contact on rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

To enhance usage in IoT space, the XR5610 comes with dry input sensor. Each input are configurable and manageable in the iDRAC interface. These are interruptible inputs to iDRAC. Dry means no energy is supplied to the contacts.

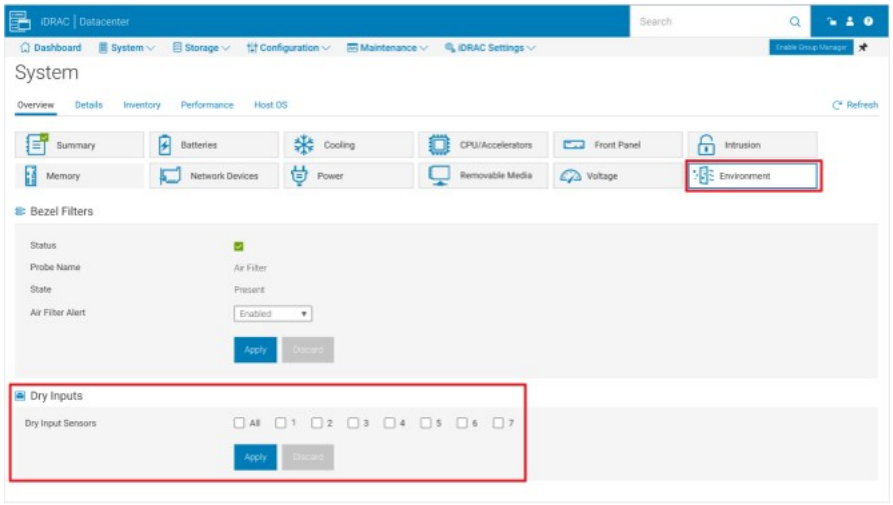

Figure 44. iDRAC interface for Dry Input sensors

NOTE: The RJ45 for dry contact does not support IP function.

The default state of the dry inputs are off/disabled. User will have 7 (one for each dry input) enable/disable (default) control that must be enabled before logging will occur.

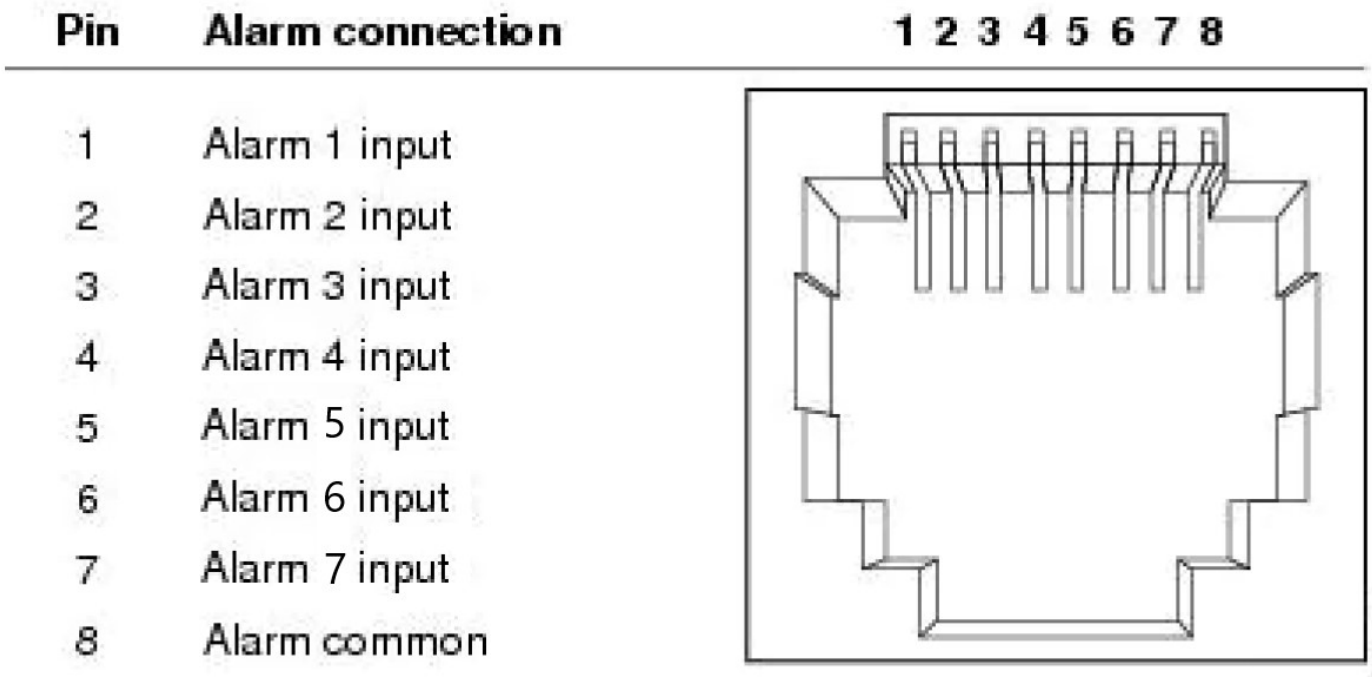

Figure 45. Dry input connection diagram

The 7 dry inputs are interruptible inputs to iDRAC.They have the following characteristics:

- Monitored by iDRAC for state transition and LC event will be logged for each state transition.

- NOT modeled as IPMI sensors but LC event only sensors. The current state of the input is not monitored or displayed anywhere.
- Event Log - transitions (Open to close or close to Open) will be logged in LC only.

Table 29. Proposed EEMI messages

Message ID	Message	RRA	DD	Severity
DCI1000	Dry input <input index> is transitioned to Open state.	None.	None	Severity -3 (Info)
DCI1001	Dry input <input index> is transitioned to Close state.	None.	None	Severity -3 (Info)

Serial connector specifications

The PowerEdge XR5610 system supports one Micro USB Type B serial connector that is located on the rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

NOTE: The serial console is disabled when share management is being used.

iDRAC9 port specifications

The PowerEdge XR5610 system supports 1 x RJ45 with port status LEDs for iDRAC remote management (dedicated port only) on rear of the Rear Accessed configuration and on the front of the Front Accessed configurations.

Display port specifications

The PowerEdge XR5610 system supports 1 x Mini-DisplayPort on the rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

Environmental specifications

The PowerEdge XR5610 system operates in these environmental categories: ASHRAE A2/A3/A4 and Edge1 (50°C) and Edge2 (55°C).

NOTE: For additional information about environmental certifications, refer to the Product Environmental Datasheet located with the Documentation > Regulatory Information on Dell Support.

Table 30. Continuous operation specifications for ASHRAE A2

Feature	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 (33.8°F/984 Ft) above 900 m (2953 Ft)

Table 31. Continuous operation specifications for ASHRAE A3

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	5–40°C (41–104°F) with no direct sunlight on the equipment

Table 31. Continuous operation specifications for ASHRAE A3 (continued)

Feature	Allowable continuous operations
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 (33.8°F/574 Ft) above 900 m (2953 Ft)

Table 32. Continuous operation specifications for ASHRAE A4

Feature	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
Operational altitude de-rating	Maximum temperature is reduced by 1°C/125 m (33.8°F/410 Ft) above 900 m (2953 Ft)

Table 33. Continuous operation specifications for Edge1 (50°C) and Edge2 (55°C)

Feature	Allowable continuous operations
Temperature range for altitudes <= 900 m (<= 2953 ft)	(-5)–55°C (23–131°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
Operational altitude de-rating	Maximum temperature is reduced by 1°C/80 m (33.8°F/410 Ft) above 900 m (2953 Ft)

NOTE: Do not perform a cold startup below 5°C.

Table 34. Common environmental specifications for ASHRAE A2, A3, A4, Edge1 (50°C) and Edge2 (55°C)

Feature	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 (41°F in 15 minutes), 5°C in an hour* (41°F in an hour) for tape **NOTE:** * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change.
Non-operational temperature limits	-40 to 65°C (-104 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	3,048 meters (10,000 feet)

NOTE: Do not perform a cold startup below 5°C

Table 35. Maximum vibration specifications for the system

Maximum vibration	Specifications

Operating	• 0.21 Grms at 5 Hz to 500 Hz (all operation orientations)
	• For Military (with Military tool kit),
	  ○ Method 514.8; Category 20(Marine Vehicles) Annex D 2.9a (Wheeled vehicles) Procedure I, 5 Hz to 500 Hz
	  ○ Method 514.8; Category 21(Ground Vehicles) Annex D 2.10, procedure I, 10 Hz to 100 Hz

Storage	• 1.88 Grms at 10 Hz to 500 Hz for 15 minutes (all six sides tested)

Table 35. Maximum vibration specifications for the system (continued)

Maximum vibration	Specifications
	• For Military (with Military tool kit), ○ Method 514.6; Category 4. 1 Hour per axis, 3 axes, 5-500 Hz, X@0.76 Grms, Y@0.21 Grms, Z@1.08 Grms , 60 minutes/axis

Table 36. Maximum shock pulse specifications for the system

Maximum shock pulse	Specifications
Operating	• Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 6 G for up to 11 ms.(4 pulse on each side of the system) • For Military (with Military tool kit) ○ Method 516.8 Procedure I, 40G, 11ms, 3 shocks, +-per direction, 3 axes
Operating (Navy)	MIL-STD-901E, Grade A, Class 2, Type A, in approved military transit case
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. • For Military (with Military tool kit) ○ Method 516.8 Procedure V, 40G, 11ms, 3 shocks, +-per direction, 3 axes

Thermal restriction matrix

Table 37. Processor thermal restrictions- Front Accessed configuration

Chassis configuration						
Ambient temperature		**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Intel Xeon Silver 4514Y	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6433N	205 W	STD heat sink	STD heat sink	STD heat sink	HPR heat sink	HPR heat sink
Intel Xeon Gold 6423N	195 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6403N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Silver 4510	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5423N	145 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Silver 4509Y	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6438N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6421N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5411N	165 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5412U	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 5416S	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 3408U	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

NOTE: The processor may reduce the performance of the rated DIMM speed.

Table 38. Memory thermal restrictions- Front Accessed configuration

Chassis configuration						
Ambient temperature		**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Memory	DDR5 RDIMM 4800 MT/s 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 4800 MT/s 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 4800 MT/s 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 4800 MT/s 16 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 5600 MT/s 96 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 5600 MT/s 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 16 GB	Supported	Supported	Supported	Supported	Supported

Table 39. Commodities thermal restrictions - Front Accessed configuration

Chassis configuration					
Ambient temperature	**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Qualcomm X100	Supported				
Dell 100GbE QSFP28	Supported				
Nokia Cloud RAN SmartNIC 2x QSFP56-DD	Supported				Not supported
NVIDIA GPU A2	A2 supports up to 50°C.				Not supported
NVIDIA GPU L4	L4 supports up to 50°C.				Not supported
2.5-inch NVMe SSD	NVMe supports up to 35°C.	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD	SAS SSD supports up to 45°C.	SAS SSD supports up to 45°C.	SAS SSD supports up to 45°C.	Not supported	Not supported
PCIe COMM Card	Non-Dell qualified PCIe COMM cards are not supported.				
OCP COMM Card	Non-Dell qualified OCP cards are not supported.				
Active Optical Cables/ Transceivers	SFP transceiver above 2.5 W only with 85°C spec is supported.				
PSU	Dual PSU in redundant mode is required while ambient > 50°C, single PSU is not supported.				

NOTE: Nokia Rinline traffic simulated up to 200G per port with non-Nokia QSFP module.

Table 40. Processor thermal restrictions- Rear Accessed configuration

Chassis configuration						
Ambient temperature		**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Intel Xeon Silver 4514Y	150 W	STD heat sink	STD heat sink	STD heat sink	HPR heat sink	Not supported
Intel Xeon Gold 6433N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 6423N	195 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6403N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Silver 4510	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Bronze 5423N	145 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Silver 4509Y	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6438N	205 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 6421N	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5412U	185 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	HPR heat sink
Intel Xeon Gold 5411N	165 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Gold 5416S	150 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink
Intel Xeon Bronze 3408U	125 W	STD heat sink	STD heat sink	STD heat sink	STD heat sink	STD heat sink

NOTE: The processor may reduce the performance of the rated DIMM speed.

Table 41. Memory thermal restrictions- Rear Accessed configuration

Chassis configuration						
Ambient temperature		**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Memory	DDR5 RDIMM 4800 MT/s 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 4800 MT/s 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 4800 MT/s 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 4800 MT/s 16 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 5600 MT/s 96 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 5600 MT/s 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 5600 MT/s 16 GB	Supported	Supported	Supported	Supported	Supported

Table 42. Commodities thermal restrictions - Rear Accessed configuration

Chassis configuration						
Ambient temperature		**ASHARE A2 (Max 35°C)**	**ASHARE A3 (Max 40°C)**	**ASHARE A4 (Max 45°C)**	**Edge1 (Max 50°C)**	**Edge2 (Max 55°C)**
Qualcomm X100		Supported	Supported	Supported	Supported	Not supported
Dell 100GbE QSFP28		Supported	Supported	Supported	Supported	Not supported
Nokia Cloud RAN SmartNIC 2x QSFP56-DD		Supported	Supported	Supported	Not supported	Not supported
M.2 NVMe (BOSS-N1)	Micron 7400	Support up to 35°C.	Not supported	Not supported	Not supported	Not supported
	Micron 7450	Support up to 35°C.	Not supported	Not supported	Not supported	Not supported
	Hynix PE8010	Support up to 35°C.	Not supported	Not supported	Not supported	Not supported
	Hynix PE9010	Support up to 35°C.	Not supported	Not supported	Not supported	Not supported
NVIDIA GPU A2		A2 supports up to 40°C.		Not supported	Not supported	Not supported
NVIDIA GPU L4		L4 supports up to 40°C.		Not supported	Not supported	Not supported
2.5-inch NVMe SSD		NVMe supports up to 35°C.	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD		SAS SSD supports up to 45°C.			Not supported	Not supported
PERC card		PERC card supports up to 45°C.			Not supported	Not supported
PCIe COMM Card		Non-Dell qualified PCIe COMM cards are not supported.				
OCP COMM Card		OCP card support up to 35°C. Non-Dell qualified OCP cards are not supported.	Not supported	Not supported	Not supported	Not supported
Active Optical Cables/ Transceivers		• Optic cables/transceivers with 70°C spec support up to 35°C. • Optic cables/transceivers with 85°C spec support up to 45°C. • Transceiver above 2.5W is only supported with 85°C spec up to 35°C.			Not supported	Not supported
PSU		Dual PSU in redundant mode is required while ambient > 50°C, single PSU is not supported.				

NOTE: Nokia Rinline traffic simulated up to 200G per port with non-Nokia QSFP module.

Other Restrictions

- Hot swap fan is not supported on the XR5610.
- Min. cold boot temperature at ≥ 5°C. System operating temperature is -5°C—55°C.
- DIMM Blank is required on empty slots.
- OCP blank is required while empty slot.
- OCP is not supported with high TDP Edge-Enhanced CPU.
- PCIE blank is required on empty slots.
- PSU blank is required on empty slots.
- 2.5-inch drive blank is required on empty slots.
- Notice that the fan speed may increase at ambient <0°C with SAS/SATA SSD. This indicates that the fan is working as design for overall system stability.
- With Nokia Cloud RAN SmartNIC 2x QSFP56-DD on Rear Accessed Configuration chassis, fan speed may be higher under normal operating temperature.

USB Ports

Figure 46. USB port on the front of the Rear Accessed configuration

Figure 47. USB port on the rear of the Rear Accessed configuration

Figure 48. USB port on the front of the Front Accessed configuration

Table 43. PowerEdge XR5610 USB ports specifications for Rear Accessed configuration

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

Table 44. PowerEdge XR5610 USB ports specifications for Front Accessed configuration

Front		Rear	
USB port type	**No. of ports**	**USB port type**	**No. of ports**
USB 3.0-compliant port	One	None	
iDRAC Direct port (Micro-AB USB 2.0-compliant port)	One		

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Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 45. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v6.4	Specifications and Test Tools
Ethernet IEEE Std 802.3-2022	IEEE Standards
MSFT WHQL Microsoft Windows Hardware Quality Labs	WHCP Specifications and Policies
IPMI Intelligent Platform Management Interface, v2.0	Intelligent Platform Management Interface
DDR5 Memory DDR5 SDRAM Specification	Standards and Document Search
PCI Express PCI Express Base Specification, v5.0	PCI Express Base Specifications
PMBus Power System Management Protocol Specification, v1.2	PMBus Specifications
SAS Serial Attached SCSI, 3 (SAS-3) (T10/INCITS 519)	SCSI Storage Interfaces
SATA Serial ATA Rev. 3.3	The SATA Ecosystem
SMBIOS System Management BIOS Reference Specification, v3.3.0	System Management BIOS Reference Specifications
TPM Trusted Platform Module Specification, v1.2 and v2.0	Trusted Computing Group
UEFI Unified Extensible Firmware Interface Specification, v2.7	UEFI Specifications
PI Platform Initialization Specification, v1.7	
USB Universal Serial Bus v2.0 and SuperSpeed v3.0 (USB 3.1 Gen1)	USB Documents
NVMe Express Base Specification. Revision 2.0c	NVMe Specifications
NVMe Command Set Specifications 1. NVM Express NVM Command Set Specification. Revision 1.1c 2. NVM Express Zoned Namespaces Command Set. Revision 1.0c 3. NVM Express® Key Value Command Set. Revision 1.0c	
NVMe Transport Specifications 1. NVM Express over PCIe Transport. Revision 1.0c 2. NVM Express RDMA Transport Revision. 1.0b 3. NVM Express TCP Transport. Revision 1.0c	
NVMe NVM Express Management Interface. Revision 1.2c	
NVMe NVMe Boot Specification. Revision 1.0	

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Appendix C Additional resources

Table 46. 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
QR code for system resources	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