

Dell PowerEdge XR5610

Technical Guide

Notes, cautions, and warnings

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

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

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

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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 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](#)
- [New technologies](#)

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 @ 32GT/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 @ 32GT/s PCIe Gen4
	80 lanes reduced to 64 lanes with EE MCC CPU and 48 lanes with EE LCC CPU.
4800 MT/s DDR5 Memory	Maximum TDP: 205W
	Max 8 DIMMs per system
Chassis orientation	Supports DDR5 ECC RDIMM
	The XR5610 has two chassis options: <ul style="list-style-type: none"> • Rear Accessed configuration chassis that is standard with power supplies and network cards in the rear

Table 1. New technologies (continued)

Technology	Detailed Description
	<ul style="list-style-type: none"> Front Accessed configuration chassis that is with power supplies and network cards in the front <p>The control panels location also change with the chassis orientation.</p>
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 new generation of servers.
	Platinum 800 W AC/HDVC
	800 W -48-(-60) LVDC
	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 is offered in the Front Accessed configuration.

 **NOTE:** 800W -48VDC and 1800W AC is offered in the Rear Accessed configuration.

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 4 th Gen Intel® Xeon® Scalable Processors including Edge Enhanced CPUs with Intel vRAN Boost	1 x 3 rd Generation Intel® Xeon® Processor Scalable Family
CPU interconnect	Intel Ultra Path Interconnect (UPI)	Intel Ultra Path Interconnect (UPI)
Memory	<ul style="list-style-type: none"> 8 x DDR5 RDIMM Up to 4800 MT/s 	<ul style="list-style-type: none"> 8 x DDR4 RDIMM, LRDIMM Two Intel Optane Persistent Memory 200 series configuration: <ul style="list-style-type: none"> 4+4 6+1
Storage Controllers	<ul style="list-style-type: none"> PERC 11G: H755, H355 PERC 12G: H965i HBA 11: HBA355i, HBA355e BOSS-N1 Software RAID: S160 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> AC (Platinum): 800 W, 1400 W, 1800 W AC (Titanium): 1100 W LVDC -48 VDC input: 800 W, 1100 W 	<ul style="list-style-type: none"> AC (Platinum): 800 W, 1400 W, AC (Titanium): 700 W, 1100 W LVDC @-48 VDC Input: 800 W, 1100 W
Chassis Orientation	<p>XR5610 has two chassis options:</p> <ol style="list-style-type: none"> Rear Accessed Configuration, where power supplies and network cards are in the rear. <p>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.</p> Front Accessed Configuration, where power supplies and network cards are in the front. <p>NOTE: Power button, network ports, serial, USB, Mini DisplayPort, 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.</p> 	<p>XR11 has two chassis options:</p> <ol style="list-style-type: none"> Rear Accessed Configuration, where power supplies and network cards are in the rear. <p>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.</p> Front Accessed Configuration, where power supplies and network cards are in the front. <p>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.</p> <p>The location of the control panel changes with the chassis orientation.</p>

Table 2. Features comparison (continued)

Features	PowerEdge XR5610		PowerEdge XR11	
	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	<ul style="list-style-type: none"> • iDRAC9 • iDRAC Direct • iDRAC RESTful API with Redfish • iDRAC Service Module 		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • BMC TrueSight • Microsoft System Center • OpenManage Integration with ServiceNow • Red Hat Ansible Modules • Terraform Providers • VMware vCenter and vRealize Operations Manager 		OpenManage Integrations <ul style="list-style-type: none"> • Microsoft System Center • OpenManage Integration with ServiceNow • Red Hat Ansible Modules • VMware vCenter • Third-party Connectors (Naglos, Tivoli, Microfocus) 	
Security	<ul style="list-style-type: none"> • Cryptographically signed firmware • Data at Rest Encryption (SEDs with local or external key management) • Secure Boot • Secured Component Verification (Hardware integrity check) 		<ul style="list-style-type: none"> • Cryptographically signed firmware • Secure Boot • Secured Component Verification (Hardware integrity check) • Secure Enterprise Key Management • Silicon Root of Trust 	

Table 2. Features comparison (continued)

Features	PowerEdge XR5610	PowerEdge XR11
	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Front: <ul style="list-style-type: none"> 1 x iDRAC Direct (Micro-AB USB 2.0) port 1 x USB 2.0 Rear: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Front: <ul style="list-style-type: none"> one standard USB 2.0 port one micro USB 2.0 port dedicated to iDRAC management Rear: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Front: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Front: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Up to 2 x PCIe Gen5 (two x16 PCIe Gen5) 	Two riser configuration options: <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Canonical Ubuntu Server LTS Microsoft Windows Server with Hyper-V Red Hat Enterprise Linux SUSE Linux Enterprise Server VMware ESXi For specifications and interoperability details, see Dell Enterprise Operating Systems on Servers, Storage, and Networking page at Dell.com/OSsupport .	<ul style="list-style-type: none"> Canonical Ubuntu Server LTS Citrix Hypervisor Windows Server LTSC with Hyper-V Red Hat Enterprise Linux SUSE Linux Enterprise Server VMware ESXi RHEL Realtime For specifications and interoperability details, see Dell Enterprise Operating Systems on Servers, Storage, and Networking page at Dell.com/OSsupport .

Chassis views and features

Topics:

- Front view of the system
- Rear view of the system
- Bezel view
- Status LED control panel
- Power button control panel
- Inside view of the system
- Quick Resource Locator

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

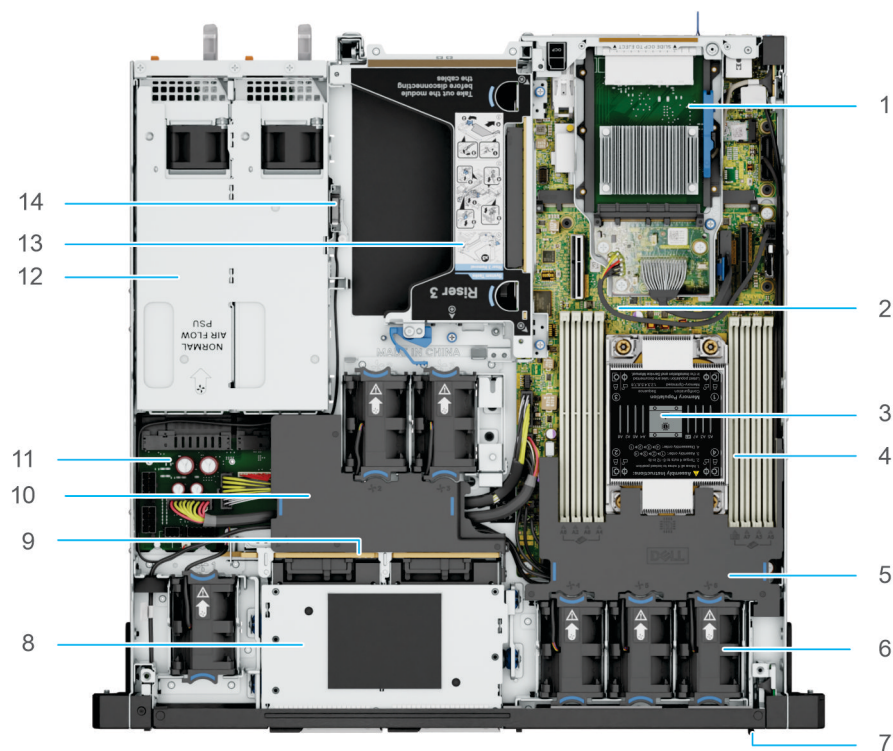


Figure 11. Inside the system - Rear Accessed configuration

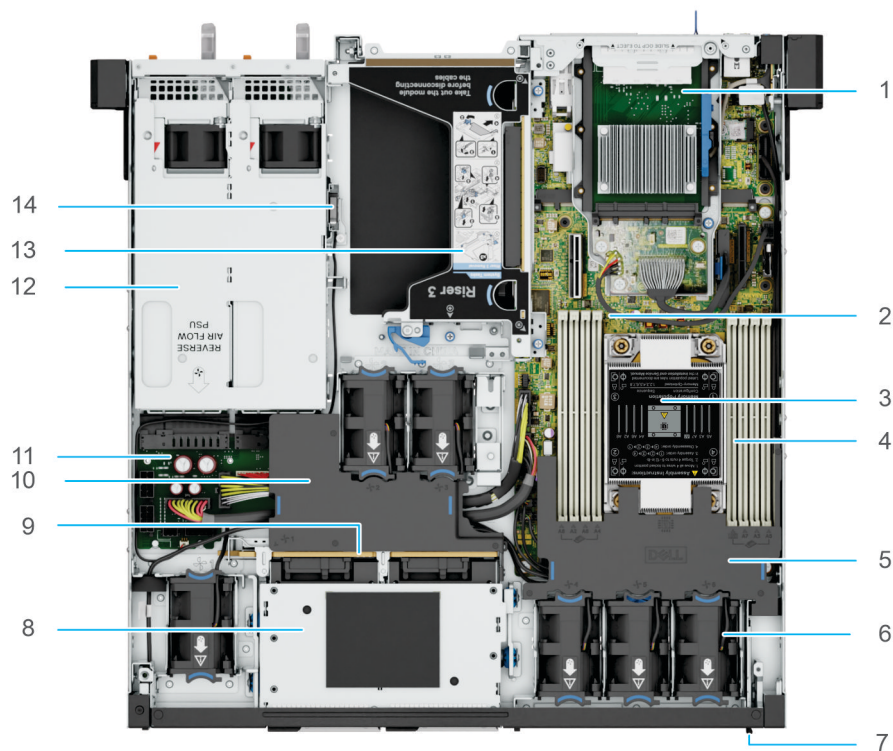


Figure 12. Inside the system - Front Accessed configuration

Quick Resource Locator

The QRL on everything (SILs, GSG, Owner's Manual except on the EST) is a generic QRL for XR5610 that leads to a webpage for that product. That webpage has links for things like setup and service videos, iDRAC manual, and other things that apply to the platform. The QRL on the EST is unique and specific to that service tag and will contain the Service Tag number and the iDRAC password. The label and the QRL code within it are printed on demand at the L10 factories. This QRL links to a webpage that shows the exact configuration as built for that customer, and the specific warranty purchased. It is one click away from the same content of generic information that applies to XR5610 that is available in the other QRLs.

Scan to see hardware servicing and software setup videos, how-to's, and documentation.



Quick Resource Locator

Dell.com/QRL/Server/PEXR5610

Figure 13. Quick Resource Locator for PowerEdge XR5610 system

Processor

Topics:

- [Processor features](#)

Processor features

The Intel 4th 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 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 4800 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	1 DPC: 4800 2 DPC: 4400	4 TB	205 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.

Memory subsystem

Topics:

- Supported memory


Supported memory

Table 6. Memory technology comparison

Feature	PowerEdge XR5610 (DDR5)
DIMM type	RDIMM
Transfer speed	4400 MT/s
Voltage	1.1 V (DDR5)

Table 7. Supported memory matrix

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

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

Storage

Topics:

- [Storage controllers](#)
- [Supported Drives](#)
- [Internal storage configuration matrix for XR5610](#)
- [External Storage](#)

Storage controllers

The PowerEdge XR5610 will support many of Dell's RAID controller options that offer performance improvements from previous generations. The Sirius PERC offerings are highly leveraged from the Polaris (14G) PERC family. The Value and Value Performance levels will carry over to Sirius from Polaris. New to Sirius, is the Harpoon-based Premium Performance tier offering. This high-end offering will drive IOPs performance and enhanced SSD performance.

Table 8. PERC Series controller offerings

Performance Level	Controller and Description
Entry	S160
Value	H355, HBA355 (internal/external)
Value Performance	H755
Premium Performance	H965i

NOTE: For more information about 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 www.dell.com/storagecontrollermanuals.

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	Capacities
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

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

Networking

Topics:

- [Overview](#)
- [OCP 3.0 support](#)

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

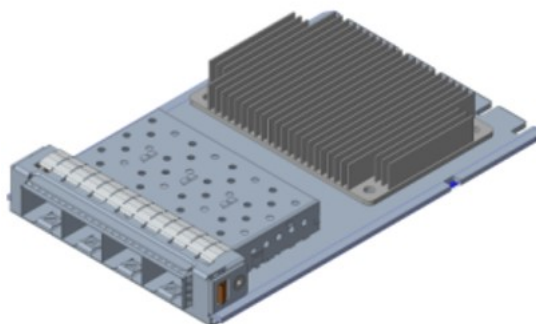


Figure 14. Floating OCP 3.0 (FLOP)

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.

PCIe subsystem

Topics:

- [PCIe risers](#)

PCIe risers

Shown below are the riser offerings for the platform.

Figure 15. Riser connector location on system board

1. Riser IO1A
2. Riser Riser 3A

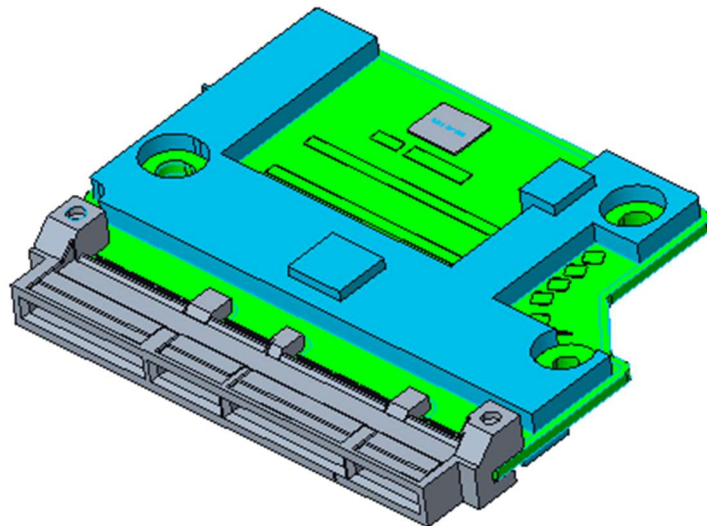


Figure 16. IO1A

1. IO bay 1

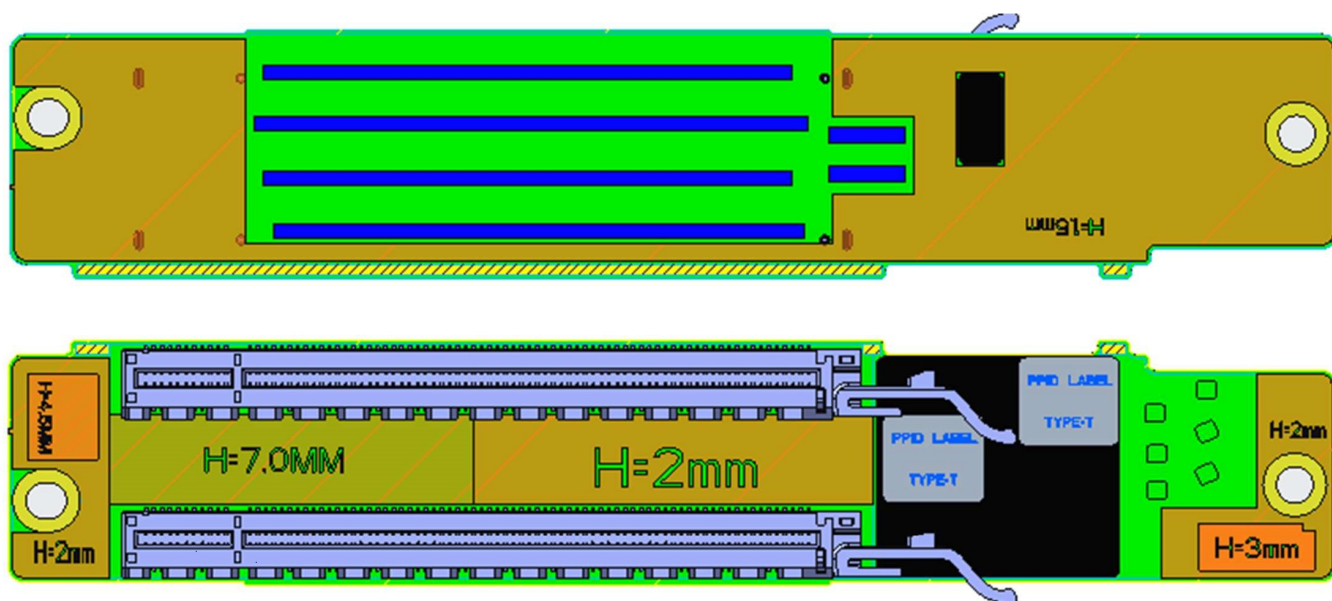


Figure 17. Riser 3A

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.

NOTE: SmartNIC and PERC H965e or H355e cannot be installed simultaneously. Any storage card with an external port can only be supported in riser 3A slot 1.

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](#)
- [Thermal](#)
- [Acoustics](#)

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 www.dell.com/calc .
Industry Compliance	Dell's servers are compliant with all relevant industry certifications and guide lines, including 80 PLUS, Climate Savers and ENERGY STAR.
Power monitoring accuracy	PSU power monitoring improvements include: <ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> Power distribution units (PDUs) Uninterruptible power supplies (UPSs) Energy Smart containment rack enclosures Find additional information at: https://www.delltechnologies.com/en-us/servers/power-and-cooling.htm .

Power Supply Units

Energy Smart power supplies have intelligent features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. Also featured are enhanced power-consumption/reduction technologies, such as high-efficiency power conversion and advanced thermal-management techniques, and embedded power-management features, including high-accuracy power monitoring. The table below shows the power supply unit options that are available for the XR5610.

Table 17. Power Supply Unit Options

Wattage	Frequency	Voltage/Current	Class	Heat dissipation
800 W DC	N/A	-48—(-60) Vdc/27 A	N/A	N/A
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.

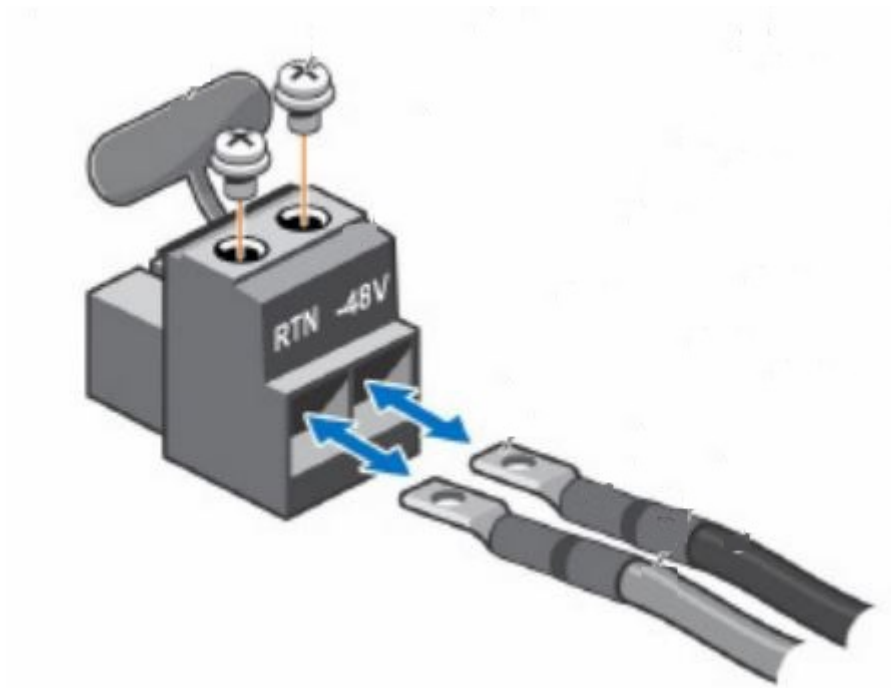


Figure 18. DC PSU power cords



Figure 19. AC PSU power cords

Table 18. PSU power cables

Form factor	Output	Power cord
Redundant 60 mm	800 W mixed mode	C13
	800 W -48 VDC	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 the PSUs in high/low line operation mode.

Table 19. PSUs highline and lowline ratings

—	800 W Platinum	800 W -48 VDC	1100 W Titanium	1100 W -48 VDC	1400 W Platinum	1800 W Titanium
Peak Power (Highline)	1360 W	1203 W	N/A	N/A	2380 W	2074 W
Highline	800 W	1100 W	N/A	N/A	1400 W	1800 W
Peak Power (Lowline)	1360 W	1247 W	N/A	N/A	1785 W	N/A
Lowline	800 W	N/A	N/A	N/A	1050 W	N/A
Highline 240 VDC	800 W	1100 W	N/A	N/A	1400 W	1800 W
Highline 200—380 VDC	N/A	N/A	N/A	N/A	N/A	N/A
DC -48—(-60) V	N/A	N/A	800 W	1100 W	N/A	N/A

The PowerEdge XR5610 supports up to 2 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. In the event that the PSU wattages do not match, the larger of the two PSUs is enabled and there is also a PSU mismatch warning 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 will be 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%

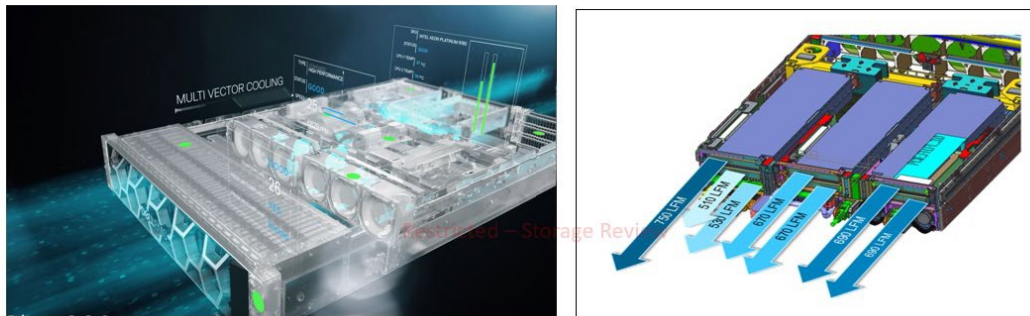
Thermal

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.

Design Innovation: Dell Multi Vector Cooling 3.0



Advanced thermal design that **streamlines the airflow pathways** within the server, **directing the appropriate volume** of air to where it is needed inside the chassis

Minimize fan and system power consumption while **maintaining component reliability**
Providing **custom cooling options** without compromising baseline system **cooling needs**

Figure 20. 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 that are oriented to deployment environments.

Sound quality describes how disturbing or pleasing a person finds a sound, as a function of a variety of psychoacoustical metrics and threshold. 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

Equivalent familiar noise experience	Value measured at your ears
	LpA (dBA re 20µPa)
Loud concert	90
Data center, vacuum cleaner, voice must be elevated to be heard	75
Conversation levels	60
Whispering, open office layout, normal living room	45
Quiet office	35

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

Equivalent familiar noise experience	Value measured at your ears
	LpA (dBA re 20µPa)
Quiet library	30
Recording studio	20

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

PowerEdge acoustical specifications

For more information about acoustical specifications, see ENG0019663. (See the category definitions.)

Dell typically categorizes servers in five categories of acoustically acceptable usage:

- Category 3: General Use Space
- Category 5: Unattended Data Center

Category 3: General Use Space

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

Table 22. Dell Enterprise Category 3, “General Use” acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program’s configuration document, then processor and hard drive operating modes are required	Simulate (that is, set air mover speeds representative) for Idle at 28° C & 35° C Ambient and for 100% loading and maximum configuration, at 35° C Ambient
Sound Power	LwA-m, bels	≤ 5.2	≤ 5.5	≤ 5.8	Report
Sound Quality (both positions must meet limits): Front Binaural HEAD and Rear Microphone	Tones, Hz, dB	No prominent tones per criteria D.10.6 and D.10.8 of ECMA-74			Report tones
	Tonality, tu	≤ 0.35	≤ 0.35	≤ 0.35	Report
	Dell Modulation, %	≤ 40	≤ 40	≤ 40	Report
	Loudness, sones	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report
Front Binaural HEAD	Transients	<ul style="list-style-type: none"> • Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria: <ul style="list-style-type: none"> ◦ Max. {ΔLpA} < 3.0 dB ◦ Event count < 3 for “1.5 dB < ΔLpA < 3.0 dB” 			N/A

Table 22. Dell Enterprise Category 3, “General Use” acoustical specification category (continued)

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)			
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program’s configuration document, then processor and hard drive operating modes are required	Simulate (that is, set air mover speeds representative) for Idle at 28° C & 35° C Ambient and for 100% loading and maximum configuration, at 35° C Ambient
		<ul style="list-style-type: none"> Report Acoustical Jump (see AC0159) during air mover speed transition from Idle to Operating Mode. Startup behavior <ul style="list-style-type: none"> Report Startup behavior re. AC0159 Startup must proceed smoothly, that is, no sudden or large jumps, and air mover speed during startup must not exceed 50% of its maximum. Transient inputs: Report time-history sound pressure levels re AC0159 “Train of Step Functions on Processor” 			
Any	Other	<p>No rattles, squeaks, or unexpected noises</p> <p>Sound should be “even” around the EUT (one side should not be dramatically louder than another)</p> <p>Unless otherwise specified, the “default” thermal-related settings shall be selected for BIOS and iDRAC.</p> <p>Specific operating conditions will be defined in “Configurations & Configuration Dependencies” for each platform.</p>			
Sound Pressure	LpA-reported, dBA, re AC0158 and program configuration document	Report for all mics	Report for all mics	Report for all mics	Report for all mics

Category 5: Unattended Data Center

When Dell determines that a specific Enterprise product is to be predominantly used in an unattended data center (and not blades or blade enclosures; these have their own category), then the acoustical specification in the table below applies. The phrase “unattended data center” is used to mean a space in which many (from tens to 1000 s) of Enterprise products are deployed together, its own heating and cooling systems condition the space, and operators or servicers of equipment enter only to deploy, service, or decommission equipment. Hearing protection or hearing monitoring programs may be expected (per government or company guidelines) in these areas. Examples in this category include monolithic rack products.

Table 23. Dell Enterprise Category 5, “Unattended Data Center” acoustical specification category

Measurement Position re AC0158	Metric, re AC0159	Test Modes, re AC0159 (note must be in steady state, see AC0159, except where noted below)				Simulate (that is, set air mover speeds representative) for 100% loading and maximum configuration, at 35° C Ambient
		Standby in 23±2° C Ambient	Idle in 23±2° C Ambient	Operating in 23±2° C Ambient – if not otherwise specified in the program’s configuration document, then processor and hard drive operating modes are required	Simulate (that is, set air mover speeds representative) for Idle at 28° C & 35° C Ambient	
Sound Power	LwA-m, bels	Report	≤ 7.5	≤ 7.7	Report	≤ 8.7
Front Binaural HEAD	Tones, Hz, dB	Report	< 15 dB	< 15 dB	Report	< 20 dB
	Tonality, tu	Report	Report	Report	Report	Report
	Dell Modulation, %	Report	Report	Report	Report	Report
	Loudness, sones	Report	Report	Report	Report	Report
	LpA-single point, dBA	Report	Report	Report	Report	Report
Front Binaural HEAD	Transients	<ul style="list-style-type: none">● Oscillation (see AC0159), if observed, during 20-minute steady-state observation, must adhere to the following two criteria:<ul style="list-style-type: none">○ Max. {ΔLpA} < 3.0 dB○ Event count < 3 for “1.5 dB < ΔLpA < 3.0 dB”● Report Acoustical Jump (see AC0159) during air mover speed transition from Idle to Operating Mode.● Startup behavior<ul style="list-style-type: none">○ Report Startup behavior re. AC0159○ Startup must proceed smoothly, that is, no sudden or large jumps, and air mover speed during startup must not exceed 50% of its maximum● Transient inputs: Report time-history sound pressure levels re AC0159 “Train of Step Functions on Processor”			N/A	
Any	Other	No rattles, squeaks, or unexpected noises Sound should be “even” around the EUT (one side should not be dramatically louder than another) Unless otherwise specified, the “default” thermal-related settings shall be selected for BIOS and iDRAC. Specific operating conditions will be defined in “Configurations & Configuration Dependencies” for each platform.				

Table 23. Dell Enterprise Category 5, “Unattended Data Center” acoustical specification category (continued)

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

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 24. 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

Table 24. XR5610 acoustical configurations (continued)

Configuration		Rear Accessed configuration			Front Accessed configuration		
		Minimum	Typical	Maximum	Minimum	Typical	Maximum
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
	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:

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

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.

Methods to reduce acoustical output of the XR5610

Although the XR5610 is designed for use in data centers, some users may prefer to use it in a quieter setting. The following is a list of means to do so.

 **NOTE:** Usually, the idle air mover speed of the system cannot be lowered without changing the configuration of the system, and sometimes, even a configuration change may not reduce idle air mover speeds.

- Reduce ambient temperature: Lowering the ambient temperature allows the system to cool components more efficiently than at higher ambient temperatures.
- Set target in third-party PCIe card options: Dell provides airflow customization for third-party PCIe adapters that are installed in PowerEdge platforms. If automatic cooling response is above wanted levels (LFM) based on the card specifications, a different LFM target can be set using PCIe Airflow Settings options in iDRAC UI.
- Replace third-party PCI cards with similar Dell supported temperature-controlled cards, if available. Dell works diligently with card vendors to validate and develop PCI cards to meet Dell standards for thermal performance.

Rack, rails, and cable management

Topics:

- [Rails and cable management information](#)

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 https://i.dell.com/sites/csdocuments/Business_solutions_engineering-Docs_Documents/en/rail-rack-matrix.pdf for information regarding:

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

Key factors governing proper rail selection include the following:

- 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 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 as well as 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.

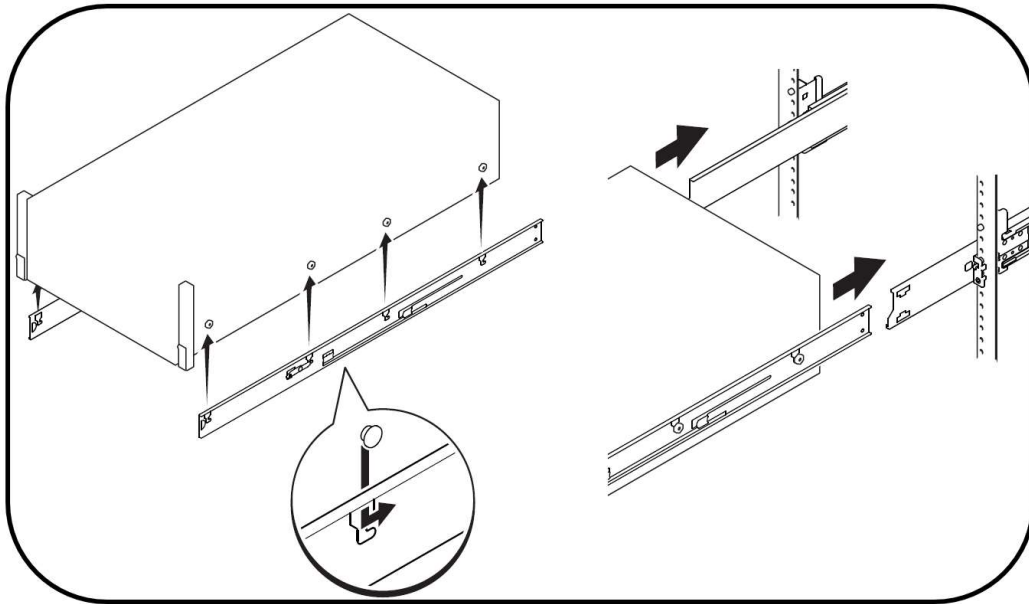


Figure 21. Installing the system in the stab-in sliding rails

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 - 750mm (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)

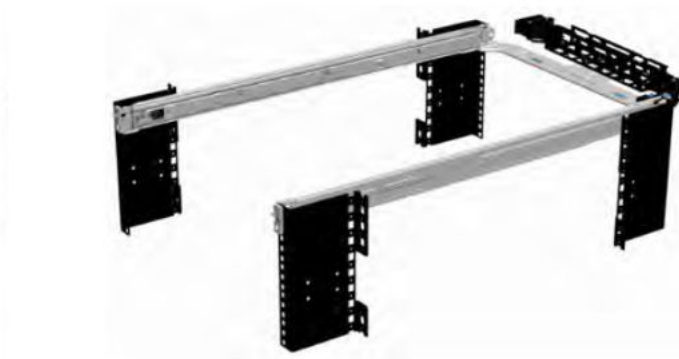


Figure 22. Sliding rails with optional CMA



Figure 23. 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 470-750mm (18.5 - 29.5"). There are additional screws included in the rail kit to tightly secure the rails to the 4-post rack if desired.

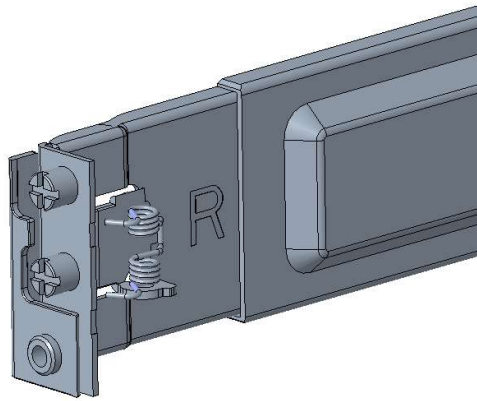


Figure 24. Stab-in sliding rail mounting interface for 4-post round or square hole racks

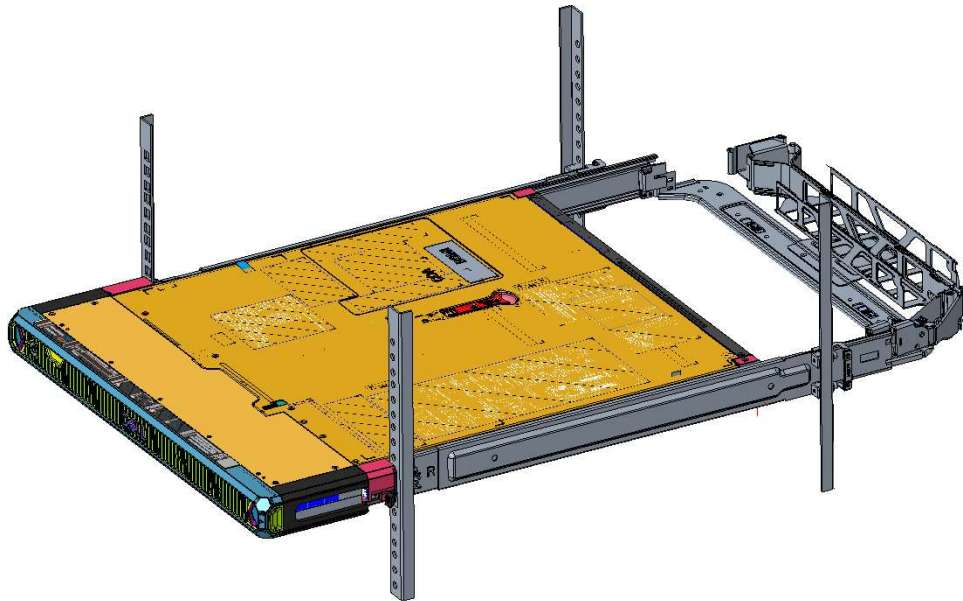


Figure 25. XR5610 system mounted in the sliding rail with the CMA in 4-post rack

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



Figure 26. Quick resource locator for combo rails

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.

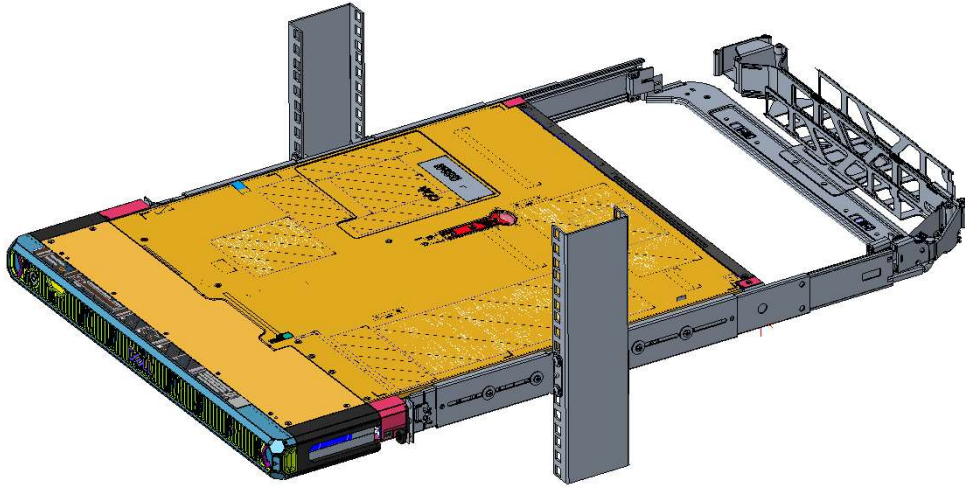


Figure 27. XR5610 mounted in sliding rails in 2-post center mount configuration

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.

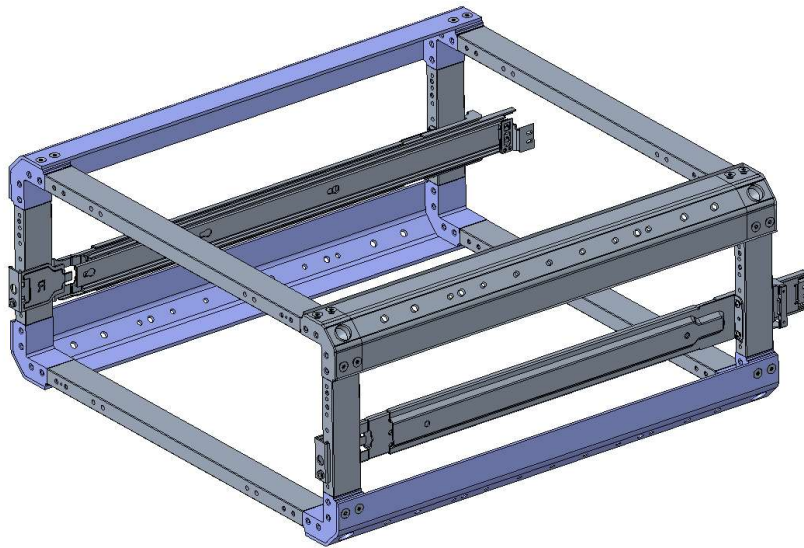


Figure 28. Pelican transit case for XR5610

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.

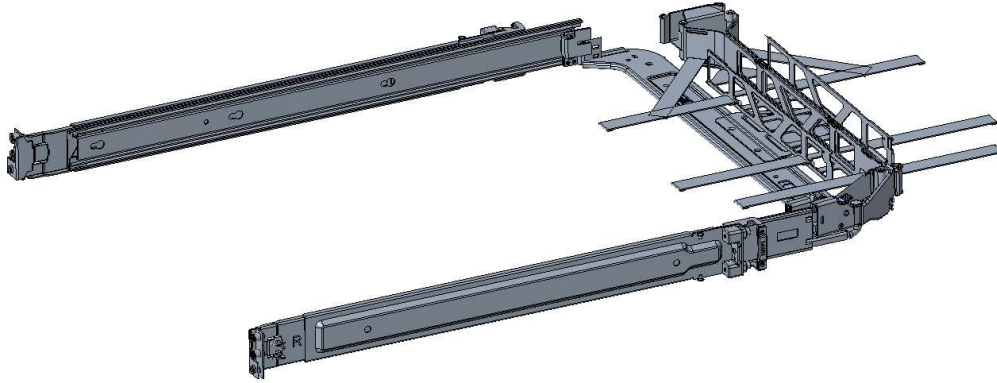


Figure 29. Sliding rails with optional CMA

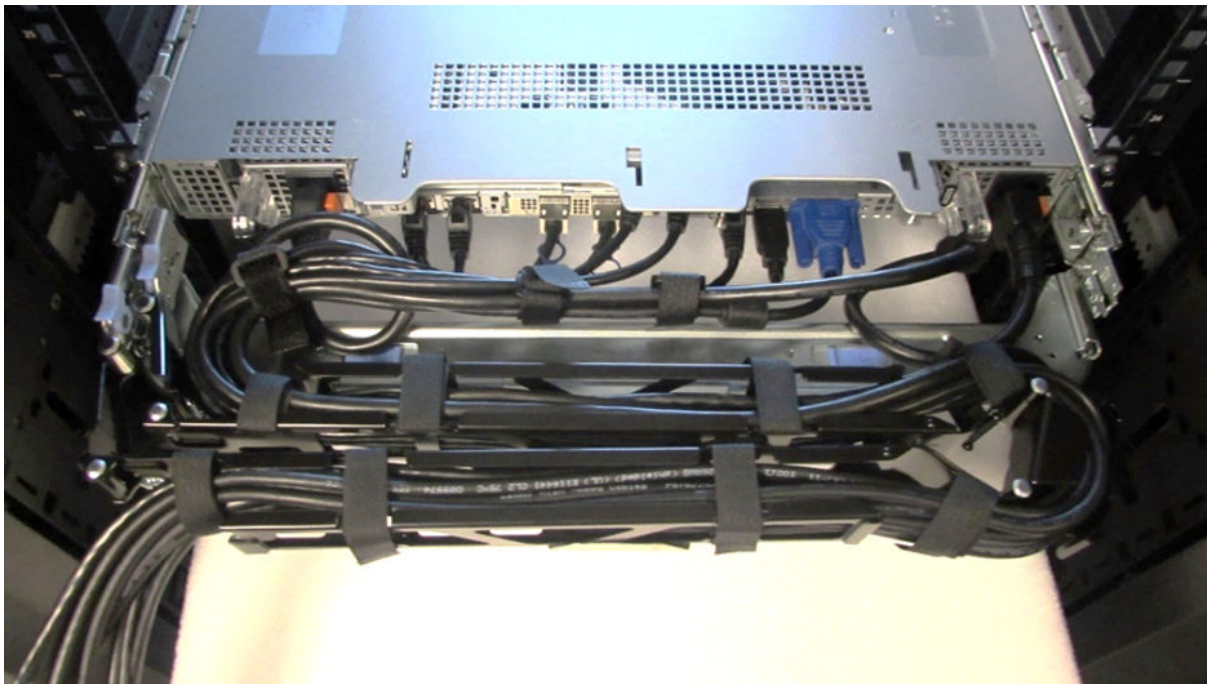


Figure 30. CMA Cabling

Strain Relief Bar (SRB)

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

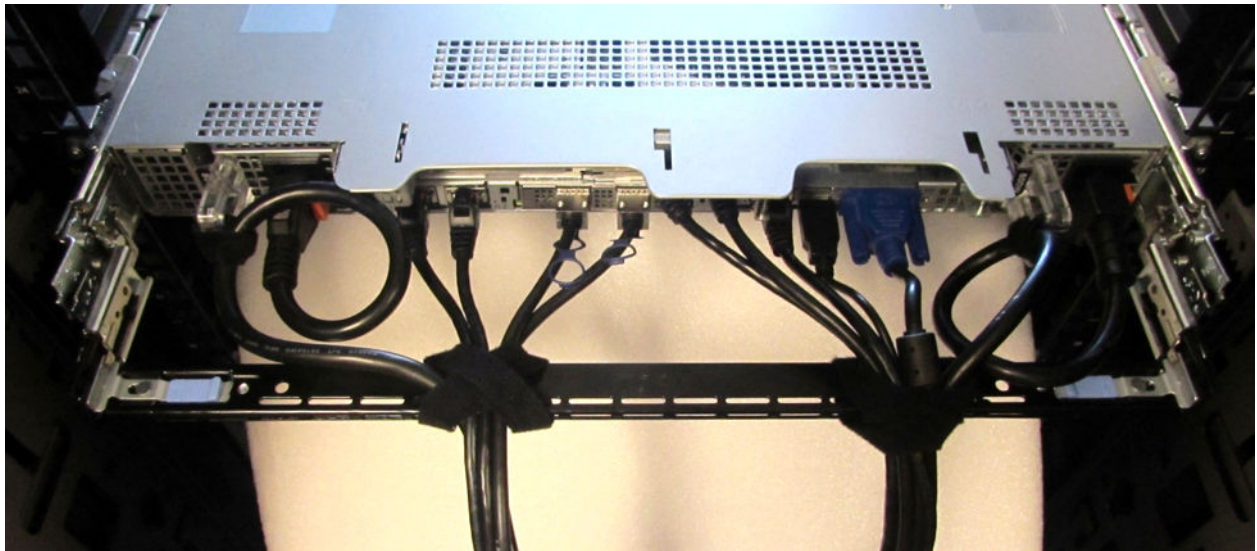


Figure 31. Cabled strain relief bar

- 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.

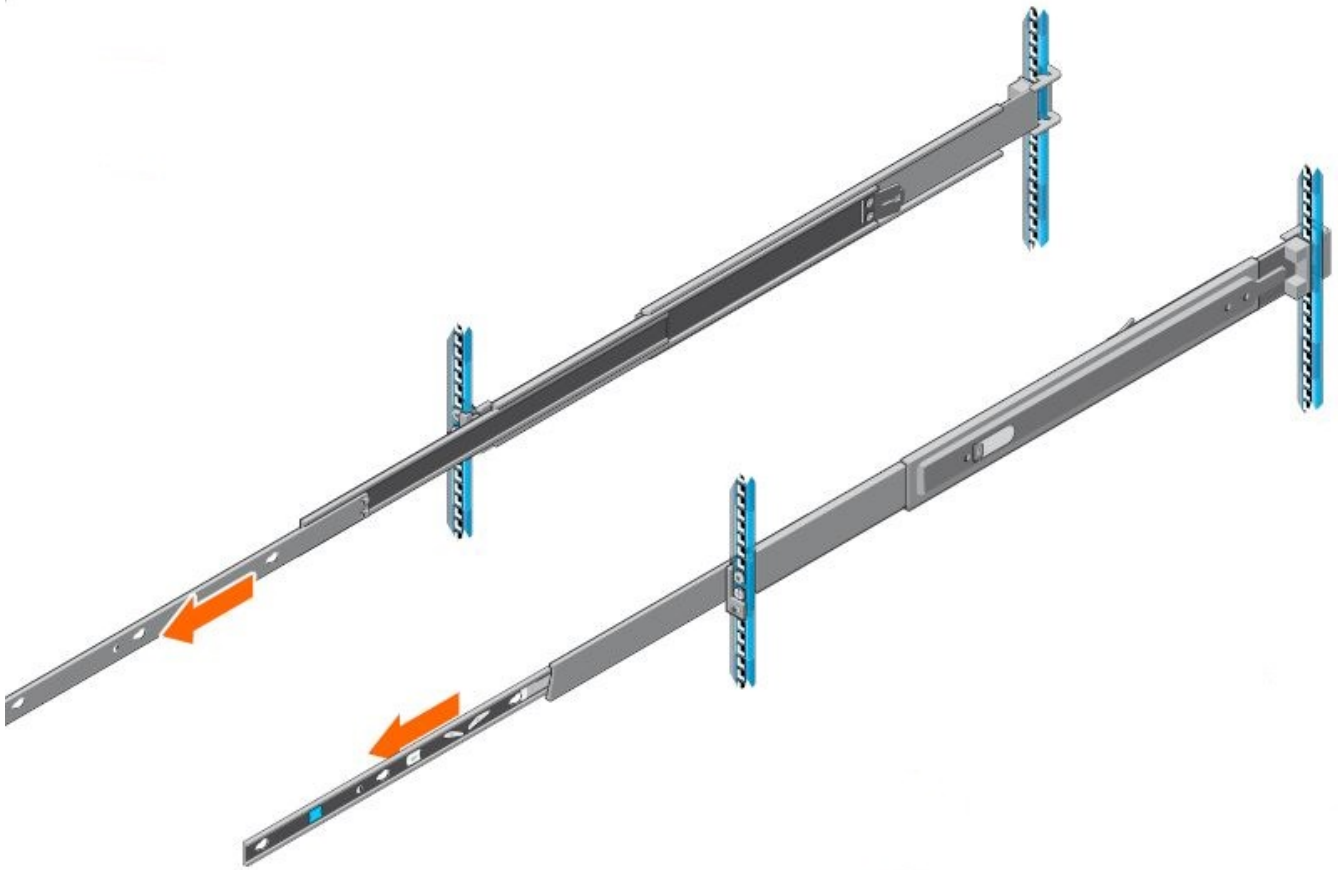


Figure 32. Pull out the intermediate rail

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

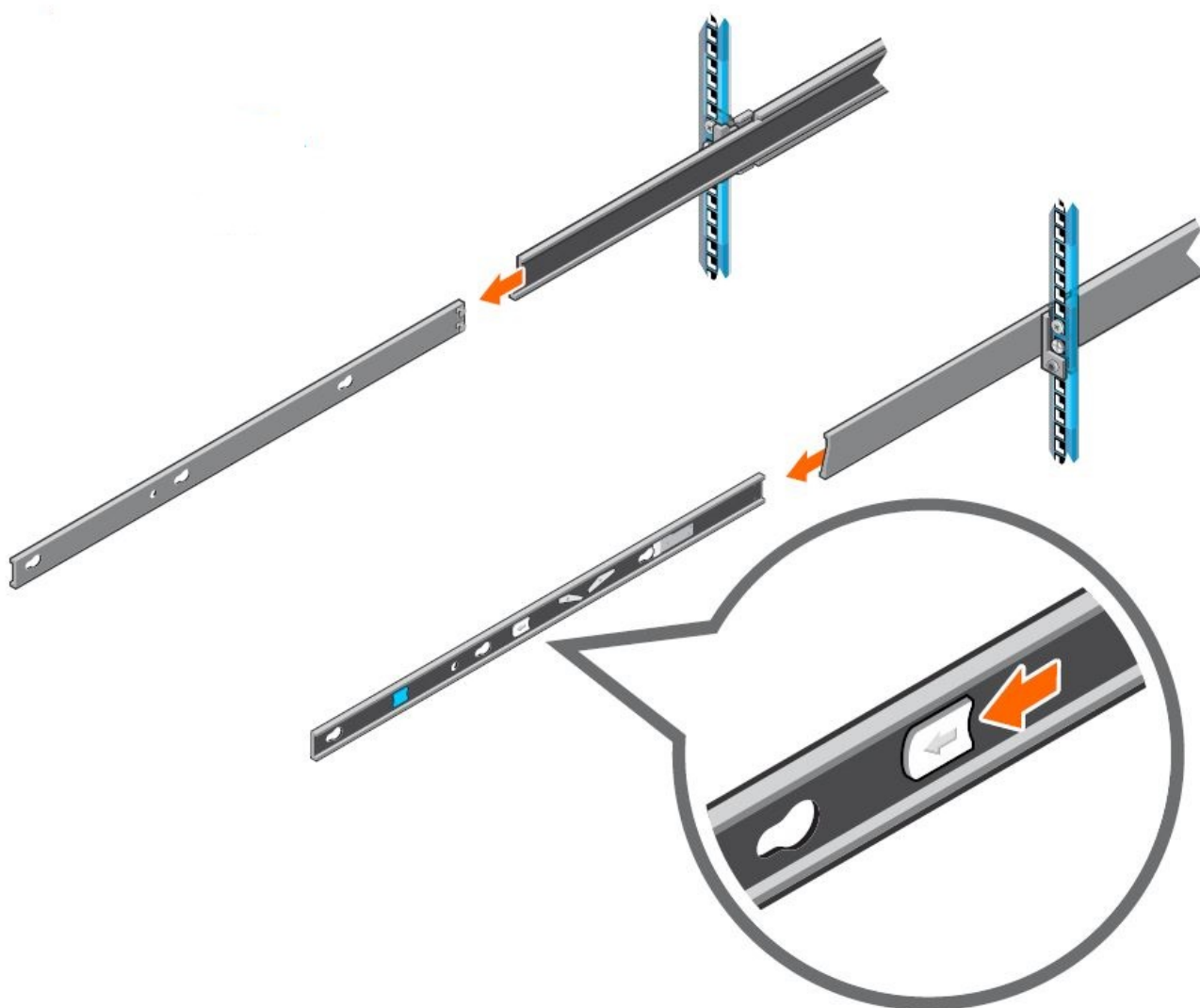


Figure 33. Releasing the inner rail

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.

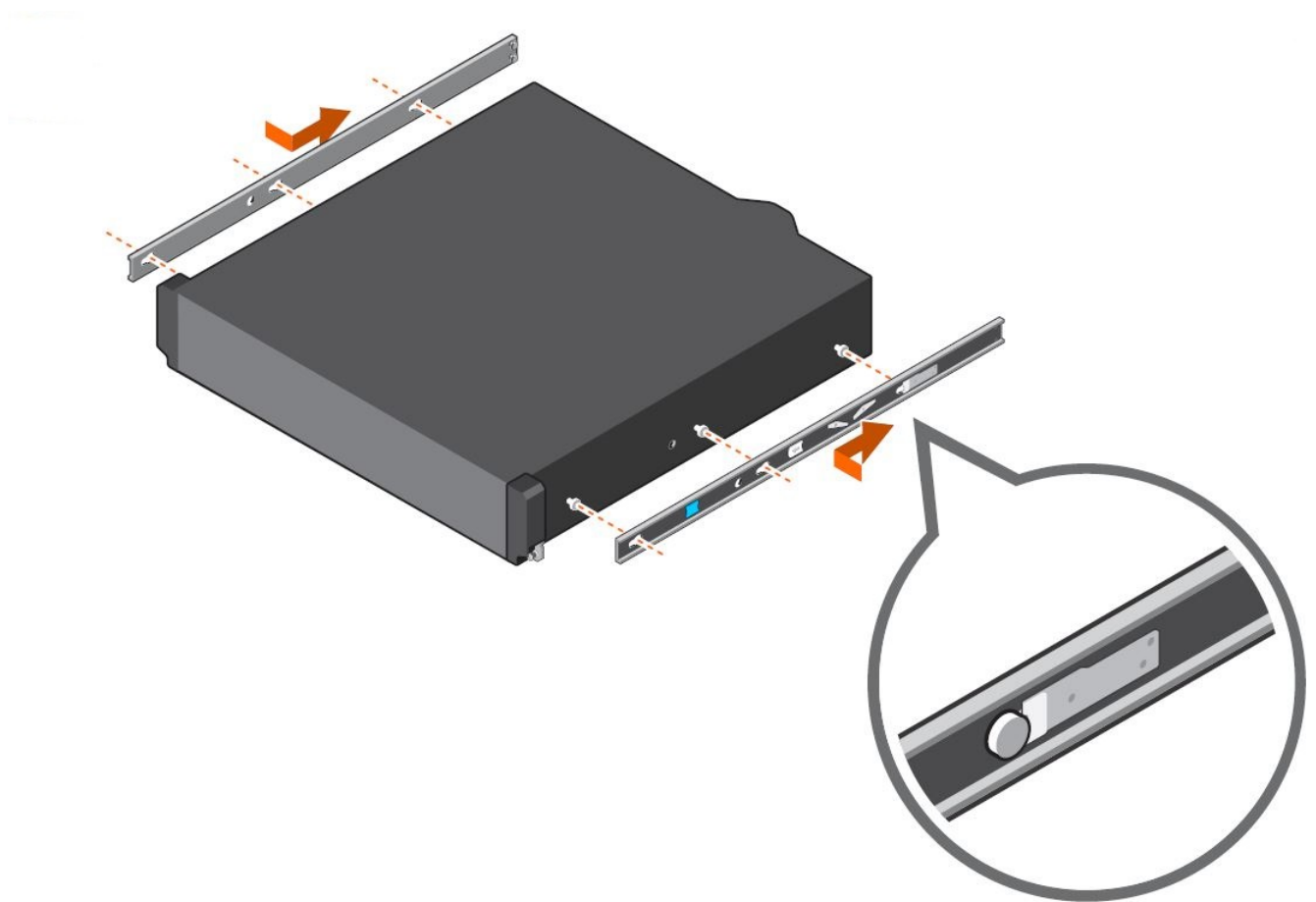


Figure 34. Attaching the rails to the sides of the system

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

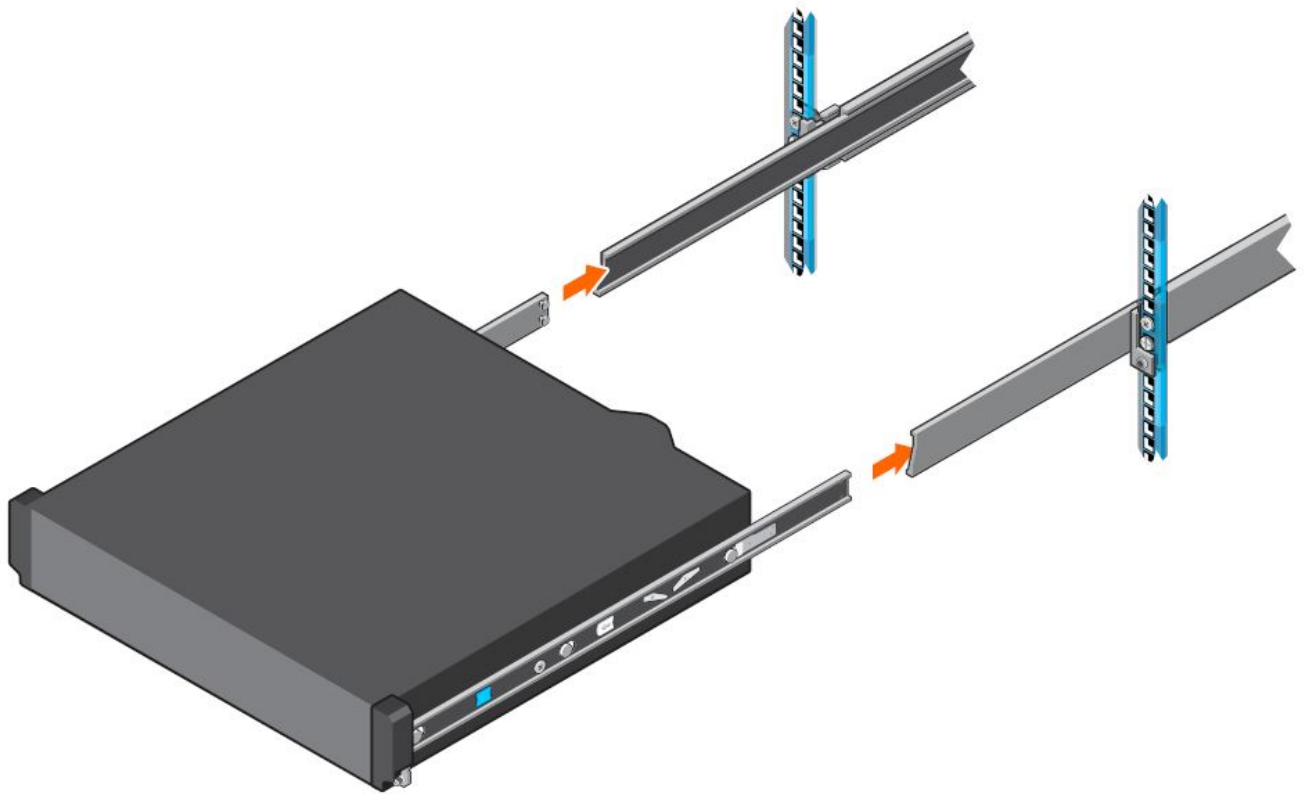


Figure 35. Installing the system into the extended rails

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

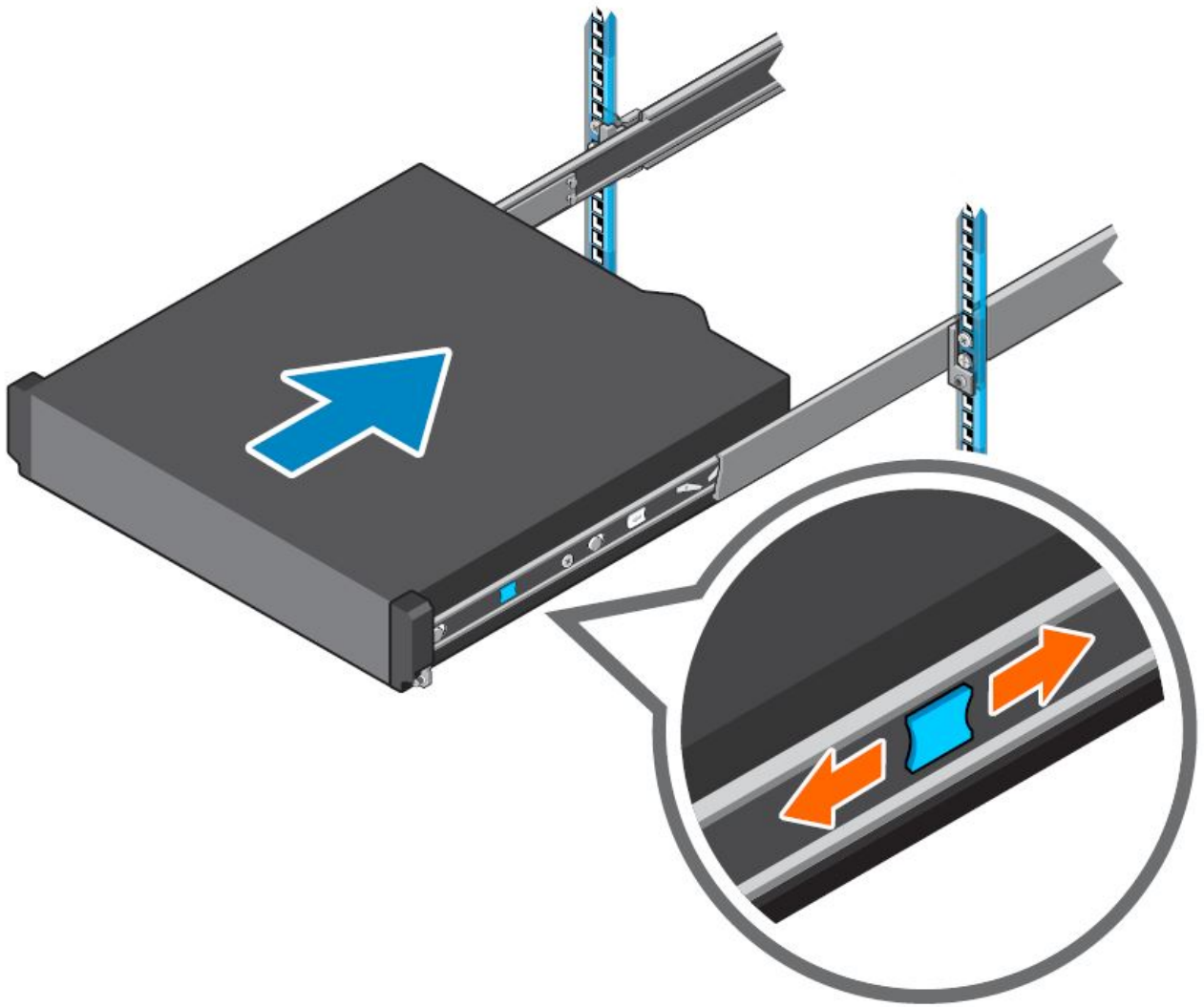


Figure 36. Sliding the system into the rack

Operating Systems and Virtualization

Topics:

- [Supported Operating Systems](#)
- [Supported Virtualization](#)

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®

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 25. Supported Virtualization

Operating Systems	Release
Microsoft	Windows Server 2019 Data Center 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](#).

Dell OpenManage Systems Management

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

The OpenManage portfolio includes:

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

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

For more information about the entire OpenManage portfolio, see:

- The latest [Dell Systems Management Overview Guide](#).

Topics:

- [Integrated Dell Remote Access Controller \(iDRAC\)](#)
- [Systems Management software support matrix](#)

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 26. iDRAC9 license tiers

License	Description
iDRAC9 Basic	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Available as an upsell on all servers Includes all features of Basic and Express. Includes key features such as virtual console, AD/LDAP support, and more Remote presence features with advanced, Enterprise-class, management capabilities
iDRAC9 Datacenter	<ul style="list-style-type: none"> 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 27. Systems Management software support matrix

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

Table 27. Systems Management software support matrix (continued)

Categories	Features	PE mainstream
	ServiceNow	Supported
	Ansible	Supported
	Third-party Connectors (Nagios, Tivoli, Microfocus)	Supported
Security	Secure Enterprise Key Management	Supported
	Secure Component Verification	Supported
Standard operating system	Red Hat Enterprise Linux, SUSE, Windows Server 2019 or 2022, Ubuntu, CentOS	Supported (Tier-1)

Appendix D: Service and support

Topics:

- [Default support levels](#)
- [Other services and support information](#)

Default support levels

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

Default deployment levels

This system is defaulted to the ProDeploy Dell Server XR Series 1U/2U which includes onsite hardware installation and remote software configuration. Optionally, the customer may choose to any of the factory or field deployment offers listed below.

Other services and support information

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

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

Dell deployment services

[Dell ProDeploy Infrastructure Suite](#)

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

ProDeploy Infrastructure Suite for servers

Versatile choices for accelerated deployments

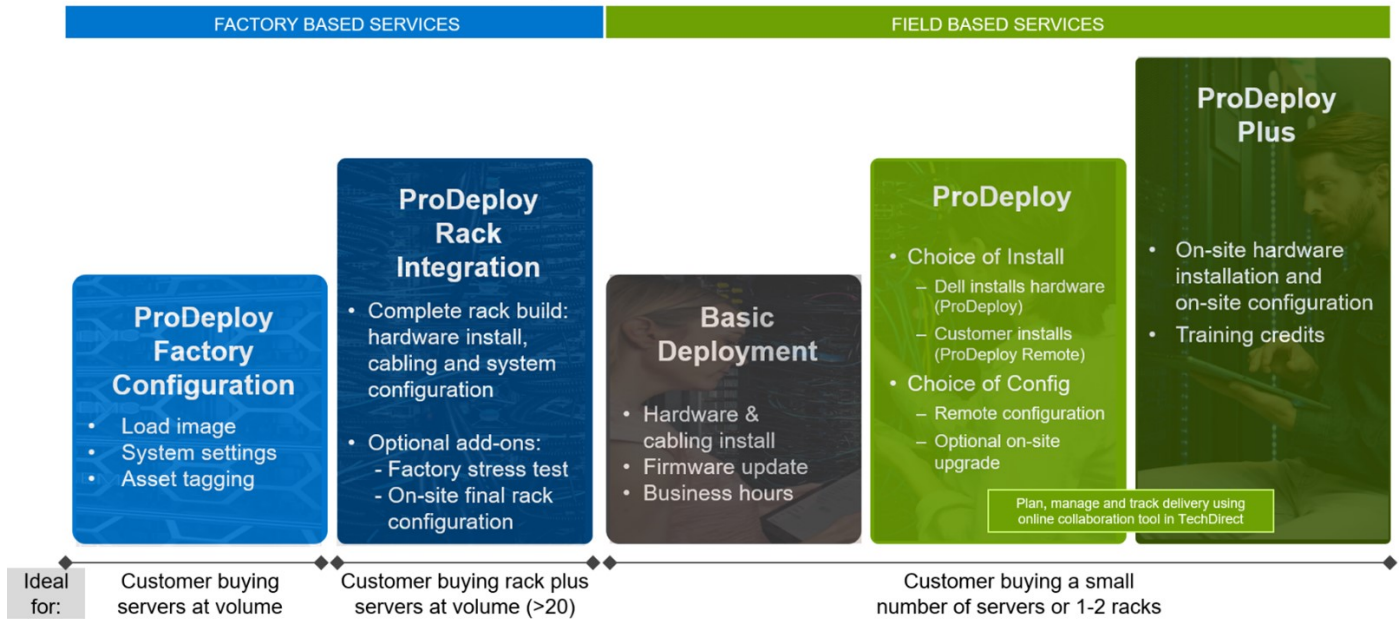


Figure 37. ProDeploy Infrastructure Suite for servers

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.

ProDeploy Infrastructure Suite Factory services		FACTORY BASED SERVICES	
		ProDeployFactory Configuration	ProDeploy Rack Integration
Asset configuration	Single point of contact for project management	●	●
	RAID, BIOS and iDRAC configuration	●	●
	Firmware freeze	●	●
	Asset Tagging and Reporting	●	●
	Customer system image	●	●
Factory implementation	Site readiness review and implementation planning	-	●
	Hardware racking and cabling	-	●
	SAM engagement for ProSupport Plus entitled accounts/devices	-	●
	Deployment verification, documentation, and knowledge transfer	●	●
Delivery	White glove logistics	-	●
	Onsite final configuration	-	Onsite add-on
	Install support software and connect with Dell Technologies	-	Onsite add-on
	Basic Deployment	Optional onsite installation	-
Online oversight	Online collaborative environment for planning, managing and tracking delivery	-	●

1 ProDeployRackIntegration Services are currently only available within the United States. Custom rack integration services are still available globally*

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Figure 38. ProDeploy Infrastructure Suite - Factory services

ProDeploy Infrastructure Suite Field services		Basic Deployment	ProDeploy	ProDeploy Plus
Pre-deployment	Single point of contact for project management	●	●	In-region
	Site readiness review	-	●	●
	Implementation planning ¹	-	●	●
	SAM engagement for ProSupport Plus entitled devices	-	-	●
Deployment	Deployment service hours	Business hours	24x7	24x7
	Onsite hardware installation and packaging material removal ² or remote guidance for hardware installation ¹	●	Remote guidance or onsite	Onsite
	Install and configure system software	-	Remote	Onsite
	Install support software and connect with Dell Technologies	-	●	●
	Project documentation with knowledge transfer	-	●	●
Post-deployment	Deployment verification	-	●	●
	Configuration data transfer to Dell Technologies technical support	-	●	●
	30-days of post-deployment configuration assistance	-	-	●
	Training credits for Dell Technologies Education Services	-	-	●
Online oversight	Online collaborative environment in TechDirect for planning, managing and tracking delivery ³	-	●	●

¹ Remote option includes project specific instructions, documentation and live expert guidance for hardware installation. Option available for select hardware. [List is available in the backup portion of this customer presentation](#)

² Packaging removal included with onsite hardware installation

³ Included with ProDeploy or ProDeploy Plus, Not included with Basic Deployment

Figure 39. ProDeploy Infrastructure Suite - Field services

Dell ProDeploy Plus for Infrastructure

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

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

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

Dell ProDeploy for Infrastructure

ProDeploy provides full-service installation and configuration of both server hardware and system software by certified deployment engineers including set up of leading operating systems and hypervisors as well our enterprise connectivity solution (secure connect gateway) and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning exercise. System testing, validation, and full project documentation with knowledge transfer complete the process.

Dell Basic Deployment

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

Additional Deployment Services

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

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

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

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

Learn more at Dell.com/HPC-Services.

ProDeploy Expansion for HPC

*Available as standard SKUs in US & Canada and as custom quote in APJC, EMEA, LATAM

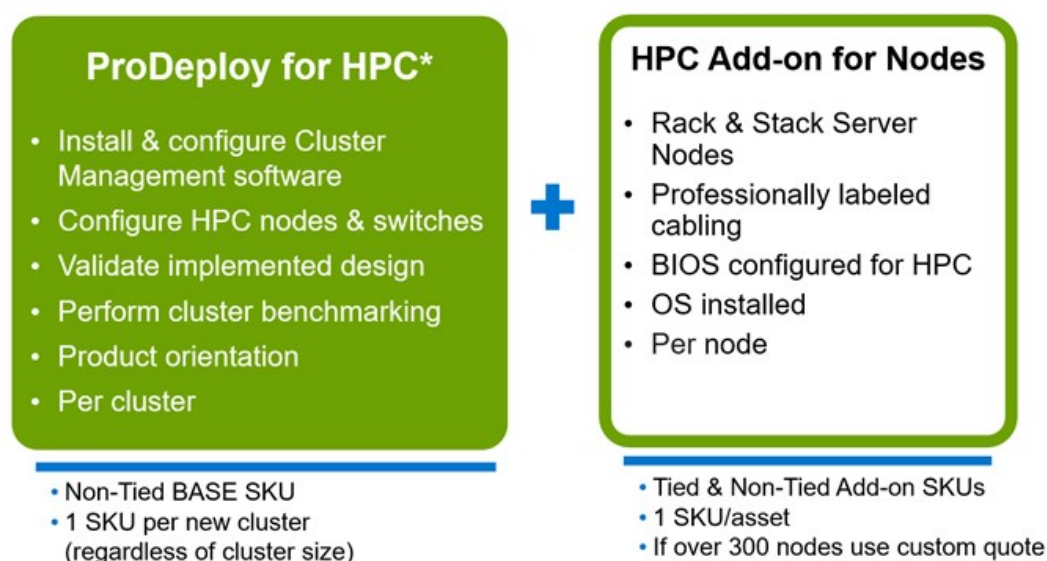


Figure 40. ProDeploy Expansion for HPC

Dell custom deployment Services

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

For more information, see [Server Configuration Services](#).

Dell Residency Services

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

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

Dell Data Migration Services

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

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

Dell Enterprise Support Services

Dell ProSupport Enterprise Suite

With the ProSupport Enterprise Suite, we help keep IT systems running smoothly, so customers can focus on running their business. We help maintain peak performance and availability of the most essential workloads. ProSupport Enterprise Suite is a suite of support services that enable customers to build the solution that is right for their organization. They choose support models that are based on how they use technology and where they want to allocate resources. From the desktop to the data center, address everyday IT challenges, such as unplanned downtime, mission-critical needs, data and asset protection, support planning, resource allocation, software application management and more. Optimize customer IT resources by choosing the right support model.

Table 28. ProSupport Enterprise Suite

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

Dell ProSupport Plus for Enterprise


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

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

Dell ProSupport for Enterprise

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

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

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

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

ProSupport Enterprise Suite Feature Comparison		Basic	ProSupport	ProSupport Plus
Remote technical support		9x5	24x7	24x7
Covered products		Hardware	Hardware Software	Hardware Software
Onsite hardware support		Next business day	Next business day or 4hr mission critical	Next business day or 4 hr mission critical
3 rd party collaborative assistance			●	●
Self-service case initiation and management			●	●
Access to software updates			●	●
Proactive storage health monitoring, predictive analytics and anomaly detection with CloudIQ and the CloudIQ mobile app			●	●
Priority access to specialized support experts				●
Predictive detection of hardware failures				●
3 rd party software support				●
An assigned Service Account Manager				●
Proactive, personalized assessments and recommendations				●
Proactive systems maintenance				●

Availability and terms of Dell Technologies Services vary by region and by product. For more information, please view our [service descriptions](#).

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Figure 41. ProSupport Enterprise Suite

Dell ProSupport One for Data Center

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

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

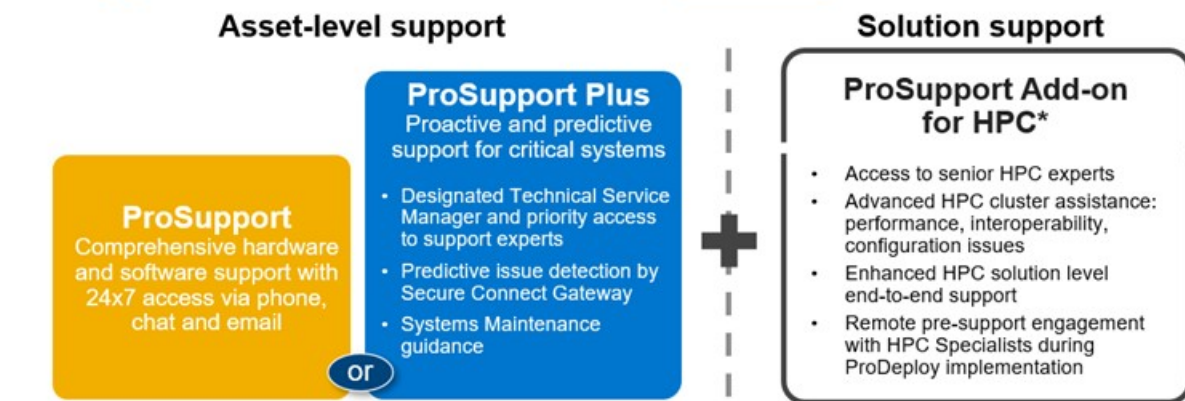
Dell ProSupport Add-on for HPC

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

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

Learn more at Dell.com/HPC-Services.

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



Eligibility

- All server, storage, and networking nodes in cluster must have PS or PSP **AND** PS Add-on for HPC attached
- All HW expansions to clusters must attach PS or PSP **AND** PS Add-on for HPC
- To retrofit an entire existing cluster with PS Add-on for HPC:
 1. HPC Specialists must review and validate the existing cluster
 2. PS or PSP **AND** the PS Add-on for HPC (APOS) must be attached to all server, storage and networking nodes

*Available in standard SKUs in NA and EMEA and as custom quote in APJC & LATAM

DELL Technologies

Figure 42. ProSupport Add-on for HPC is an add-on to PS or PSP

Support Technologies

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

NOTE: SupportAssist Enterprise capabilities are now part of the secure connect gateway technology.

Enterprise connectivity

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

Benefits include:

- Value: Our connectivity solutions are available to all customers at no additional charge
- Improve productivity: Replace manual, high-effort routines with automated support
- Accelerate time to resolution: Receive issue alerts, automatic case creation, and proactive contact from Dell experts
- Gain insight and control: Optimize enterprise devices with insights in portals reporting like TechDirect, and get predictive issue detection before the problem starts

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

Table 29. Features enabled by connectivity

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

Table 29. Features enabled by connectivity (continued)

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

Get started at DellTechnologies.com/secureconnectgateway.

Dell TechDirect

TechDirect helps boost IT team productivity when supporting Dell systems.

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- Collaborate on ProDeploy infrastructure deployment projects online
- Manage proactive and predictive alerts from secure connect gateway technology that help maximize uptime
- Integrate services functionality into your help desk with TechDirect APIs
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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.

Managed	Outsourcing or CAPEX model		APEX	as-a-Service or OPEX model
<p>We manage your technology using our people and tools.¹</p> <ul style="list-style-type: none"> • Managed detection and response* • Technology Infrastructure • End-user (PC/desktop) • Service desk operations • Cloud Managed (Pub/Private) • Office365 or Microsoft Endpoint 			<p>We own all technology so you can off-load all IT decisions.</p> <ul style="list-style-type: none"> • APEX Cloud Services • APEX Flex on Demand elastic capacity • APEX Data Center Utility pay-per-use model 	

¹ – Some minimum device counts may apply. Order via: ClientManagedServices.sales@dell.com

* Managed detection and response covers the security monitoring of laptops, servers, & virtual servers. Min. 50 devices combined. No Networking or Storage-only systems [SAN/NAS]. Available in 32 countries. [Details here](#)

Figure 43. Dell Managed Services

Dell Technologies Education Services

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

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

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

Appendix A: Additional specifications

Topics:

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

Chassis dimensions

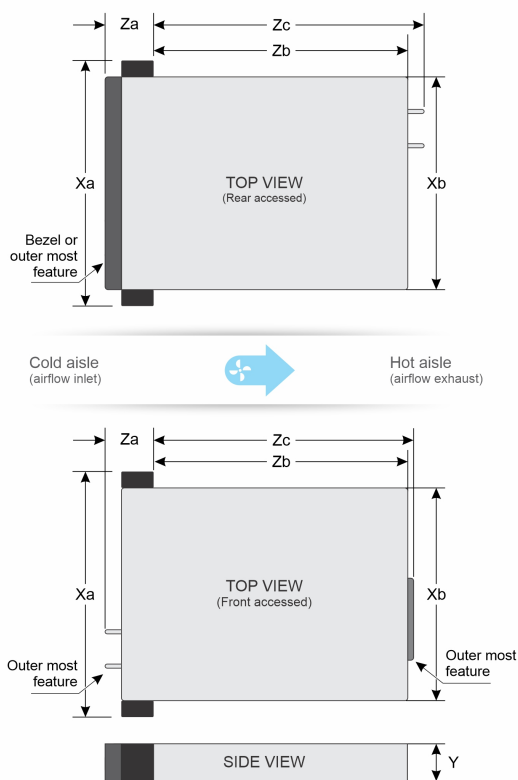


Figure 44. XR5610 Chassis dimensions for rear accessed (top) and front accessed (bottom)

Table 30. XR5610 chassis dimensions

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

Table 30. 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)

Chassis weight

Table 31. 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 4 embedded LOM ports that provide 4 x 25 GbE SFP28.

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

Table 32. Network port specifications

Feature	Specifications
LOM	10 GbE, 25 GbE  NOTE: 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 and OCP ports.

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.

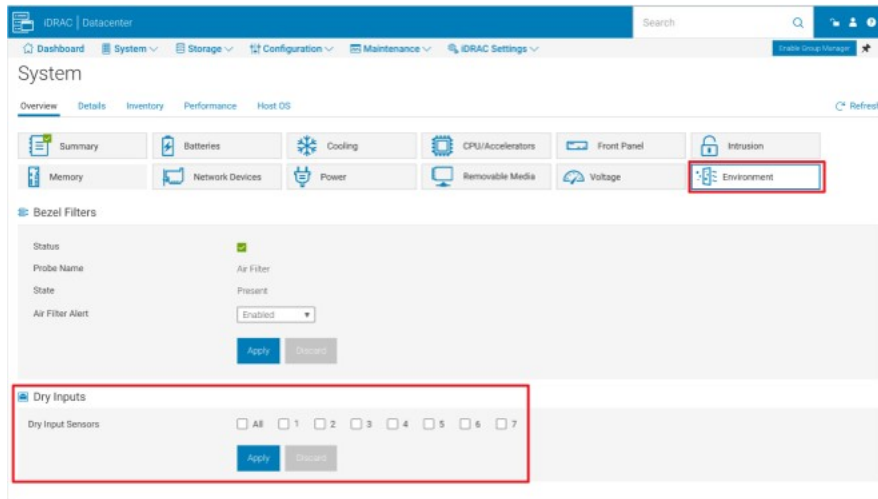


Figure 45. iDRAC interface for Dry Input sensors

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.

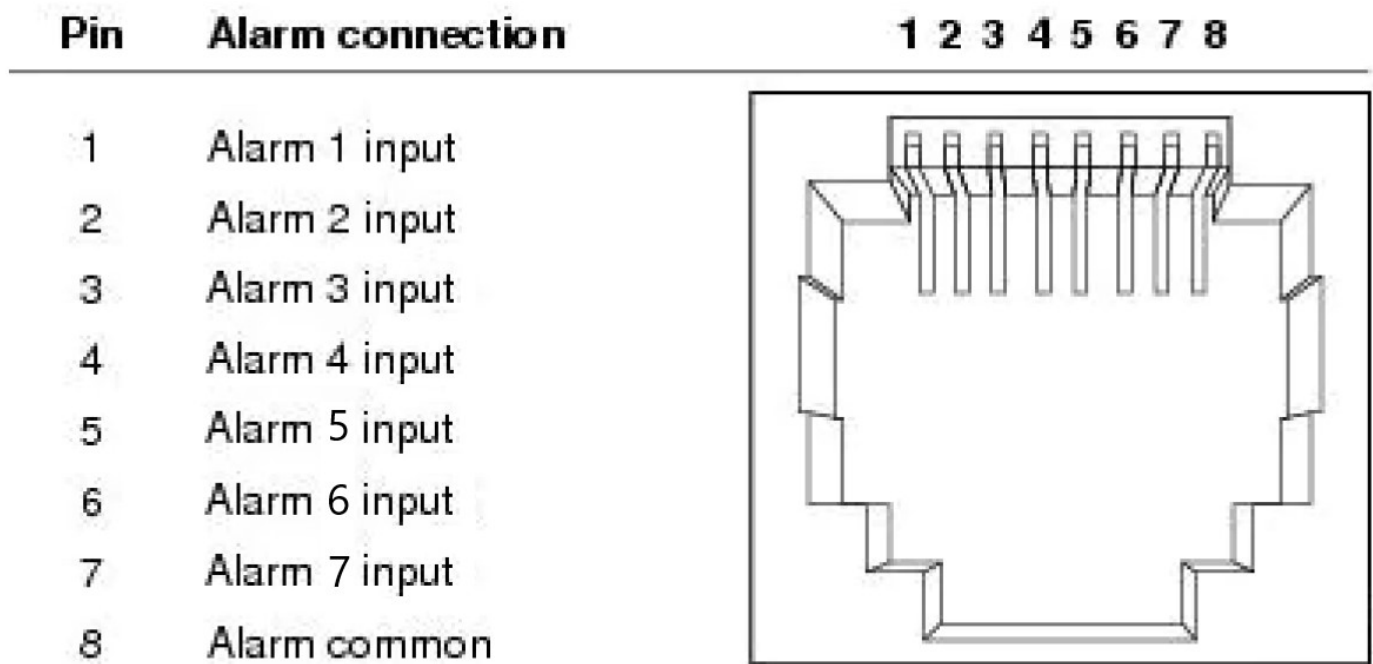


Figure 46. Dry input connection diagram

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 33. 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 located on the rear of the Rear Accessed configuration and on the front of the Front Accessed configuration.

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 www.dell.com/support/home.

Table 34. 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 35. 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
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 36. 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 37. 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 38. 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 39. Maximum vibration specifications for the system

Maximum vibration	Specifications
Operating	<ul style="list-style-type: none"> 0.21 Grms at 5 Hz to 500 Hz (all operation orientations) For Military (with Military tool kit), <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 1.88 Grms at 10 Hz to 500 Hz for 15 minutes (all six sides tested) For Military (with Military tool kit), <ul style="list-style-type: none"> 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 40. Maximum shock pulse specifications for the system

Maximum shock pulse	Specifications
Operating	<ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> Method 516.8 Procedure V, 40G, 11ms, 3 shocks, +-per direction, 3 axes

Thermal restriction matrix

Table 41. 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 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 Gold 5423N	145 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

Table 42. 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 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 16 GB	Supported	Supported	Supported	Supported	Supported

Table 43. 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)
Nvidia GPU A2	A2 support up to 50°C				Not supported
Nvidia GPU L4	L4 support up to 50°C				Not supported
2.5-inch NVMe SSD	NVMe support up to 35°C	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD	SAS SSD support up to 45°C	SAS SSD support up to 45°C	SAS SSD support up to 45°C	Not supported	Not supported
PCIe COMM Card	Not supported				
OCP COMM Card	Non-Dell qualified OCP card is not supported				
Active Optical Cables / Transceivers	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				

Table 44. 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 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 Bronze 5423N	145 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

Table 45. 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 128 GB	Supported	Not supported	Not supported	Not supported	Not supported
	DDR5 RDIMM 64 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 32 GB	Supported	Supported	Supported	Supported	Supported
	DDR5 RDIMM 16 GB	Supported	Supported	Supported	Supported	Supported

Table 46. 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)
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 support up to 40°C		Not supported	Not supported	Not supported
Nvidia GPU L4		L4 support up to 40°C		Not supported	Not supported	Not supported
2.5-inch NVMe SSD		NVMe support up to 35°C	Not supported	Not supported	Not supported	Not supported
2.5-inch SAS SSD		SAS SSD support up to 45°C			Not supported	Not supported
Perc Card with battery		PERC with battery support up to 45°C			Not supported	Not supported
PCIe COMM Card		<ul style="list-style-type: none"> Above 45°C, PCIe cards support Extended Operating Temperature (EOT) Range is required. Above 45°C, PCIe card power > 25W is not supported. Non-Dell qualified PCIe card is not supported. 				
OCP COMM Card		OCP card support up to 35°C. Non-Dell qualified OCP card is not supported.	Not supported	Not supported	Not supported	Not supported
Active Optical Cables / Transceivers		<ul style="list-style-type: none"> 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				

Other Restrictions

- Hot swap fan is not supported on 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 slot.
- 2.5-inch drive blank is required on empty slots.
- Please notice that the fan speed may increase at ambient <0°C with SAS/SATA SSD. This indicates the fan is working as design for overall system stability.

USB Ports



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



Figure 48. USB port on the rear of the Rear Accessed configuration



Figure 49. USB port on the front of the Front Accessed configuration

Table 47. 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 48. 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		

Appendix B. Standards compliance

The system conforms to the following industry standards.

Table 49. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v6.4	https://uefi.org/specsandtesttools
Ethernet IEEE Std 802.3-2022	https://standards.ieee.org/
MSFT WHQL Microsoft Windows Hardware Quality Labs	microsoft.com/whdc/system/platform/pcdesign/desguide/serverdg.msp
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR5 Memory DDR5 SDRAM Specification	jedec.org/standards-documents/docs/jesd79-4.pdf
PCI Express PCI Express Base Specification, v5.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	http://pmbus.org/Assets/PDFS/Public/PMBus_Specification_Part_I_Rev_1-1_20070205.pdf
SAS Serial Attached SCSI, 3 (SAS-3) (T10/INCITS 519)	http://www.t10.org/
SATA Serial ATA Rev. 3.3	sata-io.org
SMBIOS System Management BIOS Reference Specification, v3.3.0	DMTF SMBIOS
TPM Trusted Platform Module Specification, v1.2 and v2.0	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.7	uefi.org/specifications
PI Platform Initialization Specification, v1.7	
USB Universal Serial Bus v2.0 and SuperSpeed v3.0 (USB 3.1 Gen1)	USB Implementers Forum, Inc. https://usb.org/documents
NVMe Express Base Specification. Revision 2.0c	https://nvmexpress.org/specifications/
NVMe Command Set Specifications	
1. NVMe Express NVM Command Set Specification. Revision 1.1c	
2. NVMe Express Zoned Namespaces Command Set. Revision 1.0c	
3. NVMe Express® Key Value Command Set. Revision 1.0c	
NVMe Transport Specifications	
1. NVMe Express over PCIe Transport. Revision 1.0c	
2. NVMe Express RDMA Transport Revision. 1.0b	
3. NVMe Express TCP Transport. Revision 1.0c	
NVMe NVMe Express Management Interface. Revision 1.2c	
NVMe NVMe Boot Specification. Revision 1.0	

Appendix C Additional resources

Table 50. Additional resources

Resource	Description of contents	Location
Installation and Service Manual	<p>This manual, available in PDF format, provides the following information:</p> <ul style="list-style-type: none"> • 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	<p>This guide ships with the system, and is also available in PDF format. This guide provides the following information:</p> <ul style="list-style-type: none"> • Initial setup steps 	Dell.com/Support/Manuals
Rack Installation Guide	This document ships with the rack kits, and provides instructions for installing a server in a rack.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Inside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information, and Dell contact information.	Inside the system chassis cover
Enterprise Infrastructure Planning Tool (EIPT)	The Dell online EIPT enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use EIPT to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc

Topics:

- [BIOS](#)

BIOS

BIOS features

The XR5610 BIOS is based on the Dell BIOS core and supports the following features:

- Intel Sapphire Rapids Processor (Socket E) processor 2S Support
- Intel® Hyper-Threading Technology (Intel® HT Technology)
- Processor Turbo Mode support
- PCIe 5.0 complaint
- Plug n' Play 1.0a compliant
- Boot from hard drive, optical drive, iSCSI drive, USB key, and SD card
- ACPI support
- PXE and WOL support
- SETUP access through <F2> key at end of POST
- USB 3.0 during boot as well as in operating system
- F1/F2 error logging in NVRAM
- Virtual KVM, CD, and floppy support
- UEFI (Unified Extensible Firmware Interface) 2.7 support
- Power vs. Performance system profiles
- Chipset/processor error logging
- Personality modules support
- DAPC
- Virtualization support
- System RAS features
- Boot Guard
- SMBIOS Support
- BIOS language localization
- MS WHEA support
- Embedded Hypervisor support
- VT-x, VT-d support
- SRIOV support
- High Reliability mode/profile support
- Secure Boot
- TPM/TXT

Pre-operating system management applications

You can manage basic settings and features of a system without booting to the operating system by using the system firmware.

Options to manage the pre-operating system applications

You can use any one of the following options to manage the pre-operating system applications:

- System Setup
- Dell Lifecycle Controller
- Boot Manager
- Preboot Execution Environment (PXE)

System Setup

Using the


System Setup option, you can configure the BIOS settings, iDRAC settings, and device settings of the system.

You can access system setup by using any one of the following interfaces:

- Graphical User interface — To access go to iDRAC Dashboard, click **Configurations > BIOS Settings**.
- Text browser — To enable the text browser, use the Console Redirection.

To view

System Setup, power on the system, press F2, and click **System Setup Main Menu**.

 **NOTE:** If the operating system begins to load before you press F2, wait for the system to finish booting, and then restart the system and try again.

The options on the

System Setup Main Menu screen are described in the following table:

Table 51. System Setup Main Menu

Option	Description
System BIOS	Enables you to configure the BIOS settings.
iDRAC Settings	Enables you to configure the iDRAC settings. The iDRAC settings utility is an interface to set up and configure the iDRAC parameters by using UEFI (Unified Extensible Firmware Interface). You can enable or disable various iDRAC parameters by using the iDRAC settings utility. For more information about this utility, see <i>Integrated Dell Remote Access Controller User's Guide</i> at www.dell.com/poweredgemanuals .
Device Settings	Enables you to configure device settings for devices such as storage controllers or network cards.
Service Tag Settings	Enables you to configure the System Service Tag.

System BIOS

To view the **System BIOS** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS**.

Table 52. System BIOS details

Option	Description
System Information	Provides information about the system such as the system model name, BIOS version, and Service Tag.
Memory Settings	Specifies information and options related to the installed memory.
Processor Settings	Specifies information and options related to the processor such as speed and cache size.
SATA Settings	Specifies options to enable or disable the integrated SATA controller and ports.
NVMe Settings	Specifies options to change the NVMe settings.
Boot Settings	Specifies options to specify the Boot Mode (BIOS or UEFI). Enables you to modify UEFI and BIOS boot settings.
Network Settings	Specifies options to manage the UEFI network settings and boot protocols. Legacy network settings are managed from the Device Settings menu.
Integrated Devices	Specifies options to manage integrated device controllers and ports, specifies related features, and options.
Serial Communication	Specifies options to manage the serial ports, its related features, and options.
System Profile Settings	Specifies options to change the processor power management settings, memory frequency.

Table 52. System BIOS details (continued)

Option	Description
System Security	Specifies options to configure the system security settings, such as system password, setup password, Trusted Platform Module (TPM) security, and UEFI secure boot. It also manages the power button on the system.
Redundant OS Control	Sets the redundant OS information for redundant OS control.
Miscellaneous Settings	Specifies options to change the system date and time.

System Information

To view the **System Information** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Information**.

Table 53. System Information details

Option	Description
System Model Name	Specifies the system model name.
System BIOS Version	Specifies the BIOS version installed on the system.
System Management Engine Version	Specifies the current version of the Management Engine firmware.
System Service Tag	Specifies the system Service Tag.
System Manufacturer	Specifies the name of the system manufacturer.
System Manufacturer Contact Information	Specifies the contact information of the system manufacturer.
System CPLD Version	Specifies the current version of the system Complex Programmable Logic Device (CPLD) firmware.
UEFI Compliance Version	Specifies the UEFI compliance level of the system firmware.

Memory Settings

To view the **Memory Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Memory Settings**.

Table 54. Memory Settings details

Option	Description
System Memory Size	Specifies the size of the system memory.
System Memory Type	Specifies the type of memory that is installed in the system.
System Memory Speed	Specifies the speed of the system memory.
System Memory Voltage	Specifies the voltage of the system memory.
Video Memory	Specifies the size of the video memory.
System Memory Testing	Specifies whether the system memory tests are run during system boot. The two options available are Enabled and Disabled . This option is set to Disabled by default.
Memory Operating Mode	Specifies the memory operating mode. The option is available and is set to Optimizer Mode , by default. Options such as Fault Resilient Mode and NUMA Fault Resilient Mode are available for support when the Advanced RAS capability processor is installed on the system.
Current State of Memory Operating Mode	Specifies the current state of the memory operating mode.
Fault Resilient Mode Memory Size [%]	Select to define the percent of total memory size that must be used by the fault resilient mode, when selected in the Memory Operating mode.

Table 54. Memory Settings details (continued)

Option	Description
	When Fault Resilient Mode is not selected, this option is unavailable and not used by Fault Resilient Mode.
Node Interleaving	Enables or disables the Node interleaving option. Specifies if the Non-Uniform Memory Architecture (NUMA) is supported. If this field is set to Enabled , memory interleaving is supported if a symmetric memory configuration is installed. If the field is set to Disabled , the system supports NUMA (asymmetric) memory configurations. This option is set to Disabled by default.
ADDDC Settings	Enables or disables the ADDDC Settings feature. When Adaptive Double DRAM Device Correction (ADDDC) is enabled, failing DRAMs are dynamically mapped out. When set to Enabled it can impact the system performance under certain workloads. This feature is applicable for x4 DIMMs only. This option is set to Enabled by default.
Memory Training	<p>When the option is set to Fast and memory configuration is not changed, the system uses previously saved memory training parameters to train the memory subsystems and system boot time is also reduced. If memory configuration is changed, the system automatically enables Retrain at Next boot to force one-time full memory training steps, and then go back to Fast afterward.</p> <p>When option is set to Retrain at Next Boot, the system performs the force one-time full memory training steps at next power on and boot time is slowed on next boot.</p> <p>When option is set to Enable, the system performs the force full memory training steps on every power on and boot time is slowed on every boot.</p>
Memory Paging Policy	This option sets the Memory Paging Policy. When set to Closed Paging the DRAM page is closed immediately after every read or write.
Memory Map Out	This option controls DIMM slots on the system. This option is set to Enabled by default. It allows to disable system installed DIMMs.
Correctable Error Logging	Enables or disables correctable error logging. This option is set to Disabled by default.
DIMM Self Healing (Post Package Repair) on Uncorrectable Memory Error	Enables or disables Post Package Repair (PPR) on uncorrectable memory error. This option is set to Enabled by default.

Processor Settings

To view the **Processor Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Processor Settings**.

Table 55. Processor Settings details

Option	Description
Logical Processor	Each processor core supports up to two logical processors. If this option is set to Enabled , the BIOS reports all the logical processors. If this option is set to Disabled , the BIOS reports only one logical processor per core. This option is set to Enabled by default.
Virtualization Technology	Enables or disables the virtualization technology for the processor. This option is set to Enabled by default.
Directory Mode	Enables or disables the directory mode. This option is set to Enabled by default.

Table 55. Processor Settings details (continued)


Option	Description
Kernel DMA Protection	This option is set to Disabled by default. It is enabled for Secure Launch (Firmware Protection) support on Windows 2022.
Adjacent Cache Line Prefetch	Optimizes the system for applications that need high utilization of sequential memory access. This option is set to Enabled by default. You can disable this option for applications that need high utilization of random memory access.
Hardware Prefetcher	Enables or disables the hardware prefetcher. This option is set to Enabled by default.
DCU Streamer Prefetcher	Enables or disables the Data Cache Unit (DCU) streamer prefetcher. This option is set to Enabled by default.
DCU IP Prefetcher	Enables or disables the Data Cache Unit (DCU) IP prefetcher. This option is set to Enabled by default.
Sub NUMA Cluster	Enables or disables the Sub NUMA Cluster. This option is set to Disabled by default.
MADT Core Enumeration	Determines how BIOS enumerates processor cores in the ACPI MADT table. When set to Round Robin , processor cores are enumerated in round robin order. When set to Linear , processor cores are enumerated across all Dies within a socket before enumerating additional sockets for a linear distribution.
UMA Based Clustering Status	It is a read-only field and displays as Quadrant , when Sub NUMA Cluster is disabled or displays as Disabled , when Sub NUMA Cluster is 2-way.
UPI Prefetch	Enables you to get the memory read started early on DDR bus. The Ultra Path Interconnect (UPI) Rx path spawns the MemSpecRD that is read to Integrated Memory Controller (iMC) directly. This option is set to Disabled by default.
XPT Prefetch	This option is set to Enabled by default.
LLC Prefetch	Enables or disables the LLC Prefetch on all threads. This option is set to Enabled by default.
Dead Line LLC Alloc	Enables or disables the Dead Line LLC. This option is set to Enabled by default. You can enable this option to opportunistically fill the dead lines in LLC or disable the option to not fill the dead lines in LLC.
Directory AtoS	Enables or disables the Directory AtoS. AtoS optimization reduces remote read latencies for repeat read accesses without intervening writes. This option is set to Disabled by default.
AVX P1	Enables you to reconfigure the processor Thermal Design Power (TDP) levels during POST based on the power and thermal delivery capabilities of the system. TDP verifies the maximum heat the cooling system is must dissipate. This option is set to Normal by default.  NOTE: This option is only available on certain stock keeping units (SKUs) of the processors.
Dynamic SST-Performance Profile	Enables you to reconfigure the processor using Dynamic or Static Speed Select Technology. This option is set to Disabled by default
SST-Performance Profile	Enables you to reconfigure the processor using Speed Select Technology.
Intel SST-BF	Enables Intel SST-BF. This option is displayed if Performance Per Watt (OS) or Custom (when OSPM is enabled) system profiles are selected. This option is set to Disabled by default.

Table 55. Processor Settings details (continued)

Option	Description
Intel SST-CP	Enables Intel SST-CP. This option is displayed and selectable for each system profile mode. This option is set to Disabled by default.
x2APIC Mode	Enables or disables x2APIC mode. This option is set to Enabled by default. NOTE: For two processors 64 cores configuration, x2APIC mode is not switchable if 256 threads are enabled (BIOS settings: All CCD, cores, and logical processors enabled).
AVX ICCP Pre-Grant License	Enables or disables AVX ICCP Pre-Grant License. This option is set to Disabled by default.
Dell Controlled Turbo	
Dell Controlled Turbo Setting	Controls the turbo engagement. Enable this option only when System Profile is set to Performance or Custom , and CPU Power Management is set to Performance . This item can be selected for each system profile mode. This option is set to Disabled by default.
Dell AVX Scaling Technology	Enables you to configure the Dell AVX scaling technology. This option is set to 0 by default. Enter the value from 0 to 12 bins. The value that is entered decreases the Dell AVX Scaling Technology frequency when the Dell-controlled Turbo feature is enabled.
Number of Cores per Processor	Controls the number of enabled cores in each processor. This option is set to All by default.
CPU Physical Address Limit	Limit CPU physical address to 46 bits to support older Hyper-V. If enabled, automatically disables TME-MT. This option is set to Enabled by default.
AMP Prefetch	This option enables one of the Mid-Level Cache (MLC) AMP hardware Prefetcher. This option is set to Disabled by default.
Homeless Prefetch	This option allows L1 Data Cache Unit (DCU) to prefetch, when the Fill Buffers (FB) is full. Auto maps to hardware default setting. This option is set to Auto by default.
Unicore Frequency RAPL	This setting controls whether the Running Average Power Limit (RAPL) balancer is enabled or not. If enabled, it activates the uncore power budgeting. This option is set to Enabled by default.
Processor Core Speed	Specifies the maximum core frequency of the processor.
Local Machine Check Exception	Enables or disables the local machine check exception. This is an extension of the MCA Recovery mechanism providing the capability to deliver Uncorrected Recoverable (UCR) Software Recoverable Action Required (SRAR) errors to one or more specific logical processors threads receiving previously poisoned or corrupted data. When enabled, the UCR SRAR Machine Check Exception is delivered only to the affected thread rather than broadcast to all threads in the system. The feature supports operating system recovery for cases of multiple recoverable faults that are detected close, which would otherwise result in a fatal machine check event. The feature is available only on Advanced RAS processors. This option is set to Enabled by default.
CPU Crash Log Support	This field controls Intel CPU Crash Log feature for collection of previous crash data from shared SRAM of Out-of-Band Management Service Module at post reset. This option is set to Disabled by default.
PROCESSOR 1	NOTE: Depending on the number of processors, there might be up to n processors listed. The following settings are displayed for each processor:

Table 56. Processor n details

Option	Description
Family-Model-Stepping	Specifies the family, model, and stepping of the processor as defined by Intel.
Brand	Specifies the brand name.
Level 2 Cache	Displays the amount of memory in the processor cache
Level 3 Cache	Displays the amount of memory in the processor cache
Number of Cores	Specifies the number of cores per processor.
Maximum Memory Capacity	Specifies the maximum memory capacity per processor.
Microcode	Specifies the processor microcode version.

SATA Settings

To view the **SATA Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > SATA Settings**.

Table 57. SATA Settings details


Option	Description
Embedded SATA	Enables the embedded SATA option to be set to Off , AHCI mode , or RAID mode . This option is set to AHCI Mode by default.  NOTE: No ESXi and Ubuntu operating system support under RAID mode.
Security Freeze Lock	Sends Security Freeze Lock command to the embedded SATA drive during POST. This option is applicable only for AHCI Mode. This option is set to Enabled by default.
Write Cache	Enables or disables the command for Sends Enable or Disabled Write Cache to the embedded SATA drives during POST. This option is applicable only for AHCI Mode. This option is set to Disabled by default.
Port n	Sets the drive type of the selected device. For AHCI Mode , BIOS support is always enabled.

Table 58. Port n

Options	Descriptions
Model	Specifies the drive model of the selected device.
Drive Type	Specifies the type of drive that is attached to the SATA port.
Capacity	Specifies the total capacity of the drive. This field is undefined for removable media devices such as optical drives.

NVMe Settings

This option sets the NVMe drive mode. If the system contains NVMe drives that you want to configure in a RAID array, you must set both this field and the Embedded SATA field on the SATA settings menu to RAID Mode. You may also need to change the Boot Mode setting to UEFI.

To view the **NVMe Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > NVMe Settings**.

Table 59. NVMe Settings details

Option	Description
NVMe Mode	Enables or disables the boot mode. The option is set to Non-RAID mode by default.


Table 59. NVMe Settings details (continued)

Option	Description
BIOS NVMe Driver	The available options are Dell Qualified Drives and All Drives . This option is set to Dell Qualified Drives by default.

Boot Settings

You can use the **Boot Settings** screen to set the boot mode to either **BIOS** or **UEFI**. It also enables you to specify the boot order.

- **UEFI:** The Unified Extensible Firmware Interface (UEFI) is a new interface between operating systems and platform firmware. The interface consists of data tables with platform related information, boot and runtime service calls that are available to the operating system and its loader. The following benefits are available when the **Boot Mode** is set to **UEFI**:
 - Support for drive partitions larger than 2 TB.
 - Enhanced security (e.g., UEFI Secure Boot).
 - Faster boot time.

 **NOTE:** You must use only the UEFI boot mode in order to boot from NVMe drives.

- **BIOS:** The **BIOS Boot Mode** is the legacy boot mode. It is maintained for backward compatibility.

To view the **Boot Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Boot Settings**.

Table 60. Boot Settings details




Option	Description
Boot Mode	Enables you to set the boot mode of the system. If the operating system supports UEFI, you can set this option to UEFI. Setting this field to BIOS allows compatibility with non-UEFI operating systems. This option is set to UEFI by default.  CAUTION: Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.  NOTE: Setting this field to UEFI disables the BIOS Boot Settings menu.
Boot Sequence Retry	Enables or disables the Boot sequence retry feature or resets the system. When this option is set to Enabled and the system fails to boot, the system re-attempts the boot sequence after 30 seconds. When this option is set to Reset and the system fails to boot, the system reboots immediately. This option is set to Enabled by default.
Generic USB Boot	Enables or disables the generic USB boot placeholder. This option is set to Disabled by default.
Hard-disk Drive Placeholder	Enables or disables the Hard-disk drive placeholder. This option is set to Disabled by default.
Clean all SysPrep variables and order	When this option is set to None , BIOS will do nothing. When set to Yes , BIOS will delete variables of SysPrep ##### and SysPrepOrder this option is a onetime option, will reset to none when deleting variables. This setting is only available in UEFI Boot Mode . This option is set to None by default.
UEFI Boot Settings	Specifies the UEFI boot sequence. Enables or disables UEFI Boot options.  NOTE: This option controls the UEFI boot order. The first option in the list will be attempted first.

Table 61. UEFI Boot Settings

Option	Description
UEFI Boot Sequence	Enables you to change the boot device order.
Boot Options Enable/Disable	Enables you to select the enabled or disabled boot devices

Choosing system boot mode


System Setup enables you to specify one of the following boot modes for installing your operating system:


- UEFI boot mode (the default), is an enhanced 64-bit boot interface. If you have configured your system to boot to UEFI mode, it replaces the system BIOS.

1. From the **System Setup Main Menu**, click **Boot Settings**, and select **Boot Mode**.
2. Select the UEFI boot mode you want the system to boot into.

 **CAUTION:** Switching the boot mode may prevent the system from booting if the operating system is not installed in the same boot mode.

3. After the system boots in the specified boot mode, proceed to install your operating system from that mode.

 **NOTE:** Operating systems must be UEFI-compatible to be installed from the UEFI boot mode. DOS and 32-bit operating systems do not support UEFI and can only be installed from the BIOS boot mode.

 **NOTE:** For the latest information about supported operating systems, go to www.dell.com/ossupport.

Changing boot order


About this task

You may have to change the boot order if you want to boot from a USB key or an optical drive. The following instructions may vary if you have selected **BIOS** for **Boot Mode**.

 **NOTE:** Changing the drive boot sequence is only supported in BIOS boot mode.

Steps

1. On the **System Setup Main Menu** screen, click **System BIOS > Boot Settings > UEFI Boot Settings > UEFI Boot Sequence**.
2. Use the arrow keys to select a boot device, and use the plus (+) and minus (-) sign keys to move the device down or up in the order.
3. Click **Exit**, and then click **Yes** to save the settings on exit.

 **NOTE:** You can also enable or disable boot order devices as needed.

Network Settings

To view the **Network Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Network Settings**.


 **NOTE:** Network Settings are not supported in BIOS boot mode.

Table 62. Network Settings details

Option	Description
UEFI PXE Settings	Enables you to control the configuration of the UEFI PXE device.
Number of PXE Devices	This field specifies the number of PXE devices. This option is set to 4 by default.
PXE Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI PXE boot option is created for the device.
PXE Device n Settings (n = 1 to 4)	Enables you to control the configuration of the PXE device.
UEFI HTTP Settings	Enables you to control the configuration of the UEFI HTTP device.
HTTP Device n (n = 1 to 4)	Enables or disables the device. When enabled, a UEFI HTTP boot option is created for the device.
HTTP Device n Settings (n = 1 to 4)	Enables you to control the configuration of the HTTP device.
UEFI iSCSI Settings	Enables you to control the configuration of the iSCSI device.

Table 62. Network Settings details (continued)

Option	Description
iSCSI Initiator Name	Specifies the name of the iSCSI initiator in IQN format.
iSCSI Device1	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically. This is set to Disabled by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.
UEFI NVMe-oF Settings	Enables you to control the configuration of the NVMe-oF devices.
NVMe-oF	Enables or disables the NVMe-oF feature. When enabled, it allows to configure the host and target parameters needed for fabric connection. This is set to Disabled by default.
NVMe-oF Host NQN	This field specifies the name of the NVMe-oF host NQN. Allowed input is in the following format: nqn.yyyy-mm.<Reserved Domain Name>:<Unique String>. Leave it empty to use system generated value with following format: nqn.1988-11.com.dell:<Model name>.<Model number>.<Service Tag>. This is set to nqn.1988-11.com.dell:<model name>.<model number>.<service tag> by default.
NVMe-oF Host Id	This field specifies a 16 bytes value of the NVMe-oF host identifier that uniquely identifies this host with the controller in the NVM subsystem. Allowed input is a hexadecimal-encoded string in this format: 00112233-4455-6677-8899-aabbccddeeff. Leave it empty to use system generated value. A value of all FF is not allowed. This is set to FFFFFFFF-FFFF-FFFF-FFFF-FFFFFFFFFFFFFF by default.
Host Security Key Path	This field specifies the Host security key path.
NVMe-oF SubSystem Settings	This field controls the parameters for the NVMe-oF subsystem n connections.

Table 63. PXE Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the PXE device.
Protocol	Specifies Protocol used for PXE device. This option is set to IPv4 or IPv6 . This option is set to IPv4 by default.
VLAN	Enables Vlan for PXE device. This option is set to Enabled or Disabled . This option is set to Disabled by default.
Vlan ID	Shows the Vlan ID for the PXE device
Vlan Priority	Shows the Vlan Priority for the PXE device.

Table 64. HTTP Device n Settings details

Option	Description
Interface	Specifies NIC interface used for the HTTP device.
Protocol	Specifies Protocol used for HTTP device. This option is set to IPv4 or IPv6 . This option is set to IPv4 by default.
VLAN	Enables Vlan for HTTP device. This option is set to Enable or Disable . This option is set to Disable by default.
VLAN ID	Shows the Vlan ID for the HTTP device
VLAN Priority	Shows the Vlan Priority for the HTTP device.
DHCP	Enables or disables DHCP for this HTTP device. This option is set to Enable by default.
IP Address	Specifies IP address for the HTTP device.

Table 64. HTTP Device n Settings details (continued)

Option	Description
Subnet Mask	Specifies subnet mask for the HTTP device.
Gateway	Specifies gateway for the HTTP device.
DNS info via DHCP	Enables or disables DNS Information from DHCP. This option is set to Enable by default.
Primary DNS	Specifies the primary DNS server IP address for the HTTP Device.
Secondary DNS	Specifies the secondary DNS server IP address for the HTTP Device.
URI	Will obtain URI from the DHCP server if not specified
TLS Authentication Configuration	Specifies the option for TLS authentication configuration.

Table 65. TLS Authentication Configuration screen details

Option	Description
TLS Authentication Mode	View or modify the device's boot TLS Authentication Mode. This option is set to One Way by default. None means the HTTP server and the client will not authenticate each other for this boot.
Root Certificate Configuration	Import, delete, or export the root certificate.

Table 66. UEFI iSCSI Settings screen details

Option	Description
iSCSI Initiator Name	Specifies the name of the iSCSI initiator in IQN format.
iSCSI Device1	Enables or disables the iSCSI device. When disabled, a UEFI boot option is created for the iSCSI device automatically. This is set to Disabled by default.
iSCSI Device1 Settings	Enables you to control the configuration of the iSCSI device.

Table 67. iSCSI Device1 Settings screen details

Option	Description
Connection 1	Enables or disables the iSCSI connection. This option is set to Disabled by default.
Connection 2	Enables or disables the iSCSI connection. This option is set to Disabled by default.
Connection 1 Settings	Enables you to control the configuration for the iSCSI connection.
Connection 2 Settings	Enables you to control the configuration for the iSCSI connection.
Connection Order	Enables you to control the order for which the iSCSI connections will be attempted.

Table 68. NVMe-oF SubSystem Settings screen details

Option	Description
NVMe-oF SubSystem n (n = 1 to 4)	Enables or disables NVMe-oF SubSystem. This option is set to Disabled by default.
NVMe-oF SubSystem n Settings (n = 1 to 4)	Enables you to control the configuration of the NVMe-oF SubSystem, if Enabled .

Table 69. NVMe-oF SubSystem n Settings

Option	Description
Interface	NIC interface used for NVMe-oF connections. This option is set to Embedded NIC 1 Port 1 Partition 1 by default.

Table 69. NVMe-oF SubSystem n Settings (continued)

Option	Description
Transport Type	This field sets the value of transport type for NVMe-oF connection. This option is set to TCP by default.
Protocol	This field sets the value of protocol type for NVMe-oF connection. This option is set to IPv4 by default.
VLAN	Enables or disables VLAN for this NVMe-oF connections. This option is set to Disabled by default.
VLAN Id	Specifies the VLAN Id for this NVMe-oF connection. This option is set to 1 by default.
VLAN Priority	Specifies the VLAN priority for this NVMe-oF connection. This option is set to 0 by default.
Retry Count	Specifies the retry count for this NVMe-oF connection. This option is set to 3 by default.
Timeout	Specifies the time out for this NVMe-oF connection. This option is set to 10000 by default.
DHCP	Enables and disables the DHCP for this NVMe-oF connection. This option is set to Disabled by default.
Host IP Address	Specifies the Host IP Address for this NVMe-oF connection.
Host Subnet Mask	Specifies the Host Subnet Mask for this NVMe-oF connection.
Host Gateway	Specifies the Host Gateway for this NVMe-oF connection.
NVMe-oF Subsystem info via DHCP	Enables and disables the NVMe-oF Subsystem's DHCP for this connection. This option is set to Disabled by default.
NVMe-oF Subsystem NQN	Specifies the NVMe-oF Subsystem's NQN for this connection.
NVMe-oF Subsystem Address	Specifies the NVMe-oF Subsystem's IP address for this connection.
NVMe-oF Subsystem Port	Specifies the NVMe-oF Subsystem's port for this connection. This option is set to 4420 by default.
NVMe-oF Subsystem NID	Specifies the NamespaceID (NID) for this NVMe-oF connection.
NVMe-oF Subsystem Controller ID	Specifies the NVMe-oF Subsystem's Controller ID for this connection. This option is set to 0 by default.
Security	Enables or disables the security option for this NVMe-oF connection. This option is set to Disabled by default.
Authentication Type	Specifies the authentication type for this NVMe-oF connection. This option is set to None by default.
SecuritykeyPath	Specifies the SecuritykeyPath for this NVMe-oF connection.

Integrated Devices

To view the **Integrated Devices** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Integrated Devices**.

Table 70. Integrated Devices details

Option	Description
User Accessible USB Ports	Configures the user accessible USB ports. Selecting Only Back Ports On disables the front USB ports; selecting All Ports Off disables all front and back USB ports. ; selecting All Ports Off (Dynamic) disables all front and back USB ports during POST. And front ports can be enabled or disabled

Table 70. Integrated Devices details (continued)

Option	Description
	<p>dynamically by authorized users without resetting the system. This option is set to All Ports On by default.</p> <p>NOTE: Front Accessed configuration does not have the All Ports Off (Dynamic) function.</p> <p>The USB keyboard and mouse still function in certain USB ports during the boot process, depending on the selection. After the boot process is complete, the USB ports will be enabled or disabled as per the setting.</p>
iDRAC Direct USB Port	The iDRAC Direct USB port is managed by iDRAC exclusively with no host visibility. This option is set to ON or OFF . When set to OFF , iDRAC does not detect any USB devices installed in this managed port. This option is set to On by default.
Embedded NIC1, NIC2, NIC3 and NIC4	Enables or disables the Embedded NIC1, NIC2, NIC 3, and NIC 4. If set to Disabled (OS) , the NIC may still be available for shared network access by the embedded management controller. This option is set to Enabled by default.
I/OAT DMA Engine	Enables or disables the I/O Acceleration Technology (I/OAT) option. I/OAT is a set of DMA features designed to accelerate network traffic and lower CPU utilization. Enable only if the hardware and software support the feature. This option is set to Disabled by default.
Embedded Video Controller	<p>Enables or disables the use of Embedded Video Controller as the primary display. When set to Enabled, the Embedded Video Controller will be the primary display even if add-in graphic cards are installed. When set to Disabled, an add-in graphics card is used as the primary display. BIOS will output displays to both the primary add-in video and the embedded video during POST and preboot environment. The embedded video will then be disabled right before the operating system boots. This option is set to Enabled by default.</p> <p>NOTE: When there are multiple add-in graphic cards installed in the system, the first card discovered during PCI enumeration is selected as the primary video. You might have to rearrange the cards in the slots in order to control which card is the primary video.</p>
I/O Snoop HoldOff Response	Selects the number of cycles PCI I/O can withhold snoop requests, from the CPU, to allow time to complete its own write to LLC. This setting can help improve performance on workloads where throughput and latency are critical. The option available is 2K Cycles by default.
Current State of Embedded Video Controller	Displays the current state of the embedded video controller. The Current State of Embedded Video Controller option is a read-only field. If the Embedded Video Controller is the only display capability in the system (that is, no add-in graphics card is installed), then the Embedded Video Controller is automatically used as the primary display even if the Embedded Video Controller setting is set to Disabled .
SR-IOV Global Enable	Enables or disables the BIOS configuration of Single Root I/O Virtualization (SR-IOV) devices. This option is set to Disabled by default.
OS Watchdog Timer	If your system stops responding, this watchdog timer aids in the recovery of your operating system. When this option is set to Enabled , the operating system initializes the timer. When this option is set to Disabled (the default), the timer does not have any effect on the system.
Empty Slot Unhide	Enables or disables the root ports of all the empty slots that are accessible to the BIOS and operating system. This option is set to Disabled by default.
IIO PCIe Data Link Feature Exchange	This option allows globally disabling PCIe Data Link Feature Exchange. This may be needed to support certain legacy hardware. This option is set to Enabled by default.

Table 70. Integrated Devices details (continued)

Option	Description
Slot Disablement	Controls the of PCIe cards installed in the specified slot. Only the slots that are present on the system will be available for control.
Slot Bifurcation	<p>Auto Discovery Bifurcation Settings allows Platform Default Bifurcation, Auto Discovery of Bifurcation, and Manual bifurcation Control.</p> <p>This option is set to Platform Default Bifurcation by default. The slot bifurcation field is accessible when set to Manual Bifurcation Control and is grayed out when set to Platform Default Bifurcation.</p> <p>NOTE: The slot bifurcation supports on PCIe slot only, does not support slot type from Paddle card to Riser and Slimline connector to Riser.</p>

Serial Communication

To view the **Serial Communication** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Serial Communication**.

NOTE: The Serial Communication option uses the Micro USB Type B port connection on the XR5610 system.

Table 71. Serial Communication details

Option	Description
Serial Communication	<p>Enables the serial communication options. Selects serial communication devices (Serial Device 1 and Serial Device 2) in BIOS. BIOS console redirection can also be enabled, and the port address can be specified.</p> <p>The options available for System are On without Console Redirection, On with Console Redirection via COM1, On with Console Redirection via COM2, Off, Auto. This option is set to Auto by default.</p>
Serial Port Address	<p>Enables you to set the port address for serial devices. This option is set to either Serial Device1=COM2, Serial Device2=COM1 by default.</p> <p>NOTE: You can use only Serial Device 2 for the Serial Over LAN (SOL) feature. To use console redirection by SOL, configure the same port address for console redirection and the serial device.</p> <p>NOTE: Every time the system boots, the BIOS syncs the serial MUX setting that is saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert the serial MUX setting to the default setting of Serial Device 1.</p>
External Serial Connector	<p>Enables you to associate the External Serial Connector to Serial Device 1, Serial Device 2, or the Remote Access Device by using this option. This option is set to Serial Device 1 by default.</p> <p>NOTE: Only Serial Device 2 can be used for Serial Over LAN (SOL). To use console redirection by SOL, configure the same port address for console redirection and the serial device.</p> <p>NOTE: Every time the system boots, the BIOS syncs the serial MUX setting saved in iDRAC. The serial MUX setting can independently be changed in iDRAC. Loading the BIOS default settings from within the BIOS setup utility may not always revert this setting to the default setting of Serial Device 1.</p>
Failsafe Baud Rate	<p>Specifies the failsafe baud rate for console redirection. The BIOS attempts to determine the baud rate automatically. This failsafe baud rate is used only if the attempt fails, and the value must not be changed. This option is set to 115200 by default.</p>

Table 71. Serial Communication details (continued)

Option	Description
Remote Terminal Type	Sets the remote console terminal type. This option is set to VT100/VT220 by default.
Redirection After Boot	Enables or disables the BIOS console redirection when the operating system is loaded. This option is set to Enabled by default.

System Profile Settings

To view the **System Profile Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Profile Settings**.

Table 72. System Profile Settings details


Option	Description
System Profile	Sets the system profile. If you set the System Profile option to a mode other than Performance Per Watt (DAPC) , the BIOS automatically sets the rest of the options. You can only change the rest of the options if the mode is set to Custom . This option is set to Performance Per Watt (DAPC) by default. Other options include Performance , Performance Per Watt (OS) , Workstation Performance and Custom .  NOTE: All the parameters on the system profile setting screen are available only when the System Profile option is set to Custom .
Optimized Power Mode	When set to Enabled , processor is tuned for lower power consumption. Also sets C1E to Enabled, sets CPU Power Management of System DBPM mode, sets Energy Efficient Policy to Performance, sets Uncore Frequency to Dynamic, and sets Dynamic Load Line Switch to Enabled.
CPU Power Management	Sets the CPU power management. This option is set to System DBPM (DAPC) by default. Other option includes Maximum Performance, OS DBPM .
Memory Frequency	Sets the speed of the system memory. This option is set to Maximum Performance by default.
Turbo Boost	Enables or disables the processor to operate in the turbo boost mode. This option is set to Enabled by default.
Energy Efficient Turbo	Energy Efficient Turbo (EET) is a mode of operation where a processor's core frequency is adjusted within the turbo range based on workload. This option is set to Enabled by default.
C1E	Enables or disables the processor to switch to a minimum performance state when it is idle. This option is set to Enabled by default.
C-States	Enables or disables the processor to operate in all available power states. C States allow the processor to enter lower power states when idle. When set to Enabled (OS controlled) or when set to Autonomous (if hardware controlled is supported), the processor can operate in all available Power States to save power, but may increase memory latency and frequency jitter. This option is set to Enabled by default.
Memory Patrol Scrub	Sets the memory patrol scrub mode. This option is set to Standard by default.
Memory Refresh Rate	Sets the memory refresh rate, this option is set to 1x by default.
Uncore Frequency	Enables you to select the Uncore Frequency option. Dynamic mode enables the processor to optimize power resources across cores and uncores during runtime. The optimization of the uncore frequency to either save power or optimize performance is influenced by the setting of the Energy Efficiency Policy option.
Dynamic Load Line Switch	Dynamic Load Line (DLL) is a Power Management feature, which dynamically switches to the performance mode during periods of high CPU utilization. This setting is read-only and set to Enabled when Optimized Power Mode is Enabled.
Energy Efficient Policy	Enables you to select the Energy Efficient Policy option. The CPU uses the setting to manipulate the internal behavior of the processor and determines whether to target higher

Table 72. System Profile Settings details (continued)

Option	Description
	performance or better power savings. This option is set to Balanced Performance by default.
Monitor/Mwait	<p>Enables the Monitor/Mwait instructions in the processor. This option is set to Enabled for all system profiles, except Custom by default.</p> <p>NOTE: This option can be disabled only if the C States option in the Custom mode is set to disabled.</p> <p>NOTE: When C States is set to Enabled in the Custom mode, changing the Monitor/Mwait setting does not impact the system power or performance.</p>
Workload Profile	<p>This option allows the user to specify the targeted workload of a server. It allows optimization of performance based on the workload type. This option is set to Not Configured by default. Below is the list of available profiles:</p> <ul style="list-style-type: none"> • Not Configured • HPC Profile • Low Latency Optimized Profile • Virtualization Optimized Performance Profile • Virtualization Optimized Performance Per Watt Profile • DataBase Optimized Performance Profile • Database Optimized Performance Per Watt Profile • SDS Optimized Performance Profile • SDS Optimized Performance Per Watt Profile • Telco Optimized Profile • NFVIFP Optimized Turbo Profile • NFVIFP Energy-Balance Turbo Profile
CPU Interconnect Bus Link Power Management	Enables or disables the CPU Interconnect Bus Link Power Management. This option is set to Enabled by default.
PCI ASPM L1 Link Power Management	Enables or disables the PCI ASPM L1 Link Power Management . This option is set to Enabled by default.
Workload Configuration	This option controls Energy Performance Bias settings to allow BIOS to choose a configuration that improve performance on certain workload. Read-only unless System Profile is set to Custom .
OS ACPI Cx	Enables you to set the OS SCPI Cx to C2 or C3 state.

System Security

To view the **System Security** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > System Security**.

Table 73. System Security details

Option	Description
CPU AES-NI	Improves the speed of applications by performing encryption and decryption by using the Advanced Encryption Standard Instruction Set (AES-NI). This option is set to Enabled by default.
Strong Password Status	If enabled, you must set up a password that has at least one character in lowercase, uppercase, digit, and a special character. Also you have the option to set the minimum number of characters in both new passwords. If disabled, you can set a password that has any character in it but the password must not have more than 32 characters. Changes made by enabling or disabling this feature become immediately effective.
Strong Password Status Minimum Length (8-32)	Controls the minimum number of characters used when setting a system or setup password. You can specify 8-32 characters.

Table 73. System Security details (continued)

Option	Description
System Password	Sets the system password. This option is read-only if the password jumper is not installed in the system.
Setup Password	Sets the setup password. This option is read-only if the password jumper is not installed in the system.
Password Status	Locks the system password. This option is set to Unlocked by default.
TPM Information	Indicates the type of Trusted Platform Module, if present.

Table 74. TPM 2.0 security information


Option	Description
TPM Information	
TPM Security	<p> NOTE: The TPM menu is available only when the TPM module is installed.</p> <p>Enables you to control the reporting mode of the TPM. When set to Off, the presence of the TPM is not reported to the OS. When set to On, the presence of the TPM is reported to the OS. The TPM Security option is set to Off by default.</p>
	When TPM 2.0 is installed, the TPM Security option is set to On or Off . This option is set to Off by default.
TPM Information	Indicates the type of Trusted Platform Module, if present.
TPM Firmware	Indicates the firmware version of the TPM.
TPM Hierarchy	Enables, disables, or clears the storage and endorsement hierarchies. When set to Enabled , the storage and endorsement hierarchies can be used.
	When set to Disabled , the storage and endorsement hierarchies cannot be used.
	When set to Clear , the storage and endorsement hierarchies are cleared of any values, and then reset to Enabled .
TPM Advanced Settings	Specifies TPM Advanced Settings details.

Table 75. System Security details

Option	Description
Intel(R) TXT	Enables you to set the Intel Trusted Execution Technology (TXT) option. To enable the Intel TXT option, virtualization technology and TPM Security must be enabled with Pre-boot measurements. This option is set to Off by default. It is set On for Secure Launch (Firmware Protection) support on Windows 2022.
Memory Encryption	Enables or disables the Intel Total Memory Encryption (TME) and Multi-Tenant (Intel® TME-MT). When option is set to Disabled , BIOS disables both TME and TME-MT technology. When option is set to Single Key BIOS enables the TME technology. When option is set to Multiple Keys , BIOS enables the TME-MT technology. This option is set to Disabled by default.
Intel(R) SGX	Enables you to set the Intel Software Guard Extension (SGX) option. To enable the Intel SGX option, processor must be SGX capable, memory population must be compatible (minimum x8 identical DIMM1 to DIMM8 per CPU socket, not support on persistent memory configuration), memory operating mode must be set at optimizer mode, memory encryption must be enabled and node interleaving must be disabled. This option is set to Off by default. When this option is to Off , BIOS disables the SGX technology. When this option is to On , BIOS enables the SGX technology.
Power Button	Enables or disables the power button on the front of the system. This option is set to Enabled by default.

Table 75. System Security details (continued)

Option	Description			
AC Power Recovery	<p>Sets how the system behaves after AC power is restored to the system. This option is set to Last by default.</p> <p>NOTE: The host system will not power on up until iDRAC completes cryptographic verification of BIOS to ensure platform security. Host power on will be delayed by a few minutes after AC power is applied.</p>			
AC Power Recovery Delay	<p>Sets the time delay for the system to power up after AC power is restored to the system. This option is set to Immediate by default. When this option is set to Immediate, there is no delay for power up. When this option is set to Random, the system creates a random delay for power up. When this option is set to User Defined, the system delay time is manually to power up.</p>			
User Defined Delay (120 s to 600 s)	<p>Sets the User Defined Delay option when the User Defined option for AC Power Recovery Delay is selected. The actual AC recovery time needs to add iDRAC root of trust time (around 50 seconds).</p>			
UEFI Variable Access	<p>Provides varying degrees of securing UEFI variables. When set to Standard (the default), UEFI variables are accessible in the operating system per the UEFI specification. When set to Controlled, selected UEFI variables are protected in the environment and new UEFI boot entries are forced to be at the end of the current boot order.</p>			
In-Band Manageability Interface	<p>When set to Disabled, this setting hides the Management Engine's (ME), HECI devices, and the system's IPMI devices from the operating system. This prevents the operating system from changing the ME power capping settings, and blocks access to all in-band management tools. All management should be managed through out-of-band. This option is set to Enabled by default.</p> <p>NOTE: BIOS update requires HECI devices to be operational and DUP updates require IPMI interface to be operational. This setting needs to be set to Enabled to avoid updating errors.</p>			
SMM Security Mitigation	<p>Enables or disables the UEFI SMM security mitigation protections. It is set to Disabled by default.</p>			
Secure Boot	<p>Enables Secure Boot, where the BIOS authenticates each pre-boot image by using the certificates in the Secure Boot Policy. Secure Boot is set to Disabled by default.</p>			
Secure Boot Policy	<p>When Secure Boot policy is set to Standard, the BIOS uses the system manufacturer's key and certificates to authenticate pre-boot images. When Secure Boot policy is set to Custom, the BIOS uses the user-defined key and certificates. Secure Boot policy is set to Standard by default.</p>			
Secure Boot Mode	<p>Configures how the BIOS uses the Secure Boot Policy Objects (PK, KEK, db, dbx).</p>			
	<p>If the current mode is set to Deployed Mode, the available options are User Mode and Deployed Mode. If the current mode is set to User Mode, the available options are User Mode, Audit Mode, and Deployed Mode</p>			
	<p>Below are the details of different boot modes available in the Secure Boot Mode option.</p> <table> <tr> <td>User Mode</td><td>In User Mode, PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.</td></tr> <tr> <td>Audit mode</td><td>In Audit Mode, PK is not present. BIOS does not authenticate programmatic update to the policy objects and transitions between modes. The BIOS performs a signature verification on pre-boot images and logs the results in the image Execution Information Table, but executes the images whether they pass or fail verification. Audit Mode is useful for programmatic determination of a working set of policy objects.</td></tr> </table>	User Mode	In User Mode , PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.	Audit mode
User Mode	In User Mode , PK must be installed, and BIOS performs signature verification on programmatic attempts to update policy objects. The BIOS allows unauthenticated programmatic transitions between modes.			
Audit mode	In Audit Mode , PK is not present. BIOS does not authenticate programmatic update to the policy objects and transitions between modes. The BIOS performs a signature verification on pre-boot images and logs the results in the image Execution Information Table, but executes the images whether they pass or fail verification. Audit Mode is useful for programmatic determination of a working set of policy objects.			




Table 75. System Security details (continued)

Option	Description
	Deployed Mode Deployed Mode is the most secure mode. In Deployed Mode , PK must be installed and the BIOS performs signature verification on programmatic attempts to update policy objects. Deployed Mode restricts the programmatic mode transitions.
Secure Boot Policy Summary	Specifies the list of certificates and hashes that secure boot uses to authenticate images.
Secure Boot Custom Policy Settings	Configures the Secure Boot Custom Policy. To enable this option, set the Secure Boot Policy to Custom option.

Redundant OS Control

To view the **Redundant OS Control** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Redundant OS Control**.

Table 76. Redundant OS Control details

Option	Description
Redundant OS Location	Enables you to select a backup disk from the following devices: <ul style="list-style-type: none"> None SATA Ports in AHCI mode BOSS PCIe Cards (Internal M.2 Drives)
Redundant OS State	<p> NOTE: This option is disabled if Redundant OS Location is set to None.</p> <p>When set to Visible, the backup disk is visible to the boot list and OS. When set to Hidden, the backup disk is disabled and is not visible to the boot list and OS. This option is set to Visible by default.</p> <p> NOTE: BIOS disables the device in hardware, so it is not accessed by the OS.</p>
Redundant OS Boot	<p> NOTE: This option is disabled if Redundant OS Location is set to None or if Redundant OS State is set to Hidden.</p> <p>When set to Enabled, BIOS boots to the device specified in Redundant OS Location. When set to Disabled, BIOS preserves the current boot list settings. This option is set to Disabled by default.</p>


Miscellaneous Settings

To view the **Miscellaneous Settings** screen, power on the system, press F2, and click **System Setup Main Menu > System BIOS > Miscellaneous Settings**.

Table 77. Miscellaneous Settings details

Option	Description
System Time	Enables you to set the time on the system.
System Date	Enables you to set the date on the system.
Time Zone	Time's offset from UTC.
Daylight Savings Time	Enables or disables Daylight Savings Time.
Asset Tag	Specifies the asset tag and enables you to modify it for security and tracking purposes.
Keyboard NumLock	Enables you to set whether the system boots with the NumLock enabled or disabled. This option is set to On by default.

Table 77. Miscellaneous Settings details (continued)

Option	Description
	 NOTE: This option does not apply to 84-key keyboards.
F1/F2 Prompt on Error	Enables or disables the F1/F2 prompt on error. This option is set to Enabled by default. The F1/F2 prompt also includes keyboard errors.
Load Legacy Video Option ROM	Enables you to let the system BIOS determine whether it will load legacy video (INT 10h) option ROM from the video controller, in UEFI Boot Mode. This option is set to disabled by default
Dell Wyse P25/P45 BIOS Access	Enables or disables the Dell Wyse P25/P45 BIOS Access. This option is set to Enabled by default.
Power Cycle Request	Enables or disables the Power Cycle Request. This option is set to None by default.

iDRAC Settings

The iDRAC settings is an interface to set up and configure the iDRAC parameters by using UEFI. You can enable or disable various iDRAC parameters by using the iDRAC settings.

 **NOTE:** Accessing some of the features on the iDRAC settings needs the iDRAC Enterprise License upgrade.

For more information about using iDRAC, see *Dell Integrated Dell Remote Access Controller User's Guide* at <https://www.dell.com/idracmanuals>.

Device Settings

Device Settings enables you to configure device parameters such as storage controllers or network cards.