Dell EMC VxRail Appliances on PowerEdge Servers

P Series, V Series, and S Series Owner's Manual

DELL EMC

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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Overview

The VxRail appliances are hyper-converged appliances that support the following configurations:

Table 1. VxRail appliances supported configurations

Supported configurations	VxRail V Series	VxRail P Series	VxRail S Series
Processor	Two Intel Xeon Processor Scalable Family processors	Up to two Intel Xeon Processor Scalable Family processors	Up to two Intel Xeon Processor Scalable Family processors
DIMM	24 DIMM slots supporting up to 1536 GB of memory	24 DIMM slots supporting up to 1536 GB of memory	24 DIMM slots supporting up to 1536 GB of memory
Power supply units	Two AC or DC redundant power supply units	Two AC or DC redundant power supply units	Two AC or DC redundant power supply units
Drives	24 hard drives or solid state drives (SSDs)	24 hard drives or solid state drives (SSDs)	12 front accessible hard drives or solid state drives (SSDs), and two rear accessible SSDs

NOTE: The appliances supports only internal, hot-swappable hard drives.

NOTE: In this document, HDD generically refers to both HDD and SSD.

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

Topics:

- Supported configurations
- Front view of the appliances
- Back view of the appliance
- Hard drive indicator codes
- Locating the serial number of your appliance

Supported configurations

The VxRail P Series, V Series, and S Series appliances support the following configurations:

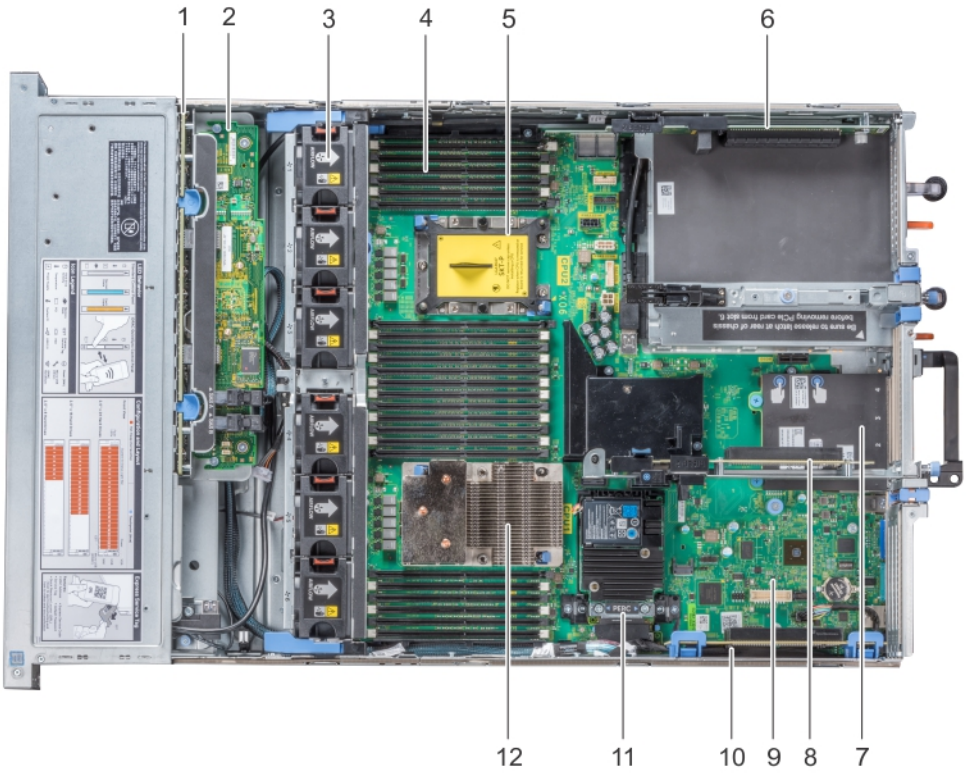

Figure 1. Supported configuration of VxRail P Series and V Series

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

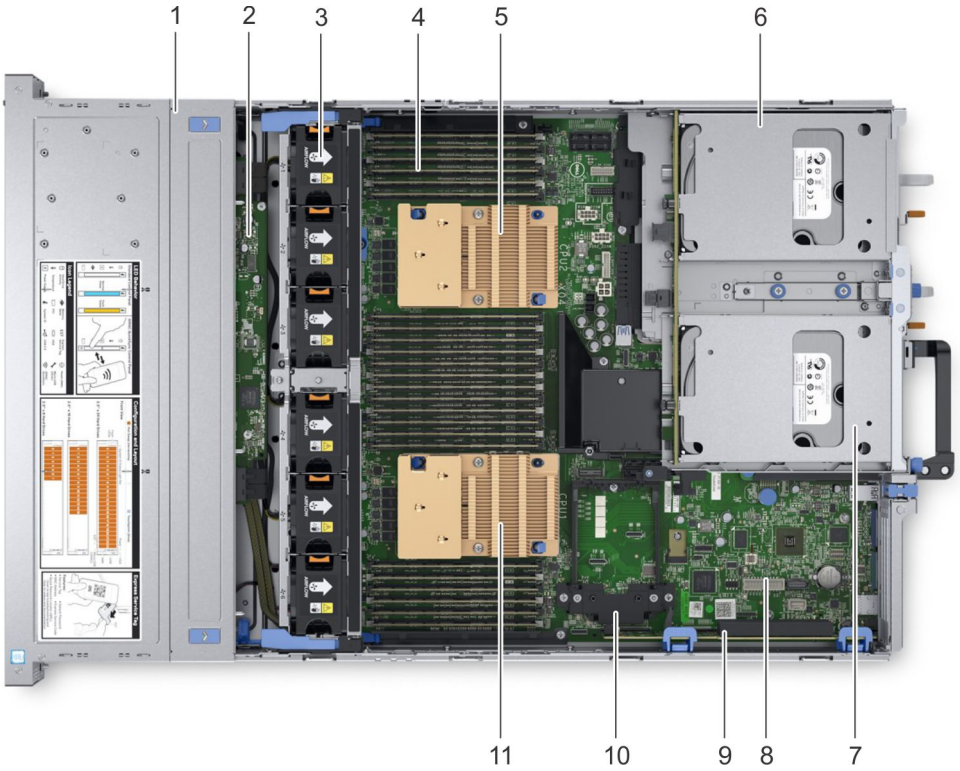

Figure 2. Supported configuration of VxRail S Series

1. drive backplane
2. backplane expander card
3. cooling fan in the cooling fan assembly (6)
4. memory module
5. CPU2 processor and heat sink module socket
6. rear drive cage 1
7. rear drive cage 2
8. system board
9. expansion card riser 1
10. integrated storage controller card
11. CPU1 processor and heat sink module

Front view of the appliances

The front view displays the features available on the front of the appliance. You can access components such as the power button, left control panel, and right control panel from the front of the system. The diagnostic LEDs are prominently located on the front panel. The hot-swappable hard drives are accessible from the front panel.

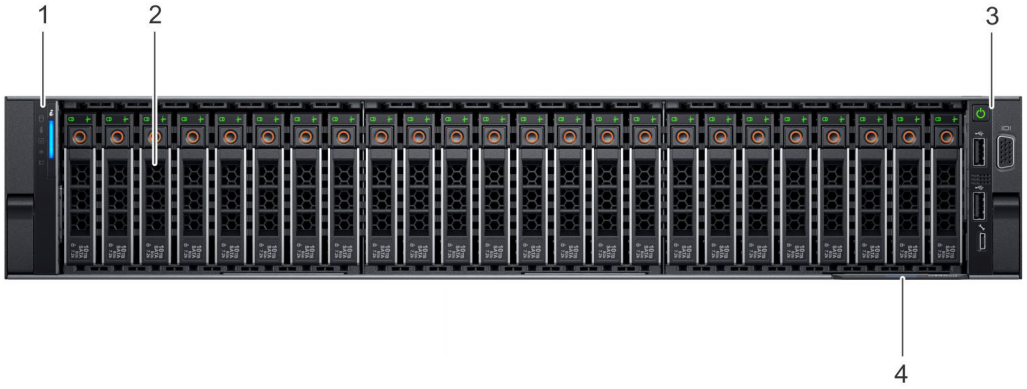

Figure 3. Front view of VxRail P Series, and V Series – 24 x 2.5 inch drive appliance

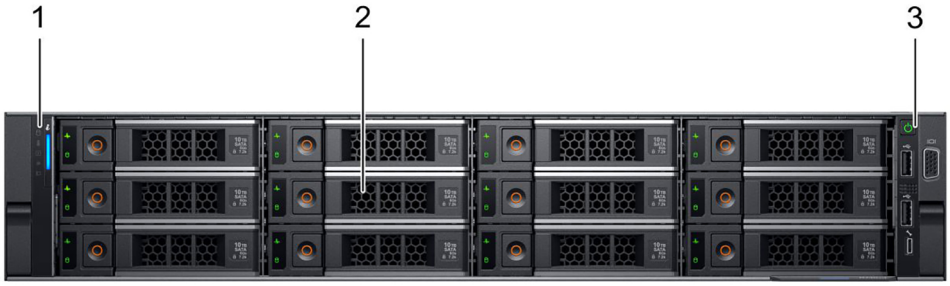

Figure 4. Front view of VxRail S Series –12 x 3.5 inch drive appliance

Table 2. Features available on the front of the appliance

Item	Panels and slots	Icon	Description
1	Left control panel	N/A	Contains appliance health and appliance ID, status LED.
2	Hard drives	N/A	Enable you to install drives that are supported on your appliance. For more information about drives, see Technical specifications.
3	Right control panel	N/A	Contains the power button, VGA port, iDRAC Direct micro-USB port and two USB 2.0 ports.
4	Information tag	N/A	The Information Tag is a slide-out label panel that contains appliance information such as Service Tag, Product Serial Number Tag (PSNT), NIC, MAC address, and so on.

Left control panel view

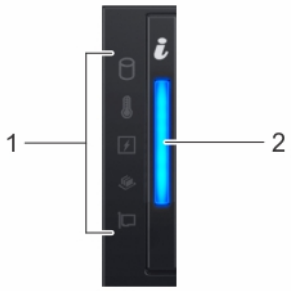

Figure 5. Left control panel view

Table 3. Left control panel features

Item	Indicator	Icon	Description
1	Status LED indicators	N/A	Indicate the status of the appliance. For more information, see Status LED indicators.
2	Appliance health and appliance ID indicator	*i*	Indicates the appliance health. For more information, see Appliance health and appliance ID indicator codes.

Status LED indicators

NOTE: The status LED indicators are always off and only turns on to a solid amber if any error occurs.

Table 4. Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
	Hard drive indicator	The indicator turns solid amber if there is a hard drive error.	Check the System Event Log to determine if the drive has an error. If the problem persists, see Getting help.
	Temperature indicator	The indicator turns solid amber if the appliance experiences a thermal error (for example, the ambient temperature is out of range or there is a fan failure).	Ensure that none of the following conditions exist: • A cooling fan has been removed or has failed. • Appliance cover, air shroud, memory module blank, or back filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed. If the problem persists, see Getting help.
	Electrical indicator	The indicator turns solid amber if the appliance experiences an electrical error (for example, voltage out of range, or a failed power supply unit (PSU) or voltage regulator).	Check the System Event Log or appliance messages for the specific issue. If it is due to a problem with the PSU, check the LED on the PSU. Reseat the PSU. If the problem persists, see Getting help.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	See the Getting help section.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	See the Getting help section. **NOTE: For more information about the supported PCIe cards, see Expansion card installation guidelines.**

Appliance health and appliance ID indicator codes

The appliance health and appliance ID indicator is located on the left control panel of your appliance.

Figure 6. Appliance health and appliance ID indicators

Table 5. Appliance health and appliance ID indicator codes

Appliance health and appliance ID indicator code	Condition
Solid blue	Indicates that the appliance is turned on, appliance is healthy, and appliance ID mode is not active. Press the appliance health and appliance ID button to switch to appliance ID mode.
Blinking blue	Indicates that the appliance ID mode is active. Press the appliance health and appliance ID button to switch to appliance health mode.
Solid amber	Indicates that the appliance is in fail-safe mode. If the problem persists, see Getting help.
Blinking amber	Indicates that the appliance is experiencing a fault. If the problem persists, see Getting help.

Right control panel view

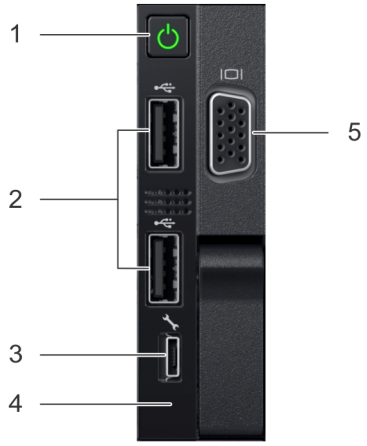

Figure 7. Right control panel view

Table 6. Right control panel features

Item	Indicator, button, or connector	Icon	Description
1	Power button		Indicates if the appliance is turned on or off. Press the power button to manually turn on or off the appliance. **NOTE: Press the power button to gracefully shut down an ACPI-compliant operating system.**
2	USB port (2)		The USB ports are 4-pin, 2.0-compliant. These ports enable you to connect USB devices to the appliance.
3	iDRAC Direct port		The iDRAC Direct port is micro USB 2.0-compliant. This port enables you to access the iDRAC Direct features. For more information, see the iDRAC User's Guide at **Dell.com/idracmanuals**.
4	iDRAC Direct LED	N/A	The iDRAC Direct LED indicator lights up to indicate that the iDRAC Direct port is connected. For more information, see iDRAC Direct LED indicator codes.
5	VGA port		Enables you to connect a display device to the appliance. For more information, see Technical specifications.

iDRAC Direct LED indicator codes

The iDRAC Direct LED indicator lights up to indicate that the port is connected and is being used as a part of the iDRAC subsystem.

iDRAC Direct LED indicator is located below the iDRAC Direct port on the right control panel.

You can configure iDRAC Direct by using a USB to micro USB (type AB) cable, which you can connect to your laptop or tablet. The following table describes iDRAC Direct activity when the iDRAC Direct port is active:

Table 7. iDRAC Direct LED indicator codes

iDRAC Direct LED indicator code	Condition
Solid green for two seconds	Indicates that the laptop or tablet is connected.
Flashing green (on for two seconds and off for two seconds)	Indicates that the laptop or tablet connected is recognized.
Turns off	Indicates that the laptop or tablet is unplugged.

Back view of the appliance

The back view displays the features available on the back of the appliance.

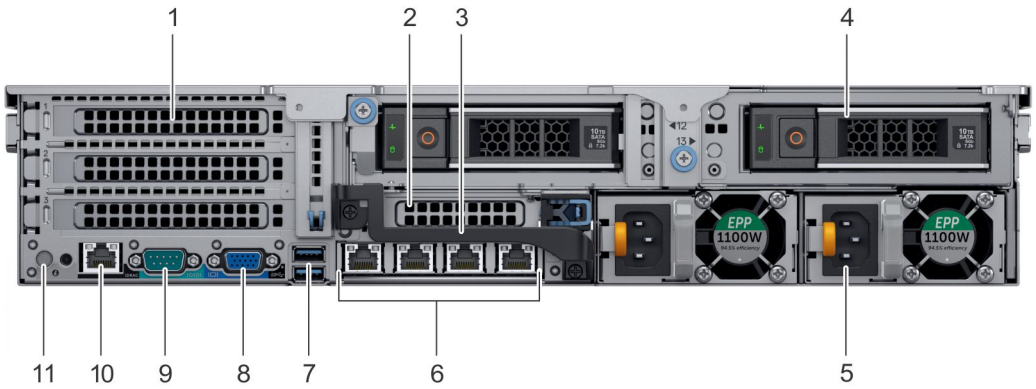

Figure 8. Back view of VxRail S Series 2 – x 3.5 inch drive appliance

Table 8. Features available on the back view

Item	Panels, ports and slots	Icon	Description
1	Full-height PCIe expansion card slot (3)	N/A	The PCIe expansion card slot (riser 1) connects up to three full-height PCIe expansion cards to the appliance. For more information, see Expansion card installation guidelines.
2	Half-height PCIe expansion card slot	N/A	The PCIe expansion card slot (riser 2) connects one half-height PCIe expansion cards to the appliance. For more information, see Expansion card installation guidelines.
3	Rear handle	N/A	The rear handle can be removed to enable any external cabling of PCIe cards that are installed in the PCIe expansion card slot 6.
4	Drives	N/A	Enable you to install drives that are supported on your appliance. For more information about drives, see Technical specifications.
5	Power supply unit (2)	N/A	For more information, see Technical specifications.
6	NIC ports		The NIC ports that are integrated on the network daughter card (NDC) provide network connectivity. For more information about the supported configurations, see Technical specifications.
7	USB port (2)		The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the appliance.
8	VGA port		Enables you to connect a display device to the appliance. For more information, see Technical specifications.
9	Serial port		Enables you to connect a serial device to the appliance. For more information, see Technical specifications.
10	iDRAC9 dedicated port	iDRAC	Enables you to remotely access iDRAC. For more information, see the iDRAC User's Guide at **Dell.com/idracmanuals**.
11	Appliance identification button		The Appliance Identification (ID) button is available on the front and back of the appliances. Press the button to identify an appliance in a rack by turning on the appliance ID button. You can also use the appliance ID button to reset iDRAC and to access BIOS using the step through mode.

NIC indicator codes

Each NIC on the back panel has indicators that provide information about the activity and link status. The activity LED indicator indicates if data is flowing through the NIC, and the link LED indicator indicates the speed of the connected network.

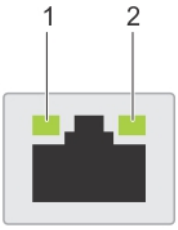

Figure 9. NIC indicator codes

1. link LED indicator
2. activity LED indicator

Table 9. NIC indicator codes

Status	Condition
Link and activity indicators are off	The NIC is not connected to the network.
Link indicator is green and activity indicator is blinking green	The NIC is connected to a valid network at its maximum port speed and data is being sent or received.
Link indicator is amber and activity indicator is blinking green	The NIC is connected to a valid network at less than its maximum port speed and data is being sent or received.
Link indicator is green and activity indicator is off	The NIC is connected to a valid network at its maximum port speed and data is not being sent or received.
Link indicator is amber and activity indicator is off	The NIC is connected to a valid network at less than its maximum port speed and data is not being sent or received.
Link indicator is blinking green and activity is off	NIC identify is enabled through the NIC configuration utility.

Power supply unit indicator codes

AC power supply units (PSUs) have an illuminated translucent handle that serves as an indicator and DC PSUs have an LED that serves as an indicator. The indicator shows whether power is present or a power fault has occurred.

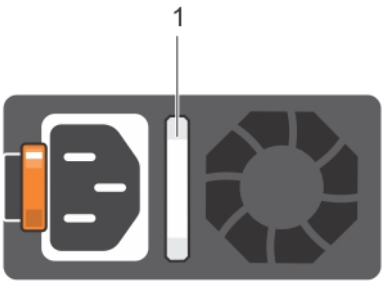

Figure 10. AC PSU status indicator

1. AC PSU status indicator/handle

Table 10. AC PSU status indicator codes

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected to the PSU.
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green.

Power indicator codes	Condition
	CAUTION: Do not disconnect the power cord or unplug the PSU when updating firmware. If firmware update is interrupted, the PSUs do not function.
Blinking green and turns off	When hot-plugging a PSU, the PSU handle blinks green five times at a rate of 4 Hz and turns off. This indicates a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to turn the appliance on.** **CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected appliance shutdown. To change from a high output configuration to a low output configuration or vice versa, you must turn off the appliance.** **CAUTION: AC PSUs support both 240 V and 120 V input voltages with the exception of Titanium PSUs, which support only 240 V. When two identical PSUs receive different input voltages, they can output different wattages, and trigger a mismatch.** **CAUTION: If two PSUs are used, they must be of the same type and have the same maximum output power.** **CAUTION: Combining AC and DC PSUs is not supported and triggers a mismatch.**

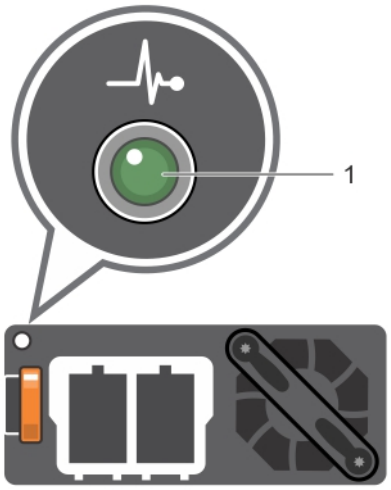

Figure 11. DC PSU status indicator

1. DC PSU status indicator

Table 11. DC PSU status indicator codes

Power indicator codes	Condition
Green	A valid power source is connected to the PSU and the PSU is operational.
Blinking amber	Indicates a problem with the PSU.
Not illuminated	Power is not connected to the PSU.
Blinking green	When hot-plugging a PSU, the PSU indicator blinks green. This indicates that there is a PSU mismatch with respect to efficiency, feature set, health status, or supported voltage. **CAUTION: If two PSUs are installed, both the PSUs must have the same type of label; for example, Extended Power Performance (EPP) label. Mixing PSUs from previous generations servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition or failure to turn the appliance on.**

Power indicator codes	Condition
	CAUTION: When correcting a PSU mismatch, replace only the PSU with the blinking indicator. Swapping the PSU to make a matched pair can result in an error condition and unexpected appliance shutdown. To change from a High Output configuration to a Low Output configuration or vice versa, you must turn off the appliance.
	CAUTION: If two PSUs are used, they must be of the same type and have the same maximum output power.
	CAUTION: Combining AC and DC PSUs is not supported and triggers a mismatch.

Hard drive indicator codes

Each hard drive carrier has an activity indicator and a status indicator. The indicators provide information about the current status of the hard drive. The activity LED indicates whether the hard drive is currently in use or not. The status LED indicates the power condition of the hard drive.

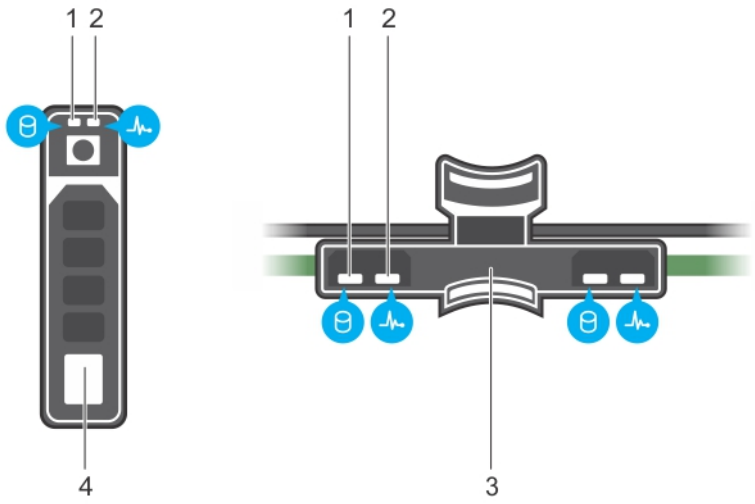

Figure 12. Hard drive indicators on the hard drive and the hard drive tray backplane

1. Hard drive activity indicator
2. Hard drive status indicator
3. Hard drive backplane on hard drive tray
4. Hard drive

Table 12. Hard drive indicator codes

Hard drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Hard drive ready for removal. **NOTE: The hard drive status indicator remains off until all drives are initialized after the appliance is turned on. Hard drives are not ready for removal during this time.**
Flashes green, amber, and then turns off	Predicted drive failure.
Flashes amber four times per second	Hard drive failed.
Solid green	Hard drive online.

Locating the serial number of your appliance

To get support for your appliance, use the VxRail Appliance serial number, also called the Product Serial Number Tag (PSNT). The PSNT is a 14-digit number used to identify your appliance to Dell EMC support.

NOTE: Only use the VxRail Appliance serial number to contact Customer Support. Sometimes, you may need to supply the 7-digit Service Tag number.

There are two identification tags on your appliance:

- The VxRail appliance serial number—You can find the serial number in **VxRail Manager**, or printed on the information tag.
- The Service Tag — You can find the Service Tag printed on the physical appliance.

Looking up your appliance serial number in VxRail Manager

1. In **VxRail Manager**, on the left navigation bar, click **HEALTH**.
2. To display appliance information, click **Physical**.
3. Observe the VxRail Appliance serial number, listed under the appliance ID as the **PSNT**.

Locating your physical VxRail Service Tag number

Your hardware is identified by a unique Service Tag number. The Service Tag is found on the front of the appliance by pulling out the information tag.

Alternatively, the information may be on a sticker on the chassis of the appliance. This information is used by Dell EMC to route support calls to the appropriate personnel.

NOTE: Use the 7-digit Service Tag, only if instructed by Technical Support.

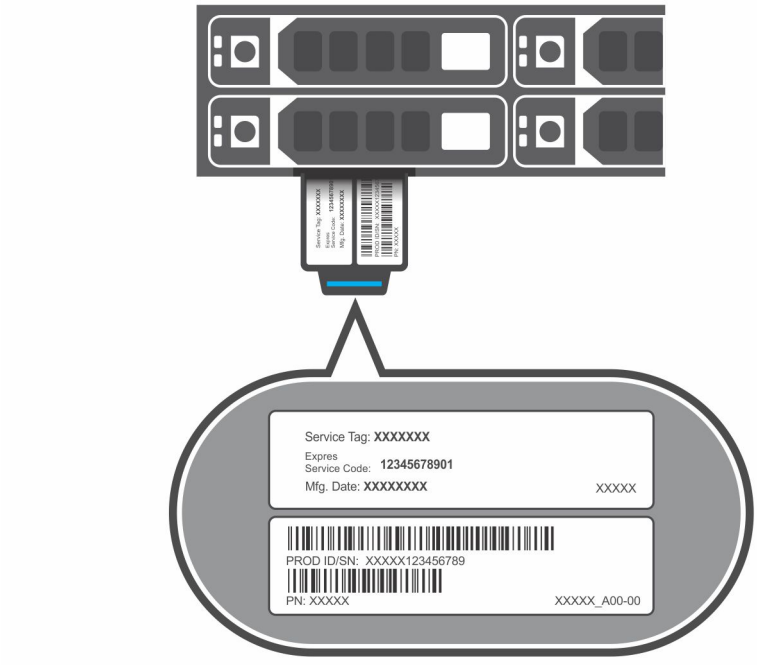

Figure 13. VxRail Service Tag

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Technical specifications

Chassis dimensions

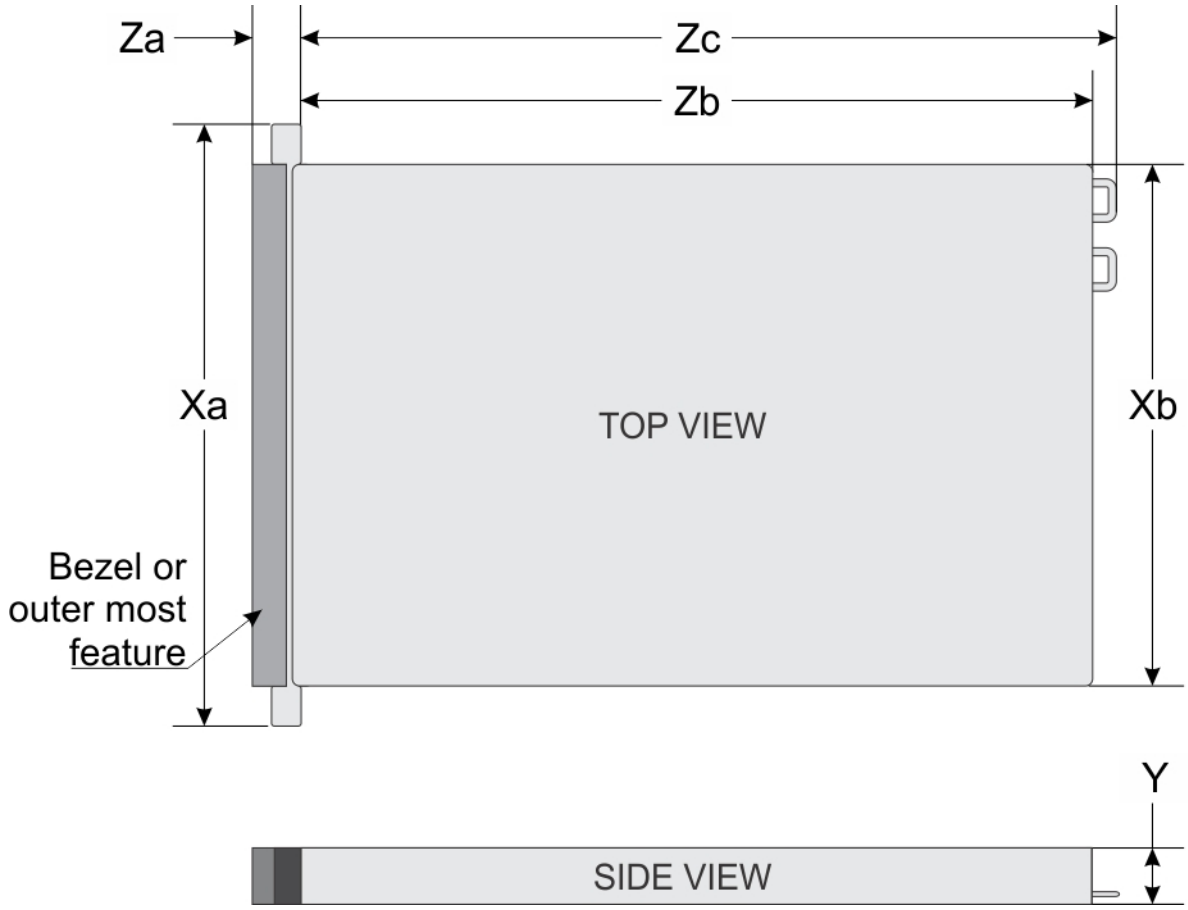

Figure 14. Chassis dimensions

Table 13. Dimension details

Appliance	Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb	Zc
P Series, V Series, and S Series	482.0 mm (18.98 inches)	434.0 mm (17.09 inches)	86.8 mm (3.42 inches)	35.84 mm (1.41 inches)	22.0 mm (0.87 inches)	678.8 mm (26.72 inches)	715.5 mm (28.17 inches)

Chassis weight

Table 14. Chassis weight

Appliance	Maximum weight (with all hard drives/SSDs)
VxRail P Series and V Series – 2.5 inch drive appliances	28.1 kg (61.95 lb)

Appliance	Maximum weight (with all hard drives/SSDs)
VxRail S Series – 3.5 inch drive appliances	33.1 kg (72.91 lb)

Processor specifications

Table 15. Processor specifications

Appliance	Maximum number of supported processors
VxRail V Series appliances	Two Intel Xeon Processor Scalable Family processors
VxRail P Series and S Series appliances	Up to two Intel Xeon Processor Scalable Family processors

PSU specifications

The VxRail P Series, V Series, and S Series appliances supports two AC or DC redundant power supply units (PSUs).

Table 16. PSU specifications

Supported VxRail configurations	PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	Current
VxRail P Series, V Series, and S Series appliances	1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging	12 A–6.5 A
	1100 W DC	N/A	4416 BTU/hr	N/A	–(48–60) V DC, autoranging	32 A
VxRail P Series and V Series appliances	1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	10 A
VxRail V Series appliance	2000 W AC	Platinum	7500 BTU/hr	50/60 Hz	100–240 V AC, autoranging	11.5 A

NOTE: Heat dissipation is calculated by using the PSU wattage rating.

NOTE: This appliance is also designed to connect to the IT power systems with a phase to phase voltage not exceeding 240 V.

NOTE: If an appliance with 2000 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 1000 W.

NOTE: If an appliance with 1600 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 800 W.

NOTE: If an appliance with 1100 W AC PSU operates at low line 100–120 V AC, then the power rating per PSU is derated to 1050 W.

Battery specifications

The VxRail P Series, V Series, and S Series appliances supports CR 2032 3.0-V lithium coin cell battery.

Expansion bus specifications

The VxRail P Series, V Series, and S Series appliances support PCI express (PCIe) generation 3 expansion cards, that can be installed on the system board by using expansion card risers. These appliances support three types of expansion card risers. The following table provides detailed information about the expansion card riser specifications:

Table 17. Expansion card riser specifications

Supported VxRail config	Riser config. and supported risers	Slot desc	PCIe slots on riser 1 (Height and length)	Proc conn	PCIe slots on riser 2 (Height and length)	Proc conn	PCIe slots on riser 3 (Height and length)	Proc conn
VxRail P Series and S Series appliances	Riser configuration 1 with or without rear storage (1B+2B)	Four x8 slots and rear storage	Slot 1: x8 full-height, full length	Processor 1				
			Slot 2: x8 full-height, full length	Processor 1	Slot 4: x8 low profile, half length	Processor 1	N/A	N/A
			Slot 3: x8 full-height, half length	Processor 1				
VxRail P Series and V Series appliances	Riser configuration 4 (1A+2A+3A)	Three x8 and four x16 slots	Slot 1: x16 full-height, full length	Processor 1	Slot 4: x16 full-height, full length	Processor 2	Slot 7: x8 full-height, full length	Processor 2
			N/A	N/A	Slot 5: x8 full-height, full length	Processor 2	Slot 8: x16 full-height, full length	Processor 2
			Slot 3: x16 full-height, half length	Processor 1	Slot 6: x8 low profile, half length	Processor 1		

Memory specifications

The VxRail P Series, V Series, and S Series appliances support up to twenty four 288-pins RDIMMs, and LRDIMMs with speeds of 2666 MT/s, 2400 MT/s and 2133 MT/s with support for memory optimized operation.

Table 18. Memory specifications

DIMM type	DIMM rank	DIMM capacity	Single processor		Dual processors	
			Minimum RAM	Maximum RAM	Minimum RAM	Maximum RAM
LRDIMM	Quad rank	64 GB	384 GB	768 GB	768 GB	1536 GB
RDIMM	Dual rank	16 GB	96 GB	192 GB	192 GB	384 GB
RDIMM	Dual rank	32 GB	192 GB	384 GB	384 GB	768 GB

Storage controller specifications

The VxRail P Series, V Series, and S Series appliances supports the following internal storage controller cards:

- HBA330
- Boot Optimized Server Storage (BOSS-S1)

Drives

The VxRail P Series, V Series, and S Series appliances supports NVMe, SAS, SATA, Nearline SAS drives, or SSDs.

Table 19. Supported drive options for the VxRail P Series, V Series, and S Series appliances

VxRail S Series appliance configuration	14 drives appliance	Up to 12 3.5 inch (Nearline SAS) front accessible drives in slots 0 to 11, and up to two 3.5 inch (SAS) rear accessible drives in slots 12 to 13.

VxRail P Series appliance configuration	24 drives appliance	Up to 24 2.5 inch (NVMe, SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 23. **NOTE: VxRail P Series appliance supports NVMe drives in cache tier, slots 20 to 23 only.**
VxRail V Series appliance configuration	24 drives appliance	Up to 24 2.5 inch (SAS, SATA or Nearline SAS) front accessible drives in slots 0 to 23.

Ports and connectors specifications

USB ports

The VxRail P Series, V Series, and S Series appliances supports:

- Two USB 2.0-compliant ports on the front of the appliance
- One internal USB 3.0-compliant port
- One micro USB 2.0-compliant port in the front of the appliance for iDRAC Direct
- Two USB 3.0-compliant ports on the back of the appliance

NIC ports

The VxRail P Series, V Series, and S Series appliances supports up to four Network Interface Controller (NIC) ports that are integrated on the network daughter card (NDC), and are available in the following configurations:

- Four RJ-45 ports that support 100 M, 1 G, and 10 Gbps
- Four SFP+ ports that support up to 10 Gbps

NOTE: You can install additional PCIe NIC cards. For more information on the PCIe NIC cards, see Expansion card installation guidelines.

VGA ports

The Video Graphic Array (VGA) port enables you to connect the appliance to a VGA display. The VxRail P Series, V Series, and S Series appliances supports two 15-pin VGA ports on the front and back panels.

Serial connector

The VxRail P Series, V Series, and S Series appliances supports one serial connector on the back panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

Internal Dual SD Module

The VxRail P Series, V Series, and S Series appliances support Internal Dual SD module (IDSDM). The IDSDM is located at the back of the appliance, in a Dell-proprietary slot. IDSDM card supports two micro SD cards. Micro SD cards capacity for IDSDM are 64 GB.

NOTE: The IDSDM on the VxRail appliances is pre-configured for appliance bare metal recovery. It is not recommended to change any of the settings.

Video specifications

The VxRail P Series, V Series, and S Series appliances supports integrated Matrox G200eW3 graphics controller with 16 MB of video frame buffer.

Table 20. Supported video resolution options

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

NOTE: 1920 x 1080 and 1920 x 1200 resolutions are only supported in reduced blanking mode.

Environmental specifications

Table 21. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Continuous operation (for altitude less than 950 m or 3117 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.
Maximum temperature gradient (operating and storage)	20°C/h (36°F/h)

Table 22. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be non-condensing at all times.
Operating	10% to 80% relative humidity with 29°C (84.2°F) maximum dew point.

Table 23. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all operation orientations).
Storage	1.88 G_{rms} at 10 Hz to 500 Hz for 15 min (all six sides tested).

Table 24. Maximum shock specifications

Maximum shock	Specifications
Operating	Six consecutively executed shock pulses in the positive and negative x, y, and z axes of 40 G for up to 2.3 ms.
Storage	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the appliance) of 71 G for up to 2 ms.

Table 25. Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)

Maximum altitude	Specifications
Storage	12,000 m (39,370 ft)

Table 26. Operating temperature de-rating specifications

Operating temperature de-rating	Specifications
Up to 35°C (95°F)	Maximum temperature is reduced by 1°C/300 m (1°F/547 ft) above 950 m (3,117 ft).
35°C to 40°C (95°F to 104°F)	Maximum temperature is reduced by 1°C/175 m (1°F/319 ft) above 950 m (3,117 ft).
40°C to 45°C (104°F to 113°F)	Maximum temperature is reduced by 1°C/125 m (1°F/228 ft) above 950 m (3,117 ft).

Standard operating temperature

The standard operating temperature for altitude less than 950 meters or 3117 feet ranges from 10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment.

Expanded operating temperature

Table 27. Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	5°C to 40°C at 5% to 85% RH with 29°C dew point. **NOTE: Outside the standard operating temperature (10°C to 35°C), the appliance can operate continuously in temperatures as low as 5°C and as high as 40°C.** For temperatures between 35°C to 40°C, de-rate maximum allowable temperature by 1°C per 175 m above 950 m (1°F per 319 ft).
≤ 1% of annual operating hours	–5°C to 45°C at 5% to 90% RH with 29°C dew point. **NOTE: Outside the standard operating temperature (10°C to 35°C), the appliance can operate down to –5°C or up to 45°C for a maximum of 1% of its annual operating hours.** For temperatures between 40°C and 45°C, de-rate maximum allowable temperature by 1°C per 125 m above 950 m (1°F per 228 ft).

NOTE: When operating in the expanded temperature range, appliance performance may be impacted.

NOTE: When operating in the expanded temperature range, ambient temperature warnings may be reported in the System Event Log.

Expanded operating temperature restrictions

- Do not perform a cold startup below 5°C.
- The operating temperature specified is for a maximum altitude of 3050 m (10,000 ft).
- 150 W/8 core, 165 W/12 core and higher wattage processor [Thermal Design Power (TDP)>165 W] are not supported.
- Redundant power supply units are required.
- Non-Dell EMC qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- Mid drive tray is not supported.
- Rear storage devices or drives are not supported.
- GPU is not supported.

Thermal restrictions

Following table lists the configuration required for efficient cooling.

Table 28. Thermal restrictions configuration

Supported VxRail Config	Number of proc	Heatsink	Processor/DIMM blank	DIMM blanks	Type of air shroud	Fan
VxRail P Series appliance	1	One 1U standard heat sink for CPU ≤ 125 W One 2U standard heat sink for CPU > 125 W	Required	Not required	Standard	Four standard fans and one blank to cover two fan slots
VxRail P Series appliance	2	Two 1U standard heat sink for CPU ≤ 125 W Two 2U standard heat sink for CPU > 125 W	Not required	Not required	Standard	Six standard fans
VxRail S Series appliance	1	One 1U high performance heat sink	Required	Required	Not required	Six high performance fans
VxRail S Series appliance	2	Two 1U high performance heat sink	Not required	Required	Not required	Six high performance fans
VxRail V Series appliance	2	Two 1U high performance heat sink	Not required	Not required	GPU air shroud	Six high performance fans

Particulate and gaseous contamination specifications

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

Table 29. Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **NOTE: This condition applies only to data center environments. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor.** **NOTE: Air entering the data center must have MERV11 or MERV13 filtration.**
Conductive dust	Air must be free of conductive dust, zinc whiskers, or other conductive particles. **NOTE: This condition applies to data center and non-data center environments.**
Corrosive dust	• Air must be free of corrosive dust. • Residual dust present in the air must have a deliquescent point less than 60% relative humidity. **NOTE: This condition applies to data center and non-data center environments.**

Table 30. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper coupon corrosion rate	<300 Å/month per Class G1 as defined by ANSI/ISA71.04-1985.
Silver coupon corrosion rate	<200 Å/month as defined by AHSRAE TC9.9.

NOTE: Maximum corrosive contaminant levels measured at ≤50% relative humidity.

3

Initial setup and configuration

For assistance on installation and deployment, contact your Dell EMC account team or your reseller for installation services.

WARNING: During the VxRail deployment process, an iDRAC account named vxadmin or PTAdmin is created. This account provides hardware information the VxRail Manager and is required for VxRail Manager and cluster to function properly. Ensure that you do not modify or delete this account.

NOTE: Do not install the appliance into a rack, or turn on the appliance without the initial configuration of your appliance.

4

Pre-operating systems

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

NOTE:

- **This appliance requires installation and deployment services. Do not rack the appliance, or turn on the appliance without the initial configurations on your appliance. Contact your Dell EMC account team or your reseller for setting up your appliance.**
- **Dell EMC has optimized your appliance. It is not recommended to change any of these settings.**

Topics:

- Options to manage the pre-operating system applications
- iDRAC configuration

Options to manage the pre-operating system applications

Your appliance has the following options to manage the pre-operating system applications:

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

NOTE: Dell EMC has optimized your appliance and it is not recommended to change any of these settings.

iDRAC configuration

The Integrated Dell Remote Access Controller (iDRAC) is designed to make appliance administrators more productive and improve the overall availability of Dell EMC appliances. iDRAC alerts administrators to appliance issues, helps them perform remote appliance management, and reduces the need for physical access to the appliance.

Log in to iDRAC

You can log in to iDRAC as:

- iDRAC user
- Microsoft Active Directory user
- Lightweight Directory Access Protocol (LDAP) user

The default user name and password are `root` and `calvin`. You can also log in by using Single Sign-On or Smart Card.

NOTE: You must have iDRAC credentials to log in to iDRAC.

For more information about logging in to iDRAC and iDRAC licenses, see the latest Integrated Dell Remote Access Controller User's Guide at **Dell.com/idracmanuals**.

The iDRAC IP address is pre-configured for DHCP. This can be changed to a static IP address by logging into iDRAC.

NOTE:

- **To access iDRAC, connect the network cable to the Ethernet connector 1 on the system board.**
- **Ensure that you change the default user name and password after setting up the iDRAC IP address.**

5

Replacing and adding hardware

Using the SolVe Desktop application for VxRail Series hardware tasks

Step-by-step hardware component tasks such as replacement and upgrade procedures are available through the SolVe Desktop application.

You must have an online support account to use the SolVe Desktop application.

WARNING: The VxRail Series procedures in the SolVe Desktop application for replacing hardware or any upgrade procedures must be performed only by Dell EMC certified service technicians.

CAUTION: To avoid data loss, ensure that you refer to the VxRail Series procedures in the SolVe Desktop application before replacing hardware or performing any upgrade procedures.

1. Log in to the EMC Online Support site.
2. Click **SolVe** on the main page.
3. Click the download link for the SolVe Desktop application.
4. Save the executable file and then run it to install the SolVe Desktop.

Supported hardware components

The following table describes the supported hardware components for V series, P series, and S series appliances.

Table 31. Supported hardware components

Hardware component	V series		P series		S series	
	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
System Memory	Yes	No	Yes	No	Yes	No
Hard Drive	Yes	No	Yes	No	Yes	No
Solid State Drive (SAS/ SATA)	Yes	No	Yes	No	Yes	No
Solid State Drive (NVMe)	N/A	N/A	Yes	No	N/A	N/A
PCIe Network Interface Cards	Yes	No	Yes	No	Yes	No
Graphical Processing Unit (GPU)	Yes	No	Yes	No	No	No
Micro SDHC Card	Yes	No	Yes	No	Yes	No
Power Supply Unit	Yes	No	Yes	No	Yes	No
Processors	No	Yes	No	Yes	No	Yes
System Motherboard	No	Yes	No	Yes	No	Yes
Host Bus Adapter (HBA330)	No	Yes	No	Yes	No	Yes
BOSS controller card and M.2 SATA disk	No	Yes	No	Yes	No	Yes

Hardware component	V series		P series		S series	
	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)	Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
Network Daughter Card (NDC)	No	Yes	No	Yes	No	Yes

NOTE: The preceding table provides a non-exhaustive list of FRUs that reflects the common top-level assembly parts.

System memory

The appliance supports DDR4 registered DIMMs (RDIMMs) and load reduced DIMMs (LRDIMMs). System memory holds the instructions that are executed by the processor.

NOTE: MT/s indicates DIMM speed in MegaTransfers per second.

Memory bus operating frequency can be 2666 MT/s, 2400 MT/s, or 2133 MT/s depending on the following factors:

- DIMM type (RDIMM or LRDIMM)
- Number of DIMMs populated per channel
- System profile selected (for example, Performance Optimized, or Custom [can be run at high speed or lower])
- Maximum supported DIMM frequency of the processors

Your appliance contains 24 memory sockets split into two sets of 12 sockets, one set per processor. Each 12-socket set is organized into six channels. In each channel, the release tabs of the first socket are marked white, and the second socket black.

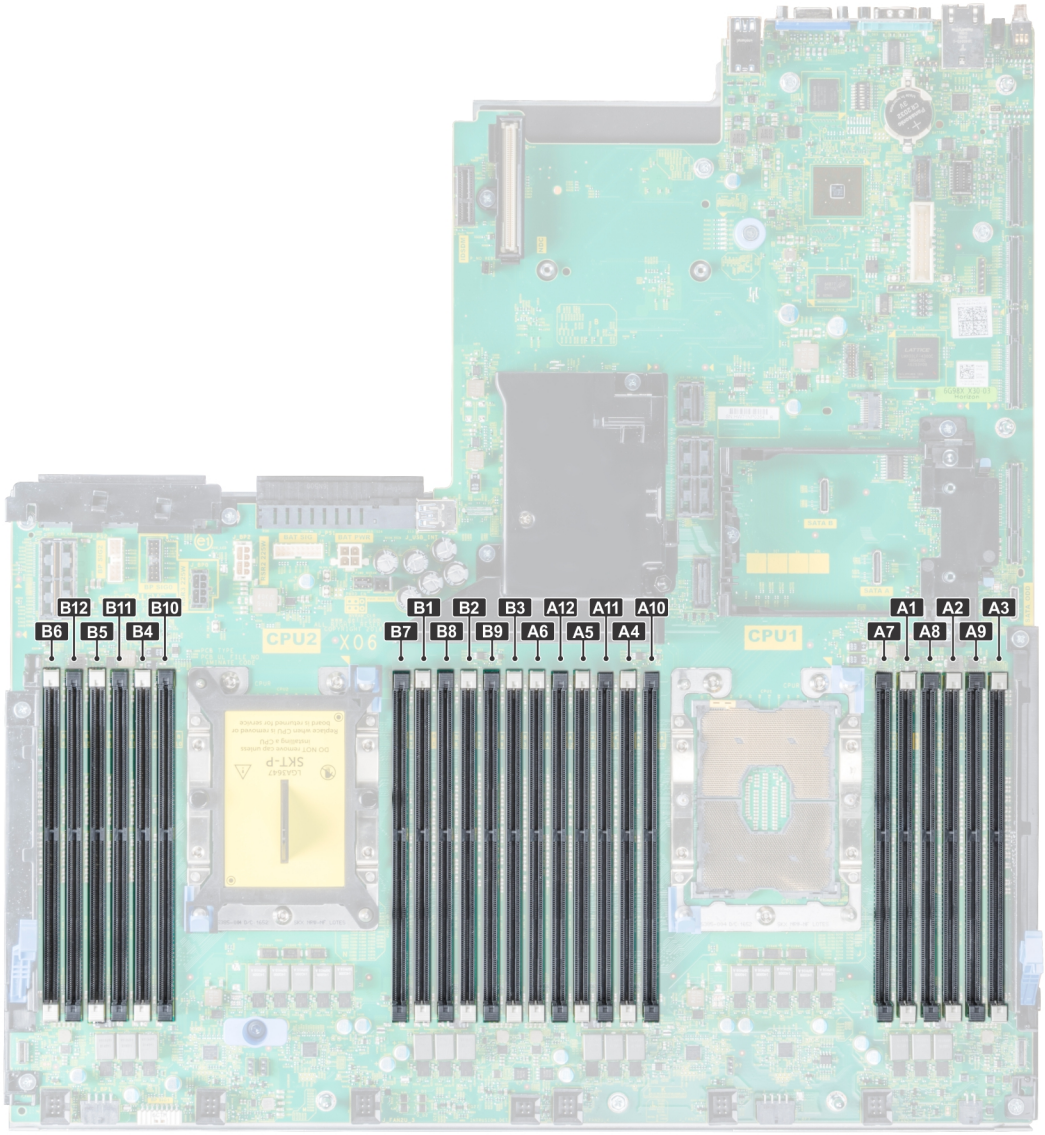

Figure 15. Memory socket locations

Memory channels are organized as follows:

Table 32. Memory channels

Proc	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Processor 1	Slots A1 and A7	Slots A2 and A8	Slots A3 and A9	Slots A4 and A10	Slots A5 and A11	Slots A6 and A12
Processor 2	Slots B1 and B7	Slots B2 and B8	Slots B3 and B9	Slots B4 and B10	Slots B5 and B11	Slots B6 and B12

General memory module installation guidelines

NOTE: Memory configurations that fail to observe these guidelines can prevent your appliance from booting, stop responding during memory configuration, or operating with reduced memory.

The following are the recommended guidelines for installing memory modules:

- RDIMMs and LRDIMMs must not be mixed.
- Up to two RDIMMs can be populated per channel.
- Up to two LRDIMMs can be populated per channel.

- If memory modules with different speeds are installed, they will operate at the speed of the slowest installed memory module(s) or slower depending on appliance DIMM configuration.
- Populate memory module sockets only if a processor is installed. For single-processor appliance, sockets A1 to A12 are available. For dual-processor appliance, sockets A1 to A12 and sockets B1 to B12 are available.
- Populate all the sockets with white release tabs first, and then followed by the black release tabs.
- Mixing of more than one memory module capacities in an appliance is not supported.
- In a dual-processor configuration, the memory configuration for each processor should be identical. For example, if you populate socket A1 for processor 1, then populate socket B1 for processor 2, and so on.
- VxRail appliances require that you populate six memory modules per processor for single processor configurations and twelve memory modules per processor for dual-processor configurations. One memory module per channel at a time to maximize performance.

Expansion cards and expansion card riser

An expansion card in the appliance is an add-on card that can be inserted into an expansion slot on the system board or riser card to add enhanced functionality to the appliance through the expansion bus.

NOTE: To avoid data loss, ensure that you refer to the procedures in the SolVe Desktop application before performing any memory or expansion card replacement or upgrade procedures.

NOTE: A System Event Log (SEL) event is logged if an expansion card riser is unsupported or missing. It does not prevent your appliance from turning on and no BIOS POST message or F1/F2 pause is displayed.

Expansion card installation guidelines

The VxRail P Series, V Series, and S Series appliance support PCI express (PCIe) generation 3 expansion cards, that can be installed on the system board using expansion card risers. The following table provides detailed information about the expansion card riser specifications:

Table 33. Expansion card riser specifications

Supported VxRail config	Riser config and supported risers	Slot desc	PCIe slots on riser 1 (Height and length)	Proc conn	PCIe slots on riser 2 (Height and length)	Proc conn	PCIe slots on riser 3 (Height and length)	Proc conn
VxRail P Series and S Series appliance	Riser configuration 1 with or without rear storage (1B +2B)	Four x8 slots and rear storage	Slot 1: x8 full-height, full length	Processor 1				
			Slot 2: x8 full-height, full length	Processor 1	Slot 4: x8 low profile, half length	Processor 1	N/A	N/A
			Slot 3: x8 full-height, half length	Processor 1				
			Slot 1: x16 full-height, full length	Processor 1	Slot 4: x16 full-height, full length	Processor 2	Slot 7: x8 full-height, full length	Processor 2
VxRail P Series and V Series appliance	Riser configuration 4 (1A+2A+3A)	Three x8 and four x16 slots	N/A	N/A	Slot 5: x8 full-height, full length	Processor 2	Slot 8: x16 full-height, full length	Processor 2
			Slot 3: x16 full-height, half length	Processor 1	Slot 6: x8 low profile, half length	Processor 1		

Table 34. Riser configurations with 4 PCIe slots [Riser configuration 1 with or without rear storage (1B+2B)]

Card Type	Slot priority	Maximum number of cards
Internal storage adapter	Integrated slot	1
10 GB NIC	1, 2, 3	3

Card Type	Slot priority	Maximum number of cards
BOSS	4	1

Table 35. VxRail P series dual processor and VxRail V series configurations — Riser configurations with greater than 4 PCIe slots [Riser configuration 4 (1A+2A+3A), and Riser configuration 5 (1B+2A+3A)]

Card Type	Slot priority	Maximum number of cards
GPU (double width) – Supported on VxRail V Series appliance only	1, 8, 4	3
Internal storage adapter	6	1
10 GB NIC	4, 5, 7, 8	4
BOSS	3	1

NOTE: For information about slot form factor, see the Expansion card riser configurations table.

NOTE: The expansion card slots are not hot-swappable.

6

Getting help

Topics:

- Contacting Dell EMC
- Registering for online support
- Accessing support resources
- VxRail documentation

Contacting Dell EMC

You can link your Online Support account with **VxRail Manager** and access support resources without having to log in separately.

NOTE: If you plan to set up Secure Remote Services (SRS), you must link your Online Support account to VxRail Manager under the same ID or it may not work properly.

Registering for online support

You can create an **Online Support** account to access support resources such as:

- Register your appliance.
- Obtain product license files and software updates.
- Download Dell EMC VxRail Series product documentation.
- Access SolVe Online for VxRail or download the SolVe Desktop Procedure Generator.
- Browse the Dell EMC VxRail Series community and support information.
- Link your support account for access to resources from within **VxRail Manager**.

To register for online support:

1. Open **www.emc.com/vxrailsupport** or **support.emc.com**.
2. Click **Register here**.
3. Fill in the required information.

You will receive a confirmation email within 48 hours.

Accessing support resources

You can access support resources for your VxRail Series using one of the following methods:

- VxRail Manager Support
- **www.emc.com/vxrailsupport** (or **support.emc.com**)
- **https://solve.emc.com**

NOTE: Additional VxRail Series information is available through the SolVe Desktop application. SolVe includes step-by-step procedures for replacing certain hardware components, and other tasks.

VxRail documentation

The following table lists available documents about VxRail Manager and VxRail Appliances.

Table 36. VxRail Documentation

Document	Description
SolVe Online for VxRail	(Login required) Step-by-step instructions for procedures such as replacing hardware or performing system administrative tasks are available through SolVe Online and the SolVe Desktop application. For more information about SolVe for VxRail, refer to KB 525271.
VxRail Appliance 4.7.x Administration Guide VxRail Appliance 4.5.x Administration Guide	These documents describe the VxRail Appliance, how it works, and how to perform administrative tasks.
VxRail 4.7.x Release Notes VxRail 4.5.x Release Notes	(Login required) These documents contain a brief description of VxRail Manager releases, including lists of known issues and workarounds.
VxRail Support Matrix	This document provides information about supported software, firmware, and hardware versions for Dell EMC VxRail appliances based on Dell PowerEdge hardware, including the E Series, P Series, S Series, and V Series.
VxRail Appliance Owner's Manuals • VxRail Appliances on 14th Generation PowerEdge Servers P Series, V series, and S Series Owner's Manual • VxRail Appliances on 14th Generation PowerEdge Servers E Series Owner's Manual • VxRail G560 and G560F Owner's Manual • VxRail 60 Series Appliance Owner's Manual • VxRail 100 Series and 200 Series Appliance Owner's Manual • VxRail G Series Appliance Owner's Manual	These documents describe the various VxRail appliances, including their physical features and technical specifications.
VxRail Appliance Getting Started Guides • VxRail G560 and G560F Getting Started Guide • VxRail E Series Appliance Getting Started With Your Appliance • VxRail P Series, S Series, and V Series Appliances Getting Started With Your Appliance	These documents describe considerations for unpacking and preparing to install VxRail appliances.
VxRail Appliance API User Guide	This document describes the API for the VxRail Appliance versions 4.5.x and 4.7.x.
VxRail Event Code Reference	(Login required) This reference guide lists the alert and event codes generated by VxRail Manager.
VxRail Security Configuration Guide	(Login required) This guide provides an overview of the configuration, deployment, and usage settings needed to ensure secure operation of the VxRail Appliance.
VxRail Appliance STIG Compliance Guide	(Login required) This document provides guidance on the secure installation and secure use of the VxRail Appliance for the DoDIN Approved Products List (APL) Deployment Configuration.
VxRail vCenter Server Planning Guide	This planning guide discusses guidance for the various vCenter Server deployment options supported on VxRail Appliances.
VxRail Planning Guide for Virtual SAN Stretched Cluster	This planning guide provides better insights into the requirements necessary for VxRail to implement Virtual SAN Stretched Cluster.
vSAN 2-Node Cluster on VxRail Planning Guide	This guide provides information for the planning of a VMware vSAN 2-Node Cluster infrastructure on a VxRail platform. (Not for VCF on VxRail solution deployments.)

Document	Description
VxRail Networking Guide with Dell EMC S4148-ON Switches	The deployment guide covers the process of connecting a cluster of VxRail nodes to Dell EMC Networking S4148-ON switches in a high-availability configuration.
VxRail Network Planning Guide	This is a network planning and consideration guide for the VxRail. It provides valuable insight into supported switch requirements and the networking required to support VxRail.
Networking Guides > VxRail Networking Solutions	The networking guides provided on this website assist with the deployment of your infrastructure and the optimal connectivity of your Dell EMC Networking products. Click VxRail Networking Solutions for specific VxRail solutions.
VxRail Fabric Automation SmartFabric Services User Guide	This solution brief provides an overview of how VxRail works with HCI network fabrics using Dell OS10 Enterprise Edition SmartFabric services. (Not for VCF on VxRail solution deployments.)