Dell VxRail P670F, P670N, V670F, and S670

Technical Specifications

June 2024
Rev. 10

DELL Technologies

Notes, cautions, and warnings

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

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

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

Contents

Revision history

Table 1. Revision history

Date	Revision	Description of change
June 2024	10	Updated the maximum capacity for 256 GB LRDIMM.
January 2024	9	Minor updates.
October 2023	8	Updates to the minimum cores, networking, and memory for P670N.
January 2023	7	Updated for VxRail software version 8.0.000.
August 2022	6	Updated for VxRail software version 7.0.380.
May 2022	5	Updated for VxRail software version 7.0.360.
February 2022	4	Updated for VxRail software version 7.0.320; added BOSS-S1 support for VxRail P670F and V670F.
November 2021	3	Updated for VxRail software version 7.0.300; added the support for 256 GB LRDIMM for VxRail P670F.
August 2021	2	Updated to include support for Intel Persistent Memory 200 series (BPS) and minor updates.
July 2021	1	Initial release

1

Introduction

This document provides the technical and environmental specifications of VxRail P670F, P670N, V670F, and S670, and their components.

The target audience for this document includes customers, field personnel, and partners who want to operate and maintain a VxRail P670F, P670N, V670F, or S670. This document is designed for people familiar with:

- Dell Technologies systems and software
- VMware virtualization products
- Data centers and infrastructure

For the most up-to-date list of VxRail documentation, see the VxRail Documentation Quick Reference List.

2

Technical specifications

This section outlines the technical and environmental specifications of VxRail P670F, P670N, V670F, and S670.

Chassis configuration

The following table describes the chassis configuration of VxRail P670F, P670N, V670F, and S670:

Table 2. Chassis configuration

VxRail model	Chassis configuration
VxRail P670F	Single-socket configuration: 24 x 2.5-inch SAS/SATA (including four universal drives) front storage drives. Dual-socket configuration: 24 x 2.5-inch SAS/SATA (including four universal drives) front storage drives with 4 x 2.5-inch SAS/SATA rear storage.
VxRail P670N	24 x 2.5-inch all NVMe front storage drives.
VxRail V670F	24 x 2.5-inch SAS/SATA (including four universal drives) front storage drives.
VxRail S670	12 x 3.5-inch SAS/SATA front storage drives with 4 x 2.5-inch SAS/SATA/NVMe rear storage.

Chassis dimensions

The following figure and table provides the chassis dimensions of VxRail P670F, P670N, V670F, and S670:

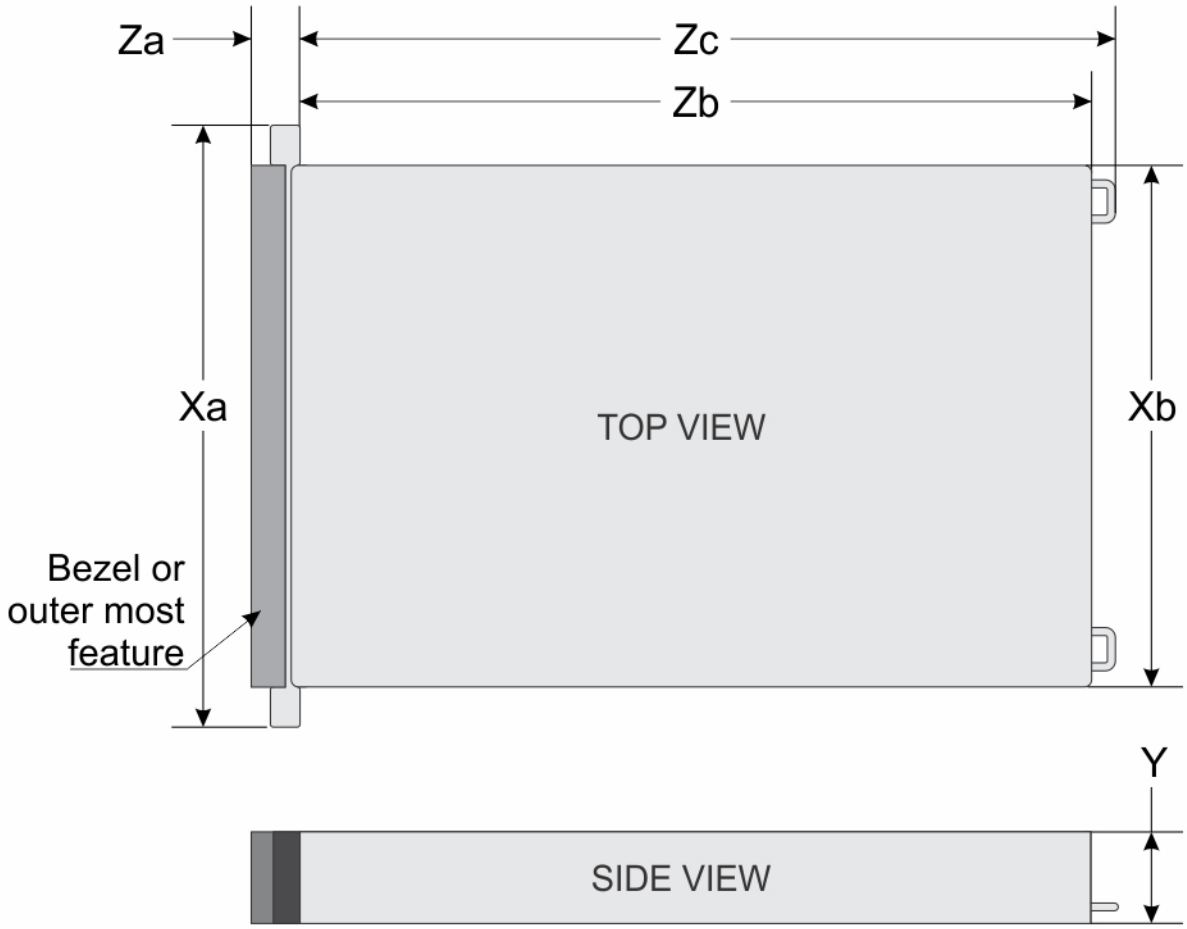

Figure 1. Chassis dimensions

Table 3. Chassis dimensions

Drives	Xa	Xb	Y	Za	Zb	Zc
4/24 drives	482.0 mm (18.97 inches)	434.0 mm (17.0 inches)	86.8 mm (3.41 inches)	35.84 mm (1.41 inches) with bezel 22.0 mm (0.86 inches) without bezel	700.7 mm (27.58 inches) Ear to rear wall	736.29 mm (28.92 inches) Ear to PSU handle

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

Chassis weight

The following table shows the chassis weight of VxRail P670F, P670N, V670F, and S670:

Table 4. Chassis weight

System configuration	Maximum weight (with all drives/SSDs)
24 x 2.5-inch	35.2 kg (77.60 lb)
12 x 3.5-inch	35.3 kg (77.82 lb)

Processor specifications

The VxRail P670F, P670N, V670F, and S670 supports up to two 3rd Generation Intel Xeon Scalable processors with up to 40 cores.

PSU specifications

The system supports up to two AC power supply units (PSUs).

WARNING: Instructions for the qualified electricians only:

Power supply cords/jumper cords and the associated plugs/inlets/connectors must have appropriate electrical ratings referencing the rating label on the system when used for connection.

Table 5. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	Current
1100 W AC Mixed Mode	Titanium	4299 BTU/hr	50/60 Hz	100 - 240 V	12 - 6.3 A
1100 W Mixed Mode	N/A	4299 BTU/hr	N/A	240 V	5.2 A
1400 W AC Mixed Mode	Platinum	5459 BTU/hr	50/60 Hz	100 - 240 V	12 - 8 A
1400 W Mixed Mode	N/A	5459 BTU/hr	N/A	240 V	6.6 A
2400 W AC Mixed Mode	Platinum	9213 BTU/hr	50/60 Hz	100 - 240 V	16 - 13.5 A
2400 W Mixed Mode	N/A	9213 BTU/hr	N/A	240 V	11.2 A

NOTE: When selecting or upgrading the system configuration, to ensure optimum power utilization, verify the system power consumption with the Dell Energy Smart Solution Advisor available at **Dell.com/ESSA**.

Cooling fan specifications

The VxRail P670F, P670N, V670F, and S670 requires various cooling components based on CPU TDP, storage modules, rear drives, GPU, and persistent memory to maintain optimum thermal performance.

The VxRail P670F, P670N, V670F, and S670 offers air cooling.

The VxRail P670F, P670N, V670F, and S670 supports up to six high-performance silver grade (HPR SLVR), or high-performance gold grade (HPR GOLD) cooling fans.

Table 6. Cooling fan specifications

Fan type	Abbreviation	Also known as	Label color	Label image
High-performance fan (Silver grade)	HPR SLVR	HPR	Silver	 **Figure 2. High-performance fan (Silver grade)**
High-performance fan (Gold grade)	HPR GOLD	VHPR - Very High Performance	Gold	 **Figure 3. High-performance fan (Gold grade)**

NOTE: Mixing of HPR SLVR, or HPR GOLD fan is not supported.

NOTE: The HPR SLVR, or HPR GOLD fan installation depends on the system configuration. For more information about the supported fan configuration or matrix, see Thermal restriction matrix.

Battery specifications

The VxRail P670F, P670N, V670F, and S670 supports CR 2032 3.0-V lithium coin cell battery.

Expansion card riser specifications

The VxRail P670F, P670N, V670F, and S670 support PCI express (PCIe) Gen 4 expansion cards with 2x bandwidth of Gen 3.

Table 7. Riser configuration of VxRail P670F (single-socket configuration)

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
Config8	Slot 1	Riser 1B	Full height	Half length	x16	Processor 1
	Slot 2					
	Slot 3	Riser 2A	Low profile		x8	Processor 1

Table 8. Riser configuration of VxRail P670F (dual-socket configuration)

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
Config5	Slot 3	Riser 2A	Low profile	Half length	x16	Processor 1 and 2
	Slot 6					
	Slot 7	Riser 4B	Full height		x8	Processor 2
	Slot 8					

Table 9. Riser configuration of VxRail P670N

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
Config2	Slot 2	Riser 1A	Full height	Full length	x16 (Double width)	Processor 1
	Slot 3	Riser 2A	Low profile	Half length	x16	Processor 1 and 2
	Slot 6					
	Slot 4	Riser 3B	Full height		x8	Processor 2
	Slot 5					
	Slot 7	Riser 4A		Full length	x16 (Double width)	

Table 10. Riser configuration of VxRail V670F

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
Config1	Slot 1	Riser 1B	Full height	Half length	x8	Processor 1
	Slot 2					
	Slot 3	Riser 2A	Low profile		x16	Processor 1 and 2
	Slot 6					
	Slot 4	Riser 3B	Full height		x8	Processor 2
	Slot 5					
	Slot 7	Riser 4B				
	Slot 8					
Config2	Slot 2	Riser 1A	Full height	Full length	x16 (Double width)	Processor 1
	Slot 3	Riser 2A	Low profile	Half length	x16	Processor 1 and 2

Table 10. Riser configuration of VxRail V670F (continued)

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
	Slot 6					
	Slot 4	Riser 3B	Full height		x8	Processor 2
	Slot 5					
	Slot 7	Riser 4A		Full length	x16 (Double width)	

Table 11. Riser configuration of VxRail S670

Riser configuration	PCIe slot	Riser	PCIe slot height	PCIe slot length	Slot width	Processor connection
Config5	Slot 3	Riser 2A	Low profile	Half length	x16	Processor 1 and 2
	Slot 6					
	Slot 7	Riser 4B	Full height		x8	Processor 2
	Slot 8					
Config9	Slot 3	Riser 2A	Low profile		x16	Processor 1

Memory specifications

The VxRail P670F, P670N, V670F, and S670 support the following memory specifications for optimized operation.

Table 12. Memory specifications of VxRail P670F and P670N

DIMM type	DIMM rank	DIMM capacity	Dual processor	
			Minimum RAM	Maximum RAM
RDIMM	Dual rank	16 GB	32 GB	512 GB
		32 GB	64 GB	1 TB
		64 GB	128 GB	2 TB
LRDIMM	Quad rank	128 GB	256 GB	4 TB
	Octa rank	256 GB	512 GB	4 TB
Intel Persistent Memory 200 series (BPS)	Dual rank	128 GB	256 GB	2 TB
		256 GB	512 GB	4 TB
		512 GB	1 TB	8 TB

Table 13. Memory specifications of VxRail P670N vSAN ESA

DIMM type	DIMM rank	DIMM capacity	Dual processor	
			Minimum RAM	Maximum RAM
RDIMM	Dual rank	16 GB	128 GB	512 GB
		32 GB	128 GB	1 TB
		64 GB	128 GB	2 TB
LRDIMM	Quad rank	128 GB	256 GB	4 TB
	Octa rank	256 GB	512 GB	4 TB

Table 13. Memory specifications of VxRail P670N vSAN ESA (continued)

DIMM type	DIMM rank	DIMM capacity	Dual processor	
			Minimum RAM	Maximum RAM
Intel Persistent Memory 200 series (BPS)	Dual rank	128 GB	256 GB	2 TB
		256 GB	512 GB	4 TB
		512 GB	1 TB	8 TB

Table 14. Memory specifications of VxRail V670F

DIMM type	DIMM rank	DIMM capacity	Dual processor	
			Minimum RAM	Maximum RAM
RDIMM	Dual rank	16 GB	32 GB	512 GB
		32 GB	64 GB	1 TB
		64 GB	128 GB	2 TB
LRDIMM	Quad rank	128 GB	256 GB	4 TB
Intel Persistent Memory 200 series (BPS)	Dual rank	128 GB	256 GB	2 TB
		256 GB	512 GB	4 TB
		512 GB	1 TB	8 TB

Table 15. Memory specifications of VxRail S670

DIMM type	DIMM rank	DIMM capacity	Dual processor	
			Minimum RAM	Maximum RAM
RDIMM	Dual rank	16 GB	32 GB	512 GB
		32 GB	64 GB	1 TB
		64 GB	128 GB	2 TB
LRDIMM	Quad rank	128 GB	256 GB	4 TB

The VxRail P670F, P670N, V670F, and S670 support 32, 288-pin memory module sockets at a speed of 3200 MT/s.

Storage controller specifications

The specifications of the storage controller cards that VxRail P670F, P670N, V670F, and S670 supports.

The single-socket configuration of VxRail P670F supports the following internal controller cards:

- HBA355i
- BOSS-S2:
  - New rear-serviceable form factor
  - 2x 480 GB M.2 SSDs with RAID 1
  - LEDs for M.2 SSD status

The dual-socket configuration of VxRail P670F supports the following internal controller cards:

- HBA355i
- BOSS-S2:
  - New rear-serviceable form factor
  - 2x 480 GB M.2 SSDs with RAID 1
  - LEDs for M.2 SSD status
- BOSS-S1:
  - Internal BOSS-S1 controller v5
  - 2x 480 GB M.2 SSDs with RAID 1

The VxRail P670N do not have internal storage controller cards. It supports the following:

- BOSS-S1:
  - Internal BOSS-S1 controller v5
  - 2x 480 GB M.2 SSDs with RAID 1
- BOSS-S2:
  - New rear-serviceable form factor
  - 2x 480 GB M.2 SSDs with RAID 1
  - LEDs for M.2 SSD status

The VxRail V670F supports the following internal controller cards:

- HBA355i
- PERC H755 storage controller
- BOSS-S2:
  - New rear-serviceable form factor
  - 2x 480 GB M.2 SSDs with RAID 1
  - LEDs for M.2 SSD status
- BOSS-S1:
  - Internal BOSS-S1 controller v5
  - 2x 480 GB M.2 SSDs with RAID 1

The VxRail S670 supports the following internal controller cards:

- HBA355i adapter
- BOSS-S2:
  - New rear-serviceable form factor
  - 2x 480 GB M.2 SSDs with RAID 1
  - LEDs for M.2 SSD status

Drives

The single-socket configuration of VxRail P670F supports the following configurations:

- One disk group with 1 cache (NVMe/SAS mix-use, write-intensive) and up to 5 capacity (SAS/SATA read-intensive) drives.
- Two disk groups with 2 cache (NVMe/SAS mix-use, write-intensive) and 10 capacity (SAS/SATA read-intensive) drives.
- Three disk groups with 3 cache (NVMe/SAS mix-use, write-intensive) and up to 15 capacity (SAS/SATA read-intensive) drives.
- Four disk groups with 4 cache (NVMe/SAS mix-use, write-intensive) and up to 20 capacity (SAS/SATA read-intensive) drives.

The dual-socket configuration of VxRail P670F supports the following configurations:

- One disk group with 1 cache (NVMe/SAS mix-use, write-intensive) and up to 6 capacity (SAS/SATA read-intensive) drives.
- Two disk groups with 2 cache (NVMe/SAS mix-use, write-intensive) and 14 capacity (SAS/SATA read-intensive) drives.
- Three disk groups with 3 cache (NVMe/SAS mix-use, write-intensive) and up to 21 capacity (SAS/SATA read-intensive) drives.
- Four disk groups with 4 cache (NVMe/SAS mix-use, write-intensive) and up to 24 capacity (SAS/SATA read-intensive) drives.

The VxRail P670N supports the following configurations:

- vSAN configuration:
  - One disk group with 1 cache (NVMe mix-use) and up to 7 capacity (NVMe read-intensive) drives.
  - Two disk groups with 2 cache (NVMe mix-use) and 14 capacity (NVMe read-intensive) drives.
  - Three disk groups with 3 cache (NVMe mix-use) and up to 21 capacity (NVMe read-intensive) drives.
  - Four disk groups with 4 cache (NVMe mix-use) and up to 20 capacity (NVMe read-intensive) drives.
- vSAN ESA (Express Storage Architecture) configuration:
  - No disk group configuration is required.
  - Supports only capacity drives (NVMe, mix-use).
  - Supports a minimum of 4 drives and a maximum of 10 drives.
  - Does not support mixing drives of different capacity in the same system.

The VxRail V670F supports the following configurations:

- One disk group with 1 cache (NVMe/SAS mix-use, write-intensive) and up to 7 capacity (SAS/SATA read-intensive) drives.
- Two disk groups with 2 cache (NVMe/SAS mix-use, write-intensive) and 14 capacity (SAS/SATA read-intensive) drives.
- Three disk groups with 3 cache (NVMe/SAS mix-use, write-intensive) and up to 21 capacity (SAS/SATA read-intensive) drives.
- Four disk groups with 4 cache (NVMe/SAS mix-use, write-intensive) and up to 20 capacity (SAS/SATA read-intensive) drives.

The VxRail S670 supports the following configurations:

- One disk group with 1 cache (NVMe/SAS/SATA mix-use, write-intensive) and up to 6 capacity (SAS/SATA read-intensive) drives.
- Two disk groups with 2 cache (NVMe/SAS/SATA mix-use, write-intensive) and 12 capacity (SAS/SATA read-intensive) drives.
- Three disk groups with 3 cache (NVMe/SAS/SATA mix-use, write-intensive) and up to 9 capacity (SAS/SATA read-intensive) drives.
- Four disk groups with 4 cache (NVMe/SAS/SATA mix-use, write-intensive) and up to 12 capacity (SAS/SATA read-intensive) drives.

Ports and connectors specifications

The VxRail P670F, P670N, V670F, and S670 supports a wide range of connectivity options using the different ports.

USB ports specifications

Table 16. USB ports specifications

Front		Rear	
USB port type	**No. of ports**	**USB port type**	**Ports**
USB 2.0-compliant port	One	USB 2.0-compliant port	One
Micro-USB 2.0, iDRAC Direct	One	USB 2.0-compliant ports	One

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

The USB 2.0 specifications provide a 5 V supply on a single wire to power connected USB devices. A unit load is defined as 100 mA in USB 2.0, and 150 mA in USB 3.0. A device may draw a maximum of 5 unit loads (500 mA) from a port in USB 2.0; 6 (900 mA) in USB 3.0.

The USB 2.0 interface can provide power to low-power peripherals but must adhere to USB specification. An external power source is required for higher-power peripherals to function, such as external CD/DVD Drives.

NIC port specifications

The VxRail P670F, P670N, V670F, and S670 supports:

- Up to two NIC ports embedded on the LAN on Motherboard (LOM).
- One OCP 3.0 card.

Table 17. NIC port specifications

Feature	Specifications
LOM card	1 GbE x Dual port
OCP card (OCP 3.0)	10 GbE x Dual port, 10 Gbe x Quad port, 25 GbE x Dual port, 25 GbE x Quad port

NOTE: P670N vSAN ESA configuration supports 10/25/100 Gbps Network Interface Controller (NIC) ports embedded on the LAN on Motherboard (LOM) and integrated on the Open Compute Project (OCP) cards.

Serial connector specifications

The VxRail P670F, P670N, V670F, and S670 supports one optional card type serial connector, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

The optional serial connector card is installed similar to an expansion card filler bracket.

VGA ports specifications

The VxRail P670F, P670N, V670F, and S670 supports One DB-15 VGA port one each on the front and back panels.

Video specifications

The VxRail P670F, P670N, V670F, and S670 supports integrated Matrox G200 graphics controller with 16 MB of video frame buffer.

Table 18. Video specifications

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

Environmental specifications

NOTE: For additional information about environmental certifications, see *Product Environmental Datasheet* located in the **Manuals & Documents** section on Dell Technologies Support.

Table 19. Operational climatic range for category A2

Temperature	Specifications
Allowable continuous operations	
Temperature ranges for altitudes <900 m (<2953 ft)	10°C to 35°C (50°F to 95°F) with no direct sunlight on the equipment
Humidity percent ranges (non-condensing at all times)	8% RH with -12°C (10.4°F) 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 20. Temperature specifications

Temperature	Specifications
Allowable continuous operations	

Table 20. Temperature specifications (continued)

Temperature	Specifications
Maximum temperature gradient (applies to both operation and non-operation)	20°C in an hour* (36°F in an hour) and 5°C in 15 minutes (9°F in 15 minutes), 5°C in an hour* (9°F in an hour) for tape
Non-operational temperature limits	-40°C to 65°C (-104°F 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 ft)
Maximum operational altitude	3,048 meters (10,000 ft)

NOTE: * - Per ASHRAE thermal guidelines for tape hardware, these are not instantaneous rates of temperature change.

Table 21. Maximum vibration specifications

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

The maximum vibration specification of an operational system is 0.21 Grms at 5 Hz to 500 Hz for 10 minutes (all operation orientations). The maximum vibration specification of a nonoperational system is 1.88 Grms at 10 Hz to 500 Hz for 15 minutes (all six sides tested).

Table 22. Maximum shock pulse specifications

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

The maximum shock specification of an operational system is six consecutively executed shock pulses in the positive and negative x, y, and z axis of 6 G for up to 11 ms. The maximum shock specification of a nonoperational system is 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.

Thermal restriction matrix

The following table describes the label references used in the restriction tables:

Table 23. Labels

Label	Description
STD	Standard
HPR	High performance
HSK	Heat sink
LP	Low profile
FH	Full height
DW	Double Wide
BPS	Intel Persistent Memory 200 series (BPS)
DPC	DIMM per channel

Table 24. System details of VxRail P670F

Configuration		CPU (TDP)	DIMM (RDIMM/ LRDIMM/ BPS)	Fan	Heatsinks	Air shroud	DIMM blank
Front storage	Rear storage						
24 x 2.5-inch with 4 universal slots	4 x 2.5-inch rear storage	<=165W	RDIMM/ LRDIMM (except 256GB LRDIMM and BPS)	HPR Silver fans	1U Standard Heatsink	Regular air shroud	No
		>165W to <205W			HPR 2U Heatsink		No
		>205W	Any DIMM type	VHPR Gold fans			No
		Any CPU configuration	BPS	VHPR Gold fans			No

Table 25. Thermal restrictions of VxRail P670F

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch with 4 universal slots + 4 x 2.5-inch rear storage**
CPU TDP	105 W	HPR Silver fan Supports at 35°C.
	120 W	
	135 W	
	150 W	
	165 W	
	185 W/190 W	
	205 W	HPR Gold fan Supports at 35°C.
	220 W	
	250 W	
	270 W	
Memory	BPS + DIMM <= 128GB	
	128 GB LRDIMM	HPR Gold fan Supports at 35°C if CPU TDP <= 165W Supports at 30°C if CPU TDP > 165W

NOTE:

- CPU TDP = 250 W/270 W supports up to 30°C ambient temperature.
- 5 percent performance drop with 220 W.
- Up to 30°C ambient temperature with CPU <= 205 W + 128 GB LRDIMMs only in 4 x 2.5-inch rear storage configuration.

Table 26. Thermal restrictions for BPS memory of VxRail P670F

Ambient Support Matrix for ICX CPU and BPS + DIMM <= 128GB		
Configuration	**Value**	**24 x 2.5-inch with 4 universal slots + 4 x 2.5-inch rear storage**
CPU TDP	105 W	HPR Gold fan Supports at 35°C.
	120 W/135 W	

Table 26. Thermal restrictions for BPS memory of VxRail P670F (continued)

Ambient Support Matrix for ICX CPU and BPS + DIMM <= 128GB		
Configuration	**Value**	**24 x 2.5-inch with 4 universal slots + 4 x 2.5-inch rear storage**
	150 W	
	165 W	
	185 W/190 W	
	205 W	
	220 W	
	250 W	
	270 W	
Memory	BPS + 64 GB RDIMM	
	BPS + 128 GB LRDIMM	

Table 27. System details of VxRail P670N

Configuration		**GPU**	**CPU (TDP)**	**DIMM (RDIMM/ LRDIMM/ BPS)**	**Fan**	**Heatsinks**	**Air shroud**	**DIMM blank**
Front storage	**Rear storage**							
24 x 2.5-inch All NVMe Switched	N/A	Non-GPU	<=165W	RDIMM/ LRDIMM	HPR Gold fans	1U Standard Heat sink	Regular air shroud	Will be covered as part of thermal profile SKU.
			>165W			HPR 2U Heat sink or 1U EXT Heatsink for 256GB LRDIMM		
24 x 2.5-inch All NVMe Switched	N/A	GPU	<=165W	<=128GB		1U EXT Heat sink	GPU shroud	
			>165W	No support available for 256 GB LRDIMM and BPS				

Table 28. Thermal restrictions of VxRail P670N for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**TDP value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP	105 W	1U STD HSK and HPR Gold fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK and HPR Gold fans Supports at 35°C.
	190 W	

Table 28. Thermal restrictions of VxRail P670N for non-GPU configuration (continued)

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**TDP value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

Table 29. Thermal restrictions of VxRail P670N with memory <= 64GB for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP / Memory <= 64GB 3200 MT/S	105 W	1U STD HSK and HPR Gold fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK and HPR Gold fans Supports at 35°C.
	190 W	
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

Table 30. Thermal restrictions of VxRail P670N with memory <= 128GB LRDIMM for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP / Memory <= 128GB 3200 MT/S	105 W	1U STD HSK and HPR Gold fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK and HPR Gold fans Supports at 35°C.
	190 W	

Table 30. Thermal restrictions of VxRail P670N with memory <= 128GB LRDIMM for non-GPU configuration (continued)

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

Table 31. Thermal restrictions of VxRail P670N with memory <= 256GB LRDIMM for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP / Memory <= 256GB 3200 MT/S	105 W	1U STD HSK and HPR Gold fans (1 DPC) Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK and HPR Gold fans (1 DPC) Supports at 30°C.
	190 W	
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

NOTE: Request HPR GOLD FAN for 2.5-inch configurations and 1U-EXT HSK for all CPUs 105W~270W and new CPU HSK blank (V2778).

Table 32. Thermal restrictions of VxRail P670N with BPS + DIMM <= 128GB for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP / BPS + DIMM <= 128GB 3200 MT/S	105 W	1U STD HSK and HPR Gold fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	

Table 32. Thermal restrictions of VxRail P670N with BPS + DIMM <= 128GB for non-GPU configuration (continued)

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
	165 W	
	185 W	2U HPR HSK and HPR Gold fans Supports at 35°C.
	190 W	
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

Table 33. Thermal restrictions of VxRail P670N with BPS + 256GB LRDIMM for non-GPU configuration

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch All NVMe (NVMe Switch)**
CPU TDP / BPS + 256GB LRDIMM 3200 MT/S	105 W	1U STD HSK and HPR Gold fans Supports at 30°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK and HPR Gold fans Supports at 30°C.
	190 W	
	205 W	
	225 W	
	230 W	
	240 W	
	250 W	
	270 W	

NOTE: Request HPR GOLD FAN for 2.5-inch configurations and 1U-EXT HSK for all CPUs 105W~270W and new CPU HSK blank (V2778).

Table 34. System details of VxRail V670F

Configuration		CPU (TDP)	DIMM (RDIMM/ LRDIMM/ BPS)	Fan/ Quantity	Heatsinks	Air shroud	DIMM blank
Front storage	**Rear storage**						
24 x 2.5-inch with 4 universal slots	N/A	Any CPU configuration	Any DIMM type	VHPR Gold fans	HPR T-Type HSK	GPU air shroud	No

Table 35. Thermal restrictions of VxRail V670F with GPU + DIMM <= 128GB

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**24 x 2.5-inch with 4 universal slots**
CPU TDP	105 W	HPR Gold fan Supports at 35°C.
	120 W	
	135 W	
	150 W	
	165 W	
	185 W/190 W	
	205 W	
	220 W	
	250 W	
	270 W	
Memory/GPU	SW GPU + BPS + DIMM <= 128GB	HPR Gold fan Supports at 30°C.

NOTE: DW GPU +BPS configuration supports up to 25°C.

Table 36. System details of VxRail S670

Configuration		CPU (TDP)	DIMM (RDIMM/ LRDIMM/ BPS)	Fan	Heatsinks	Air shroud	DIMM blank
Front storage	**Rear storage**						
12 x 3.5-inch	4 x 2.5-inch SAS/SATA rear storage 4x2.5-inch NVMe rear storage	<=165W	RDIMM/ LRDIMM	HPR Silver fans	1U STD Heatsink	Regular air shroud	No
		>165W			2U HPR Heatsink		No

Table 37. Thermal restrictions of VxRail S670

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**TDP value**	**12 x 3.5-inch front storage + 4 x 2.5-inch SAS rear storage** **12 x 3.5-inch front storage + 4 x 2.5-inch NVMe rear storage**
CPU TDP	105 W	1U STD HSK & HPR Silver fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK & HPR Silver fan Supports at 35°C.
	190 W	

Table 37. Thermal restrictions of VxRail S670 (continued)

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**TDP value**	**12 x 3.5-inch front storage + 4 x 2.5-inch SAS rear storage** **12 x 3.5-inch front storage + 4 x 2.5-inch NVMe rear storage**
	205 W	
	225 W	
	230 W	2U HPR HSK & HPR Silver fan Supports at 30°C.
	240 W	
	250 W	
	270 W	

Table 38. Thermal restrictions of VxRail S670 with memory <= 64GB

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**12 x 3.5-inch front storage + 4 x 2.5-inch SAS rear storage** **12 x 3.5-inch front storage + 4 x 2.5-inch NVMe rear storage**
CPU TDP/Memory <= 64GB 3200 MT/S	105 W	1U STD HSK & HPR Silver fans Supports at 35°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK & HPR Silver fan Supports at 35°C.
	190 W	
	205 W	
	225 W	
	230 W	2U HPR HSK & HPR Silver fan Supports at 30°C.
	240 W	
	250 W	
	270 W	

NOTE:

- CPU TDP 230 W - 270 W with 4 x 2.5-inch rear storage supports up to 30°C ambient temperature.
- Do not support 256 GB LRDIMM.
- Do not support BPS memory.

Table 39. Thermal restrictions of VxRail S670 with memory 128GB LRDIMM

Ambient Support Matrix for ICX CPU (2S)		
Configuration	**Value**	**12 x 3.5-inch front storage + 4 x 2.5-inch SAS rear storage** **12 x 3.5-inch front storage + 4 x 2.5-inch NVMe rear storage**
CPU TDP/Memory 128GB LRDIMM 3200 MT/S	105 W	1U STD HSK & HPR Silver fans Supports at 30°C.
	120 W	
	135 W	
	140 W	
	150 W	
	165 W	
	185 W	2U HPR HSK & HPR Silver fan Supports at 30°C.
	190 W	
	205 W	
	225 W	
	230 W	Not supported
	240 W	
	250 W	
	270 W	

NOTE:
- CPU TDP 230 W - 270 W with 4 x 2.5-inch rear storage is not supported.
- Do not support 256 GB LRDIMM.
- Do not support BPS memory.

Particulate and gaseous contamination specifications

This section defines the limitations that help avoid any equipment damage or failure from particulate and gaseous contamination.

If the levels of particulate or gaseous pollution exceed the specified limitations and result in equipment damage or failure, you must rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 40. 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. The ISO Class 8 condition applies to data center environments only. This air filtration requirement does 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.

Table 41. Gaseous contamination specifications

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