Dell EMC VxFlex Appliance and VxFlex Ready Node R740xd

Owner's Guide

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DELL EMC

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Dell EMC
Hopkinton, Massachusetts 01748-9103
1-508-435-1000 In North America 1-866-464-7381
www.DellEMC.com

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CHAPTER 1

About this guide

This guide provides an overview of the VxFlex Appliance and VxFlex Ready Node R740xd system, diagnostic tools, and technical specifications.

Use this guide for information about your system.

- Typographical conventions 6
- Notes, cautions, and warnings 6

Typographical conventions

Dell EMC uses the following type style conventions in this document:

Bold	Used for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
Italic	Used for full titles of publications referenced in text
`Monospace`	Used for: • System code • System output, such as an error message or script • Pathnames, filenames, prompts, and syntax • Commands and options
Monospace italic	Used for variables
`Monospace bold`	Used for user input
[ ]	Square brackets enclose optional values
|	Vertical bar indicates alternate selections - the bar means “or”
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

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.

CHAPTER 2

VxFlex appliance and VxFlex Ready Node R740xd system overview

The R740xd system is a 2U rack server that supports a maximum of:

- All
  - Two Intel Xeon Scalable Processors
  - 24 DIMM slots
  - Two AC or DC power supply units
  - 24 SAS or SATA drives, and up to 24 NVMe drives. For more information about supported drives, see Technical specifications on page 21
- VxFlex Ready Node only
  - Up to 32 SAS, SATA drives, and up to 24 NVMe drives. For more information about supported drives, see Technical specifications on page 21. Only VxFlex Ready Node supports HDD.

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

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Front view of the R740xd system

The front view displays the features available on the front of the system.

Figure 1 Front view R740xd system

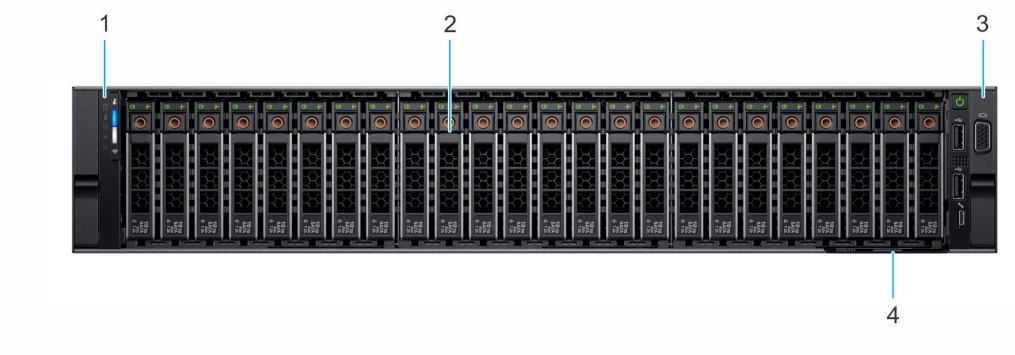


Table 1 Features available on the front of the 24 x 2.5 inch drive R740xd system

Item	Ports, panels, and slots	Icon	Description
1	Left control panel	N/A	Contains system health and system ID, status LED and optional iDRAC Quick Sync 2 (wireless).
2	Drive slots	N/A	Enable you to install drives that are supported on your system. For more information, 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 system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password.

Left control panel view

The left control panel with optional iDRAC Quick Sync 2.0 indicator is explained as follows:

Figure 2 Left control panel

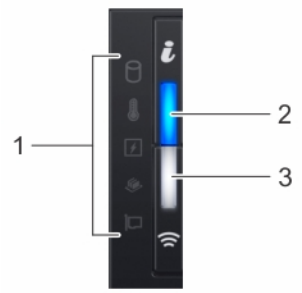


Table 2 Left control panel options

Item	Indicator or button	Icon	Description
1	Status LED indicators	N/A	Indicate the status of the system. For more information, see Status LED indicators.
2	System health and system ID indicator		Indicates the system health. For more information, see System health and system ID indicator codes.
3	iDRAC Quick Sync 2 wireless indicator (optional)		Indicates if the iDRAC Quick Sync 2 wireless option is activated. The Quick Sync 2 feature allows management of the system using mobile devices. This feature aggregates hardware/firmware inventory and various system level diagnostic/error information that can be used in troubleshooting the system. You can access system inventory, Dell EMC Lifecycle Controller logs or system logs, system health status, and also configure iDRAC, BIOS, and networking parameters. You can also launch the virtual Keyboard, Video, and Mouse (KVM) viewer and virtual Kernel based Virtual Machine (KVM), on a supported mobile device. For more information about the feature, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals. **Note:** iDRAC Quick Sync 2 wireless indicator is available only on certain configurations.
Note: For more information about the indicator codes, see System diagnostics and indicator codes.			

Right control panel view

The right control panel is explained as follows:

Figure 3 Right control panel

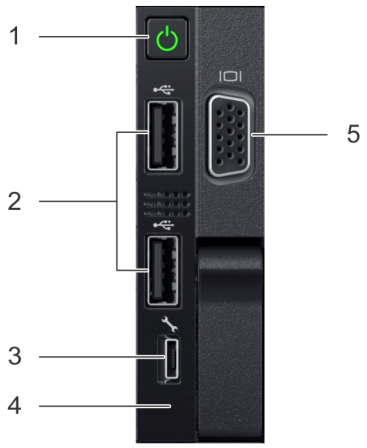


Table 3 Right control panel features

Item	Indicator or button	Icon	Description
1	Power button		Indicates if the system is turned on or off. Press the power button to manually turn on or off the system. **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 system.
3	iDRAC Direct port	N/A	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 *Integrated Dell Remote Access Controller User's Guide* at www.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 the iDRAC Direct LED indicator codes.
5	VGA port		Enables you to connect a display device to the system. For more information, see Technical specifications.

LCD panel

The LCD panel provides system information, status, and error messages to indicate whether the system is functioning correctly or requires attention. The LCD panel can also be used to configure or view the system's iDRAC IP address.

The LCD panel is available only on the optional front bezel. The optional front bezel is hot pluggable.

The statuses and conditions of the LCD panel are outlined here:

- The LCD backlight is white during normal operating conditions.
- When the system needs attention, the LCD backlight turns amber, and displays an error code followed by descriptive text.
  Note: If the system is connected to a power source and an error is detected, the LCD turns amber regardless of whether the system is turned on or off.
- When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.
- If the LCD panel stops responding, remove the bezel and reinstall it.
  If the problem persists, see "Getting help" at the end of this publication.
- The LCD backlight remains off if LCD messaging is turned off using the iDRAC utility, the LCD panel, or other tools.

Figure 4 LCD panel

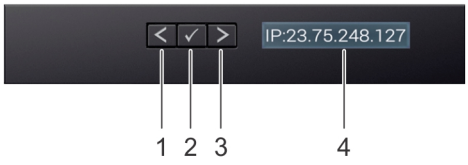


Table 4 LCD panel features

Item	Button or display	Description
1	Left	Moves the cursor back in one-step increments.
2	Select	Selects the menu item that is highlighted by the cursor.
3	Right	Moves the cursor forward in one-step increments. During message scrolling: • Press and hold the right button to increase scrolling speed. • Release the button to stop. **Note:** The display stops scrolling when the button is released. After 45 seconds of inactivity, the display starts scrolling.
4	LCD display	Displays system information, status, and error messages or iDRAC IP address.

Viewing Home screen

The **Home** screen displays user-configurable information about the system. This screen is displayed during normal system operation when there are no status messages or errors. When the system turns off and there are no errors, LCD enters the standby mode after five minutes of inactivity. Press any button on the LCD to turn it on.

Procedure

1. To view the **Home** screen, press one of the three navigation buttons (Select, Left, or Right).
2. To navigate to the **Home** screen from another menu, complete the following steps:
   a. Press and hold the navigation button till the up arrow is displayed.
   b. Navigate to the **Home** icon using the up arrow .
   c. Select the **Home** icon.
   d. On the **Home** screen, press the **Select** button to enter the main menu.

Setup menu

The **Setup** menu contains the following options:

Note: When you select an option in the **Setup** menu, you must confirm the option before proceeding to the next action.

iDRAC

Select **DHCP** or **Static IP** to configure the network mode. If **Static IP** is selected, the available fields are **IP**, **Subnet (Sub)**, and **Gateway (Gtw)**. Select **Setup DNS** to enable DNS and to view domain addresses. Two separate DNS entries are available.

Set error

Select **SEL** to view LCD error messages in a format that matches the IPMI description in the SEL. This enables you to match an LCD message with an SEL entry.
Select **Simple** to view LCD error messages in a simplified user-friendly description. For information about the event and error messages generated by the system firmware and agents that monitor system components, see the Error Code Lookup page at qrl.dell.com

Set home

Select the default information to be displayed on the **Home** screen. See View menu section for the options and option items that can be set as the default on the **Home** screen.

View menu

The **View** menu contains the following options:

Note: When you select an option in the **View** menu, you must confirm the option before proceeding to the next action.

iDRAC IP

Displays the **IPv4** or **IPv6** addresses for iDRAC9. Addresses include **DNS** (**Primary** and **Secondary**), **Gateway**, **IP**, and **Subnet** (IPv6 does not have Subnet).

MAC

Displays the MAC addresses for **iDRAC**, **iSCSI**, or **Network** devices.

Name

Displays the name of the **Host**, **Model**, or **User String** for the system.

Number

Displays the **Asset tag** or the **Service tag** for the system.

Power

Displays the power output of the system in BTU/hr or Watts. The display format can be configured in the **Set home** submenu of the **Setup** menu.

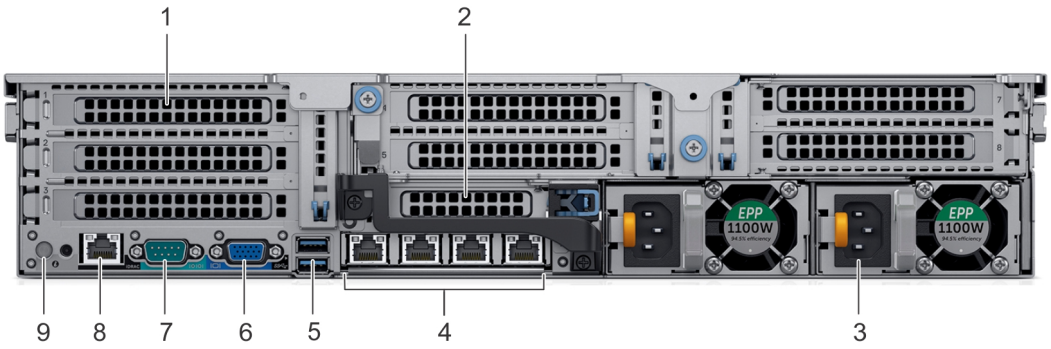
Temperature

Displays the temperature of the system in Celsius or Fahrenheit. The display format can be configured in the **Set home** submenu of the **Setup** menu.

Back view of the R740xd system

The back view displays the features available on the back of the system. The back views are different between the VxFlex Appliance andVxFlex Ready Node.

Figure 5 Back view of the R740xd



The following table lists the features available on the back view of the VxFlex Ready Node 4 x 2.5 inch drive system

Table 5 Back view features for the R740xd

Item	Ports, panels, or slots	Icon	Description
1	Full-height PCIe expansion card slot (7)	N/A	The PCIe expansion card slot (riser 1, 2 and 3) connects up to seven full-height PCIe expansion cards to the system. For more information, see Expansion bus specifications.
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 system. For more information, see Expansion bus specifications.
3	Power supply unit (2)	N/A	For more information, see Technical specifications.
4	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.
5	USB port (2)		The USB ports are 9-pin and 3.0-compliant. These ports enable you to connect USB devices to the system.
6	VGA port		Enables you to connect a display device to the system. For more information, see Technical specifications.
7	Serial port		Enables you to connect a serial device to the system. For more information, see Technical specifications.
8	iDRAC9 dedicated port		Enables you to remotely access iDRAC. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals.
10	System identification button		The System Identification (ID) button is available on the front and back of the system. Press the system ID button to identify a system in a rack. You can also use the system ID button to reset iDRAC and access BIOS using step-through mode.

Figure 6 Back view of the VxFlex Ready Node R740xd 4 x 2.5 inch drive system

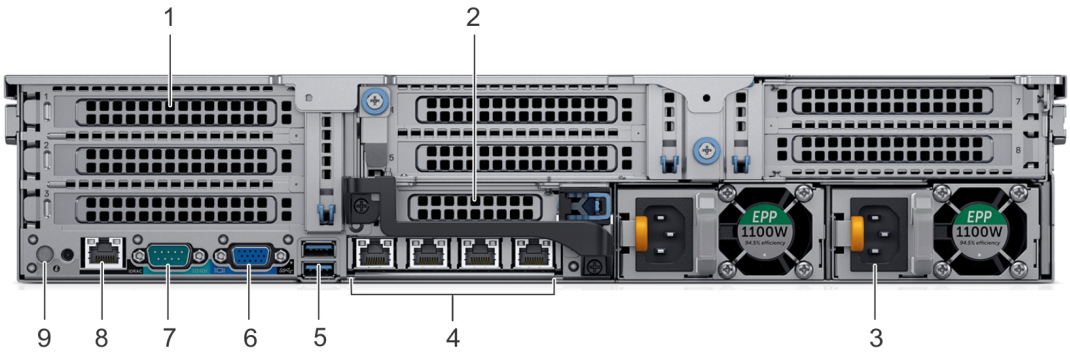


Table 6 Back view features for the VxFlex Ready Node R740xd 4 x 2.5 inch drive system

Item	Ports, panels, or 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 system. For more information, see Expansion bus specifications.

Table 6 Back view features for the VxFlex Ready Node R740xd 4 x 2.5 inch drive system (continued)

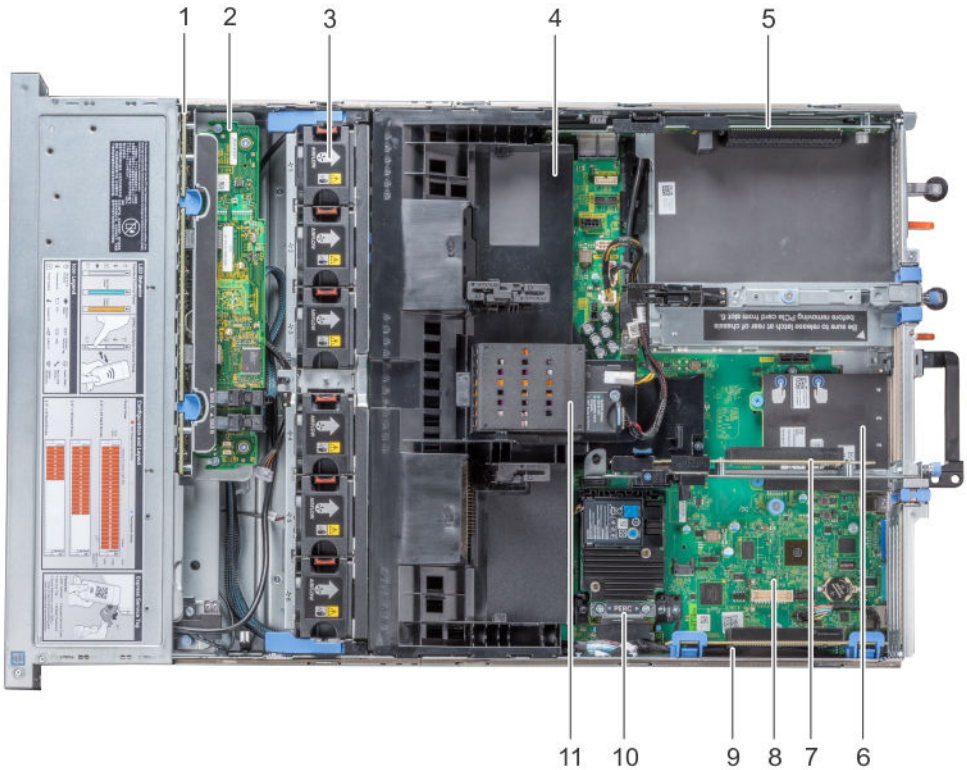
Item	Ports, panels, or slots	Icon	Description
2	Half-height PCIe expansion card slot	N/A	The PCIe expansion card slot (riser 2) connects one half-height PCIe expansion cards to the system. For more information, see Expansion bus specifications.
3	Rear handle	N/A	The rear handle can be removed to enable any external cabling of PCIe cards that are installed in PCIe expansion card slot 6.
4	Rear disk drive (4)	N/A	This system supports 4 x 2.5 inch drives in the back of the appliance.
5	Power supply unit (2)		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 system.
8	VGA port		Enables you to connect a display device to the system. For more information, see Technical specifications.
9	Serial port		Enables you to connect a serial device to the system. For more information, see Technical specifications.
10	iDRAC9 dedicated port		Enables you to remotely access iDRAC. For more information, see the *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals.
11	System identification button		The System Identification (ID) button is available on the front and back of the system. Press the system ID button to identify a system in a rack. You can also use the system ID button to reset iDRAC and access BIOS using step-through mode.

Inside the system

Internal components that are hot swappable are marked orange and touch points on the components are marked blue.

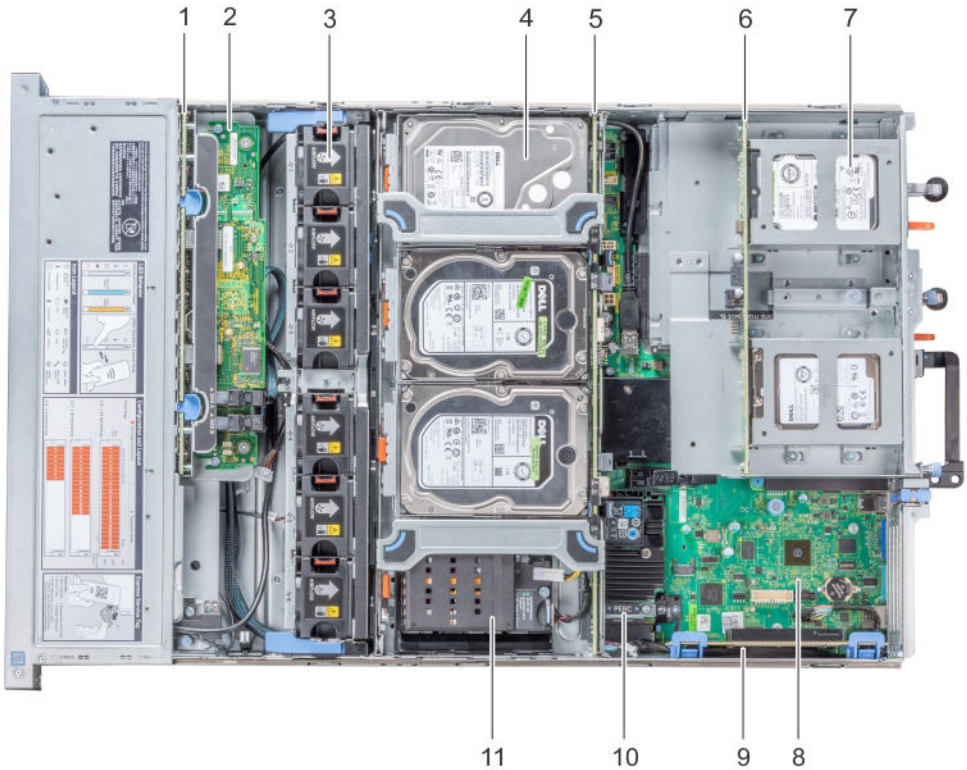
CAUTION Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell EMC is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

Figure 7 Inside your R740xd system



1. drive backplane
2. backplane expander card
3. cooling fan (6) in the cooling fan assembly
4. air shroud
5. expansion card riser 3
6. network daughter card
7. expansion card riser 2
8. system board
9. expansion card riser 1
10. integrated storage controller card
11. NVDIMM-N battery

Figure 8 Inside the system with mid-drive tray and rear drive cage (VxFlex Ready Node only)



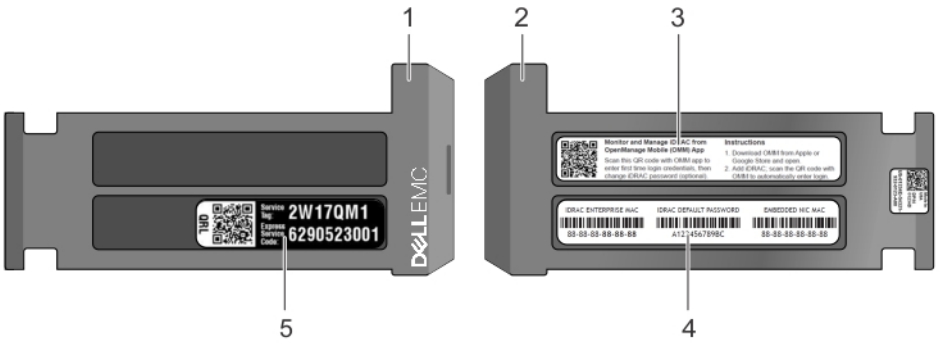
1. drive backplane
2. backplane expander card
3. cooling fan (6) in the cooling fan assembly
4. drive (4) in the mid drive tray
5. mid drive backplane
6. rear drive backplane
7. drive (2 or 4) in the rear drive cage
8. system board
9. expansion card riser 1
10. integrated storage controller card
11. NVDIMM-N battery

Locating the Service Tag of your system

You can identify your system using the unique Express Service Code and Service Tag. Pull out the information tag in the front of the system to view the Express Service Code and Service Tag. Alternatively, the information may be on a sticker on the chassis of the system.

The mini Enterprise Service Tag (EST) is found on the back of the system. This information is used by Dell EMC to route support calls to the appropriate personnel.

Figure 9 Service Tag



1. Information tag (top view)
2. Information tag (bottom view)
3. OpenManage Mobile (OMM) label (optional)
4. iDRAC MAC address and iDRAC secure password label

   Note: If you have opted for secure default access to iDRAC, the iDRAC secure default password is available on the back of the system Information tag. This section of label will be blank, if you have not opted for secure default access to iDRAC, then the default user name and password are root and Scaleio123, respectively.
5. Service Tag

System information tag

The Information tag is a slide-out label panel that contains system information such as Service Tag, NIC, MAC address, and so on. If you have opted for the secure default access to iDRAC, the Information tag also contains the iDRAC secure default password.

Front system information

Front system information explains LED behavior and displays hard drive configuration and layout

Note: The images below are standard images placed on systems that are based on PowerEdge technology. Not all options in these images are supported for VxFlex appliance and VxFlex Ready Node.

Figure 10 LED behavior

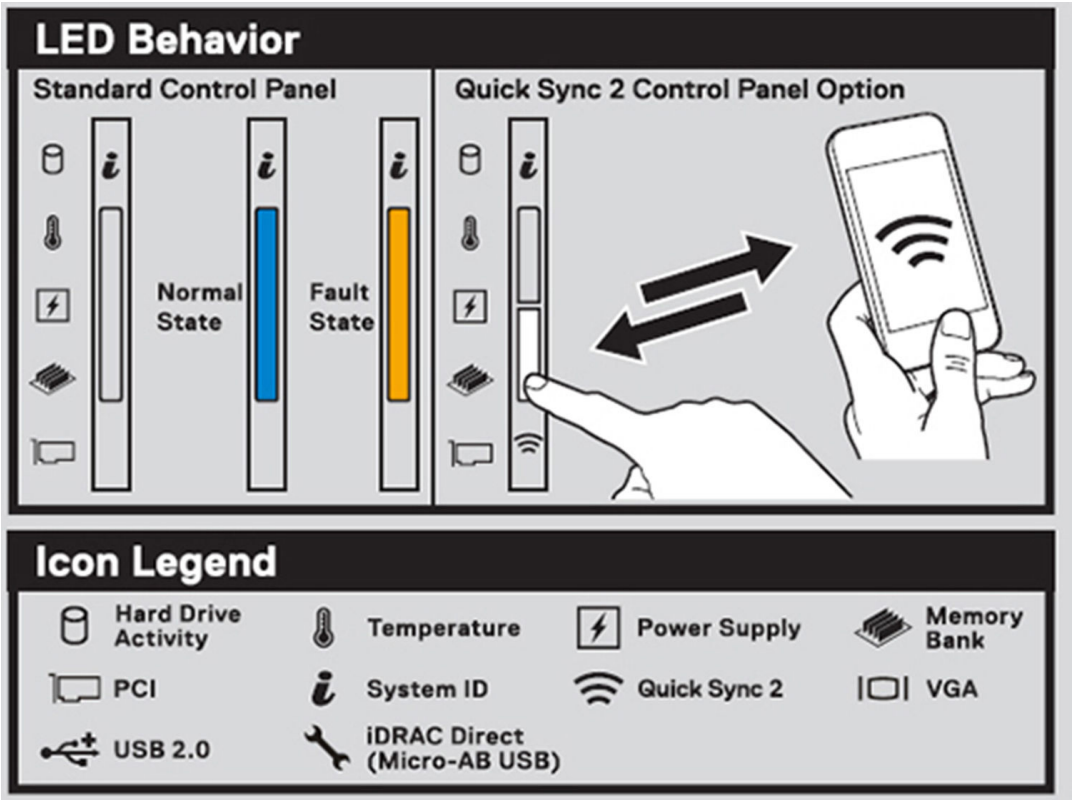
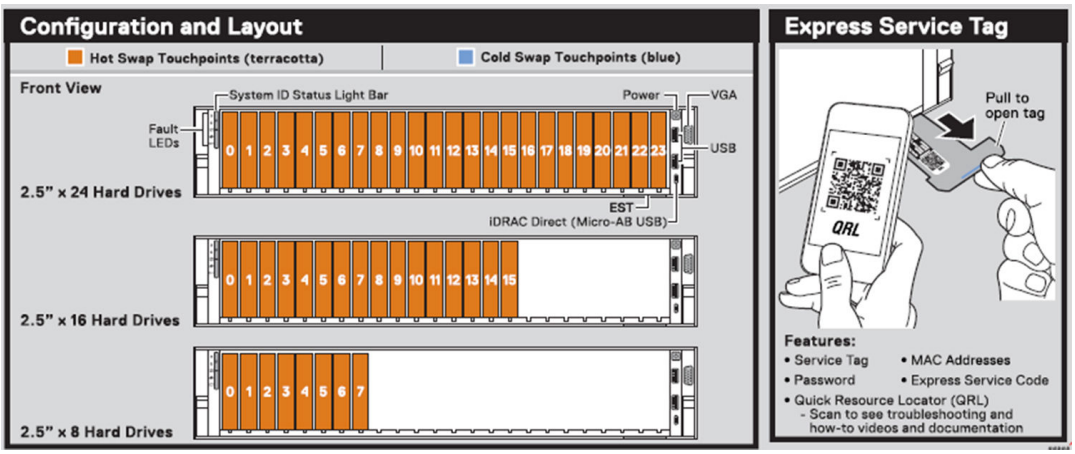


Figure 11 Drive configuration and layout



Service information

The information tag displays information to assist service technicians, including system touchpoints, electrical and mechanical overviews, and rear view configurations. It also displays jumper settings and memory information, and NVDIMM battery and mid-tray hard drive replacement instructions. Mid-tray and hard drives are only supported on VxFlex Ready Node.

Note: The images below are standard images placed on systems that are based on PowerEdge technology. Not all options in these images are supported for VxFlex appliance and VxFlex Ready Node.

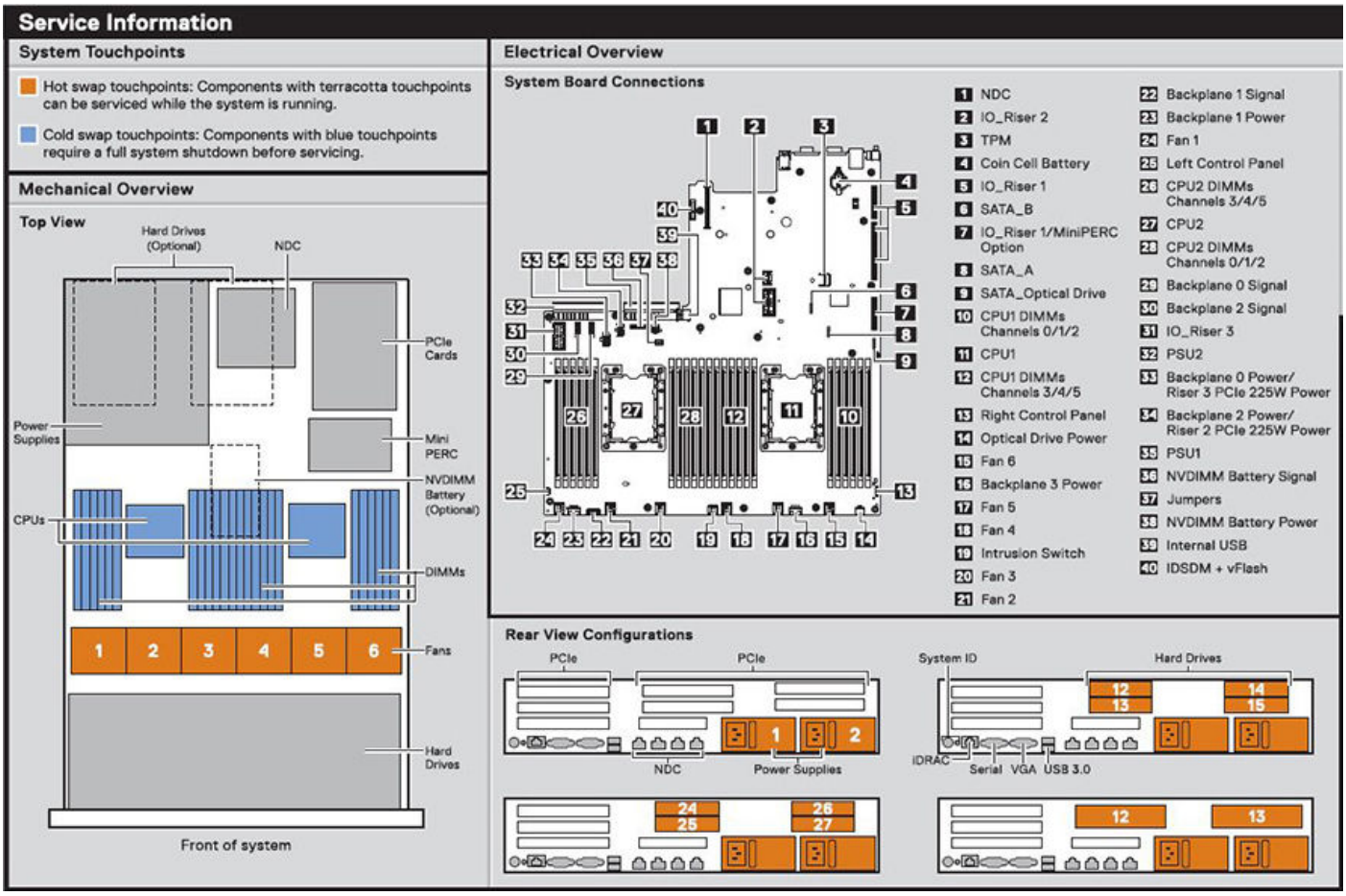
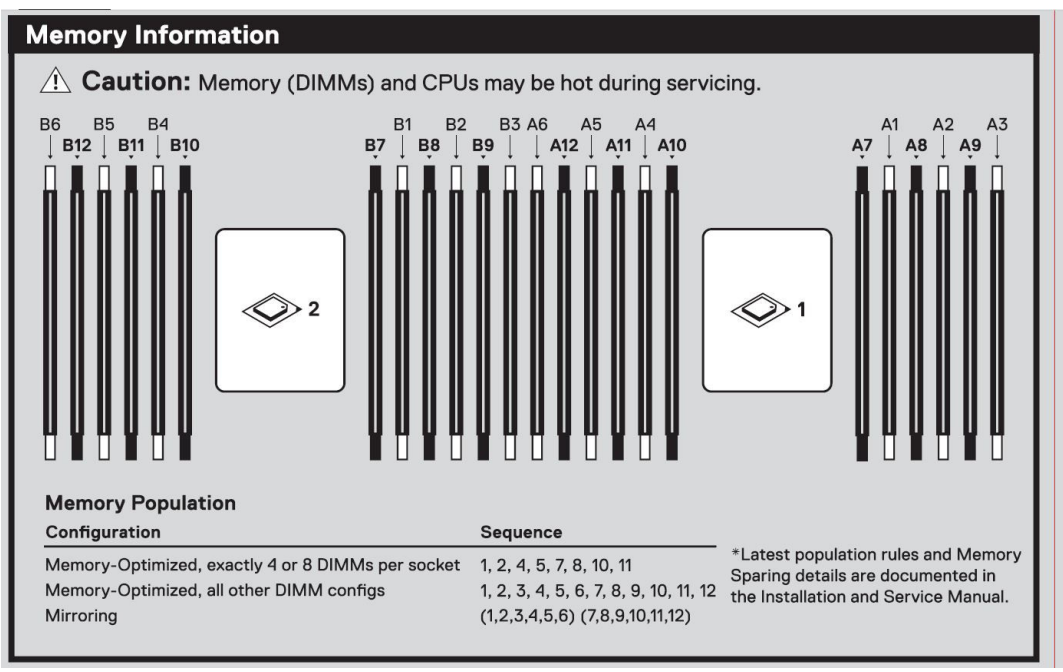


Figure 12 Jumper settings and memory information

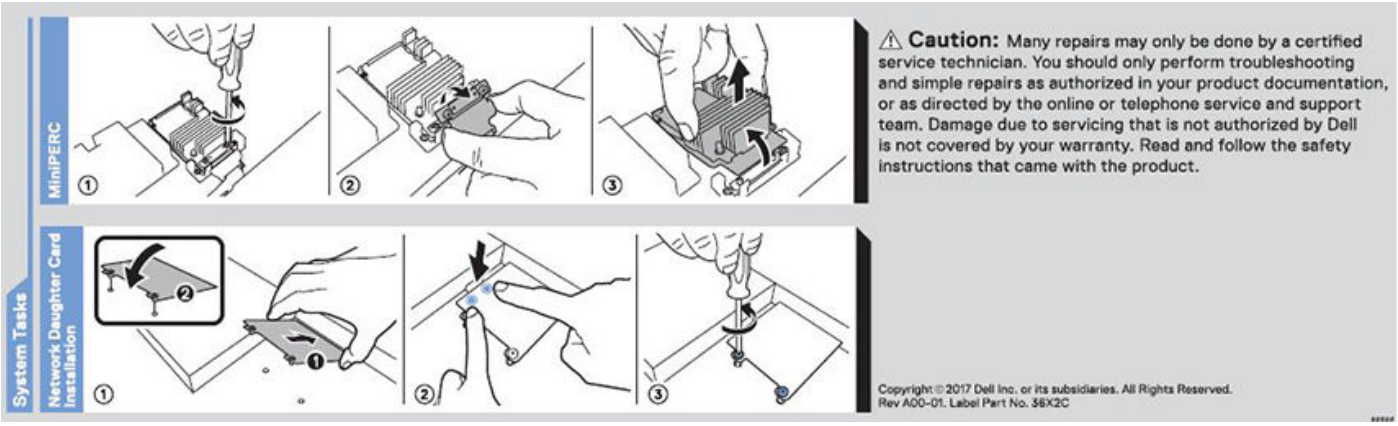


Memory Population

Configuration	Sequence
Memory-Optimized, exactly 4 or 8 DIMMs per socket	1, 2, 4, 5, 7, 8, 10, 11
Memory-Optimized, all other DIMM configs	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Mirroring	(1,2,3,4,5,6) (7,8,9,10,11,12)

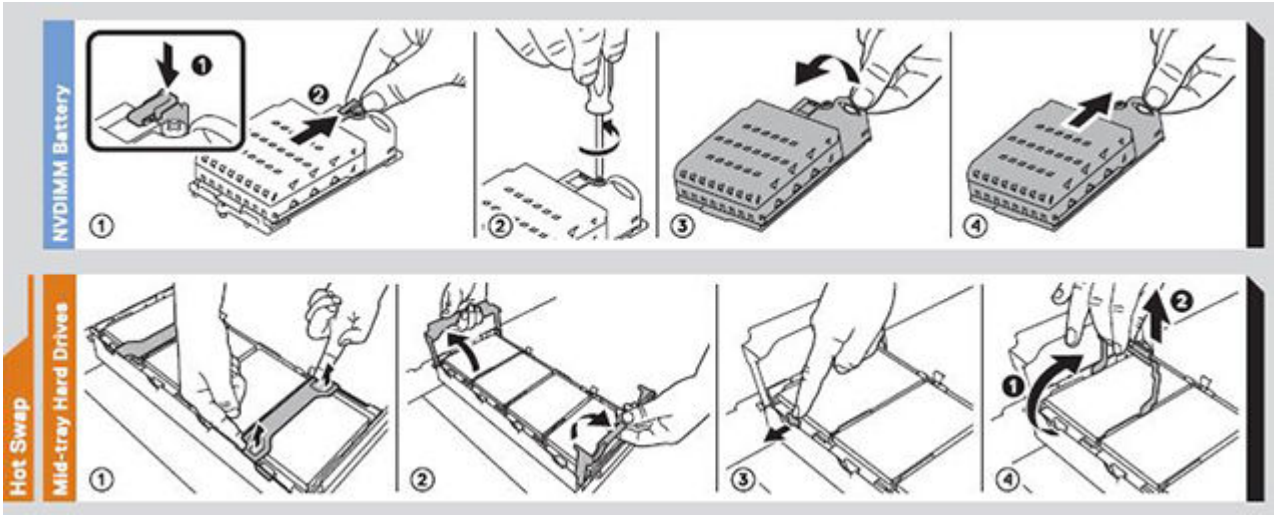
*Latest population rules and Memory Sparing details are documented in the Installation and Service Manual.

Figure 13 System tasks



Note: Mid-tray and hard drives are only supported on VxFlex Ready Node.

Figure 14 NVDIMM battery and mid-tray hard drives.



CHAPTER 3

Technical specifications

The technical and environmental specifications of your system are outlined in this section.

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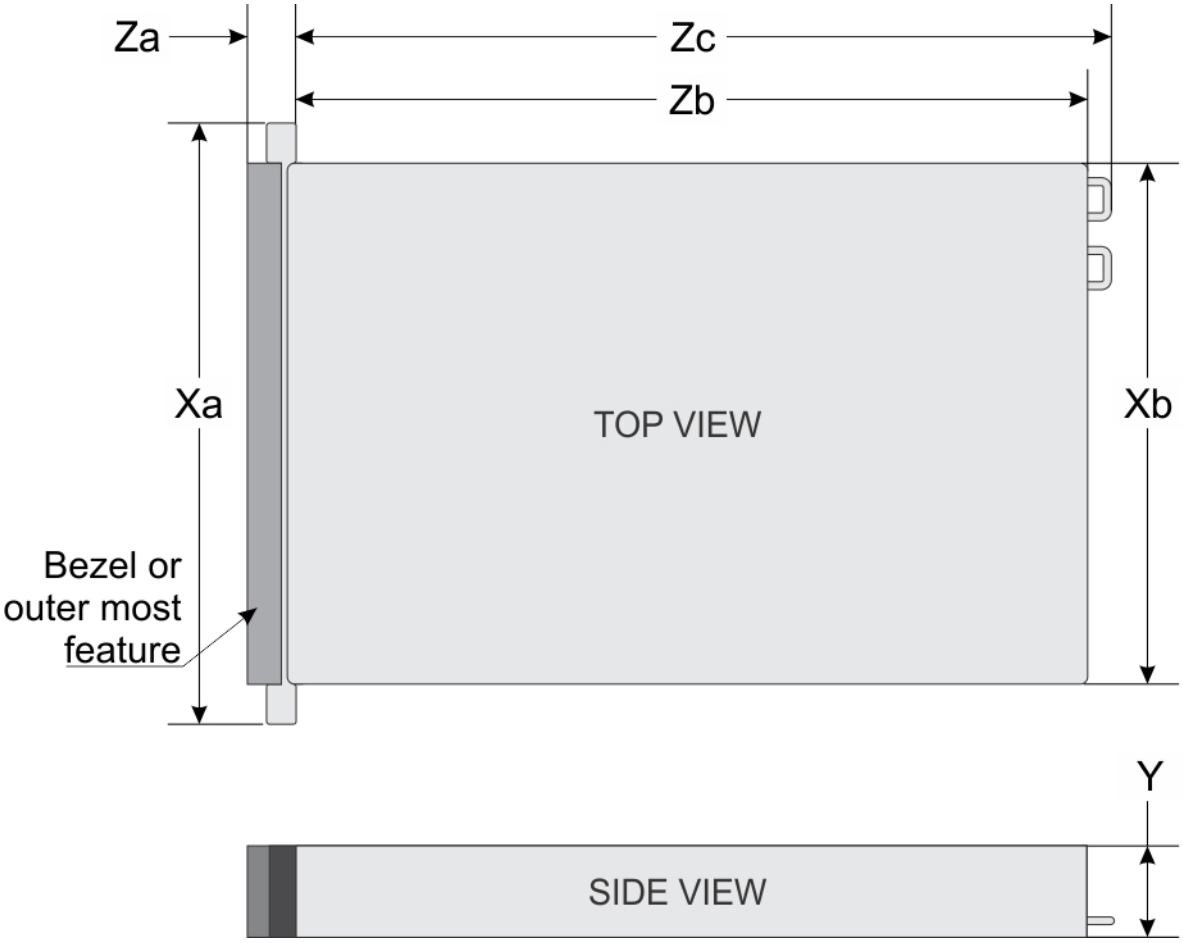
- Environmental specifications 29

System dimensions

This topic provides details of the R740xd system's dimensions:

Figure 15 System dimensions



This table gives details of the dimensions of the R740xd system:

Table 7 Dimensions

System	Xa	Xb	Y	Za (with bezel)	Za (without bezel)	Zb	Zc
R740xd	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

The following table shows the maximum weight of the R740xd system:

Table 8 Chassis weight

System	Maximum weight (with all drives/SSDs)
2.5 inch drive systems	28.1 kg (61.95 lb)

Processor specifications

The R740xd system supports up to two Intel Xeon Scalable Family Processors, up to 28 cores per processor.

Cooling fan specifications

The cooling fans are integrated into the system to dissipate the heat generated by the functioning of the system. These fans provide cooling for the processors, expansion cards, and memory modules.

Your system supports up to six standard or high-performance cooling fans.

Note:

- High-performance fans can be identified by a blue label on top of the cooling fan.
- Mixing of standard and high-performance cooling fans is not supported.
- Each fan is listed in the systems management software, referenced by the respective fan number. If there is a problem with a particular fan, you can easily identify and replace the proper fan by noting the fan number on the system.

PSU specifications

The R740xd system supports up to two AC or DC power supply units (PSUs).

The table below are the specifications for 1100 W, 1600 W, 2000 W and 2400 W power supplies:

Table 9 PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	High line 200v240 V	Low line 100– 140 V	DC	Current
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1100 W	1050 W		12 A–6.5 A
1100 W DC	N/A	4416 BTU/hr	N/A	–(48–60) V DC, autoranging			1100 W	32 A
1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1600 W	800 W		10 A
2000 W AC	Platinum	7500 BTU/hr	50/60 Hz	100–240 V AC, autoranging	2000 W	1000 W		11.5 A
2400 W AC	Platinum	9000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	2400 W	1400 W		16 A

Note: Heat dissipation is calculated using the PSU wattage rating.

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

System battery specifications

The R740xd system supports CR 2032 3.0-V lithium coin cell system batteries.

Expansion bus specifications

The R740xd system supports up to eight PCI express (PCIe) generation 3 expansion cards that can be installed on the system board using expansion card risers. The following tables provide detailed information about the expansion card riser specifications:

Table 10 Expansion card riser configuration for R740xd system

Expansion card riser	PCIe slots on the riser	Height	Length	Link
Riser 1A	Slot 1	Full Height	Full Length	x16
	Slot 3	Full Height	Half Length	x16
Riser 2A	Slot 4	Full Height	Full Length	x16
	Slot 5	Full Height	Full Length	x8
	Slot 6	Low Profile	Half Length	x8
Riser 3A	Slot 7	Full Height	Full Length	x8
	Slot 8	Full Height	Full Length	x16

Table 11 Additional expansion card riser configuration for R740xd system

Riser configuration and supported risers	Slot description	PCIe slots on riser 1 (Height and length)	Processor connection	PCIe slots on riser 2 (Height and length)	Processor connection	PCIe slots on riser 3 (Height and length)	Processor connection
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		
Riser configuration 9 (1A+2D+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

Table 11 Additional expansion card riser configuration for R740xd system (continued)

Riser configuration and supported risers	Slot description	PCIe slots on riser 1 (Height and length)	Processor connection	PCIe slots on riser 2 (Height and length)	Processor connection	PCIe slots on riser 3 (Height and length)	Processor connection
		Slot 3: x16 full-height, half length	Processor 1	Slot 6: x8 low profile, half length	Processor 1		

Memory specifications

The following table shows the memory specifications for the R740xd system:

Table 12 Memory specifications

DIMM type	DIMM rank	DIMM capacity	Dual processors	
			Minimum RAM	Maximum RAM
LRDIMM (VxFlex Ready Node only)	Octal Rank	128 GB	256 GB	3 TB
RDIMM	Dual rank	16 GB	32 GB	384 GB
RDIMM	Dual rank	32 GB	64 GB	768 GB
RDIMM	Dual rank	64 GB	128 GB	1536 GB
NVDIMM-N	Single rank	16 GB	RDIMM: 192 GB	RDIMM: 384 GB
			NVDIMM-N: 32 GB	NVDIMM-N: 96 GB

Note: 8 GB RDIMMs and NVDIMM-N must not be mixed.

Storage controller specifications

The R740xd system supports the following storage controller cards:

The H740p, and H730p internal and external cards are only supported on VxFlex Ready Node.

- Internal storage controller cards: RAID Controller PERC H740P, H730p, HBA330, and Boot Optimized Server Storage (BOSS-S1).
  The BOSS card is a simple RAID solution card designed specifically for booting a server's operating system. The card supports up to two 6 Gbps M.2 SATA drives. The BOSS adapter card has a x8 connector using PCIe gen 2.0 x2 lanes, available only in the low-profile and half-height form factor.
- External storage controller cards: PERC H740, H730p, and 12Gbps SAS HBA.

Drive specifications

The R740xd system supports SAS, SATA, or NVMe drives. Hard drives are only supported on the VxFlex Ready Node.

Table 13 Supported drive options for the VxFlex Appliance R740XD system

Drives	Definition
24 drives system	Up to 24 2.5 in. (SAS or SATA) front-accessible drives in slots 0–23
24 drives system	Up to 24 2.5-inch NVMe drives in bay 1 (slots 0–11) and bay 2 (slots 0–11)

Hard drives are only supported on the VxFlex Ready Node.

Table 14 Supported drive options for VxFlex Ready Node R740xd system

Drives	Definition
32 drive system	Up to 24 2.5 in. (SAS, SATA) front accessible drives in slots 0–23, up to four 2.5 in. (SAS, SATA) mid drives in slots 28–31, and up to four 2.5 in. (SAS, SATA) rear accessible drives in slots 24–27 . (VxFlex Ready Node only)
24 drive system	Up to 24 2.5 in. (SAS or SATA) front-accessible drives in slots 0–23
24 drive system	Up to 24 2.5-inch NVMe drives in bay 1 (slots 0–11) and bay 2 (slots 0–11)
24 drive system	Chassis with up to 24 x 2.5” hard drives for 1 CPU configuration (VxFlex Ready Node only)
24 drive system	Chassis up to 24 x 2.5” hard drives including maximum of 12 NVMe drives, 2 CPU configuration
24 drive system	Chassis with Up to 24 x 2.5” hard drives for 2 CPU

Ports and connector specifications

The R740xd system supports the following ports and connectors:

USB ports

The R740xd system supports the following USB ports:

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

NIC ports

The R740xd system 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:

Table 15 Supported NICs

NICs	VxFlex appliance	VxFlex Ready Node
Intel X710 DP 10Gb DA/SFP+, + I350 DP 1Gb Ethernet, Network Daughter Card	X	X
Intel X550 2 Port 10Gb Base-T + I350 2 Port 1Gb Base-T, rNDC		X
Intel X550 Dual Port 10G Base-T Adapter, Full Height		X

Table 15 Supported NICs (continued)

NICs	VxFlex appliance	VxFlex Ready Node
Intel X550 Dual Port 10G Base-T Adapter, Low Profile		X
Mellanox ConnectX-4 Lx Dual Port 25GbE DA/SPF rNDC	X	X
Mellanox ConnectX-4 Lx Dual Port 25GbE DA/SFP Network Adapter, Full Height	X	
Mellanox ConnectX-4 Lx Dual Port 25GbE DA/SFP Network Adapter, Full Height	X	
Mellanox ConnectX-4 Lx Dual Port 25GbE DA/SFP Network Adapter, Low Profile	X	
Mellanox ConnectX-4 Dual Port 100GbE QSFP28 PCIe Adapter, FH		X

VGA ports

The Video Graphic Array (VGA) port enables you to connect the system to a VGA display. The R740xd system supports two 15-pin VGA ports: one each on the front and back of the system.

Serial port

The R740xd system supports one serial connector on the back panel, which is a 9-pin connector, Data Terminal Equipment (DTE), 16550-compliant.

Video specifications

The R740xd system supports the integrated Matrox G200eW3 graphics controller with 16 MB of video frame buffer.

Table 16 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

The following tables describe the general environmental specifications for the R740xd system.

Note: For additional information about environmental certifications, see the *Product Environmental Datasheet* located with the Manuals & Documents at www.dell.com/poweredgemanuals.

Table 17 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 (68°F/h)

Table 18 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 19 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 20 Maximum shock specifications

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

Table 21 Maximum altitude specifications

Maximum altitude	Specifications
Operating	3048 m (10,000 ft)
Storage	12,000 m (39,370 ft)

Table 22 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 following table lists standard operating temperature specifications.

Table 23 Standard operating temperature specifications

Standard operating temperature	Specifications
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.

Expanded operating temperature

The following table lists expanded operating temperature specifications for the R740xd system.

Table 24 Expanded operating temperature specifications

Expanded operating temperature	Specifications
Continuous operation	5°C–40°C at 5% to 85% RH with 29°C dew point. **Note:** Outside the standard operating temperature (10°C–35°C), the system can operate continuously in temperatures as low as 5°C and as high as 40°C. For temperatures between 35°C–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–45°C at 5% to 90% RH with 29°C dew point. **Note:** Outside the standard operating temperature (10°C–35°C), the system 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, system 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

The following additional restrictions apply:

- 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 unit is required.
- Non-Dell qualified peripheral cards and/or peripheral cards greater than 25 W are not supported.
- PCIe SSD is not supported.
- DCPMMs are not supported.
- Mid drive tray is only supported on VxFlex Ready Node.
- Tape backup unit is not supported.

Ambient temperature limitations

The following table lists configurations that require ambient temperature of less than 35°C.

Note: The ambient temperature limit must be adhered to ensure proper cooling and to avoid excess processor throttling, which may impact system performance.

Table 25 Configuration based ambient temperature restrictions

System	Backplane	Processor Thermal Design Power (TDP)	Processor heat sink	Fan type	GPU	Ambient restriction
R740xd	24 x 2.5 inch SAS/SATA	150 W/8 core, 165 W/12 core, 200 W, 205 W	1U high performance	High performance fan	≥1 double-width/single-width	30°C
	24 x 2.5 inch SAS/SATA + 4 x 2.5 inch + 4 x 2.5 inch	150 W/8 core, 165 W/12 core, 200 W, 205 W	High performance fan		NA	25°C

Particulate and gaseous contamination specifications

The following table 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 may need to rectify the environmental conditions. Remediation of environmental conditions is the responsibility of the customer.

Table 26 Particulate contamination specifications

Particulate contamination	Specifications
Air filtration	Data center air filtration as defined by ISO Class 8 per ISO 14644-1 with a 95% upper confidence limit. **Note:** This condition applies to data center environments only. Air filtration requirements do not apply to IT equipment designed to be used outside a data center, in environments such as an office or factory floor. **Note:** Air entering the data center must have the 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 27 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.

CHAPTER 4

System diagnostics and indicator codes

This section explains the system diagnostics and indicator codes for your system.

- Indicator codes 34
- Using system diagnostics 41

Indicator codes

The diagnostic indicators on the system front panel display system status during system startup and assist you in diagnosing system health.

Status LED indicators

The status indicators display solid amber if any error occurs on the system.

Table 28 Status LED indicators and descriptions

Icon	Description	Condition	Corrective action
	Drive indicator	The indicator turns solid amber if there is a drive error.	• Check the System Event Log to determine if the drive has an error. • Run the appropriate Online Diagnostics test. Restart the system and run embedded diagnostics (ePSA).
	Temperature indicator	The indicator turns solid amber if the system 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. • System 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 on page 45.
	Electrical indicator	The indicator turns solid amber if the system 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 system 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 on page 45.
	Memory indicator	The indicator turns solid amber if a memory error occurs.	Check the System Event Log or system messages for the location of the failed memory. Reseat the memory module. If the problem persists, see Getting help on page 45.
	PCIe indicator	The indicator turns solid amber if a PCIe card experiences an error.	Restart the system. Update any required drivers for the PCIe card. Reinstall the card. If the problem persists, see Getting help on page 45.

System health and system ID indicator codes

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

Figure 16 System health and system ID indicators

Table 29 System health and system ID indicator codes

System health and system ID indicator code	Condition
Solid blue	Indicates that the system is turned on, the system is healthy, and system ID mode is not active. Press the system health and system ID button to switch to system ID mode.
Blinking blue	Indicates that the system ID mode is active. Press the system health and system ID button to switch to system health mode.
Solid amber	Indicates that the system is in fail-safe mode. If the problem persists, see Getting help on page 45.
Blinking amber	Indicates that the system is experiencing a fault. Check the System Event Log or the LCD panel, if available on the bezel, for specific error messages.

iDRAC Quick Sync 2 indicator codes

The iDRAC Quick Sync 2 module (optional) is located on the left control panel of your system.

Figure 17 iDRAC Quick Sync 2 indicators

Table 30 iDRAC Quick Sync 2 indicators and descriptions

iDRAC Quick Sync 2 indicator code	Condition	Corrective action
Off (default state)	Indicates that the iDRAC Quick Sync 2 feature is turned off. Press the iDRAC Quick Sync 2 button to turn on the iDRAC Quick Sync 2 feature.	If the LED fails to turn on, reseat the left control panel flex cable and check. If the problem persists, see "Getting help."
Solid white	Indicates that iDRAC Quick Sync 2 is ready to communicate. Press the iDRAC Quick Sync 2 button to turn off.	If the LED fails to turn off, restart the system. If the problem persists, see Getting help on page 45.
Blinks white rapidly	Indicates data transfer activity.	If the indicator continues to blink indefinitely, see Getting help on page 45.
Blinks white slowly	Indicates that firmware update is in progress.	If the indicator continues to blink indefinitely, see Getting help on page 45.
Blinks white five times rapidly and then turns off	Indicates that the iDRAC Quick Sync 2 feature is disabled.	Check if iDRAC Quick Sync 2 feature is configured to be disabled by iDRAC. If the problem persists, see Getting help on page 45. For more information, see *Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals or *Dell OpenManage Server Administrator User's Guide* atwww.dell.com/openmanagemanuals .

Table 30 iDRAC Quick Sync 2 indicators and descriptions (continued)

iDRAC Quick Sync 2 indicator code	Condition	Corrective action
Solid amber	Indicates that the system is in fail-safe mode.	Restart the system. If the problem persists, see Getting help on page 45.
Blinking amber	Indicates that the iDRAC Quick Sync 2 hardware is not responding properly.	Restart the system. If the problem persists, see Getting help on page 45.

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.

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:

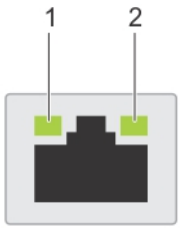
Table 31 iDRAC Direct LED indicator codes

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.

NIC indicator codes

Each NIC on the back of the system 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 18 NIC indicator codes



1. Link LED indicator
2. Activity LED indicator

The NIC indicators table describes different NIC indicator codes and condition of the connectivity.

Table 32 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.

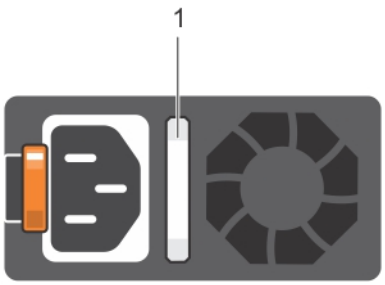
Power supply unit indicator codes

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

For more information about the PSU specifications, see the technical specifications for your system.

For information about the event and error messages generated during POST, see the Dell Event and Error Messages Reference Guide at www.dell.com/openmanagemanuals.

Figure 19 AC PSU status indicator



1. AC PSU status indicator/handle

Table 33 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.

Table 33 AC PSU status indicator codes (continued)

Power indicator codes	Condition
Blinking green	When the firmware of the PSU is being updated, the PSU handle blinks green. CAUTION Do not disconnect the power cable, or unplug the PSU when updating firmware. If a 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 regarding 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, the Extended Power Performance (EPP) label. Mixing PSUs from previous generations of systems based on PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition, or failure to turn on the system. 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 system shutdown. To change from a high output configuration to a low output configuration or conversely, you must turn off the system. AC PSUs support both 240 V and 120 V input voltages except for 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 20 DC PSU status indicator

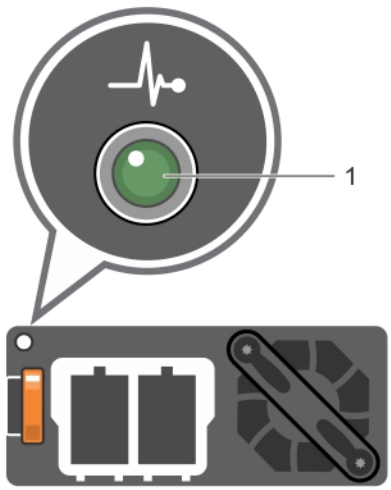


Figure 20 DC PSU status indicator (continued)

1. DC PSU status indicator

Table 34 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 regarding 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 of systems based on PowerEdge servers is not supported, even if the PSUs have the same power rating. This results in a PSU mismatch condition, or failure to turn on the system. 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 system shutdown. To change from a High Output configuration to a Low Output configuration or conversely, you must turn off the system. CAUTION Combining AC and DC PSUs is not supported and triggers a mismatch.

Drive indicator codes

The LEDs on the drive carrier indicate the state of each drive. Each drive carrier in your system has two LEDs: an activity LED (green) and a status LED (bicolor, green/amber). The activity LED flashes whenever the drive is accessed. The status LED indicator indicates the power condition of the drive.

Figure 21 Drive indicators on the drive and the mid drive tray backplane

1. Drive activity LED indicator
2. Drive status LED indicator
3. Drive capacity label

Note: If the drive is in the Advanced Host Controller Interface (AHCI) mode, the status LED indicator does not turn on.

Table 35 Drive indicator codes

Drive status indicator code	Condition
Flashes green twice per second	Identifying drive or preparing for removal.
Off	Drive ready for removal. **Note:** The drive status indicator remains off until all drives are initialized after the system is turned on. 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	Drive failed.
Flashes green slowly	Drive rebuilding.
Solid green	Drive online.
Flashes green for three seconds, amber for three seconds, and then turns off after six seconds	Rebuild stopped.

Using system diagnostics

If you experience a problem with your system, run the system diagnostics before contacting Dell EMC for technical assistance. The purpose of running system diagnostics is to test your system hardware without using additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use the diagnostics results to help you solve the problem.

Dell Embedded System Diagnostics

The Embedded System Diagnostics provides a set of options for particular device groups or devices.

Also known as Enhanced Pre-boot System Assessment (ePSA) diagnostics, Embedded System Diagnostics allows you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

Running Embedded System Diagnostics from Boot Manager

If your system does not boot., run the Embedded System Diagnostics (ePSA).

Procedure

1. While the system is booting, press F11.
2. Use the keyboard arrows to select **System Utilities** > **Launch Diagnostics**.

Results

The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Running Embedded System Diagnostics from the Dell Lifecycle Controller

Perform the following steps to run the Embedded System Diagnostics from the Dell Lifecycle Controller.

Procedure

1. While the system is booting, press F10.
2. Select **Hardware Diagnostics** > **Run Hardware Diagnostics**.

   The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

Results

The **ePSA Pre-boot System Assessment** window is displayed, listing all devices detected in the system. The diagnostics starts executing the tests on all the detected devices.

System diagnostic controls

Configuration

Displays the configuration and status information of all detected devices.

Results

Displays the results of all tests that are run.

System health

Provides the current overview of the system performance.

Event log

Displays a time-stamped log of the results of all tests run on the system. This is displayed if at least one event description is recorded.

CHAPTER 5

Reference material

This section contains additional information that may be required for the procedures described in this document.

- Trusted Platform Module.....44

Trusted Platform Module

The Trusted Platform Module (TPM) is a dedicated microprocessor designed to secure hardware by integrating cryptographic keys into devices. Software can use a TPM to authenticate hardware devices.

Because each TPM chip contains a unique and secret RSA key embedded during the TPM's manufacture, the TPM is capable of performing platform authentication.

The TPM must be replaced only while installing a new system board.

Upgrading the Trusted Platform Module

Before you begin

- Follow all safety guidelines.
- Ensure that your operating system supports the version of the TPM being installed.
- Ensure that you download and install the latest BIOS firmware on your system.
- Ensure that the BIOS is configured to enable UEFI boot mode.

About this task

CAUTION If you are using the Trusted Platform Module (TPM) with an encryption key, you may be prompted to create a recovery key during program or System Setup. Ensure that you create and safely store this recovery key. If you replace this system board, you must supply the recovery key when you restart your system or program before you can access the encrypted data on your hard drives.

CAUTION After the TPM plug-in module is installed, it is cryptographically bound to that specific system board. Any attempt to remove an installed TPM plug-in module breaks the cryptographic binding, the removed TPM cannot be reinstalled or installed on another system board.

Initialize the TPM for BitLocker users

Procedure

1. Initialize the TPM.

   For more information, see https://technet.microsoft.com/en-us/library/cc753140.aspx.

   The **TPM Status** changes to **Enabled, Activated**.

Initialize the TPM 1.2 for TXT users

Procedure

1. While booting the system, press F2 to enter System Setup.
2. In the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
3. From the **TPM Security** option, select **On with Pre-boot Measurements**.
4. From the **TPM Command** option, select **Activate**.
5. Save the settings.
6. Restart the system.
7. Enter **System Setup** again.
8. On the **System Setup Main Menu** screen, click **System BIOS** > **System Security Settings**.
9. From the **Intel TXT** option, select **On**.

CHAPTER 6

Getting help

This section explains the different resources available for getting help for your system.

- Contacting Dell EMC 46
- Secure Remote Services 46
- Recycling or End-of-Life service information 46

Contacting Dell EMC

Use this topic to learn how to contact Dell EMC.

About this task

Dell EMC provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical support, or customer service issues use the steps in this task.

Note: If you do not have an active internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell EMC product catalog.

Procedure

1. Go to **https://dell.com/support/incidents-online/contactus**.
2. For customized support:
   a. Type your system **Service Tag** in the **Service Tag** box.
   b. Click **Submit**.
3. For general support:
   a. Select your product category.
   b. Select your product segment.
   c. Select your product.

   The support page that lists the various support categories is displayed.

Secure Remote Services

Secure Remote Services (formerly ESRS) is a secure, two-way connection between Dell EMC products and Dell EMC Customer Support that helps customers avoid and resolve issues up to 73 percent faster. It is completely virtual and offers flexibility for enterprise environments of any size.

Key benefits

- Proactive wellness monitoring and issue prevention
- Automated issue detection, notification and case creation for quicker uptime
- Predictive analytics-based recommendations through MyService360 and product consoles

The Secure Remote Services lifeline is a heartbeat that pulses outbound from the Secure Remote Services gateway to Dell EMC Customer Service in 30-second intervals, providing Dell EMC with connectivity status as well as the status of each product. The heartbeat ensures continuous monitoring, notification, and if necessary, proactive remote troubleshooting to ensure high availability of your products. As a result, you will experience faster resolution and greater uptime.

Recycling or End-of-Life service information

Take back and recycling services are offered for this product in certain countries.

If you want to dispose of system components, visit Dell.com/recyclingworldwide and select the relevant country.