Dell EMC PowerEdge MX7000 Enclosure

Installation and Service Manual

Regulatory Model: E44S Series
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DELL Technologies

Notes, cautions, and warnings

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

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

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

Contents

Chapter 1: About this document **6**

Chapter 2: Next Generation Modular overview **7**
PowerEdge MX architecture overview 10

Chapter 3: Enclosure overview **11**
Front view of the enclosure 12
Control panel 12
PSU indicators 15
Fan module indicator codes 16
Back view of the enclosure 17
Management module indicator codes 18
Locating the information tag of your system 19

Chapter 4: Initial system setup and configuration **20**
Setting up your enclosure 20
Management module configuration 20
Options to set up the management module IP address 20
Log in to the management module 21
Methods to download firmware and drivers 21
Downloading drivers and firmware 22
LCD touch panel 22
LCD features 23
Assigning an IP address out-of-the-box 24
Configuring the Static IP address using the LCD 24
Configuring the DHCP IP address using the LCD 25
KVM features 25

Chapter 5: Installing and removing system components **28**
Safety instructions 28
Before working inside your enclosure 28
After working inside your enclosure 29
Hot plug and Non-hot plug devices 29
Storage and compute sleds 29
Removing a sled blank 29
Installing a sled blank 30
Removing a compute or storage sled from the enclosure 31
Installing a compute or storage sled into the enclosure 33
Cooling fan modules 35
Removing a front fan module 35
Installing a front fan module 35
Removing a rear fan module 36
Installing a rear fan module 37
Power supply units 37

Removing a power supply unit....37
Installing a power supply unit....38
Fabrics and modules....39
Removing a blank from Fabric A or B slot....39
Installing a blank in Fabric A or B slot....40
Removing a module from Fabric A or B slot....41
Installing a module in Fabric A or B slot....42
Removing a MX7000 blank from Fabric C slot....42
Installing a MX7000 blank in Fabric C slot....43
Removing a MX7000 module from Fabric C slot....44
Installing a MX7000 module into Fabric C slot....45
Removing a management module blank....46
Installing a management module blank....47
Removing a management module....48
Installing a management module....49
Installing the second management module....50
Support information for GPU....51

Chapter 6: Technical specifications....52
Component guidelines....52
Population rules....52
PSU redundancy and population rules....53
Chassis dimensions....54
Chassis weight....55
Fan specifications....55
PSU specifications....55
Ports and connectors specifications....56
USB ports....56
Mini DisplayPort....56
PowerEdge MX modules ports and connectors....56
PowerEdge MX760c....56
PowerEdge MX750c....57
PowerEdge MX740c....57
PowerEdge MX840c....57
MX7116n Fabric Expander Module....57
MX9116n Fabric Switching Engine....57
MX9002m Management Module....58
MX5108n Ethernet Switch....58
MXG610s Fibre Channel Switch....58
PowerEdge MX 10GBASE-T Ethernet Pass-Through Module....58
PowerEdge MX 25 Gb Ethernet Pass-Through Module....59
Video specifications....59
Environmental specifications....59
Standard operating temperature....60
Expanded operating temperature....60
Particulate and gaseous contamination specifications....61

Chapter 7: Getting help....63
Recycling or End-of-Life service information....63

Contacting Dell EMC.....63
Documentation feedback.....64
Accessing system information by using QRL.....64
Quick Resource Locator for PowerEdge MX7000 enclosure.....64
Receiving automated support with SupportAssist.....64

Chapter 8: Documentation resources.....66

1

About this document

This document provides an overview about the PowerEdge MX7000, information about installing and replacing components, technical specifications, and guidelines to follow while installing components.

2

Next Generation Modular overview

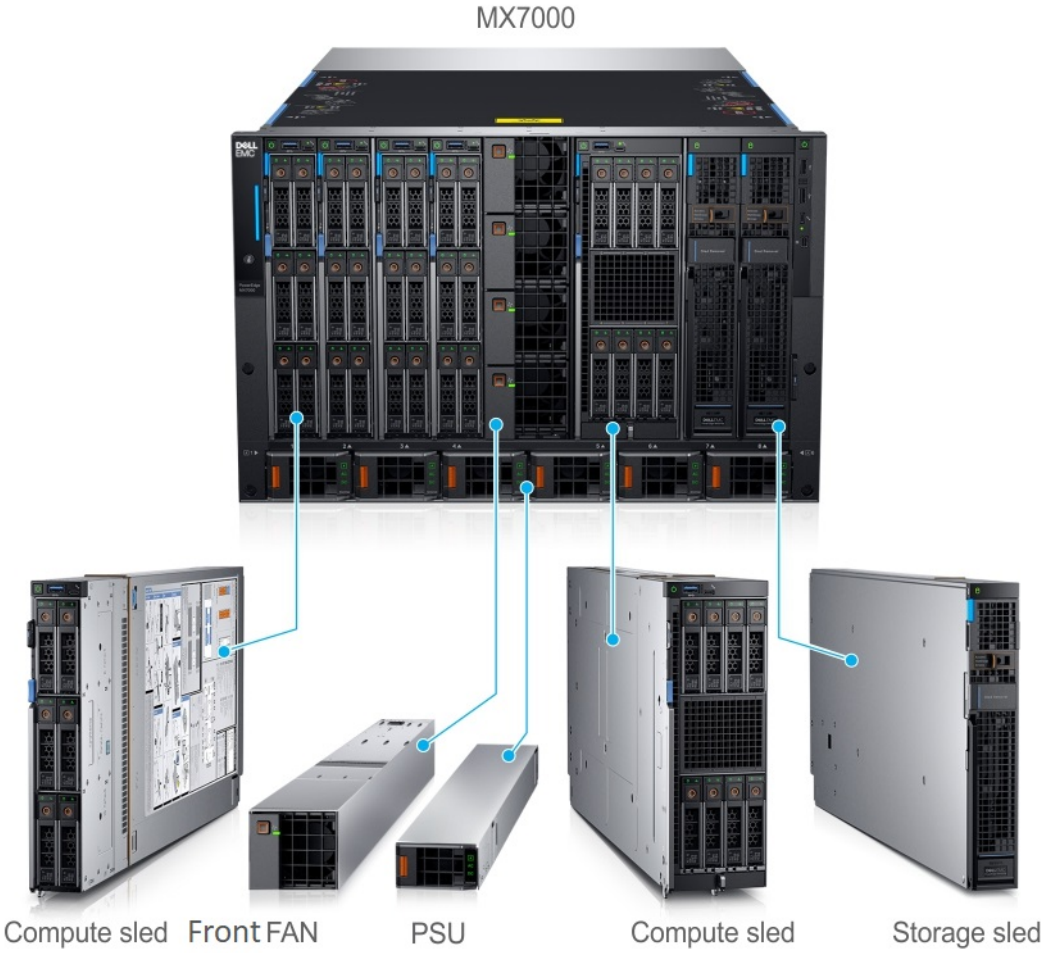

Figure 1. Next Generation Modular - Front view

- Compute sleds - MX760c, MX750c, MX740c, and MX840c
- Storage sled - MX5016s

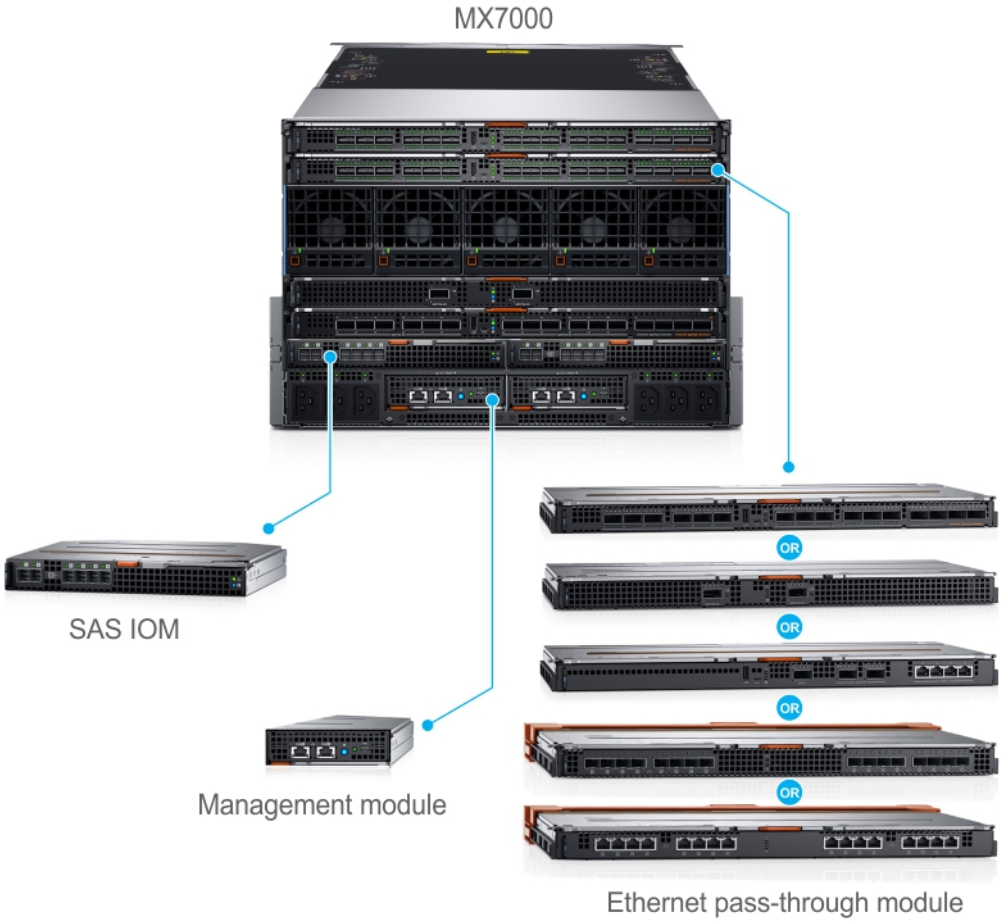

Figure 2. Next Generation Modular - Back view

The Dell EMC PowerEdge MX7000 enclosure supports the following sleds and I/O modules:

- I/O modules -
  - Dell EMC Networking MX7116n Fabric Expander Module
  - Dell EMC Networking MX9116n Fabric Switching Engine
  - Dell EMC Networking MX5108n Ethernet Switch
  - Dell EMC Networking MXG610s Fibre Channel Switch
  - Dell EMC M9002m Management Module
  - Dell EMC PowerEdge MX5000s SAS Switch
- Ethernet Pass-Through Module -
  - Dell EMC PowerEdge MX 10GBASE-T Ethernet Pass-Through Module
  - Dell EMC PowerEdge MX 25 Gb Ethernet Pass-Through Module
- **MX760c**

  The PowerEdge MX760c is a single-width compute sled that supports:

  - Up to two 4th Generation Intel Xeon Scalable Processors
  - 32 DIMM slots
  - Up to one mini Mezzanine card, two Mezzanine cards, one PERC 10/11/12 card, and one BOSS-N1 card
- **MX750c**

  The PowerEdge MX750c is a single-width compute sled that supports:

  - Up to two 3rd Generation Intel Xeon Scalable Processors
  - 32 DIMM slots
  - Up to one mini Mezzanine card, two Mezzanine cards, one PERC 9/10/11 card, and one BOSS card
- **MX740c**

  The PowerEdge MX740c is a single-width compute sled that supports:

- Up to two Intel Xeon Scalable Processors
- Up to 24 DIMM slots
- Up to six 2.5-inch SAS, SATA, SSD, or NVMe drives

- **MX840c**

  The PowerEdge MX840c is a double-width compute sled that supports:

  - Up to four Intel Xeon Scalable Processors
  - Up to 48 DIMM slots
  - Up to eight 2.5-inch SAS, SATA, SSD, or NVMe drives

- **MX5016s**

  The PowerEdge MX5016s is a single-width storage sled that provides disk expansion for the PowerEdge MX series compute sleds that support:

  - Up to 16 hot-swappable 2.5-inch SAS drives
  - Two hot-swappable expanders providing dual SAS paths for all drives
  - Dual x4 SAS links to the MX platform infrastructure
  - 12 Gb/s SAS

- **Dell EMCManagement Module M9002m**

  The Dell EMC MX9002m Management Module controls the overall chassis power, cooling, and hosts the OpenManage Enterprise-Modular (OME-M) console. Two external 1G-BaseT Ethernet ports are provided to enable management connectivity and to connect more PowerEdge MX7000 chassis into a single logical chassis. The PowerEdge MX7000 chassis supports two PowerEdge MX9002m management modules for redundancy. The Management module offers:

- Two x 1G-BaseT Ethernet ports
- One x Micro-B USB port

- **Dell EMC Networking MX7116n Fabric Expander Module**

  The Dell EMC Networking MX7116n Fabric Expander Module operates as an unmanaged Ethernet repeater to connect servers to the MX9116n Fabric Switching Engine using QSFP28-DD connections. The Expander Module offers:

  - Sixteen 25 GE server-facing ports
  - Two QSFP28-DD ports for connection to a Fabric Switching Engine

- **Dell EMC Networking MX9116n Fabric Switching Engine**

  The Dell EMC Networking MX9116n Fabric Switching Engine is a scalable L2/L3 switch designed that provides high-bandwidth, low-latency 25 GbE networking. This high-end switch offers:

  - Sixteen 25 GE server-facing ports
  - 12 QSFP28-DD ports that you can use to connect to Fabric Expanders or break out to: 8x10GE or 8x25GE ports for connection to rack servers or other Ethernet devices, or 2x40GE/2x100GE ports for uplinks, connection to SAN storage, and switch interconnects
  - Two QSFP28 uplink ports that can operate in 1x100GE, 1x40GE, 4x25GE, 2x50GE, or 4x10GE mode
  - Two QSFP28 unified ports that operate in Ethernet or Fibre Channel 1x100GE, 1x40GE, 4x25GE, 4x10GE, 2x50GE, or 8x8/16/32GFC mode

- **Dell EMC Networking MX5108n Ethernet Switch**

  The Dell EMC Networking MX5108n Ethernet Switch is a basic L2/L3 switch that is designed to provide high-performance, low-latency networking for the PowerEdge MX7000 installations. It provides FCoE transit, but no native Fibre Channel functionality, and offers:

  - Eight 25 GE server-facing ports
  - Two 100 GE QSFP28 uplink ports
  - One 40 GE QSFP28 uplink port
  - Four 10GBASE-T uplink ports

- **Dell EMC Networking MXG610s Fibre Channel Switch**

  The Dell EMC Networking MXG610s Fibre Channel Switch provides the following hardware features:

  - Up to 16 external FC ports to connect with external FC storage or an FC switch
  - Up to 16 internal backplane FC ports to connect with the FC controller on the sleds
  - A dual-core T1022E processor operating at 1.2 GHz delivers high performance, scalability, and advanced fabric vision functionality
  - Two 32 Gbps short wavelength (SWL) optical SFP+ transceivers in the entry-level 8-port model

- Four 32 Gbps SWL optical SFP+ transceivers in the midlevel 16-port model
- Eight 32 Gbps SWL optical SFP+ transceivers in the enterprise 16-port model

- **Dell EMC PowerEdge MX5000s SAS Switch**

  The Dell EMC PowerEdge MX5000s SAS Switch IOM provides the following hardware features:

  - Up to 8 internal 12Gbit/sec x4 SAS connections
  - Internal SAS Fabric that enables the connectivity without any need for attached cables

- **Dell EMC PowerEdge MX 10GBASE-T Ethernet Pass-Through Module**

  The Dell 10 Gb Ethernet pass-through module II supports 10 Gb connections. It provides a direct connection between the optional internal Ethernet mezzanine card in the sled and an external Ethernet device. The Ethernet pass-through modules are hot-swappable. The 10 Gb Ethernet pass-through module enables you to use optical SFP+ (short reach or long reach) and direct- attached copper (DCA) SFP+ modules.

  NOTE: The Ethernet pass-through module does not support 1G mezzanine cards in the sleds.

- **Dell EMC PowerEdge MX 25 Gb Ethernet Pass-Through Module**

  To better address high-performance network and scalability requirements, we are increasingly implementing 25 GbE for their customers. These implementations capitalize on the 25GbE specification of the 25 Gigabit Ethernet Consortium. The specification uses a single-lane 25 Gbps Ethernet links and is based on the existing IEEE 100 GbE standard. The 25 GbE is an easier upgrade path from 10 GbE as it fits into the existing model. It requires half the number of PCIe lanes that are compared to 40 GbE. It leads to better PCIe bandwidth utilization, and lower power consumption. The 25GbE SFP28 physical interface specification also supports various form factors, enabling flexible configuration options.

  Benefits of deploying 25 GbE:
  - Maximize performance and scalability
  - Lower capital and operating expenses
  - Future upgrade path

For more information about these modules and sleds, see www.dell.com/poweredgemanuals.

Topics:

- PowerEdge MX architecture overview

PowerEdge MX architecture overview

The PowerEdge MX portfolio delivers a fully managed, high-performance system that frees up valuable IT resources and personnel so you can focus on innovation. It enables you to work beyond silos and routine, daily, and time consuming operational management to realize your IT and digital business transformations. With the kinetic architecture and Agile management, the MX portfolio dynamically configures compute, storage, and fabric, increases team effectiveness and accelerates operations. The responsive design delivers the innovation and longevity customers of all sizes need for their IT and digital business transformations.

The PowerEdge MX infrastructure provides:

Flexible architecture

- A flexible architecture – Nondisruptive provisioning, on-demand allocation of compute, storage, and networking resource pools
- A scalable fabric – Cost-effective multichassis architecture with a broad array of open networking options and upgrade simplicity for future I/O flexibility
- Granular storage – Dense, highly flexible, hot swappable, scale-out Direct Attached Storage sled with front access bays

Agile management

- End-to-end life cycle management and single point authentication for all devices from a single interface
- Simplified set-up/updates with no specialized training needed, and with multiple at-the-box management options
- An operational template methodology and comprehensive Rest API

Responsive design

- An industry-leading fabric, system thermal architecture, mechanical design, and control algorithms for dense configurations with future compatibility
- A hardened design to protect, detect, and recover underlying infrastructure from cyber attacks

For more information about these modules and sleds, see their documents which are available at www.dell.com/poweredgemanuals.

3

Enclosure overview

The Dell EMC PowerEdge MX7000 is the next-generation M1000e follow-on chassis and a revolutionary architecture set to be the future foundation of modular architecture.

The PowerEdge MX7000 enclosure is a 7U chassis that supports:

- Up to eight standard height, single-width sleds, or four standard height, double-width sleds.

  Up to seven Storage sleds can be populated in the enclosure.

  NOTE: One compute node must be present and it must be mapped to a storage node.
- Up to six hot swappable power supply units.
- Up to two hot swappable management modules.
- Up to six I/O modules:
  - Four Fabric-A/B type IOMs
  - Two Fabric-C type IOMs
- Four front accessible hot swappable cooling fans.
- Five rear accessible hot swappable cooling fans.

For more information about dual management modules, see Technical specifications.

Topics:

- Front view of the enclosure
- Back view of the enclosure
- Locating the information tag of your system

Front view of the enclosure

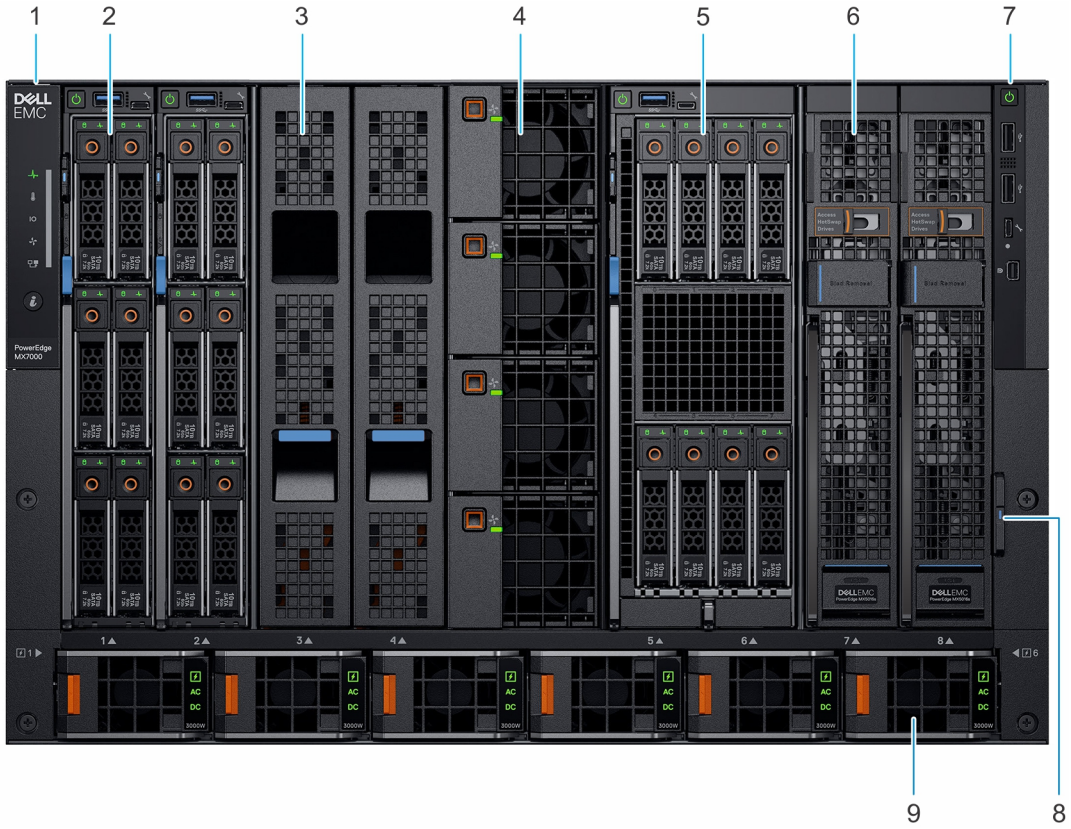

Figure 3. Front view of the enclosure

1. Left control panel
2. Single-width compute sled
3. Sled blank
4. Front fan (4)
5. Double-width compute sled
6. Single-width storage sled
7. Right control panel
8. Information tag
9. Power supply unit (6)

Control panel

Left control panel

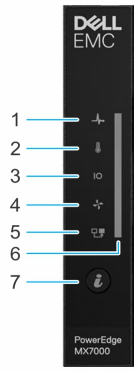

Figure 4. Left control panel - Status LED

Table 1. Left control panel - LED indicator description

Indicator	Description	Status	
1	System health	Blinks amber for 2 seconds and is OFF for 1 second when the chassis health has degraded. By default, the LED is unlit.	
2	System temperature	Blinks amber for 2 seconds and is OFF for 1 second when a thermal fault exists on the enclosure. By default, the LED is unlit. **NOTE:** A thermal fault includes excessive ambient temp, I/O modules thermal status, PSU thermal status, and fan status.	
3	I/O module health	Blinks amber for 2 seconds and is OFF for 1 second when an I/O module is faulty. By default the LED is unlit.	
4	Fan health	Blinks amber for 2 seconds and is OFF for 1 second when a front or rear mounted fan fails or has a warning. By default, the LED is unlit.	
5	Stack or group	Indicates that the enclosure is a member of a group.	
6	LED status bar	**Indicator status**	**Description**
		Solid blue	Indicates that the enclosure is healthy.
		Blinking blue	Indicates that the system ID mode is active.
		Blinking amber	Indicates that the system is experiencing a fault.
7	System ID button	Allows you to identify the system or the installed sleds.	

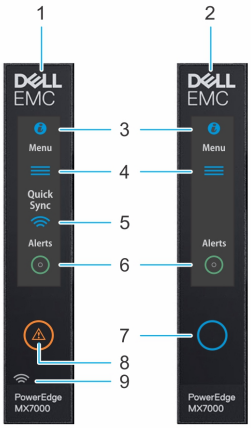

Figure 5. Left control panel - LCD options

Table 2. Left control panel - LCD panel description

Indicator	Description	Status
1	LCD with Quick Sync	LCD enabled with Quick Sync module
2	LCD without Quick Sync	LCD without Quick Sync module
3	System ID indicator on LCD panel	This option is a button/indicator on the LCD panel to identify the chassis, or choose specific sleds to identify.
4	Settings	This option button provides access to the inventory and configuration data of the MX7000 enclosure. It includes the Network Settings, System Information, (Model, Asset Tag, Service Tag), and Language Settings.
5	Optional QuickSync indicator (Only	Enables access to QuickSync related controls and connection information. **NOTE:** QuickSync feature allows you to manage your system using mobile devices. This feature is only available on certain configurations.

Table 2. Left control panel - LCD panel description (continued)

Indicator	Description	Status	
	for LCD with QuickSync 2.0)	**NOTE:** If not ordered at the time of purchase, the QuickSync module will not be available on the enclosure.	
6	System alerts indicator	**System ID Indicator status**	**Description**
		Solid green	The chassis has no degraded or critical alerts.
		Solid amber	The chassis has critical or degraded health alerts.
		NOTE: This option button/indicator shows an amber colored alert icon and a combined critical and degraded alert count. Pressing the button takes the user to the alert details menu.	
7	LCD activation button/ System ID indicator/ Identification indicator	Allows you to identify the enclosure. **NOTE:** Press the button to activate the LCD.	
		System ID Indicator status	**Description**
		Blinking blue	System ID is active.
		Blinking amber	Chassis alerts are present.
8	Error indicator	The error indicator is displayed on the LCD when there are any critical/warning alerts on the enclosure.	
9	Optional Quick Sync wireless status indicator	Displays the connection status of the enclosure with any QuickSync enabled device.	

Right control panel

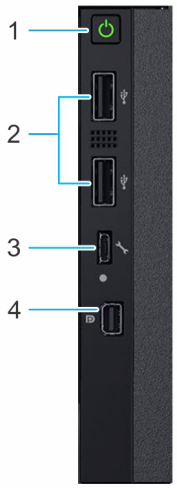

Figure 6. Right control panel

1. Power button
2. USB 2.0 port (2)
3. iDRAC Direct port (Micro-AB USB)
4. Mini DisplayPort

NOTE: For more information on the ports, see Technical specifications.

PSU indicators

Figure 7. PSU indicators

1. PSU health indicator
2. AC supply status indicator
3. DC output status indicator

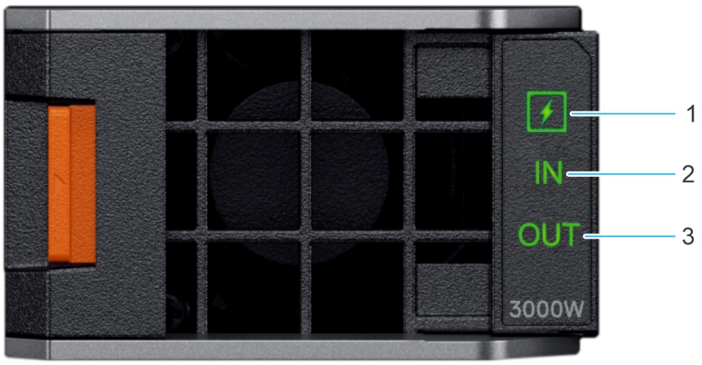

Figure 8. PSU indicators for DC power supply

1. PSU health indicator
2. DC supply status indicator
3. DC output status indicator

Table 3. PSU health indicator codes

PSU health indicator	Indicator state
PSU functioning normally	Green
PSU faulty	Blinking amber
PSU mismatch	ON for 1 second, and then 5 blinks and OFF (non-repeating cycle).

Table 4. AC indicator codes

AC indicator	Indicator state
AC source available	ON
AC source unavailable or power cable unplugged	OFF

Table 5. DC indicator codes

DC indicator	Indicator state
DC output available	ON

Table 5. DC indicator codes (continued)

DC indicator	Indicator state
DC output unavailable	OFF

Fan module indicator codes

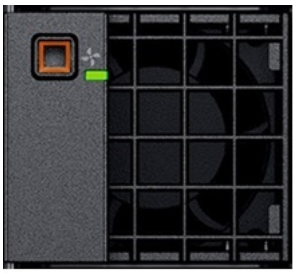

Figure 9. Front fan module

Figure 10. Rear fan module

Table 6. Fan module indicator codes

Fan indicators	Indicator state
Fan functioning normally - Front/ Rear	Solid green
Fan failure	Blinks amber 2 seconds and 1 second OFF

NOTE: When the chassis is powered off with the AC or DC connection that is powered on, only the rear fans are powered off.

Back view of the enclosure

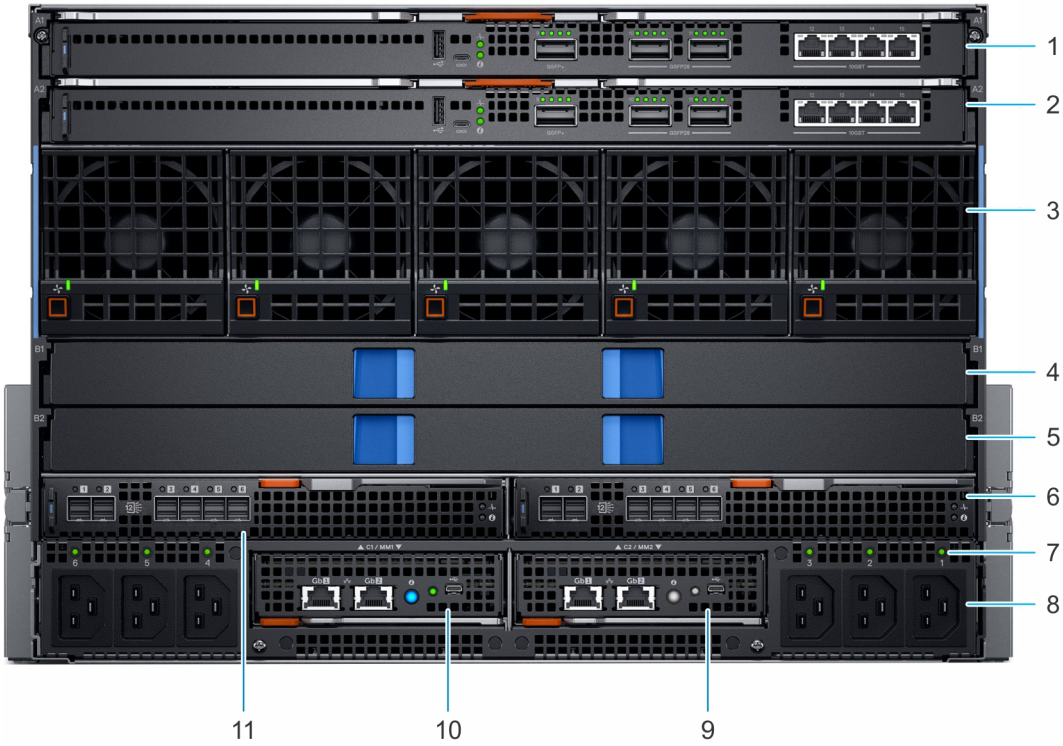

Figure 11. Back view of the enclosure

1. Slot for Fabric A1
2. Slot for Fabric A2
3. Rear fans (5)
4. Slot for Fabric B1
5. Slot for Fabric B2
6. Slot for Fabric C2
7. Power cable connection status LED
8. C22 Power inlet connectors (6)
9. Management Module 2
10. Management Module 1
11. Slot for Fabric C1

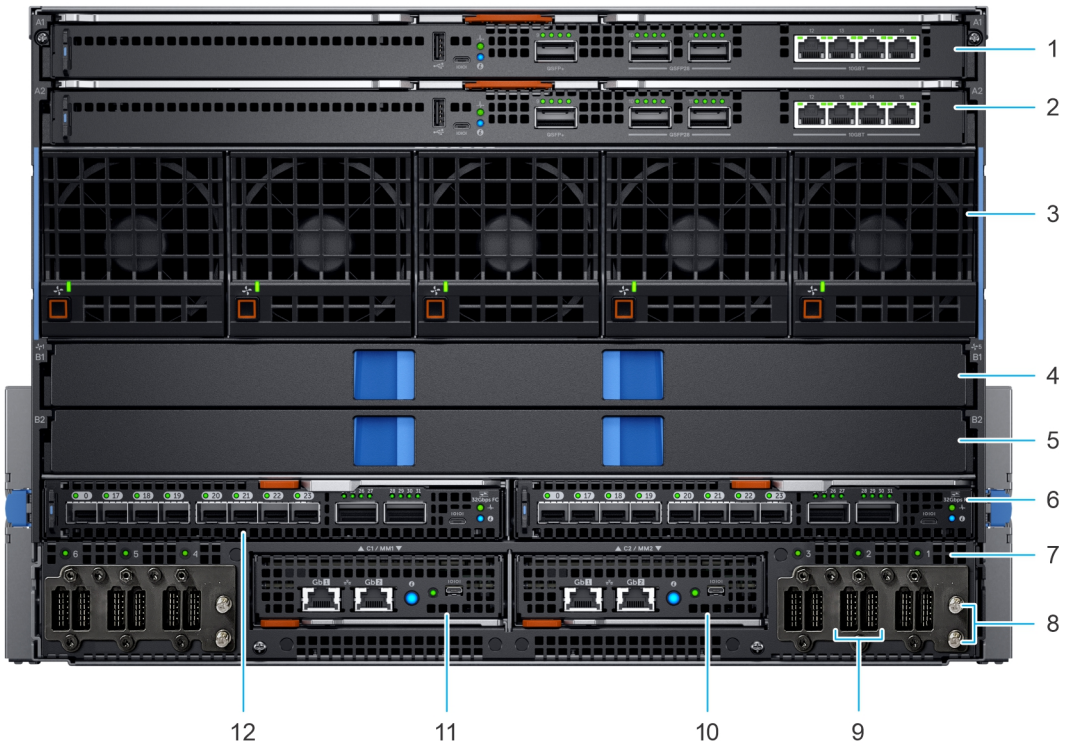

Figure 12. Back view of the enclosure with DC power supplies

1. Slot for Fabric A1
2. Slot for Fabric A2
3. Rear fans (5)
4. Slot for Fabric B1
5. Slot for Fabric B2
6. Slot for Fabric C2
7. Power cable connection status LED
8. Grounding post
9. Power inlet connectors
10. Management module 2
11. Management module 1
12. Slot for Fabric C1

NOTE: For more information about the ports and connectors, see Technical specifications.

Management module indicator codes

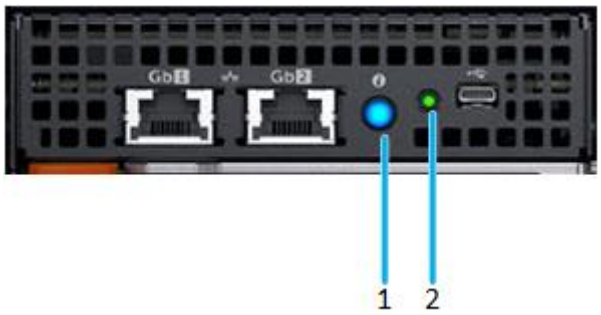

Figure 13. Management module indicators

1. Status indicator, Identification button/ Indicator - Dual color: Blue and amber
2. Power indicator - Green

Table 7. Management module indicator behavior

Status	Indicator combination
Healthy chassis/ Management module (Standby)	Power indicator ON (green), status indicator OFF
Healthy chassis/ Management module (Active)	Power indicator ON (green), status indicator blue ON
Healthy chassis/ Management module (Identifying mode)	Power indicator ON (green), status indicator blue blinking **NOTE:** Available only when the management module is active.
Faulty chassis/ Management module (Active)	Power indicator ON (green), status indicator amber blinking
Faulty chassis/ Management module (Identifying mode)	Power indicator ON (green), status indicator blue blinking
Failed chassis/ Management module: Mode 1	Power indicator OFF, status indicator OFF **NOTE:** Hardware failure prevents the management module from powering.
Failed chassis/ Management module: Mode 2	Power indicator OFF, status indicator Amber-solid **NOTE:** • The management module starts boot but is unable to boot to one or more operating system partitions. • The management module boots but detects a failure such as a network switch failure, or a voltage regulator failure.

Locating the information tag of your system

You can identify your system using the unique express service code and Service Tag. Pull out the information tag in front of the system to view the express service code and Service Tag. Alternatively, the information may be on a sticker on the back of the system chassis. The mini Enterprise Service Tag (EST) is found on the back of the system chassis. Dell uses this information to route support calls to the appropriate personnel.

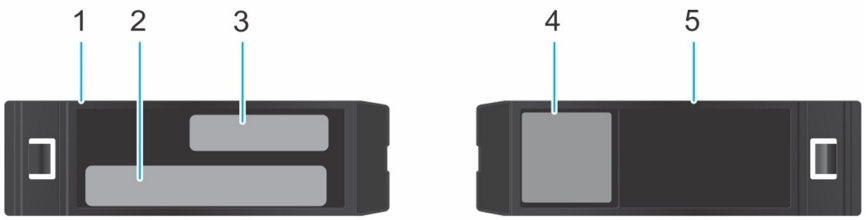

Figure 14. Locating the information tag of your system

1. Information tag (Top view)
2. MAC address and secure password label

   NOTE: If you have opted for default access to the management module, the default password is available on the Information tag. This label is blank, if you have not opted for secure default access, then the default username and password are **root** and **calvin**.
3. Express Service Tag
4. Quick resource locator
5. Information tag (Bottom view)

4

Initial system setup and configuration

Topics:

- Setting up your enclosure
- Management module configuration
- Methods to download firmware and drivers
- Downloading drivers and firmware
- LCD touch panel
- Assigning an IP address out-of-the-box
- KVM features

Setting up your enclosure

Complete the following steps to set up your enclosure:

Steps

1. Unpack the enclosure.
2. Install the enclosure into the rack. For more information, see the *Rail Installation Guide* at www.dell.com/poweredgemanuals.
3. Connect the peripherals to the enclosure.
4. Connect the enclosure to its electrical outlet.
5. Power on the enclosure by pressing the power button.

   NOTE: You can configure the static or DHCP IP address using the touch panel on the chassis.

6. Power on the attached peripherals.

   For more information about setting up your enclosure, see the *Getting Started Guide* that shipped with your enclosure.

Management module configuration

Using the management module (MM), you can manage SAS storage subsystem, drive assignments, and monitor the health status for the associated SAS devices. You can manage SAS fabric by using the OpenManage Enterprise-Modular user interface to view inventory, storage event logs and manage drive or enclosure assignments. For more information about managing the SAS fabric using OpenManage Enterprise-Modular, see *OpenManage Enterprise-Modular User's Guide* available at www.dell.com/openmanagemanuals > Chassis Management Controllers.

Options to set up the management module IP address

Configure the initial network settings on your network infrastructure to enable the communication to and from the management module.

NOTE: For static IP configuration, you must request for it at the time of purchase.

Use the OpenManage Essentials Quick Deploy feature to assign a static or DHCP IP address.

Interfaces	Document/Section
Dell Deployment Toolkit	See *Dell Deployment Toolkit User's Guide* at www.dell.com/openmanagemanuals > OpenManage Deployment Toolkit

Interfaces	Document/Section
Dell Lifecycle Controller	See *Dell Lifecycle Controller User's Guide* at www.dell.com/idracmanuals > Lifecycle Controller
OpenManage Enterprise Modular	See *Dell OpenManage Enterprise-Modular User's Guide* at www.dell.com/openmanagemanuals > Chassis Management Controllers
Server LCD panel	See the LCD touch-panel section.
Management module and Quick Sync 2 (optional)	See *Dell Integrated Dell Remote Access Controller User's Guide* at www.dell.com/idracmanuals

NOTE: To access the management module, ensure that all the management modules are connected to the network. You can also access the management module through the shared LOM mode, if you have opted for a system that has the shared LOM mode enabled.

Log in to the management module

You can log in to management module as:

- Management module user
- Microsoft Active Directory user
- Lightweight Directory Access Protocol (LDAP) user

If you have opted for secure default access to management module, the management module secure default password is available on the information tag available on the front of the enclosure. If you have not opted for secure default access to management module, then 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 the management module credentials to log in to management module.

NOTE: Ensure that you change the default username and password after setting up the management module IP address.

For more information about logging in to the management module, see the *Dell EMC OpenManage Enterprise Modular User's Guide* at www.dell.com/manuals.

Methods of setting up and configuring the IP address for the management module

You can configure management module IP using the following:

1. Management module web interface
2. Remote Access Controller ADMin (RACADM)
3. Remote Services that include Web Services Management (WS-Man)

Methods to download firmware and drivers

You can download the firmware and drivers by using any of the following methods:

Table 8. Firmware and drivers

Methods	Location
From the Dell EMC support site	www.dell.com/support/home
Using Dell Repository Manager (DRM)	www.dell.com/openmanagemanuals > Repository Manager
Using Dell OpenManage Essentials	www.dell.com/openmanagemanuals > OpenManage Essentials

Table 8. Firmware and drivers (continued)

Methods	Location
Using Dell OpenManage Enterprise	www.dell.com/openmanagemanuals > OpenManage Enterprise
Using Dell Server Update Utility (SUU)	www.dell.com/openmanagemanuals > Server Update Utility
Using OpenManage Enterprise Modular	www.dell.com/openmanagemanuals > OpenManage Enterprise Modular

Downloading drivers and firmware

Dell EMC recommends that you download and install the latest BIOS, drivers, and systems management firmware on your system.

Prerequisites

Ensure that you clear the web browser cache before downloading the drivers and firmware.

Steps

1. Go to www.dell.com/support/home.
2. In the **Drivers & Downloads** section, type the Service Tag of your system in the **Enter a Service Tag or product ID** box, and then click **Submit**.

   NOTE: If you do not have the Service Tag, select **Detect Product** to allow the system to automatically detect the Service Tag, or click **View products**, and navigate to your product.

3. Click **Drivers & Downloads**.
   The drivers that are applicable to your system are displayed.
4. Download the drivers to a USB drive, CD, or DVD.

LCD touch panel

The LCD touch panel (optional) is on the left control panel of your enclosure.

The LCD touch panel displays the following options:

- System information
- System status
- Error messages
- QuickSync options - Available on the optional QuickSync LCD panel only.

NOTE: The LCD touch panel is not a hot swappable module. Before you replace the module, power off the enclosure and disconnect the power from the chassis.

The LCD touch panel enables you to scroll or swipe on the screen. The options available on the LCD touch panel are:

- **Welcome Screen** - Enables you to select your native language and the default LCD home page.
- **Main Menu** - Enables you to access the LCD functionality such as Identify, Settings, QuickSync, Alerts, Help, and Powered off.
- **QuickSync** - Enables you to connect OpenManage Mobile to the enclosure.
- **Alerts** - Enables you to view a list of all the critical and warning alerts of the enclosure.
- **Network Settings** - View and configure the chassis management IP address.
- **LCD Configuration** - Enables you to configure the LCD options such as View and Modify, View only, Disabled, Present, and Not present.
- **Settings** - Enables you to edit the Network settings, LCD Language, and Home screen.
- **Service Interaction** - Displays the impact on drive mapping when a server or sled is replaced in the enclosure.
- **System Info** - Displays the Model number, Asset tag, and Service tag of the enclosure.
- **Chassis Power Off** - Enables you to perform a Shutdown or Graceful shutdown.

LCD features

Multi-Chassis Management group

About this task

The PowerEdge MX7000 enclosures LCD allows you to manage the enclosures Multi-Chassis Management (MCM) group. In this management feature, a lead enclosure will manage a subset of enclosures.

The MCM groups management feature allows you to perform the actions mentioned below:

- Viewing the group status
- Creating a group
- Joining a group
- Leaving a group
- Deleting a group

Viewing the group status

To view a group status

Steps

1. From the selected home screen, tap **Settings**.
2. Tap **Manage Group**.

Creating a group

To create a stand-alone chassis group

Steps

1. From the selected home screen, tap **Settings**.
2. Tap **Manage Group**.
3. To create a group, tap **Select Group**.

   NOTE: A confirmation message is displayed.

   NOTE: It may take several minutes to update the available group names.

Joining a group

To join a stand-alone chassis group

Steps

1. From the selected home screen, tap **Settings**.
2. Tap **Manage Group**.
3. To join a group, tap **Join Group**.

   NOTE: If no available groups, an error message is displayed.

   NOTE: If there are available groups, a list of available group names is displayed.

Leaving a group

To leave a member chassis group

Steps

1. From the selected home screen, tap **Settings**.
2. Tap **Manage Group**.
3. To exit a group, tap **Leave Group**.

   NOTE: A confirmation message is displayed.

Deleting a group

To delete a lead chassis group

Steps

1. From the selected home screen, tap **Settings**.
2. Tap **Manage Group**.
3. To exit a group, tap **Leave Group**.

   NOTE: A confirmation message is displayed.

Assigning an IP address out-of-the-box

About this task

The PowerEdge MX7000 enclosure offers out-of-the-box IP address assignment using the LCD touch panel. For more information about the LCD, see LCD touch panel.

Steps

To set up the IP address out-of-the-box:

1. Select the **Language**, and tap **Next**.
   The select **Home Page** screen is displayed.
2. Tap **Preview**, to view the default **Home page** view.
   The available **Home page** views are:
   - **Main Menu**
   - **IP Settings**
   - **System Info**
   - **Custom Text String**

   The **Home Page Preview** screen is displayed.
3. Tap **Save** to store the settings.

   NOTE: You can tap **Home Pages** to view the selected **Home Page** screen.

Configuring the Static IP address using the LCD

Steps

The PowerEdge MX7000 enclosures LCD touch panel enables you to configure the Static or the DHCP IP address.

To configure the Static IP address:

1. From the selected home screen, tap **Settings**.

2. Tap **Network Settings**.
3. Select **IPv4**, and tap **Edit**.
   The **Change IP settings from DHCP to Static?** screen is displayed.
4. Tap **Yes**.
5. Update the **IPv4** octet, and tap **Next**.
6. Edit the **Mask** octet, and tap **Next**.
7. Edit the **Gateway** octet, and tap **Save**.
   The **Success** screen is displayed.
   NOTE: If the IP address is incorrect, an **Error** screen is displayed.

Configuring the DHCP IP address using the LCD

Steps

To configure the DHCP IP address:

1. From the selected home screen, tap **Settings**.
2. Tap **Network Settings**.
3. Select **IPv6** and, tap **Edit**.
   The **Change IP settings from DHCP to Static?** screen is displayed.
4. Tap **Yes**.
5. The network IP address is automatically updated in the enclosure.
   The **Success** screen is displayed.
   NOTE: If the IP address is incorrect an **Error** screen is displayed.

KVM features

The PowerEdge MX7000 supports Keyboard, Video, Mouse (KVM) which provides access to the servers via the management modules.

KVM functionality

The keyboard, video, mouse (KVM) solution from Dell includes an LED screen, a keyboard, and a touch pad mouse, all contained in a space-saving 1U package. The KVM provides access to the servers via the management modules. The management module receives the keyboard/mouse events and redirects the input to the virtual USB keyboard/mouse to the compute sled iDRAC. The management module automatically redirects the chassis console output to the front panel display port.

The KVM accessibility keys are:

- **Open the OSD menu** - Press the **PrintScreen** key twice to enable the On Screen Display (OSD).
- **Navigation** - Use the **Up** or **Down** arrow keys to scroll through the list of available sled.
- **Access a sled** - Press the **Enter** key to select a sled.
- **Exit a sled** - Press the **Escape** key to exit the OSD/sled selection menu.

KVM supported ports

The KVM solution supported ports for the PowerEdge MX7000 enclosure are:

- Mini display port
- Mini display port to VGA adapters
- Mini display port to display port cables

Out of the box IP setup using the KVM

To setup the IP address out of the box using the KVM:

1. Connect the keyboard and mouse to the USB ports on the right control panel.
2. Connect the display port or the display port adapter to the display port on the right control panel.
   The **KVM selection menu** is displayed.
3. Select **OME Modular** from the list.
   The **OME credentials** page is displayed.
4. Enter the login credentials and login to the OME user interface.
   The **RACADM CLI** screen is displayed.

KVM supported RACADM commands

Table 9. KVM supported RACADM commands

Command	Description
`help`	Displays a list of RACADM subcommands.
`help <subcommand>`	Displays the usage summary for a subcommand.
`?`	Displays a list of RACADM subcommands.
`? <subcommand>`	Displays the usage summary for a subcommand.
`arp`	Displays the networking ARP table.
`getmodinfo`	Displays the module configuration and status information.
`chassisaction`	Performs a chassis power on/off or power cycle/reset operation.
`chassislog`	Displays the chassis log messages.
`cmcchangeover`	Toggles the redundant state of the CMC between active/standby.
`connect`	Connects the switch or blade serial console.
`debug`	Enables the debug authorization commands.
`deploy`	Deploys the blade or IOM with specified properties.
`faultlist`	Displays the active messages in the chassis subsystem.
`getniccfg`	Displays the current network settings.
`getsensorinfo`	Displays the system sensor information.
`getsysinfo`	Displays the general management module and system information.
`getpminfo`	Displays the power management status information.
`getpbinfo`	Displays the power budget status information.
`racreset`	Performs a management module reset operation.
`racresetcfg`	Performs a management module factory reset operation.
`swinventory`	Displays the list of software's installed on the chassis.
`serveraction`	Perform a server or storage power management operation.
`setniccfg`	Modify the network configuration properties.
`traceroute`	Displays the route packets trace to network host.
`traceroute6`	Displays the IPv6 route packets trace to network host.
`ifconfig`	Displays the network interface information.
`ping`	Sends ICMP echo packets on the network.
`ping6`	Sends IPv4 ICMP echo packets on the network.
`getconfig`	Displays the management module configuration properties.
`config`	Modify the management module configuration properties.

Table 9. KVM supported RACADM commands (continued)

Command	Description
`chassisgroup`	Enables multiple chassis management.

KVM limitations

The KVM features are disabled in the following scenarios:

- If the iDRAC is undergoing a reset process.
- If the management module is undergoing a reset process or not active.
- The OSD is blank until the management module is active.
- DP - DVI and DP - HDMI are not supported by the PowerEdge MX7000 KVM solution.
- The maximum resolution that is supported by the PowerEdge MX7000 are:
  - 1920 x 1200, 32 bits per pixel @ 60 Hz
  - 1600 x 1200, 32 bits per pixel @ 75 Hz

For more information about the PowerEdge MX7000 *at the box serial access feature of the chassis management firmware* , see PowerEdge MX7000 At-the-Box Serial Access to Management Firmware

For more information about the PowerEdge MX7000 supported *RACADM Commands*, see Dell EMC OpenManage Enterprise Modular Edition Version 1.00.01 for PowerEdge MX7000 Chassis

5

Installing and removing system components

Topics:

- Safety instructions
- Before working inside your enclosure
- After working inside your enclosure
- Hot plug and Non-hot plug devices
- Storage and compute sleds
- Cooling fan modules
- Power supply units
- Fabrics and modules
- Support information for GPU

Safety instructions

WARNING: To avoid injury, do not attempt to lift the enclosure by yourself. Dell recommends that a minimum of two people lift the enclosure.

WARNING: Opening or removing the cover while the enclosure is powered on may expose you to a risk of electric shock.

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 is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

NOTE: Dell recommends ESD protection while working on components inside the enclosure.

CAUTION: For proper operation and cooling for all the sleds, module bays, power supply units, and system fans must be populated with a component or a blank.

Before working inside your enclosure

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Power off the compute sleds, the storage sleds, and then the attached peripherals.
2. Disconnect the sleds, and the peripherals from the enclosure.
3. Power off the enclosure.
4. Disconnect the enclosure from the electrical outlet.
5. Remove the enclosure from the rack.
   For more information, see the *Rack Installation Guide* at www.dell.com/poweredgemanuals.

After working inside your enclosure

Prerequisites

Follow the safety guidelines listed in Safety instructions.

Steps

1. Install the enclosure into the rack, if removed.
   For more information, see the *Rack Installation Guide* at www.dell.com/poweredgemanuals.
2. Connect the enclosure to the electrical outlet.
3. Power on the enclosure.
4. Reconnect the sleds, and the peripherals into the enclosure.
5. Power on the attached peripherals, the storage sleds, and then the compute sleds.

Hot plug and Non-hot plug devices

Table 10. Hot plug devices

Hot plug devices	Non-hot plug devices
Cooling fans	Main distribution board
Power supply units	Vertical power distribution board
Management services modules	Rear fan board
Fabric A/ B/ C input output modules	Left and right control panels
Sleds **NOTE:** Ensure that the sled is powered off before removing it from the enclosure.	

Storage and compute sleds

Removing a sled blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Press the release button to release the sled blank.
2. Pull the sled blank out of the enclosure.

   CAUTION: Ensure to install a sled blank in all the empty bays. Operating the enclosure without a blank results in overheating.

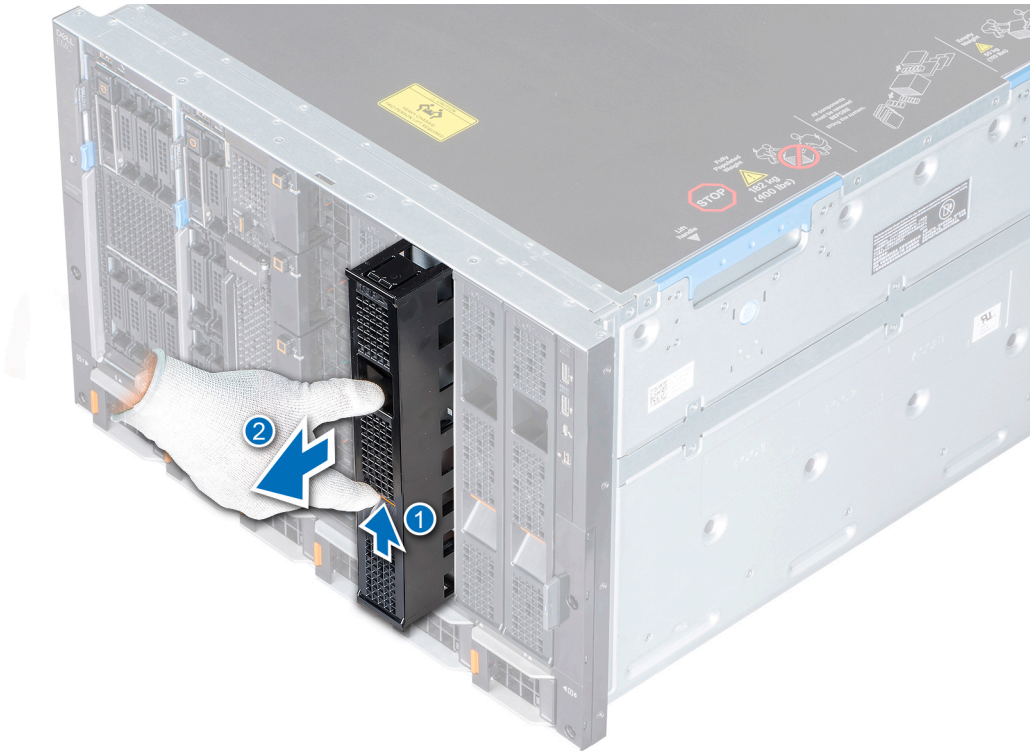

Figure 15. Removing a sled blank

Next steps

1. Install a sled or sled blank.

Installing a sled blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align the sled blank with the bay in the enclosure.
2. Insert and push the sled blank, until it locks into place.

   NOTE: Install two sled blanks when a double-width sled is removed.

Figure 16. Installing a sled blank

Removing a compute or storage sled from the enclosure

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Power off the sled.

   CAUTION: Ensure the compute sleds mapped to the storage sleds are powered off.

   CAUTION: Remove the storage sled only when the hard drive LED is off.

   NOTE: If the storage sled drive LED indicator is off, it indicates that all the compute sleds mapped to the storage sled are powered off.

   NOTE: If there are two Fabric C SAS IOMs in powered on state, the management module in the enclosure powers on the storage sleds automatically.

Steps

1. To remove a storage or compute sled:

   NOTE: The procedure to remove a single-width and double-width compute sled is the same.

   For a storage sled,
   a. Open the **sled removal** hatch on the front panel of the sled.
   b. To release the sled release lever, push the blue release button to the unlock position.
   For a compute sled,
   a. To release the sled release lever, push the blue release button on the sled.
2. Hold the sled release lever, pull the sled out of the enclosure.

   NOTE: Ensure that you install a sled blank if you are removing the sled permanently.

CAUTION: Operating the enclosure without a blank, for an extended time can result in overheating.

CAUTION: Ensure that the sled is supported with both hands while you are removing the sled.

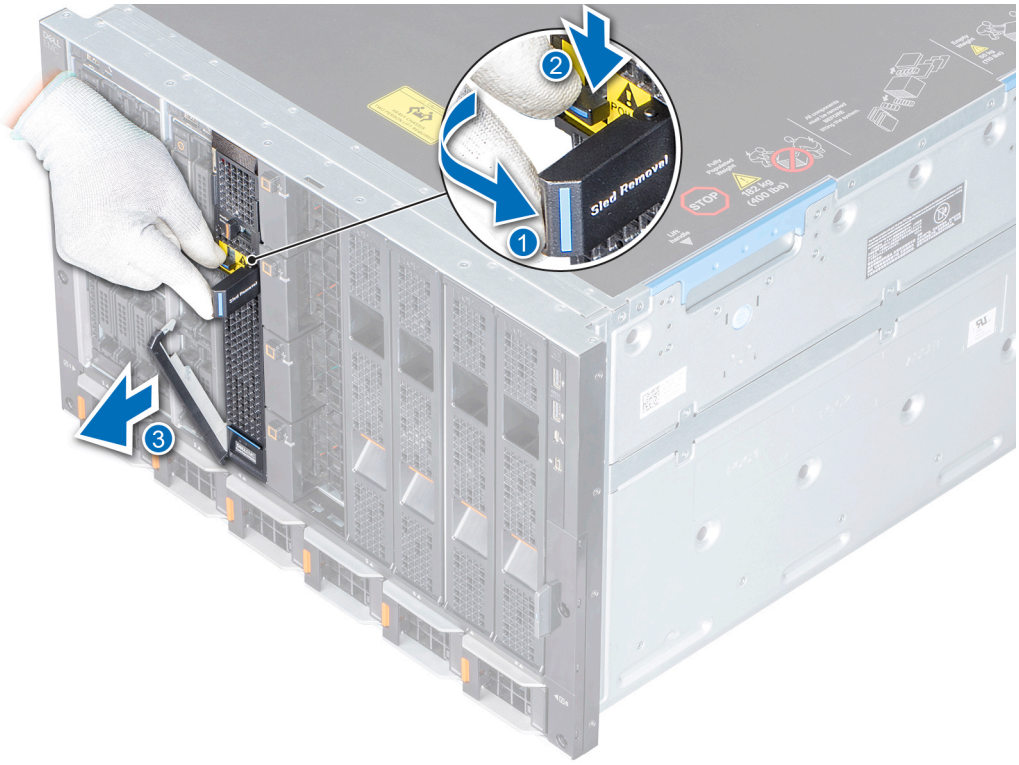

Figure 17. Removing a storage sled from an enclosure

Figure 18. Removing a single-width compute sled from the enclosure

3. Install the I/O connector cover on the sled.

Next steps

1. Install a sled or a sled blank.

Installing a compute or storage sled into the enclosure

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Ensure that the sled release lever is in the open position.

Steps

1. Remove the I/O connector cover from the sled.

Figure 19. Removing the I/O cover

2. Hold and align the sled with the bay in the enclosure.
3. Push the sled into the bay in the enclosure.

   NOTE: The procedure to install a single-width and double-width sled is the same.

4. Close the release lever to lock the sled in place.

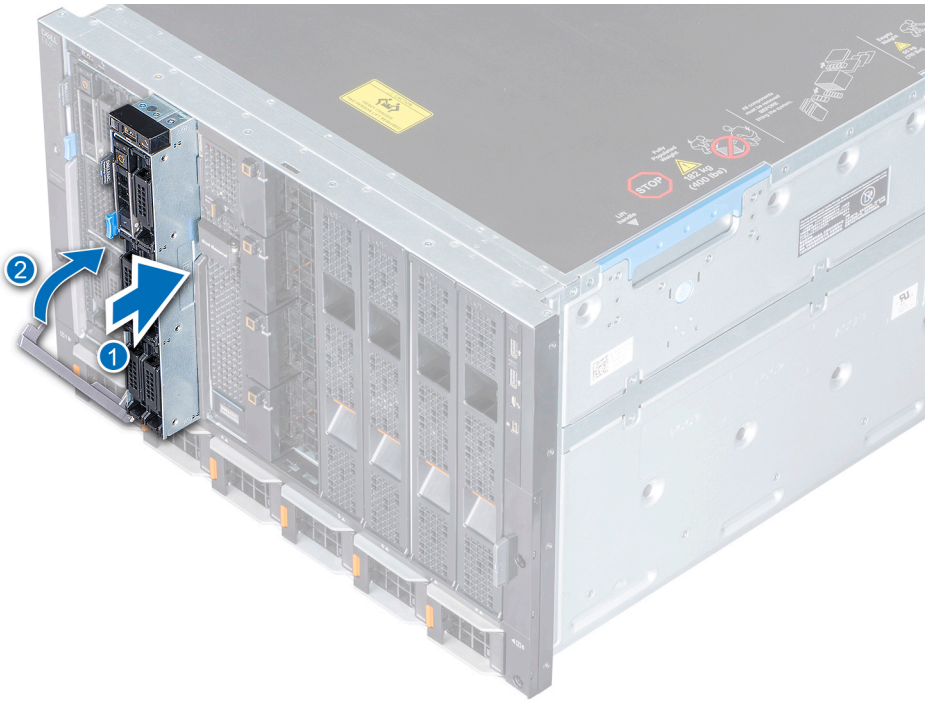

Figure 20. Installing a single-width compute sled into the enclosure

Figure 21. Installing a storage sled into the enclosure

Next steps

1. Power on the sled.

Cooling fan modules

NOTE: The system must be populated with the full set of fans to support the airflow requirements of the chassis.

Removing a front fan module

Steps

1. Press the release button to release the fan module.
2. Hold and pull the fan module out of the fan bay.

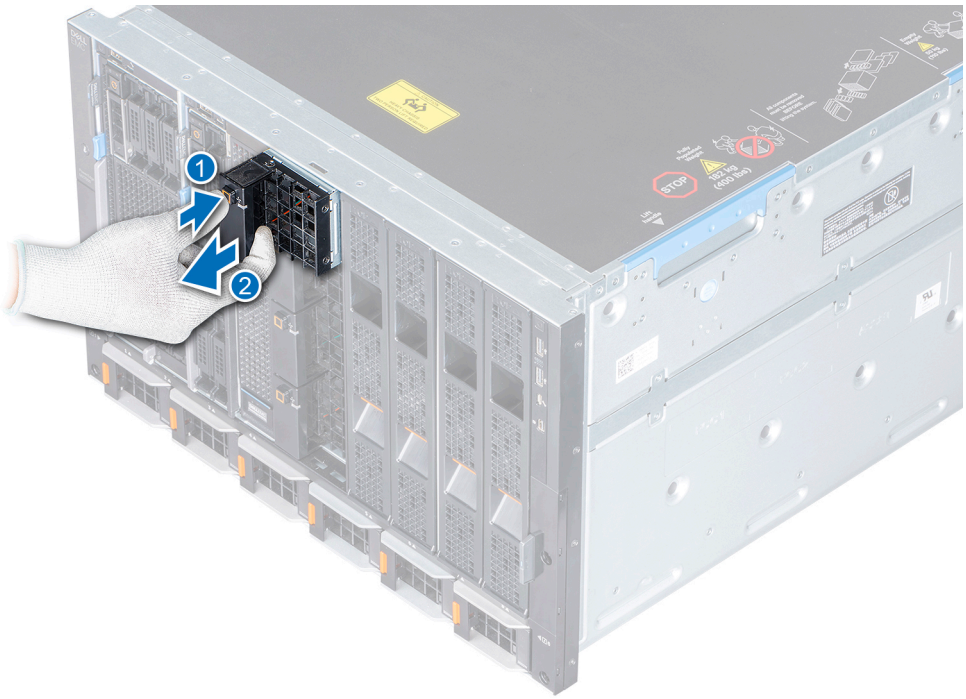

Figure 22. Removing a front fan module

Next steps

1. Install a front fan module.

Installing a front fan module

Steps

1. Insert the fan module into the fan bay.
2. Push the fan module into the fan bay, until it locks into place.

   NOTE: Ensure that the green LED on the fan module is illuminated, indicating that the module is functioning properly.

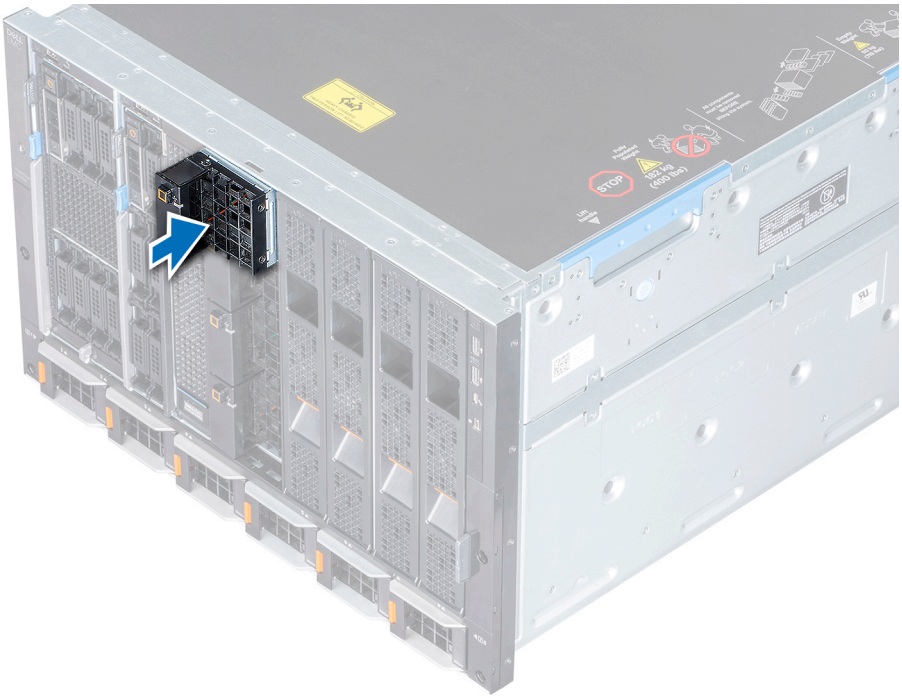

Figure 23. Installing the front fan module

Removing a rear fan module

Steps

1. Press the release button to release the fan module.
2. Hold and pull the fan module out of the fan bay.

Figure 24. Removing a rear fan module

Next steps

1. Install the rear fan module.

Installing a rear fan module

Steps

1. Insert the fan module into the fan bay.
2. Push the fan module into the fan bay, until it locks into place.

   NOTE: Ensure that the green LED on the fan module is illuminated, indicating that the module is functioning properly.

Figure 25. Installing a rear fan module

Power supply units

Removing a power supply unit

Prerequisites

CAUTION: At least two power supply units (PSUs) must be installed for the enclosure to function properly.

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the power cable from the power connector associated to the PSU you intend to remove.

Steps

1. Press the orange release button to open the PSU release lever.
2. Hold the release lever, pull the PSU out of the enclosure.

   CAUTION: Ensure that you install a PSU blank if you are removing a PSU permanently.

Figure 26. Removing a power supply unit

Next steps

1. Install a PSU or a PSU blank.

Installing a power supply unit

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Push the PSU into the enclosure until it is seated firmly.
2. Close the PSU release lever to secure the PSU in the bay.

Figure 27. Installing a power supply unit

Next steps

1. Connect the power cable to the corresponding PSU connector on the rear of the chassis.

   NOTE: When installing or hot swapping a PSU, wait for 15 seconds for the system to recognize the PSU and determine its status. The PSU redundancy may not occur until discovery is complete. Wait until the new PSU is discovered and enabled before you remove any PSU. The PSU status indicator turns green to indicate that the PSU is functioning properly.

Fabrics and modules

There are several connections on the Main Distribution Board to enable communication between the IOMs. Between each pair of IOMs (C1 and C2), there is a link for intermodule communication. This link is referred as Fabric-V in the schematics. This link supports a x1 connection with each lane operating up to 10 Gbps per direction. In addition to the Fabric-V, there are handshake signals between the two modules to facilitate redundancy/failover or other module to module communication. The usage of these interconnects depends on the IOM design and its particular requirements.

There are three fabrics connections available in MX7000 enclosure.

- General purpose (2) - Fabric A and B
- Storage (1) - Fabric C

- Fabric module A or B
- Fabric module C
- Management module

Removing a blank from Fabric A or B slot

Steps

1. Press the blue release button to release the blank.
2. Pull the blank out of the enclosure.

   NOTE: To maintain proper airflow, ensure that the blanks are installed if the IOMs are not installed.

Figure 28. Removing a blank from Fabric A or B slot

Next steps

1. Install a module in the Fabric A or B slot or a blank.

Installing a blank in Fabric A or B slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Remove the module from Fabric A or B slot.

Steps

1. Align and insert the blank in the empty slot.
2. Push the blank, until it locks into place.

Figure 29. Installing a blank in Fabric A or B slot

Removing a module from Fabric A or B slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the cables that are connected to the modules.

Steps

1. Press the orange release button on the module to open the release levers.
2. Hold the release levers, and pull the module out of the enclosure.

NOTE: Ensure that you install an IOM blank if you are removing a module permanently.

Figure 30. Removing a module from Fabric A or B slot

Next steps

1. Install a module into Fabric A or B slot or a blank.

Installing a module in Fabric A or B slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align and push the I/O module into the enclosure.
2. Close the release lever to lock the module in place.

Figure 31. Installing a module into Fabric A or B slot

Next steps

1. Connect the cables to the module.

Removing a MX7000 blank from Fabric C slot

Steps

1. Press the release button to release the blank.
2. Pull the blank out of the enclosure.

NOTE: To maintain proper airflow, ensure that the blanks are installed if the MX7000 IOMs is not installed.

Figure 32. Removing a blank from Fabric C slot

Next steps

1. Install the module in the Fabric C slot or a blank.

Installing a MX7000 blank in Fabric C slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Remove the module from Fabric C slot.

Steps

1. Align and insert the blank in the empty slot.
2. Push the blank until it locks into place.

Figure 33. Installing a blank in Fabric C slot

Removing a MX7000 module from Fabric C slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the cables that are connected to the modules.

Steps

1. Press the orange release button on the module to open the release lever.
2. Hold the release lever, and pull the I/O module out of the enclosure.

   NOTE: Ensure that you install MX7000 an IOM blank if you are removing a module permanently.

Figure 34. Removing a MX7000 module from Fabric C slot

Next steps

1. Install a module into Fabric C or Install a blank.
2. Connect the cables to the module.

Installing a MX7000 module into Fabric C slot

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align and push the I/O module into the enclosure.
2. Close the release lever to lock the module in place.

Figure 35. Installing a MX7000 module into Fabric C slot

Next steps

1. Connect the cables to the module.

NOTE: Ensure that the SAS IOMs have the same firmware version. The OpenManage-Enterprise modular allows you to view the firmware details. For more information, see *OpenManage Enterprise-Modular User's Guide*.

Removing a management module blank

Steps

1. Press the release button to release the blank.
2. Pull the blank out of the enclosure.

NOTE: To maintain proper airflow, ensure that the blanks are installed if the management module is not installed.

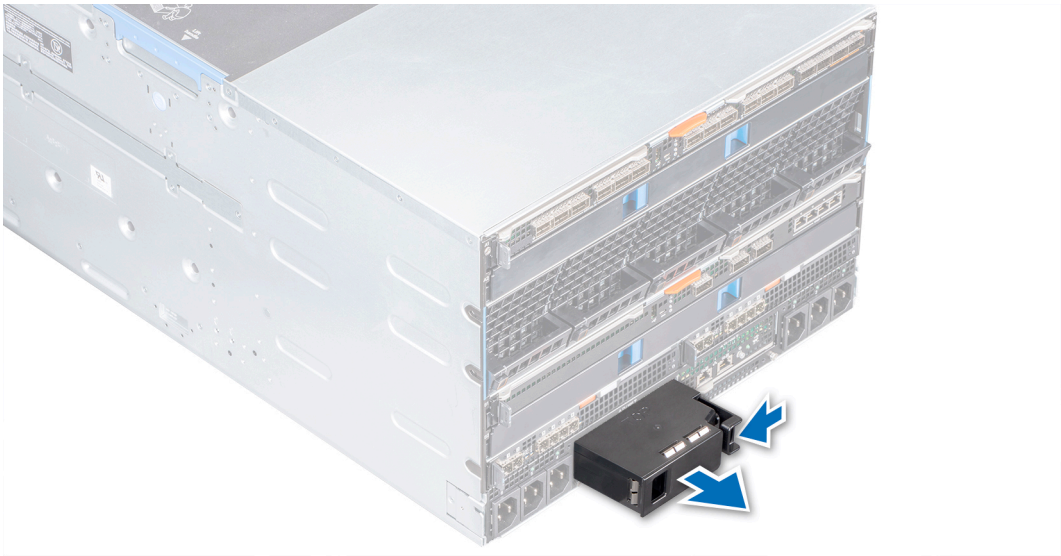

Figure 36. Removing a management module blank

Next steps

1. Install the management module or Install a blank.

Installing a management module blank

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Remove the management module.

Steps

1. Align and insert the blank in the empty slot.
2. Insert and push the blank until it locks into place.

Figure 37. Installing a management module blank

Removing a management module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.
2. Disconnect the cables that are connected to the modules.

Steps

1. Press the orange release button on the module to open the release lever.
2. Hold the release lever, and pull the management module out of the enclosure.

   NOTE: Ensure that you install a IOM blank if you are removing a module permanently.

Figure 38. Removing a management module

Next steps

1. Install the management module or Install a blank.
2. Connect the network cables to the module.

Disabling a forgotten Management Module password

The software security feature of the system includes a Management Module password. The Management Module password jumper enables or disables Management Module password features and clears any Management Module passwords in use. You must have physical access to the chassis to recover and reset the forgotten password.

Prerequisites

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 is not covered by your warranty. Read and follow the safety instructions that are shipped with your product.

Steps

1. From the chassis, remove both the Management Modules (MM).
2. Turn the MM over and locate the P57 RESET PASSWORD jumper (marked as PWD_RST on the printed circuit board).

Figure 39. Management Module jumper

3. Move the jumper from pins 2 and 3 to pins 1 and 2.
4. Reinsert the MM into the chassis and connect the network cables.
5. When OME-M is available, log in with the default username **root** and password **calvin**.
6. After the root user authenticates, change the **root** password through the **Application Settings** > **Users page**.
7. Log out and log in again using the modified password to ensure that the change is successful.
8. Remove the MM and move the jumper from pins 1 and 2 back to pins 2 and 3.
9. Reinsert the MM into the chassis and connect the network cables.
10. When OME-M is available, log in with the new password.
11. Insert the second MM and connect the network cables.
12. Wait for the password to automatically synchronize with the second MM.

Installing a management module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Align and push the management module into the enclosure.
2. Close the release lever to lock the module in place.

Figure 40. Installing a management module

Next steps

1. Reconnect the network cables to the management module.

Installing the second management module

Prerequisites

1. Follow the safety guidelines listed in Safety instructions.

Steps

1. Remove the filler from the second management module slot.
2. Align and push the second management module into the enclosure.
3. Follow the wiring chassis guidelines from the User's Guide.

   NOTE: User's Guide URL: Dell EMC OpenManage Enterprise-Modular Edition for PowerEdge MX7000 Chassis User's Guide.

4. Ensure that both management modules have the same firmware version of OpenManage Enterprise-Modular.

   NOTE: Deployment engineers will see "Firmware mismatch, and management modules redundancy lost" alerts.

5. No chassis reboot is required once the management module is fully installed.
   a. Management module reboot occurs automatically if the firmware update is required. This will not impact data path.
   b. Management interfaces (iDRAC, IOM, and management module) may encounter link drops during cabling and firmware updates. This is expected as STP reconnects when the management module links are modified or rebooted.

Next steps

1. Reconnect the network cables to the management module.

Support information for GPU

The MX7000 system can support up to 16 T4 GPUs through the vendor module, Amulet Hotkey CoreModule. If you choose to install the Amulet Hotkey core modules, they could be installed in the Fabric B slots of the MX7000 chassis, however support for the vendor modules from Amulet Hotkey comes from Amulet Hotkey. The following list shows the email addresses by region for Amulet Hotkey's technical support:

- eurosupport@amulethotkey.com
- ussupport@amulethotkey.com
- latamsupport@amulethotkey.com
- apsupport@amulethotkey.com

6

Technical specifications

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

Topics:

- Component guidelines
- Chassis dimensions
- Chassis weight
- Fan specifications
- PSU specifications
- Ports and connectors specifications
- PowerEdge MX modules ports and connectors
- Video specifications
- Environmental specifications

Component guidelines

Population rules

System modules must be populated as described in the following table:

Table 11. MX7000 population rules

Category	Maximum population
Blanks	All the empty slots in the MX7000 enclosure must be populated with blanks (Sled, IOM, EC, and PSU). This is required for proper cooling of the enclosure and components.
Fans	All system fans must be populated in the enclosure.
Power supply units	The number of power supply units that are required is dependent upon system configuration and redundancy mode, and the minimum recommended quantity is two. The six PSUs are organized into two groups: Grid A consists of PSUs 1, 2, 3, and Grid B consists of PSUs 4, 5, 6. It is recommended to populate the PSUs in the following order: 1, 4, 2, 5, 3, 6 where an equal number of PSUs on each grid is optimized for Grid Redundancy. PSU redundancy and No Redundancy options do not have any PSU population requirements.
Power cable	AC: One C21/C20 power cable must be connected to the C22 plug corresponding to each populated PSU.
DC power and ground cables	The DC chassis requires special consideration when attaching to site power. Power and ground cables must both use 2AWG wire. **NOTE:** For information about the DC PSU cabling instructions, please see the Cabling instructions for -48 V to -60 V DC power supply Tech sheet that is shipped together with your DC PSU.
Management module	A Management module must be present to control and manage the enclosure. **NOTE:** If a single Management module crashes, the system functions normally. **NOTE:** The enclosure cannot be managed or controlled until the Management module is replaced.
Control panel	The right control panel and one of the left control panel configurations (LCD or LED) must be present on the MX7000 enclosure.

Table 11. MX7000 population rules (continued)

Category	Maximum population
Compute sled	Up to eight single-width or four double-width sleds or a combination can be populated. The double-width sleds must be in slots 1, 3, 5, 7 due to the enclosures design.
Storage Sled	Up to seven Storage sleds can be populated in the enclosure. **NOTE:** One compute node must be present and it must be mapped to a storage node. One Fabric-C SAS IOM must be present and powered ON.
I/O Module	Only Brocade and SAS IOM are supported in Fabric-C.
	Only one type of IOM can be offered in Fabric-C (Fibre Channel or SAS IOM, not mixed).
	Only one type of switch can be offered in Fabric-B (HPCC or Ethernet).
	Two Fabric-C SAS IOMs must be installed if the enclosure contains a Storage Node.
	Mix Speed of pass-through in same fabric is not enabled.
Mezzanine cards	If the enclosure contains a storage node, Fabric-C MiniMezzanine card (HBA330 or Jumbo PERC) must be installed in one compute node.
	Dual Port or quad port mezzanine cards must be installed for redundant IOM/Pass-through configurations.
	The second processor must be installed on the compute node to support Fabric-B Mezzanine / IOM and Fabric-C Mezzanine / IOM.

PSU redundancy and population rules

The number of PSUs required depends on the enclosure configuration and redundancy required. The minimum requirement is two PSUs. The enclosure supports one of the following redundancy modes:

- **No redundancy:** This mode distributes the enclosure power load across all PSUs. There are no specific PSU population requirements for No redundancy. The intent of this mode is to have the highest possible limit for power enablement of devices that are added to the enclosure. If there are single or multiple PSU failures, then the enclosure limits performance to operate within the power capabilities of the remaining PSUs.
- **Grid redundancy:** This mode distributes the enclosure power load across all PSUs. The six PSUs are organized into two groups: Grid A consisting of PSUs 1, 2, 3, and Grid B consists of PSUs 4, 5, 6. For grid redundancy, PSUs should be populated in the following order: 1, 4, 2, 5, 3, 6. The grid with the largest PSU capacity determines the limit for power enablement of devices that are added to the enclosure. If there is a grid or PSU failure, then the enclosure power is distributed among the remaining PSUs with the intent that a single healthy grid will continue to provide power to all the components in the system which can experience varied performance depending on the workload.
- **PSU redundancy:** This mode distributes the enclosure power load across all PSUs. There are no specific PSU population requirements for PSU redundancy. PSU redundancy is optimized for a population of six PSUs, and the enclosure limits the power enablement of devices to fit within five PSUs. If there is a single PSU failure, then the enclosure power is distributed among the remaining PSUs to provide power to all the components in the system which can experience varied performance depending on the workload. If there are fewer than six PSUs, then the enclosure limits the power enablement of devices to fit within all populated PSUs. If there is a single PSU failure, then the enclosure limits performance to operate within the power capabilities of the remaining PSUs.

Table 12. PSU population rules

PSU count	Population order
2	1, 4 (Optimized for Grid Redundancy 1+1, and Hot Spare)
3	1, 4, 2
4	1, 4, 2, 5 (Optimized for Grid Redundancy 2+2, and Hot Spare)
5	1, 4, 2, 5, 3
6	1, 4, 2, 5, 3, 6 (Optimized for Grid Redundancy 3+3, PSU Redundancy 5+1, and Hot Spare)

Hot Spare: The MX7000 PSUs support the Hot Spare feature with three PSU pairs. This feature enables a PSU pair to have one active PSU and one PSU in sleep mode while the enclosure power consumption is low, and the three PSU pairs meet all the power requirements for the enclosure. This enables efficient power utilization when the overall enclosure power requirement is low. The partner PSU wakes the paired PSU from sleep mode by sending a WAKE signal when the enclosure power requirement increases. The PSU pairs for MX7000 are—1 & 4, 2 & 5, and 3 & 6.

Chassis dimensions

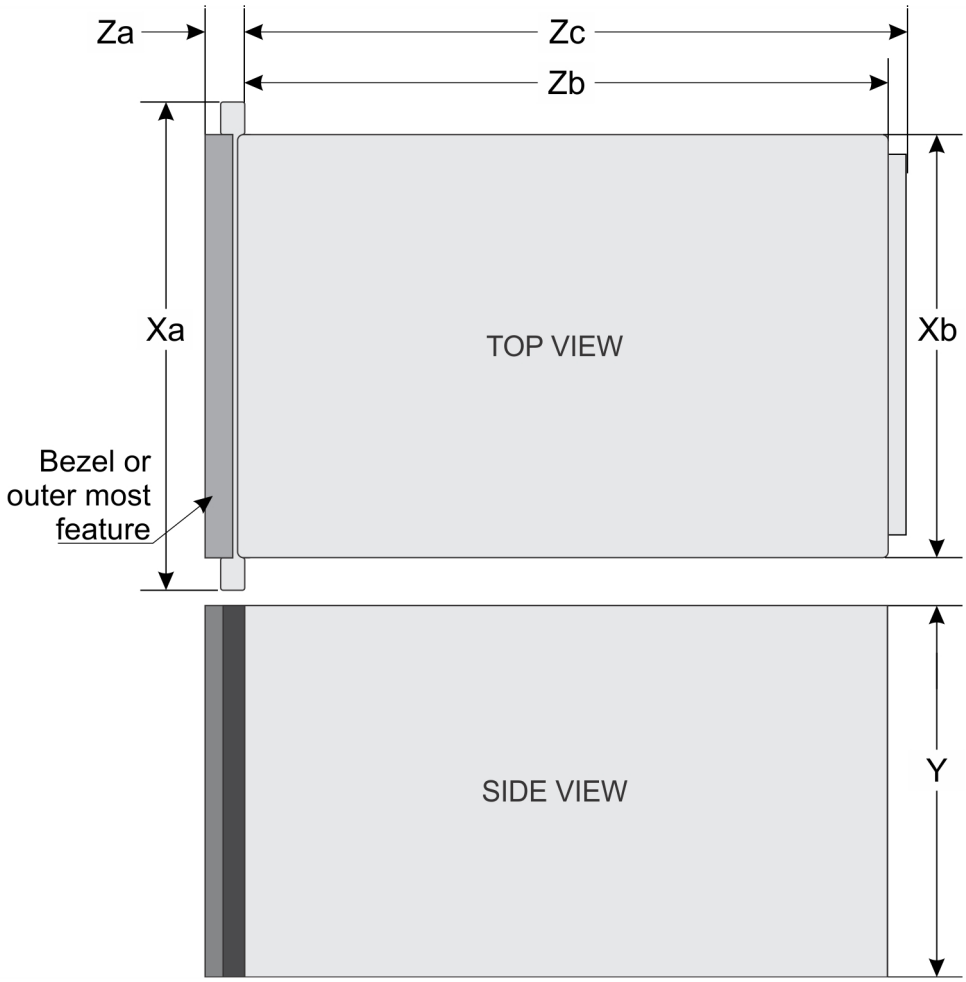

Figure 41. Dimensions of the PowerEdge MX7000

Table 13. Dimensions of the PowerEdge MX7000

Description	Dimension
Xa	482 mm (18.98 inches)
Xb	445 mm (17.52 inches)
Y	307.4 mm (12.11 inches)
Zb	811.6 mm (31.96 inches)
Zc	816.6 mm (32.15 inches)

Chassis weight

Table 14. Chassis weight

Enclosure	Minimum weight	Maximum weight (fully populated)
PowerEdge MX7000	82 kg (180 lbs)	182 kg (400 lbs)

Fan specifications

The PowerEdge MX7000 enclosure supports four front accessible hot-swap cooling fans and five rear accessible hot-swap cooling fans. The cooling fan assembly ensures that the key components of the server such as the sleds, Fabrics, and I/O modules get adequate air circulation to keep them cool. A cooling fan failure can result in overheating and may lead to damage.

Table 15. Supported fans

Fan location	Front	Rear
Size	60 mm	80 mm
Number of fans	4	5
Redundancy	3+1	4+1

PSU specifications

The PowerEdge MX7000 enclosure supports up to six AC or DC power supply units (PSUs).

Table 16. PSU specifications

Description	Specification
PSU	6 x 3000 W AC or DC
Class	Platinum
Heat dissipation (maximum)	1205 BTU/hr
Frequency	50/60 Hz
Voltage	100–240 V AC, autoranging -48 V DC to -60 V DC
Current	6 x 16 A for AC input 6 x 83.2 A for DC input
Inrush current (AC)	• Maximum 40 A per power supply for 10 ms or less • Maximum 50 A per power supply for 1.2 ms or less
Inrush current (DC)	The DC PSU inrush conforms to the maximum inrush current characteristics for telecommunications and datacom equipment at nominal voltage and maximum load as described in ETSI EN 132-2 V2.5.1 (2016-10).
Connector	AC or DC power connector

CAUTION: Mixed high line and low line AC inputs in the same enclosure is not supported.

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

NOTE: In an ideal input voltage condition and over the entire enclosures ambient operating range, the AC inrush current may reach 120 A per power supply for 10 ms or less.

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

Class A system- warning statement for -48vDC power supply.

警告使用者：

此為甲類資訊技術設備，於居住的環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

E44S (本型式係準系統DC機種)

Figure 42. Warning statement

NOTE: For information about DC PSU cabling instructions, see the Cabling Instruction for MX7000 with -48 V DC Power Supply Tech sheet that is shipped with your DC PSU or check the online document available on dell/support.

Ports and connectors specifications

USB ports

The PowerEdge MX7000 enclosure supports two Type A, USB 2.0 ports on the front panel.

Mini DisplayPort

The PowerEdge MX7000 enclosure supports one Mini DisplayPort (mini DP) on the front panel.

NOTE: You must use a mini DP dongle to connect the enclosure to a VGA display.

PowerEdge MX modules ports and connectors

PowerEdge MX760c

Table 17. PowerEdge MX760c externally accessible connectors

Connector	Description
USB ports	• One USB 3.0-compliant port on the front of the sled. • One micro USB 2.0-compliant port for iDRAC Direct on the front of the sled. **NOTE:** The micro USB 2.0-compliant port on the front of the sled can only be used as an iDRAC Direct port.

PowerEdge MX750c

Table 18. PowerEdge MX750c externally accessible connectors

Connector	Description
USB ports	• One USB 3.0-compliant port on the front of the sled. • One micro USB 2.0-compliant port for iDRAC Direct on the front of the sled. **NOTE:** The micro USB 2.0-compliant port on the front of the sled can only be used as an iDRAC Direct port.

PowerEdge MX740c

Table 19. PowerEdge MX740c externally accessible connectors

Connector	Description
USB ports	• One USB 3.0-compliant port on the front of the sled. • One USB 3.0-compliant internal port. • One micro USB 2.0-compliant port for iDRAC Direct on the front of the sled. **NOTE:** The micro USB 2.0-compliant port on the front of the sled can only be used as an iDRAC Direct port.

PowerEdge MX840c

Table 20. PowerEdge MX840c externally accessible connectors

Connector	Description
USB ports	• One USB 3.0-compliant port on the front of the sled. • One USB 3.0-compliant port internal port. • One micro USB 2.0-compliant port for iDRAC Direct on the front of the sled. **NOTE:** The micro USB 2.0-compliant port on the front of the sled can only be used as an iDRAC Direct port.

MX7116n Fabric Expander Module

Table 21. MX7116n Fabric Expander Module externally accessible connectors

Connector	Description
Externally accessible connectors	• 2 QSFP28-DD connections to the MX7116n

MX9116n Fabric Switching Engine

Table 22. MX9116n Fabric Switching Engine externally accessible connectors

Connector	Description

Externally accessible connectors	• 12 QSFP28-DD ports that can be configured as:
	  ○ 2 x 40 GbE or 2 x 100 GbE ports for uplinks
	  ○ 8 x 10 GbE or 8 x 25 GbE ports for rack servers
	• 2 QSFP28 uplink ports that can be configured as:
	  ○ 1 x 40 GbE
	  ○ 1 x 100 GbE

Table 22. MX9116n Fabric Switching Engine externally accessible connectors

Connector	Description
	○ 2 x 50 GbE ○ 4 x 10 GbE ○ 4 x 25 GbE ● 2 QSFP28 unified ports that can be configured as: ○ 1 x 40 GbE ○ 1 x 100 GbE ○ 2 x 50 GbE ○ 4 x 10 GbE ○ 4 x 25 GbE ○ 8 x 8/ 16/ 32 GbE Fibre Channel mode

MX9002m Management Module

Table 23. MX9002m Management Module externally accessible connectors

Connector	Description
Externally accessible connectors	● Two x 1G-BaseT Ethernet ports ● One x Micro-B USB port

MX5108n Ethernet Switch

Table 24. MX5108n Ethernet Switch externally accessible connectors

Connector	Description
Externally accessible connectors	● 2 x 100 GbE QSFP28 uplink ports ● 1 x 40 GbE QSFP+ uplink port ● 4 x 10GBASE-T uplink ports ● USB Serial and USB Flash ports

MXG610s Fibre Channel Switch

Table 25. MXG610s Fibre Channel Switch externally accessible connectors

Connector	Description
USB port	One micro USB 2.0-compliant port on the front of the sled.
Fibre Channel transceiver	16 external ports supporting 8/ 16/ 32 Gbps speeds using 8 SFPs and 2 QSFPs.

PowerEdge MX 10GBASE-T Ethernet Pass-Through Module

Table 26. PowerEdge MX 10GBASE-T Ethernet Pass-Through Module externally accessible connectors

Connector	Description
Fibre Channel transceiver	16 external ports supporting 10 GbE connections

PowerEdge MX 25 Gb Ethernet Pass-Through Module

Table 27. PowerEdge MX 25 Gb Ethernet Pass-Through Module externally accessible connectors

Connector	Description
Fibre Channel transceiver	16 external ports supporting 25 GbE connections

Video specifications

The management module supports an integrated Matrox G200eW3 graphics controller with a 16 MB video frame buffer.

Table 28. 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

NOTE: For additional information about environmental measurements for specific system configurations, see www.dell.com/poweredgemanuals.

Table 29. Temperature specifications

Temperature	Specifications
Storage	–40°C to 65°C (–40°F to 149°F)
Maximum temperature gradient (Operating and storage)	20°C/h (36°F/h)

Table 30. Relative humidity specifications

Relative humidity	Specifications
Storage	5% to 95% RH with 33°C (91°F) maximum dew point. Atmosphere must be noncondensing always.
Operating	10% to 80% RH with 29°C (84.2°F) maximum dew point.

Table 31. Maximum vibration specifications

Maximum vibration	Specifications
Operating	0.26 G_{rms} at 5 Hz to 350 Hz (all axis)
Storage	1.88 G_{rms} at 10 Hz to 500 Hz (vertical axis)

Table 32. Maximum shock pulse specifications

Maximum shock pulse	Specifications
Operating	Shock pulses in the positive and negative x, y, and z axis of 6 G for up to 11 ms.
Storage	Shock pulses in the positive z axis of 71 G for up to 2 ms. Shock pulses in the positive and negative x and y axis of 20 G for up to 7 ms.

Table 33. Maximum altitude specifications

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

Table 34. Operating temperature derating specification

Operating temperature derating	Specifications
Up to 35°C (95°F)	Maximum temperature reduces 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 reduces 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 reduces by 1°C/125 m (1°F/228 ft), above 950 m (3,117 ft).

Standard operating temperature

Table 35. 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

Table 36. 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 system can operate continuously in temperatures as low as 5°C and as high as 40°C. For temperatures 35°C to 40°C, derate maximum allowable temperature by 1°C per 175 m (1°F per 319 ft) above 950 m (3,1171 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–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.

Table 36. Expanded operating temperature specifications (continued)

Expanded operating temperature	Specifications
	For temperatures between 40°C and 45°C, derate maximum allowable temperature by 1°C per 125 m (1°F per 228 ft) above 950 m (3.117 ft).

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

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

Expanded operating range

- The operating temperature is specified for a maximum altitude of 950 m for expanded operating range.
- Do not perform cold start at 5°C or lower, due to hard drive constraints.
- Redundant power supplies are required.

Expanded operating temperature restrictions

For more information about the expanded operating temperature restrictions, see the Installation and Service Manual for the PowerEdge MX sleds at www.dell.com/poweredgemanuals.

Table 37. Expanded operating temperature restrictions

System	C30	C35	C40E45
Dell EMC PowerEdge MX7000 including the fans, Management Module, and PSUs	No restrictions	No restrictions	No restrictions
Fabrics A and B modules	No restrictions	No restrictions	The MX9116n is not supported.
Fabric C I/O modules	No restrictions	No restrictions	No restrictions

Particulate and gaseous contamination specifications

The following table defines the limitations that help avoid any damages to the IT equipment and/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 38. Particulate contamination specifications

Particulate contamination	Specifications
Air Filtration	Data center air filtration defines that, 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 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 nondata center environments.

Table 38. Particulate contamination specifications (continued)

Particulate contamination	Specifications
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 nondata center environments.

Table 39. Gaseous contamination specifications

Gaseous contamination	Specifications
Copper Coupon Corrosion	<300 Å/month per Class G1 defines that, ANSI/ISA71.04-1985.
Silver Coupon Corrosion	<200 Å/month defines that, AHSRAE TC9.9.

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

7

Getting help

Topics:

- Recycling or End-of-Life service information
- Contacting Dell EMC
- Documentation feedback
- Accessing system information by using QRL
- Receiving automated support with SupportAssist

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 www.dell.com/recyclingworldwide and select the relevant country.

Contacting Dell EMC

Dell EMC provides several online and telephone based support and service options. If you do not have an active internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell EMC product catalog. Availability varies by country and product, and some services may not be available in your area. To contact Dell EMC for sales, technical assistance, or customer service issues:

Steps

1. Go to www.dell.com/support/home.
2. Select your country from the drop-down menu on the lower right corner of the page.
3. For customized support:
   a. Enter your system Service Tag in the **Enter your Service Tag** field.
   b. Click **Submit**.
   The support page that lists the various support categories is displayed.
4. 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.
5. For contact details of Dell EMC Global Technical Support:
   a. Click Contact Technical Support.
   b. Enter your system Service Tag in the **Enter your Service Tag** field on the Contact Us webpage.

Documentation feedback

You can rate the documentation or write your feedback on any of our Dell EMC documentation pages and click **Send Feedback** to send your feedback.

Accessing system information by using QRL

You can use the Quick Resource Locator (QRL) located on the information tag in the front of the system, to access the information about the PowerEdge system.

Prerequisites

Ensure that your smartphone or tablet has the QR code scanner installed.

The QRL includes the following information about your system:

- How-to videos
- Reference materials, including the Installtion and Service Manual, and mechanical overview
- Your system service tag to quickly access your specific hardware configuration and warranty information
- A direct link to Dell to contact technical assistance and sales teams

Steps

1. Go to www.dell.com/qrl and navigate to your specific product or
2. Use your smartphone or tablet to scan the model-specific Quick Resource (QR) code on your system or in the Quick Resource Locator section.

Quick Resource Locator for PowerEdge MX7000 enclosure

Figure 43. Quick Resource Locator for PowerEdge MX7000 enclosure

Receiving automated support with SupportAssist

Dell EMC SupportAssist is an optional Dell EMC Services offering that automates technical support for your Dell EMC server, storage, and networking devices. By installing and setting up a SupportAssist application in your IT environment, you can receive the following benefits:

- **Automated issue detection** — SupportAssist monitors your Dell EMC devices and automatically detects hardware issues, both proactively and predictively.
- **Automated case creation** — When an issue is detected, SupportAssist automatically opens a support case with Dell EMC Technical Support.
- **Automated diagnostic collection** — SupportAssist automatically collects system state information from your devices and uploads it securely to Dell EMC. This information is used by Dell EMC Technical Support to troubleshoot the issue.

- **Proactive contact** — A Dell EMC Technical Support agent contacts you about the support case and helps you resolve the issue.

The available benefits vary depending on the Dell EMC Service entitlement purchased for your device. For more information about SupportAssist, go to www.dell.com/supportassist.

8

Documentation resources

This section provides information about the documentation resources for your system.

To view the document that is listed in the documentation resources table:

- From the Dell EMC support site:
  1. Click the documentation link that is provided in the Location column in the table.
  2. Click the required product or product version.

     NOTE: To locate the product name and model, see the front of your system.
  3. On the Product Support page, click **Manuals & documents**.
- Using search engines:
  - Type the name and version of the document in the search box.

Table 40. Documentation resources

Task	Document	Location
Setting up your system	For more information about installing and securing the system into a rack, see the Rail Installation Guide included with your rack solution. For information about setting up your system, see the *Getting Started Guide* document that is shipped with your system.	https://www.dell.com/poweredgemanuals
Configuring your system	For information about the iDRAC features, configuring and logging in to iDRAC, and managing your system remotely, see the Integrated Dell Remote Access Controller User's Guide. For information about understanding Remote Access Controller Admin (RACADM) subcommands and supported RACADM interfaces, see the RACADM CLI Guide for iDRAC. For information about Redfish and its protocol, supported schema, and Redfish Eventing implemented in iDRAC, see the Redfish API Guide. For information about iDRAC property database group and object descriptions, see the Attribute Registry Guide. For information about Intel QuickAssist Technology, see the Integrated Dell Remote Access Controller User's Guide.	https://www.dell.com/poweredgemanuals
	For information about earlier versions of the iDRAC documents. To identify the version of iDRAC available on your system, on the iDRAC web interface, click **?** > **About**.	https://www.dell.com/idracmanuals

Table 40. Documentation resources (continued)

Task	Document	Location
	For information about installing the operating system, see the operating system documentation.	https://www.dell.com/operatingsystemmanuals
	Managing your system	For information about system management software offered by Dell, see the Dell OpenManage Systems Management Overview Guide.
For information about setting up, using, and troubleshooting OpenManage, see the Dell OpenManage Server Administrator User's Guide.		www.dell.com/openmanagemanuals > OpenManage Server Administrator
For information about installing, using, and troubleshooting Dell OpenManage Enterprise, see the Dell OpenManage Enterprise User's Guide.		https://www.dell.com/openmanagemanuals
For information about installing and using Dell SupportAssist, see the Dell EMC SupportAssist Enterprise User's Guide.		https://www.dell.com/serviceabilitytools
For information about partner programs enterprise systems management, see the OpenManage Connections Enterprise Systems Management documents.		https://www.dell.com/openmanagemanuals
Working with the Dell PowerEdge RAID controllers	For information about understanding the features of the Dell PowerEdge RAID controllers (PERC), Software RAID controllers, or BOSS card and deploying the cards, see the Storage controller documentation.	www.dell.com/storagecontrollermanuals
Understanding event and error messages	For information about the event and error messages generated by the system firmware and agents that monitor system components, go to qrl.dell.com > **Look Up** > **Error Code**, type the error code, and then click **Look it up**.	www.dell.com/qrl

Table 40. Documentation resources (continued)

Task	Document	Location
Troubleshooting your system	For information about identifying and troubleshooting the PowerEdge server issues, see the Server Troubleshooting Guide.	https://www.dell.com/poweredgemanuals